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Article

Analysis and Measurement of The Impact of Some Monetary and Financial Variables on Achieving Economic Growth

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Abstract: This study objectives to highlight the role of monetary and financial economic variables in promoting economic growth in Iraq. Using the E views 13 programs, the unit root test was applied using the Augmented Dickey-Fuller test. The study concluded that 88% the variation in economic growth is indicated by the independent variables included in the model., while the remaining 12% is attributed to other variables outside the model or may be due to stochastic variables. The results revealed a significant and inverse relationship between interest rates, inflation rates, and government spending in the short term with Gross Domestic Product (GDP). There was no significant relationship between tax revenues in the short term with GDP, and a significant and direct relationship between interest rates and government spending in the long term with GDP. Additionally, there was an significant and inverse relationship between tax revenues and inflation rates long-term with GDP .

Keywords: Economic growth, monetary variables, financial variables

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1. Introduction

The topic of economic growth is of great interest to policymakers, as most countries prioritize increasing their gross domestic product (GDP) to elevate the living standards of their populations. To achieve this, governments resort to a set of measures and actions intended to increase production and thus achieve economic growth [1], [2], [3]. Consequently, several economic variables, including monetary and financial indicators, can be utilized by policymakers to manage the economy and growth. This is because monetary and financial variables significantly influence economic activity. Therefore, achieving economic growth economists and thinkers worldwide, with every country striving to attain it due to its positive effects on various macroeconomic and microeconomic indicators and the living standards of individuals [4].

Study Problem:

This study addresses: the inefficiency in the utilization of monetary and financial variables within national economies, including Iraq, which experiences a significant imbalances. These inefficiencies adversely affect overall economic performance and particularly on the economic growth rate.

Importance of the study:

This study is significant due to the positive effect that monetary and financial variables have on economic growth, highlighting the necessity for policymakers to coordinate these variables effectively.

Objectives of the study:

This study objectives to answer the questions that arise in the mind:

Does the Iraqi economy heavily depend on monetary and financial variables?

To what dimension do these variables effect economic growth in Iraq?

Subsequently, an experimental study will be conducted using econometric analysis to show the effect of monetary and financial variables on economic growth in Iraq [5].

Study hypothesis:

There are several monetary and financial variables (inflation, interest rates, government spending, public revenues (taxes)) that affect the economic growth rate and vary in their impact on the relationship between them and the dependent variable, the economic growth rate [6].

2. Materials and Methods

The theoretical component employed a descriptive approach, focusing on relevant literature, while the practical component utilized quantitative measurement based on economic measurement methods and tools. Subsequently, the quantitative results were interpreted to evaluate the practical aspect in Iraq.

Chapter One: Theoretical Framework of Economic Growth

First: The Concept of Economic Growth and Economic Development Economic growth has become a considerable and widely recognized concept among economists, and it is a goal that many strive to achieve. It is also one of the main objectives of every country in the world. Due to the strong relationship between economic growth and economic development, some economists consider them synonymous. We will attempt to address the concept of each separately with the aim of clarifying the distinction between them.

1. Definition of Economic Growth:

Economic growth indicates to the long term raise in domestic production. Specifically, it denotes the growth in the volume of gross domestic product over a production. Specifically, it denotes. It is a continuous, gradual, and cumulative process. Economic growth signifies a sustained rise in the average real per capita income over time. Average per capita income = sum income / population, meaning that it expresses the per capita share of the average sum income of society. This means that growth is not only an raise in the sum product or sum income, but it goes beyond that to achieve an enhancement in the level of living for individuals represented by an rise in the per capita share of income. Growth can also be accompanied by economic progress if the gross domestic product (GDP) growth rate exceeds the population growth rate. Growth may not lead to economic progress if the gross domestic product (GDP) growth rate is the population growth rate is equal to the growth rate of the gross domestic product; however, if the population growth rate exceeds the GDP growth rate, then, total economic growth is then accompanying by economic decline. Importantly,, economic growth refers to an rise in real per capita income, not nominal income. Therefore, economic growth will not occur unless the average of rise in nominal income exceeds the average of inflation.

2. Defining Economic expansion

Economic expansion can be expressed as the process that brings about thorough and continuous changes, characterized by an rise in real income, an enhancing income distribution benefiting the poor, an enhancing in quality of life, with structural changes in production. Based on this definition, economic development follows two paths. The first is directed toward achieving prosperity, which opens up a broader scope for all non-economic, political, and cultural aspects, making development, in its general sense, intertwine with the concept of economic development. The second points toward the approach that views economic development from the perspective of the quantitative production of goods and services.

3. The Difference Between Growth and Economic Development

The most important differences between economic growth and economic enhancing can be explain through the following points:

1. Economic growth is achieved without implementing decisions that structurally change society. Economic development, on the other hand, is intentional, and its goal is to fundamentally change the social structure to improve the population's standard of living .
2. Economic growth focuses on changes in the volume and quantity of pieces and service individuals receive, whereas economic development emphasizes the quality and types of pieces and service themselves.
3. Economic growth does not significantly focus on the distribution of real income between Individually. In contrast, economic development emphasizes the real rise in average per capita income, particularly for the poor.
4. Economic growth does not emphasize the sources of increased national income, whereas economic development focuses on diversifying these sources.

Second - Sources of Economic Growth

Identifying and controlling the sources of economic growth is a primary objective of economic growth theory. Understanding these sources is crucial, as they are key factors driving economic expansion, the most significant of which include:

1. Population Growth: Population growth results an actual increase in the labor force, thereby raising the number of productive workers. High population growth rates also increase the purchasing power of the population, leading to an expansion of market size. However, there is ongoing debate regarding whether population growth has a positive or negative impact on economic growth. This impact depends on the economic system and its ability to employ and absorb the additional labor force.
2. Technical progress: Technological progress is a crucial factor that increases economic growth and accelerates its rate within society.

It involves is the application of advanced systems and modern technologies in production to either maximize output with minimal input, or maintain the same quantity with the same output using fewer. Consequently, technological progress enhances the productivity of production factors and more efficient utilization of each factor of production.

3. Natural Resources: Natural resources within a society, whether scarce or abundant, are one of the most important determinants of a high rate of economic growth, such as the availability of natural resources, energy sources, and other mineral resources. However, the mere presence of natural resources in a country does not guarantee economic growth; rather, it depends on their optimal utilization. Poor distribution and inefficient use of resources, often resulting from inaccurate and unsound procedures and planning as observed in some Arab oil-producing countries have contributed to long-term declines in economic growth in these countries.
4. Capital: Capital is considered an accumulative factor, comprising of physical assets such as machinery, buildings, land, and others that are involved in production processes. Generally, the greater the stock of capital increases, and the per capita share of it in particular, the greater the volume of production. Over time, capital is exposed to extinction, which requires a specific investment level to cover and exceed what has been lost. Also, the high rate of Labor also requires a level of investment to stabilize the level of capital an individual obtains.

Section Two: The Theoretical Framework of Monetary Variables

First - Monetary Variables

A - Interest Rate

Opinions vary regarding the precise definition of the interest rate, depending on the schools of thought addressing it. However, all definitions share a common core: content: the interest rate is the price a borrower pays in exchange over using borrowed funds for a specific period. It differs from the prices of goods and services because it represents a ratio between the monetary cost of borrowing divided by the amount borrowed. Therefore, it is considered a double-edged sword, as serves is both as return on borrowed funds and a cost. Despite differences in defining the interest rate, it fundamentally represents the return or percentage that the owner of capital receives in exchange for depositing a certain amount in a bank. It also represents the amount of return or percentage that the bank pays in exchange for borrowing a certain amount of money.

Types of Interest Rates

Due to the lack of consensus on a unified definition of the interest rate, several types have emerged with multiple concepts, the most important of these are as follows:

1. **The Nominal Interest Rate**

The nominal interest rate is the rate established by the monetary authority, typically the central bank. Its designation varies across countries. Three types of nominal interest rates are defined: the first rate, the second rate, and the nominal rate.

The first is applied by the central bank to institutions with good financial performance, while the second is applied to institutions with less financial viability than the first. The third is applied to small financial institutions.

2. **The Real Interest Rate**

The real interest rate that Fisher defined in the equation of the share

$$p^e \qquad - i = r$$

As shown in the equation, the real interest rate (r) is equal to the difference between the nominal interest rate (i) and the expected inflation rate (p^e). The distinction between the nominal and real interest rates is of great importance because it is the factor that influences the decisions of creditors and debtors and is the real return on investment and borrowing.

Second: Inflation

Before discussing inflation, it is important to attempt to define it. This definition clarifies the nature of this term, which has recently become a focus of interest among economists due to its impact on the economy and the economic policies adopted to address it. It is a difficult term to explain.

Definition of Inflation

Definitions of inflation vary depending on its causes, as it is a dynamic, multidimensional phenomenon that may result from an increase in the money supply without a corresponding increase in the supply of goods, thereby raising the general price level. One of the most common definitions associates inflation with sustained increases in the general price level over a specific period. However, a temporary rise in the prices of some goods due to certain circumstances is not considered inflation, as prices typically decline once those circumstances improve. Oner defined inflation as "the rate of increase in prices over a specific period. It is a broad measure that reflects the overall increase in prices or the rise in the cost of living for a given country." Labonte defined inflation as "the steady and continuous rise in the general price level or the continuous decline in the value of money."

Types of Inflation

1. Hyperinflation: This is the most dangerous type of inflation, characterized by prices rising at an extremely high rate and the currency's value declining to the point where it becomes insignificant and nearly worthless. It is the most harmful form of inflation to the national economy.

2. Creeping Inflation: This type of inflation refers to a gradual rise in price levels, occurring at a much lower rate than hype inflation.
3. Suppressed or restrained inflation:

Suppressed inflation refers to a situation in which the general price level remains low through various means; however, this apparent stability comes at the cost of a significant accumulation of pressures that could trigger an (explosive) rise in prices later. Suppressed inflation occurs when effective demand exceeds the available supply of goods and services.

Financial Variables

The Concept of Public Expenditures

Public expenditure is defined as the amount of money disbursed by the state to achieve public benefit. It is also described as a cash sum expended by a public entity serving the public interes.

Additionally, public expenditure encompasses all payments and purchases made by various government agencies, including those that the private sector cannot provide but are important to the public sector as a whole, such as spending on defense, infrastructure, health and education sectors, and social welfare payments. It is encompasses defined as from the state's or a public institution's treasury to meet public needs. According to the definitions provided, public expenditures typically take a monetary form, as the state pays to acquire productive resources, goods and services, and consumer goods needed to carry out its activities, such as paying salaries and wages to employees, paying suppliers and contractors, expenditures on the army and security forces, and funding for public services and utilities

1. Elements of Public Expenditures

a. The Monetary Form of Public Expenditures: The state generally adopts a monetary approach to public spending in order to meet public needs. Funds may be paid to purchase goods and services required by public institutions to manage facilities, such as education or health, for example. These sums may also be disbursed as cash subsidies to individuals, including unemployment benefit, disability benefits, and old-age pensions. Additionally, subsidies may be provided to certain economic or social projects to encourage the achievement of their goals.
b. B- Public expenditure must be issued by the state or one of its agencies: Public expenditure must be spent by a public legal entity, such as the Ministry of Health spending one billion dinars to build a hospital. This means that the money spent voluntarily is disbursed from the state treasury to satisfy public needs. Consequently, funds by individuals or companies, without any formal spending relationship with the state, are not considered public expenditure, even if they result in public benefit. Reason: The text was revised to improve clarity, coherence, and formal tone.
c. The purpose of public expenditure is to satisfy public needs: For expenditure to be considered public, it must be allocated to achieve a public benefit. The purpose or intent of public expenditure is to satisfy a public need, not a private one, as the public good is the key criterion when determining public expenditures and them allocations.

2. Divisions of Public Expenditures: Public expenditures are categorized into the following functional divisions: Reason: - Corrected punctuation and capitalization:
   a. State Administrative Expenditures: These encompass costs public facilities and those essential for the state to perform its functions. They also include expenditures defense, security, justice, wages, and similar expenses for state employees. Additionally, administrative expenditures cover also include the Additionally, administrative the head of state and legislative authorities

b. State Social Expenditures: These expenditures are aimed at fulfilling the state's social objectives, including general needs that satisfy citizens' social requirements. This includes providing educational and health facilities, as well as offering assistance to disadvantaged and low-income groups within society. Education expenditures are among the most significant components of social spending, as they contribute to the progress and advancement of societies in both developing and developed countries.

c. Economic expenditures: These represent the total expenditures incurred by the state to achieve economic objectives, including participation in economic activities through investments in various projects. Examples include economic grants provided by the state to increase output, and expenditures that support the national economy by providing essential services such as energy, transportation, and infrastructure

B. The concept of public revenues

Public revenues represent the sum of funds obtained by the government in its sovereign capacity, from its own activities or assets, or from external banks, such as loans, to cover public spending over a specific period of time to achieve a number of economic, social, and financial objectives. From this, it is clear that public revenues are diverse and multifaceted.

1. Types of Public Revenue

Public finance thinkers have differed on the types of public revenues, but most opinions can be summarized as follows.

a. Sovereign revenues: These are revenues obtained by the state by compulsion based on the state's sovereign authority, such as taxes, fines, and fees.

b. Non-sovereign economic revenues: These are revenues obtained by the state in its capacity as a legal and corporate entity, such as revenues generated from the rental of state-owned properties, loans, and grants.

2. Sources of Public Revenue

a. Revenues from State Property

The state owns both movable assets, such as the goods it sells and the services it provides, and immovable assets, including real estate, mines, forests, and oil wells. Revenues generated from these assets support the state in fulfilling its economic role. State property revenues are of two types.

Public domain revenues: These assets are governed by public law and are designated for public benefit, such as roads, public squares, parks, rivers, and ports. The state does not have the right to dispose of such assets, and the state typically does not charge individuals for their use of these assets.

Private domain revenues: These are funds subject to the provisions of private law, as the state disposes of them just as individuals dispose of their own property, such as oil wells, agricultural lands, forests, and various industrial, commercial, agricultural, and financial investment projects undertaken by the state. The private domain is divided into several sections, the most important of which are:

a. Real estate domain: The state owns real estate assets that generate profits, which are deposited into its treasury and classified as public revenues. These revenues specifically include from state ownership of land, buildings, forests, and mines.

b. Industrial and commercial domain: Industrial and commercial domain refers to the industrial and commercial projects owned by the state and represent the revenues the state obtains from the sale of the products and services of these projects. These projects include railway transportation, electricity, gas, postal services, communications, banking, and insurance projects.

c. Financial domain: This refers to the state's financial portfolio, i.e., the stocks and bonds owned by the state. The revenues generated by this portfolio are the profits and interest earned by the state from the stocks and bonds it owns.

C. Tax revenues:

In the modern era, taxes constitute the most significant source of public revenue that the state collects to finance its public expenditures. Their importance arises from their role in achieving the objectives of fiscal policy, the technical and economic problems they raise, and the resulting social and economic impacts. Taxes are defined as a sum of money or financial obligation that the state compulsorily and definitively collects from individuals, without any corresponding public benefit. They are levied to fulfill public objectives, such as covering public expenditures or enabling the state's intervention in economic and social life to achieve its goals. Therefore, taxes represent a compulsory obligation collected without specific compensation; in other words, they are not the price paid for a particular service provided by individuals to the state.

D. Revenues from Fees

Fees are one of the oldest sources of public revenue and are considered extraordinary revenues because they do not recur recurring in the budget.

A fee is a sum of money collected by the state from certain individuals in exchange for a service it provides, such as judicial fees, education fees, license fees, and travel fees. These fees collectively help finance public expenditures and part a portion of the costs of services provided to citizens

E. Revenues from Loans

Public loans are a source of public revenue for the state and are classified as credit revenues. When all regular revenues have been exhausted, the state may need to borrow to cover its increasing expenditures, resorting borrowing from domestic or foreign sources

A public loan is a sum of money that the state obtains from individuals, banks, or other domestic or international financial institutions, with the promise to repay the borrowed amount, along with the accrued interest, on a specified date, in accordance with the terms of the contract.

Section Three

Standard Estimation of the Study Model

Measuring the Impact of Some Monetary and Financial Variables on Achieving Economic Growth in Iraq for the Period (1990-2024)

Based on what was presented from previous studies that included the same topic, in addition to confirming the main study hypotheses and achieving its objectives, this was translated according to a quantitative model in order to measure the impact of some monetary and financial variables in achieving economic growth in Iraq, and using a time series with a range of (35) years for the period (1990-2024), this was achieved by applying the Auto-regressive Distribution Lag Model (ARDL) and what it includes of standard tests before and after estimation.

3. Results and Discussion

First: Model Description:

In this step, the study variables and their expected effects are identified. Therefore, the functional form of the model will be as follows:

$$\boldsymbol{GDP = f(INF, INT, SPN, TAX)} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (\mathbf{1})$$

Where:

GDP: The dependent variable, represented by economic growth, expressed as annual growth in gross domestic product (GDP) (%).

INF: Inflation rate, expressed as annual consumer prices (%).

INT: Real interest rate (%).

SPN: Total general government expenditure (% of GDP).

TAX: Total tax revenue (% of GDP).

Second: The methodology used to estimate the model parameters:

In order to obtain accurate and unbiased results, we relied on the ARDL model, developed in 2001 by Pesaran et al., because it is one of the most important models used

in applying the frontier methodology for discovering cointegration relationships, as well as the error correction model and short- and long-term equilibrium relationships. When applying ARDL, it is required whether the time series have rank I(0), rank I(1), or a combination of the two, provided that they do not have rank I(2). This model also has better properties for short time series compared to other common methods for testing integration [7], [8], [9]. From equation (1) above, the ARDL model will be estimated according to the following standard formula:

$$\boldsymbol{GDP_t = \alpha_0 + \beta_1 GDP_{t-1} + \beta_2 INF_{t-1} + \beta_3 INT_{t-1} + \beta_4 SPN_{t-1} + \beta_5 TAX_{t-1} + \sum_{i=1}^{p} \gamma_1 \Delta GDP_{t-i} + \sum_{i=1}^{p} \gamma_2 \Delta INF_{t-i} + \sum_{i=1}^{p} \gamma_3 \Delta INT_{t-i} + \sum_{i=1}^{p} \gamma_4 \Delta SPN_{t-i} + \sum_{i=1}^{p} \gamma_5 \Delta TAX_{t-i} + \emptyset ECM_{t-i} + \varepsilon_t \dots\dots\dots (2)}$$

Where:

Δ: the change or difference of the variables, **t**: time, $\boldsymbol{\alpha_0}$: the constant term, $\boldsymbol{p}$: the number of time lags, $\boldsymbol{\beta_i}$: the long-run parameters, $\boldsymbol{\gamma_i}$: the short-run parameters, ECM: the error correction coefficient, which expresses the rate of adjustment at which the short-run imbalance is adjusted toward long-run equilibrium after a disturbance or imbalance occurs [9], [10]. The value must be negative and significant, and $\boldsymbol{\varepsilon_t}$: the random variable, also known as the random error term of the model [11].

Third: Applying the Model and Interpreting the Results:

1. Stationary of the Time Series of Variables:

To determine whether the time series were stationary, the ADF test was used, as it is one of the best methods for testing unit roots and determining the degree of cointegration of variables [12]. The criterion "AIC" was also used to eliminate the possibility of any autocorrelation problem for the random error term. This was done to test the null hypothesis, which assumes that the time series is stationary (has a unit root), and the alternative hypothesis, which assumes that the time series is non-stationary (does not have a unit root).

It is clear from Table 1 that the dependent variable and the two independent variables (first and fourth) appeared stationary at the level, meaning they do not contain a unit root. The remaining model variables appeared non-stationary at the level, indicating the acceptance of the null hypothesis, which states that these variables have a unit root [13], [14], [15]. This is because the calculated t-values for these variables were at a significance level greater than 5%, but when the first difference of these variables was taken into account, they became stationary.

Table 1. Results of the stationarity test for the model variables.

Unit Root Test Table by: Augmented Dickey-Fuller "ADF"						
At Level						
Variables		**GDP**	**INF**	**INT**	**SPN**	**TAX**
Intercept	**t-Stat.**	**-9.1868**	**-3.1825**	**-0.9291**	**-2.3023**	**-3.6485**
	Prob.	**0.0000**	**0.0302**	**0.7657**	**0.1770**	**0.0099**
	Decision	***	**	**No**	**No**	***
Trend & Intercept	**t-Stat.**	**-9.2224**	**-3.3408**	**-3.9658**	**-2.3601**	**-4.9607**
	Prob.	**0.0000**	**0.0768**	**0.0198**	**0.3925**	**0.0017**
	Decision	***	*	**	**No**	***
None	**t-Stat.**	**-8.1968**	**-2.9929**	**0.5918**	**-1.2314**	**-1.9263**
	Prob.	**0.0000**	**0.0040**	**0.8384**	**0.1959**	**0.0527**

	Decision	***	***	**No**	**No**	*
At First Difference						
Variables		**d(GDP)**	**d(INF)**	**d(INT)**	**d(SPN)**	**d(TAX)**
Intercept	**t-Statist.**	**-3.8061**	**-5.7205**	**-4.2849**	**-4.3702**	**-8.6844**
	Prob.	**0.0067**	**0.0000**	**0.0022**	**0.0016**	**0.0000**
	Decision	***	***	***	***	***
Trend & Intercept	**t-Statist.**	**-3.7310**	**-5.6302**	**-4.4589**	**-4.3361**	**-8.8019**
	Prob.	**0.0373**	**0.0003**	**0.0071**	**0.0086**	**0.0000**
	Decision	***	***	***	***	***
None	**t-Statist.**	**-3.7608**	**-5.7976**	**-6.8123**	**-4.4447**	**-8.7782**
	Prob.	**0.0005**	**0.0000**	**0.0000**	**0.0001**	**0.0000**
	Decision	***	***	***	***	***

2. Determining the optimal lag period for the model:

It is clear from Figure 1, and by using the Akaike Information Criterion (AIC), that the optimal lag period is (4). Therefore, the model that determines the relationship between the study variables is (2, 1, 4, 4, 1), as shown in the figure below:

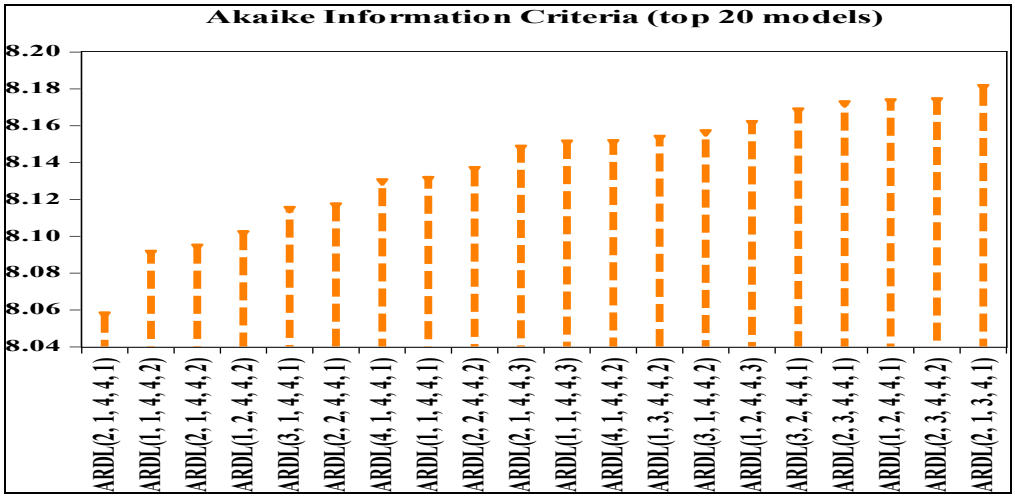

Figure 1. Optimal lag period for the model according to the AIC criterion

3. Bounds testing methodology:

This methodology was proposed in 2001 by Pesaran et al. and is used to verify the presence of cointegration between variables. In other words, it confirms the existence of a long-run equilibrium relationship between the model variables. This is done by comparing the calculated F value with the table F values at significance levels of (10%, 5%, 2.5%, and 1%), respectively (Al-Bajjari and Al-Mashhadani, 2019, p. 175-176). Table 2 shows that the calculated F value reached (7.328), which is greater than the table F value for the minimum of (3.47) and the maximum of (4.57) at a significance level of (5%). This indicates the presence of cointegration, or in other words, the existence of a long-run relationship between the study variables [16], [17].

Table 2. Cointegration testing using the bounds testing methodology

Bound Test Approach		
Test Statistic	**Value**	**K**
F-Statistic	**7.3275394**	**4**

Critical Value Bounds		
Significance	**Lower Bound I(0)**	**Upper Bound I(1)**
10%	**3.03**	**4.06**
5%	**3.47**	**4.57**
2.5%	**3.89**	**5.07**
1%	**4.4**	**5.72**

5. Estimating and Interpreting Short- and Long-Term Results and the Error Correction Factor:

Table 3 shows the results of estimating the short- and long-term relationship and the error correction factor. The following is noted:

a. Short-Term Relationship Results and the Error Correction Factor:
b. The results showed that the error correction factor reached (-0.760292), which is a negative and statistically significant value, confirming the validity of the long-term equilibrium relationship. In other words, the possibility of correcting model errors. This means that (76%) of the imbalances that occur in the model's equilibrium in Iraq require correction within one year and three months. $\left\{\frac{1}{0.760292} = 1.32 \cong 1.3\right\}$
c. There is an inverse and significant relationship between the inflation rate and economic growth. This means that a 1% increase in the inflation rate will lead to a decrease in economic growth by -0.157%.
d. There is an inverse and significant relationship in the first lag period between the interest rate and economic growth. This means that a 1% increase in the interest rate in the first lag period will lead to a decrease in economic growth by -1.666%.
e. There is an inverse and significant relationship in the first lag period between government spending and economic growth [18], [19], [20]. This means that a 1% increase in government spending in the first lag period will lead to a decrease in economic growth by -0.815%.
f. There is no significant relationship between tax revenues and economic growth, as the calculated t value for the parameter is at a significance level greater than 5%.

Results of the long-run relationship:

a. There is an inverse and significant relationship between the inflation rate and economic growth [21], [22], [23]. This means that a 1% increase in the inflation rate will lead to a decrease in economic growth by -0.252%.
b. There is a direct and significant relationship between the interest rate and economic growth. This means that a 1% increase in the interest rate will lead to an increase in economic growth by 3.413%. This result is the opposite of the short-term effect.
c. There is a direct and significant relationship between government spending and economic growth [24], [25]. This means that a 1% increase in government spending will lead to an increase in economic growth by 1.817%.
d. There is an inverse and significant relationship between tax revenues and economic growth. This means that a 1% increase in tax revenues will lead to a decrease in economic growth by -36.602%.

Explanatory power and significance of the estimated model:

The results indicate the significance and quality of the estimated model, as the coefficient of determination (R2) value reached 88%, indicating that the model has high explanatory power. The remaining 12% is attributed to other variables outside the model or may be due to the random variable [26], [27]. The calculated F value also reflects the

significance of the model as a whole, reaching 10.593, with a significance level of less than 5%.

Table 3. Estimates of long- and short-term results

Method: ARDL (2, 1, 4, 4, 1)				
Short Run Coefficients				
Variables	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
ECM(-1)*	**-0.760292**	**0.183143**	**-4.151348**	**0.0011**
D(GDP(-1))	**-0.369239**	**0.266223**	**-1.386955**	**0.1888**
D(INF)	**-0.157107**	**0.046219**	**-3.399216**	**0.0047**
D(INT)	**0.324691**	**0.354569**	**0.915734**	**0.3765**
D(INT(-1))	**-1.665784**	**0.403791**	**-4.125360**	**0.0012**
D(INT(-2))	**-1.135915**	**0.317566**	**-3.576944**	**0.0034**
D(INT(-3))	**-0.342441**	**0.208900**	**-1.639255**	**0.1251**
D(SPN)	**0.203210**	**0.400597**	**0.507267**	**0.6205**
D(SPN(-1))	**-0.815441**	**0.285558**	**-2.855605**	**0.0135**
D(SPN(-2))	**-0.760292**	**0.242646**	**-3.133333**	**0.0079**
D(SPN(-3))	**-0.386073**	**0.175742**	**-2.196815**	**0.0468**
D(TAX)	**-7.106092**	**8.461161**	**-0.839848**	**0.4162**
Long Run Coefficients				
Variables	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
INF	**-0.252483**	**0.056830**	**-4.442748**	**0.0007**
INT	**3.413167**	**0.771056**	**4.426614**	**0.0007**
SPN	**1.816714**	**0.384897**	**4.719996**	**0.0004**
TAX	**-36.60222**	**12.58070**	**-2.909394**	**0.0122**
C	**58.70307**	**16.76149**	**3.502258**	**0.0039**
R-squared	**0.875960**	**Adjusted R-squared**	**0.793267**	**R-squared**
F-statistic	**10.59292**	**Prob. (F-statistic)**	**0.000008**	**F-statistic**
(*): Error Correction Model.				

6. Model Diagnostic Testing Phase:

After completing the estimation of the model parameters, a set of diagnostic tests will be conducted to ensure the quality of the estimated model's performance before its adoption [28], [29]. Table 4 shows that the diagnostic tests for examining the standard problems facing the estimated model in Iraq showed no evidence of any standard problems, indicating its proper use [30], [31], [32], [33].

Table 4. Diagnostic Tests for Examining the Standard Problems of the Estimated Model

The Diagnostic Checking			
Jarque-Bera Test			
Jarque-Bera	**3.8597**	**Prob.**	**0.1452^{No}**
Serial Correlation LM Test: Breusch-Godfrey			
F-statistic	**0.4648**	**Prob. F(4,9)**	**0.7604^{No}**
Heteroskedasticity Test: ARCH			

F-statistic	**1.3104**	**Prob. F(4,22)**	**0.2970**[No]
Ramsey RESET Test			
F-statistic	**1.1374**	**df (4,16)**	**0.3743**[No]
Variance Inflation Factors			
INF	**4.68E-05**	**4.652849**	**1.008929**
INT	**4.83E-05**	**1.155204**	**1.031803**
SPN	**1.95E-06**	**1.268671**	**1.046658**
TAX	**7.08E-05**	**1.914267**	**1.057717**
C	**0.129995**	**6.389704**	**NA**

7. Structural stability test of the estimated model parameters:

Figure 2 shows that the estimated coefficients of the model variables enjoy a degree of structural stability throughout the study period, based on the cumulative sum of recurring residuals and cumulative sum of squared recurring residuals tests [34], [35], [36]. This is because the graph for both tests lies between the two lines throughout the study period, indicating the stability of the parameters at a significance level of (5%) [37].

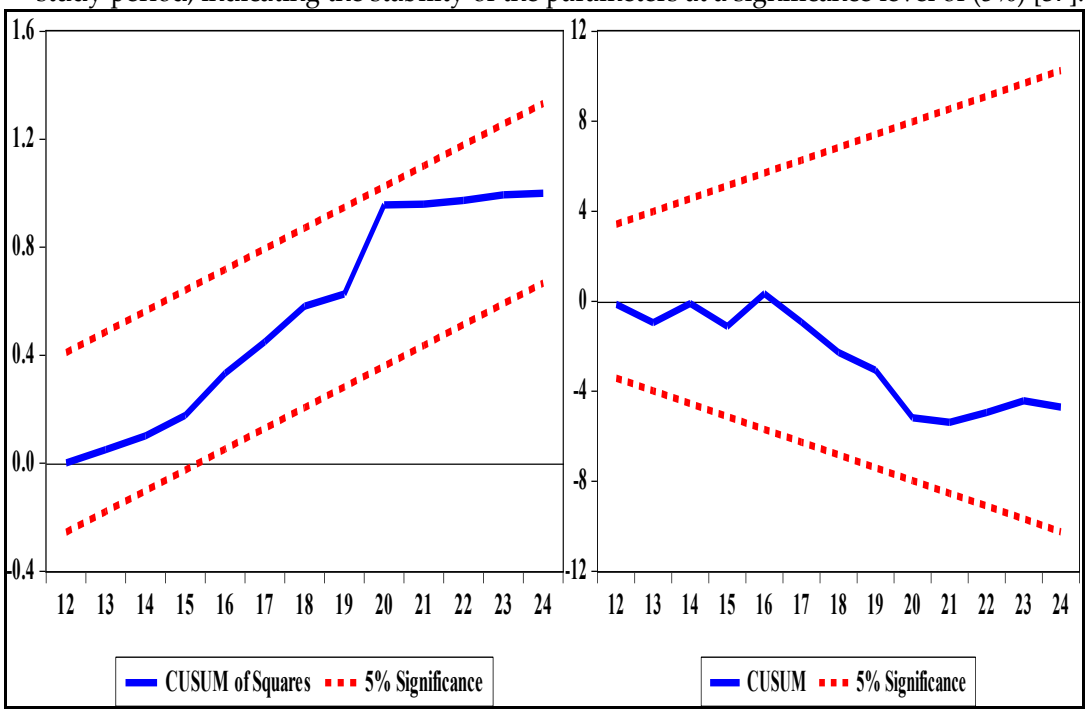

Figure 2. Structural stability test for the parameters of the estimated model

4. Conclusion

The analysis conducted in this study highlights the significant role of monetary and financial variables in driving economic growth in Iraq. The findings suggest that key variables such as inflation, interest rates, government spending, and tax revenues play varying roles in shaping the economic landscape. In the short run, inflation and interest rates show an inverse relationship with economic growth, while government spending demonstrates a similar negative effect. However, in the long term, the relationship shifts, with government spending and interest rates exhibiting a positive effect on economic growth, suggesting that strategic fiscal policies can foster sustained economic progress. Additionally, the study reveals that despite the significant influence of these monetary and financial variables, tax revenues did not show a substantial short-term impact on economic growth. This underlines the importance of optimizing fiscal policies to enhance their effectiveness in promoting economic development. The ARDL model employed provides valuable insights into the dynamic relationships between these variables, with

the results indicating a high explanatory power of 88% in terms of the variation in Iraq's economic growth.

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