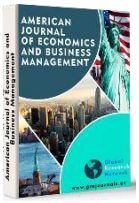

American Journal of Economics and Business Management

Vol. 7 Issue 11 | **pp.** 996-1008 | **ISSN:** 2576-5973
Available online @ https://www.globalresearchnetwork.us/index.php/ajebm

Article

The Effect of Financial and Economic Strategies on Monetary Development in Iraq for the Period (1990-2022)

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Abstract: The research directs to examine the performance of monetary and economic strategies (1990-2022) and their influence on financial development according to the St. Louis model. The results of the analysis determine that the influence of economic strategy on monetary development, in the long run, is greater than the impact of budgetary procedure, but in practice, the impact of each is large and complementary to the other. Accordingly, using the (ARDL) Auto Regressive Distributive Lag Model, a direct and significant association was observed for both money supply and government spending on economic growth, confirming the presence of a long-term association.

Keywords: Economic Strategies, Financial Development, Monetary Development

1. Introduction

Monetary and economic strategies are amongst the most important economic policies for any developed or developing country. Interest in monetary and fiscal strategies has yet to be highlighted in economics literature since the world has witnessed several economic shocks resulting from the emergence of new problems that were unfamiliar before, represented by unemployment, inflation, and stagflation. Like other countries, Iraq demands such economic policies to advance its economy, achieve high growth rates, control inflation rates, reduce the unemployment gap, and achieve external balance. The research combines these two models to comprehensively examine the association between financial and commercial strategies and pecuniary development in Iraq. The St. Louis formula will focus on the direct impact of both money source and government spending (Bahit, 2020). At the same time, the ARDL model will provide a framework for understanding how these variables network over time in the brief and extended term. This link between the two models targets to make the results more precise about the value of financial procedures in stimulating growth in GDP in an environment characterized by economic and political fluctuations.

1. The Problem

The problem raises many queries about how fiscal policy, represented by government spending, and monetary policy, represented by money supply, affect GDP growth in Iraq and whether there is a difference in their short and long-term impact. The following question develops the problem:

Citation: Al-Adhimi, A, M, H. The Effect of Financial and Economic Strategies on Monetary Development in Iraq for the Period (1990-2022). American Journal of Economics and Business Management 2024, 7(11), 996-1008.

Received: 10th August 2024
Revised: 11th Sept 2024
Accepted: 24th Oct 2024
Published: 22th Nov 2024

To what degree do financial and economic strategies affect pecuniary development in Iraq?

2. Study hypotheses

To reach the anticipated results of the research, the subsequent postulate was prepared: Since the Iraqi economy is rentier, fiscal strategy affects economic growth more than monetary policy.

2. Materials and Methods

Study method and tools: Scientific research can only reach the required results if done according to a clear method by studying the problem under study and reaching reliable scientific results. The researcher utilizes a set of methodological procedures and rules. To check the phenomenon of the association between economic policy, fiscal strategy, and economic development and to study this phenomenon and analyze its dimensions in the Iraqi economy, the descriptive method will be used and supported by the standard method by formulating the standard model according to the St. Louis equation and the ARDL model.

Research objectives

a. Identify the growths that monetary and economic strategies have gone through in Iraq.
b. Know the degree of the effect of currency source and public spending on commercial development in Iraq.
c. Analyze and examine the impression of budgetary and efficient approaches on profitable development using Eviews 12 software.

3. Results

The first axis: Definition of fiscal strategy and monetary policy

1. Monetary policy

Monetary policy has many definitions, incorporating what economist Johnson described as "the tool utilized by the central bank to influence the money source by functioning it to maintain the overall purposes of financial strategy. Others defined budgetary strategy as a group of implements utilized by the central bank in order to achieve economic stability (Haddad & Hadhloul, 2005).

"While economist Bach described it as "everything the government does that successfully assumes the extent and structure of fluid benefits considered by the non-banking segment, whether exchange, payment, or management relationships (Ali, 1986) " and another defined it as "a group of administration-type choices proceeded by the central bank to organize the amount of currency distributing in the budget (Ragan, 2004)".

2. Economic Procedure

Economic procedure is described as a tool for using both government devoting and taxes in addition to credits to affect collective request according to the republic's cost-effective circumstances, with the position in attaining commercial development, reducing unemployment, and attaining rightfulness through redistributing income.

(Enzing, 1964), Moreover, it is worth noting in (Bach's) definition that he concentrated on the goal of economic growth and reducing unemployment growth without addressing other economic variables and their role in achieving stability in the general price level.

Some also see it as (the use of the overall budget through taxes, loans, and community expenses to reach financial goals and primarily achieve balance and stability in the national economy) (Annaba, 1985).

Others see fiscal policy as a systematic study of financial activity in the public sector and the effects of this activity on the various economic sectors in the country,

including adjusting the size of spending and sources of public revenues to attain specific targets such as advancing the national economy and bringing society's demands closer together (Zhang, 2024).

Public spending characterizes the government's total cash amounts and transfers to produce goods and services to satisfy various public needs, transfer payments, and paying public debt installments and interest (Al-Obaidi, 2011). Public spending constitutes a large part of aggregate request in developing or developed countries. Public spending is not determined according to government revenues, exports, or profit expectations and is independent of national income. The state must continue public spending even if its income is very low or zero due to its unlimited ability to specify various revenues through borrowing or issuing new currency. Also, the decision on public spending is subject to political decisions in the first place, as well as the viewpoint of the authorities regarding the extent of satisfying public needs and services (Al-Wadi & Azzam, 2010). **The second axis**

The influence of financial and economic strategies on pecuniary development in Iraq (1990-2022)

Iraq's fiscal and monetary policies can be divided into four phases, which are as follows.

1. **The first period: economic sanctions for the period (1990-2003)**

   It is observed in Table No. (1) that the gross national product certified a significant decrease, as it declined from (55,926.5) to (29,585,788.6) for the period (1990-2003), and this is because of the financial supports imposed on Iraq.

   As for public expenditures, they amplified from (0.011) in 1990 to (3.631) in 2003, which is a slight percentage that is not enough to meet the challenges, while the money supply witnessed a noticeable increase, as it rose from (0.015) to (5.773), but no growth in the total local outcome, because of the significant impact of international sanctions on the country's productive capacity, as the growth in the cash source in light of the unavailability of goods led to inflation, indicating the inability of financial strategy to achieve commercial growth in the imposed international sanctions.

2. **The second period: After the economic sanctions (economic regaining) for the period (2003-2008)**

   With the help of Table No. (1) it is observed that the gross domestic product increased significantly from (53,235.36) in 2004 to (155,982.26) in 2008, with a compound growth rate of (51.309%).

   Public expenditures witnessed an increase from (13,609) in 2004 to (52,301) in 2008, which contributed to stimulating economic movement, while money supply increased from (10,149) in 2004 to (28.19) in 2008 at a compound growth rate of (60.73%), which helped provide the liquidity needed for growth.

   The economic recovery in (2003-2008) led to an increase in both GDP and money source as incomes subsequent from the growth in oil values were used to increase public spending.

3. **The third period: The period of the substantial increase in oil prices (recovery) for the period (2009-2014):**

   It is observed in Table No. (1) that the gross local product certified growth, as it rose from (130,643.20) in 2009 to (260,610.44) in 2014, and the compound growth rate reached (16.11%).

   While public expenditures rose from (78.74) in 2009 to (45.941) in 2014, reflecting the government's investment in services and infrastructure developments, the money supply rose from (37.7) in 2009 to (72.692) in 2014. However, it was different from the preceding period.

   The rise in oil prices led to increased government incomes, which prompted the government to increase public spending. However, the money source needed to be higher to increase growth rates.

4. **The fourth period:**

The period of security confronts and political crises (2015-2022): This period witnessed many security challenges imposed by the terrorist organization ISIS in addition to political crises, which led to an increase in community spending and money supply, but economic stability was not achieved, as the gross domestic product witnessed: a slowdown in growth, as the compound growth rate decreased to (9.27%).

Table 1. The influence of community spending and money source on GDP development

Year	GDP (Billion)	Overhead Expenditure (Billion)	Money supply (billion)	Change in GDP	Change in overhead expenditure	Change in money supply	Compound growth rate		
							CAGR (GDP)	CAGR (G)	CAGR (M)
1990	55.926	0.011	0.015	-	-	-	49.85	42.75	42.91
1991	42.452	0.016	0.025	-13.475	0.004	0.009			
1992	115.108	0.026	0.044	62.656	0.01	0.019			
1993	321.647	0.05	0.086	206.539	0.024	0.043			
1994	1,658.33	0.172	0.239	1,336.68	0.122	0.131			
1995	6,695.48	0.606	0.705	5,037.16	0.434	0.466			
1996	6,500.93	0.506	0.961	-14.558	-0.099	0.255			
1997	15,093.14	0.534	1.038	8,592.22	0.028	0.779			
1998	17,125.85	0.825	1.352	2,227.70	0.291	0.314			
1999	34,464.01	0.832	1.484	17,338.17	0.009	0.22			
2000	50,214.70	1.152	1.728	15,750.69	0.32	0.244			
2001	41,314.57	1.49	2.159	-8,898.83	0.288	0.43			
2002	41,022.93	1.762	3.014	-391.641	0.272	0.853			
2003	29,585.79	3.631	5.773	-11,100.14	1.868	2.76			
2004	53,235.36	13.609	10.149	23,649.57	9.978	4.375	51.3	64.3	60.73
2005	73,533.60	14.684	11.399	20,298.24	0.174	1.246			
2006	95,588.96	32.78	15.46	22,054.36	18.096	4.051			
2007	111,455.81	32.72	21.721	15,866.86	0	6.261			
2008	155,982.26	52.301	28.19	44,526.45	19.581	6.477			
2009	130,643.20	45.941	37.7	-25	-6.35	9.509	16.1	8.51	5.79
2010	162,064.57	54.581	51.743	31,321	8.64	14.043			
2011	217,327.11	60.926	62.474	55,363	6.049	1.074			
2012	251,907.66	75.789	63.737	34.581	14.863	2.609			
2013	271,091.78	78.747	73.858	19.184	2.148	1.012			
2014	260,610.44	76.742	72.692	-0.148	-1.051	-0.167	9.27	8.65	8.55
2015	207,912.54	55.382	65.435	-5.28	-2.136	-7.263			
2016	196,546.57	55.162	70.733	-1.366	0	0.498			
2017	225,722.38	59.026	76.986	29.176	3.865	0.063			
2018	251,064.48	67.053	77.829	25.342	8.708	0.419			
2019	277,912.13	87.301	86.8	26.848	20.348	0.897			
2020	219,832.58	72.875	119.921	-58	-14.428	33.021			
2021	301,212.46	102.824	139.425	81.38	29.917	19.493			
2022	415,621.23	116.827	146.512	114	4.727	70.192			

- Central Bank of Iraq Annual Economic Statements for the Years (1990-2022).
- Ministry of Planning, Statistics and Geographic Information Systems Authority Annual Notices for the Years (1990-2022).

- Ministry of Finance Economic and Financial Department for the Years (1990-2022).

The third axis: The theoretical framework of the analysis models

1. St. Louis formula

We will take the (St. Louis) equation as a basis for controlling the model, which explains a simple basic relationship through the reduced formula model to determine the effectiveness of both monetary and fiscal policy. It was called the decreased formula model because it links spending directly to monetary and fiscal policy variables. Its results have shown the importance of monetary policy towards fiscal strategy and that the efficiency of economic strategy in the economy depends on the continuity of monetary policy. The Lewis equation can be marked through the following formula:

$$y_t = \alpha_0 + \sum_{i=1}^{j} \beta_i M_{t-i} + \sum_{i=1}^{k} \delta E_{t-i} + \mu_t \quad (4 \qquad (1)$$

Y: Nominal GDP

M: Money Supply

E: Government Spending

(J, K) are the number of lagged terms included in the investigation; since the effectiveness of the policy extends over a longer period, the model includes the current period and lagged values. In the framework of neoclassical evaluation and rational expectations, the assumption of policy neutrality is based on the assumption that an unexpected policy must determine deviations from the natural output rate and not be affected by an expected policy. The regression equation by which neutrality is verfied:

$$y\text{-}y^n = \alpha_o + \alpha_1(m - m^e) + \alpha_2 m^e \quad (2)$$

Under the rational prospects hypothesis - the neoclassical school - only the unexpected policy hypothesis ($m\text{-}m^e$) has an effect, and therefore the estimates that confirm neutrality are when ($\alpha_2 = 0, \alpha_1 > 0$), and the estimate of the α_2 that is significantly different from zero, implies that the expected policy actually affects the fluctuations of output around the neutral rate, knowing that:

$$y^n = \beta_o + \beta_1 t \quad (3)$$

Where the normal rate is represented by the slope and t is the time path:

$$m^e = \gamma_0 + \gamma_1 \chi_1 + \gamma_2 \chi_2 \quad (4)$$

Equation (4) shows the predicted value of the money supply, represented by certain economic variables, χ_1, χ_2 which may be lagged values of the money supply or another equation, and the predicted values $\hat{m}$ are an alternative to m^e, and by substituting Equation (3) in (2) we get:

$$y - (\beta_o + \beta_1 t) = \alpha_o + \alpha_1(m - m^e) + \alpha_2 m^e \quad (5)$$

$$y = (\alpha_0 + \beta_0) + \beta_1 t + \alpha_1(m - \hat{m}) + \alpha_2 \hat{m} \quad (6)$$

Where the regression estimate α_2 of y in equation (6) gives us the basic test of neutrality, and α_2 tests the joint theory of neutrality and appropriateness of the expected money equation (4); Lucas advanced the test of policy neutrality, and showed that deviations of output from natural output levels must be random fluctuations, uncorrelated over time, where the proponents of the neoclassical method suggest that y^n can be modeled as follows:

$$y^n = \beta_0 + \beta_1 y_{-1} \quad (7)$$

That is, the natural production level is associated to the production level itself and different from it. To predict the neoclassical supply function, equation (7) is replaced by equation (2) to produce:

$$y = \alpha_0\beta_0 + \beta_1 y_{-1} + \alpha_1(m - m^e) + \alpha_2 m^e \quad (8)$$

The previous equation shows that production differs due to unexpected policies $(m - m^e)$ and due to variations in the natural rate (y_{-1}); experimental results have shown that unexpected policies have little effect, while the main source of variation in production is variations in the natural rate, and such variations are not clear in the neoclassical method; thus, Lucas introduced the supply function, which includes cases of production lags that represent the natural rate of production:

$$y = \alpha_0 + \alpha_1 y_{-1} + \alpha_2(m - m^e) \quad (9)$$

The structure that determines the money supply:

$$m = b_0 + \sum b_i m_{t-i} + \nu \quad (10)$$

The expected money supply is:

$$m^e = \mathrm{E}\hat{m} = b_0 + \sum b_i m_{t-i} \quad (11)$$

Substituting m^e into Lucas's supply function (4-9) yields:

$$y = \alpha_0 + \alpha_1 y_{-1} + \alpha_2\left[m - \left(b_0 + \sum b_i m_{t-i}\right)\right] \quad (12)$$

$$y = (\alpha_0 - \alpha_2 b_0) + \alpha_1 y_{-1} + \alpha_2 m - \alpha_2 \sum b_i m_{t-i} \quad (13)$$

The last equation (13) is the production regression function for the time-lagged output and current and lagged money. It also maintains and backs up the neoclassical hypothesis, as each case of money lagging has negative coefficients. It confirms that even if expected, real money has a short-term consequence and no long-term consequence. That is, currency is indistinct in the long run according to the neoclassical theory (Wachtel, 1989);

2. Autoregressive Distributed Lag (ARDL) model

The ARDL model is one of the co-integration methods, as the prototypical offers an approach to present time-lagged unknowns as free variables in the prototypical. This model was related by Pesaran and Shin in (1999) and then developed in (2001) by Pesaran and others (Khalil & Dombrecht, 2011). The most significant features of the model are:

1. It is used if the variables are combined to degree zero [I (0)] or combined to grade one [I (1)] or a grouping of both, i.e., the model does not require the variables to be integrated to the same degree (Budha, 2012).
2. ARDL can be used in small samples and provides well-organized and unbiased estimators because it is autocorrelation-free (Hassan & Shoman, 2013).
3. It also provides short- and long-term financial examination based on the Unrestricted Error Correction Model (UECM).
4. Testing the existence of a long-term association between unknowns based on the Bound Examination Method, which is represented by associating the F-Stat test rate for the coefficients of the explanatory variables with the corresponding tabular values? If the computed F-Stat rate is more than the higher bound of the critical rate, the null hypothesis (H0: b=0) is rejected, and the substitute hypothesis (H1: b≠0) is accepted, i.e., the existence of a long-term complementary association between the unknowns. If the computed rate locates between the higher and minimum bounds, the outcome is

unconvincing, but if it is lower than the lower limit, there is no long-term association (Alimi, 2014). The essential procedure of the (ARDL) model is:

$$Y_t = b_0 + b_1Y_{t-1} + \text{-- } + b_pY_{t-p} + a_0X_t + a_1X_{t-1} + a_2X_{t-2} + \text{-- } + a_qX_{t-q} + U_t \quad (7.4)$$

Y_t: Dependent variable in period (t).
Y_{t-1}: Independent variable in period (t-1).
X: Independent variable.
b, a: Parameters.
Ut: Random error term.

And follow the following steps to predict the (ARDL) model:

1) Check the strength of the time series and control their rank using unit root tests.
2) Establish the optimum lag phases according to the unlimited autoregressive model (VAR) and through the lag period that conveys the lowest value for the Akaike criteria (AIC), Schwarz (SC), and Hannen and Quinn criteria (H-Q) (Jarallah & Dhnoon, 2011).
3) Estimate the model to measure the existence of a long-term joint integration association using the bound test (Mahmoud & Bashar, 2012).
4) Checking the integrity and strength of the model through a group of assessments, which are:
   a. Testing the model's nonexistence of successive correlation through the (Breusch-Godfrey Serial Correlation LM Test).
   b. Testing the significance of the predicted parameters using the (Wald Test).
   c. Testing the strength of the model parameters utilizing the (CUSUM, CUSUM Squares) test
5) Estimating the association in the short and long term, in addition to dividing the unrestricted error correction model.

Fourth axis

The functional aspect of the study variables in Iraq

Consequently, the Lucas equation for the variable (Gross Domestic Product (GDP), government spending (G), and money supply (M)) will be tested in the test function, and the test hypothesis was determined as follows:

a. That changes in production outcome from unexpected monetary policies in the short term and not through economic strategies.
b. A growth in money source outcomes in a growth in nominal spending.
c. That currency is indistinct in the long term.
d. The growth in output is achieved if the increase in government spending is through an increase in the monetary base.

To recognize the kind of the causal association between the unknowns included in the test, we use ARDL (Auto Regressive Distributed Lag Mode)

4. Discussion

1. (Phillips–Perron Test)

Phillips and Perron (1988) advanced a test that is considered one of the important and common assessments to detect the stationarity of the time sequences and determine its grade of incorporation, as it uses the same formulas adopted in the simplified Dickey-Fuller test except for the first formula without a constant and direction. However, it differs in how it allocates with higher-degree autocorrelation and heterogeneity (Phillips & Perron, 1988). The Phillips–Perron test varies from the extended Dickey-Fuller test in that the (extended Dickey-Fuller test) can allocate with the serial correlation present in the random error term by adding the lag period differences to the variable on which it is descended, while

the (Phillips–Perron) test utilizes the correlation covariance matrix Self and variation.

The UNIT ROOT TEST RESULTS TABLE (PP) can also be controlled for the study variables in Iraq as in Table (2). We notice that the time series of the variables (GDP, G, M) were non-stationary at the level (Level), whether there was a categorical or a categorical and general trend, meaning that they contained a unit root and a false regression at a significance level of 5%. Therefore, the assessment was conducted after removing the first alterations of the original series (First difference). It was found that they stabilized at the level (5%) and will be integrated of degree I(1) whether there was a categorical or a categorical and general trend, which specifies the opportunity of utilizing the ARDL model, as the first difference of the unknowns can be used.

Table 2. UNIT ROOT TEST RESULTS TABLE (PP)

Null Hypothesis: the variable has a unit root							
	At Level				**At First Difference**		
		GDP	G	M	d(GDP)	d(G)	d(M)
With Constant	t-Statistic	1.3169	0.7807	2.5985	-3.1185	-6.0694	-3.0878
	Prob.	0.9982	0.9921	1.0000	0.0355	0.0000	0.0380
With Constant & Trend	t-Statistic	-1.4904	-1.8001	-0.3644	-3.0756	-6.4593	-3.7879
	Prob.	0.8120	0.6811	0.9847	0.1295	0.0000	0.0309
Without Constant & Trend	t-Statistic	2.6368	2.0595	4.2790	-2.9359	-5.392	-2.2962
	Prob.	0.9971	0.9888	1.0000	0.0047	0.0000	0.0231

Source: Researcher's work based on Eviews12 outputs.

2. Optimal deceleration periods

We achieve from Table (3) that the number of optimal deceleration periods is two.

Table 3. Optimal number of slowdowns

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1697.6	NA	8.95E+43	109.7159	109.8546	109.7611
1	-1618.14	138.4052	9.54E+41	105.1704	105.7255	105.3513
2	-1602.02	24.96736*	6.14e+41*	104.7107*	105.6822*	105.0274*

Source: Researcher's work based on Eviews12 outputs.

3. Estimating the ARDL model for the short-term

The ARDL model was denoted by Pesaran and others in 2001 and is considered one of the most important tests used in determining the co-integration and long-term relationships of economic models. The ARDL model method suggested by Pesaran and Shinn (2001) was utilized to prove the continuation of co-integration or a long-term association between unknowns. It was greatly chosen because of its capability to simultaneously determine both short-term and long-term parameters. It is also preferred over other co-integration models, for example, Engel-Kranger (1987) with two steps, Johansen (1991), and Gregory and Hansen (1996) because it needs the time sequences to be static with the first difference and a large number of samples. The autoregressive distributed lag (ARDL) model needs that tests of time series stationarity precede it and that the time series be stable at Level or first differences (First - difference) or a mixture of both. This was done in Table No. (2) and the time series were unchanging at the first difference. Thus, the estimation was controlled, and the outcomes were as in Table (4): The

analysis indicates that government spending Prob.: 0.0000 (G) has a substantial constructive outcome on financial development (GDP).

The effect of money source (M) appears to be negative in some cases, which requires further study to understand this dynamic. The table also identified great illustrative influence of the model identified by the extraordinary coefficient of determination that performed with a value of (R^2=0.986729), as well as the (F) test whose calculated value was (372.7631) and its significance was high (Prob (Fstatistic) = 0.0000). Also, the value of Darbin Watson appeared (D–W= 1.5923) which is closer to the number (2) in which the option of the existence of a first-type autocorrelation between the residuals is absent.

Table 4. Outcomes of assessing the short-term ARDL model approximations of the association between GDP and both community expenditures and money supply

Dependent Variable: GDP
Method: ARDL
Date: 10/04/24 Time: 21:56
Sample (adjusted): 1992 2022
Included observations: 31 after adjustments
Maximum dependent lags: 2 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (2 lags, automatic): G M
Fixed regressors: C
Number of models evalulated: 18
Selected Model: ARDL(1, 2, 1)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
GDP(-1)	0.409963	0.147939	2.771163	0.0106
G	2.493302	0.28306	8.808378	000000
G(-1)	-0.50756	0.51876	-0.9784	0.3376
G(-2)	-0.74477	0.290187	-2.56652	0.0169
M	-1.23877	0.401499	-3.08537	0.0051
M(-1)	1.913382	0.451781	4.235201	0.0003
C	11888444	4336248	2.741643	0.0114
R-squared	0.989383	Mean dependent var		1.33E+08
Adjusted R-squared	0.986729	S.D. dependent var		1.15E+08
S.E. of regression	13211349	Akaike info criterion		35.82673
Sum squared resid	4.19E+15	Schwarz criterion		36.15053
Log likelihood	-548.314	Hannan-Quinn criter.		35.93228
F-statistic	372.7631	Durbin-Watson stat		1.59225
Prob(F-statistic)	0000000			

Source: Researcher's work based on Eviews12 outputs.

4. Error Correction Model

Demonstrating the joint integration between the model variables in the previous step leads us to conduct the Error Correction Model (ECM) test to measure the short-term association on the one hand and to measure the rate of alteration (adaptation) to restore balance in the model (Menza, 2024). The error correction term coefficient should be substantial and negative, and its value should be between (1-< (ECM-1) < 0). The negative symbol of the error correction coefficient indicates an inequity in the long-term balance, which means that there must be a mechanism for short-term adjustments to occur. At the same time, the significance of the error correction coefficient specifies the continuation of a joint integration association from the descriptive unknown (independent) towards the

determined unknown. The outcomes of Table (5) for the error correction model based on the (ARDL) procedure utilizing the statistical program EViews identified that the error correction coefficient is statistically acceptable (-1< -0.59004 - < 0), and this reveals the rate of alteration for the short-term inequity towards the long-term stability by (0.59) in the calculated time unit for the values of the model variables (Sinyor, 2024).

Table 4. Outcomes of the error alteration model based on the (ARDL) procedure for the association between GDP and both community expenditures and money supply

ARDL Error Correction Regression

Dependent Variable: D(GDP)
Selected Model: ARDL(1, 2, 1)
Case 2: Restricted Constant and No Trend
Date: 10/04/24 Time: 22:57
Sample: 1990 2022
Included observations: 31
ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(G)	2.493302	0.243901	10.22258	000000
D(G(-1))	0.744769	0.24179	3.080227	0.0051
D(M)	-1.23877	0.329335	-3.76143	0.001
CointEq(-1)*	-0.59004	0.1042	-5.66252	000000
R-squared	0.875134	Mean dependent var		13405767
Adjusted R-squared	0.861261	S.D. dependent var		33440355
S.E. of regression	12455779	Akaike info criterion		35.63318
Sum squared resid	4.19E+15	Schwarz criterion		35.81821
Log likelihood	-548.314	Hannan-Quinn criter.		35.6935
Durbin-Watson stat	1.59225			

* p-value incompatible with t-Bounds distribution.

Source: Researcher's work based on Eviews12 outputs.

5. Bounds test and long-term model estimation

In order to validate the presence of joint integration (long-term relationship) between the independent variables (public expenditures (G) and money supply (M)) and the dependent unknown gross domestic product (GDP), it is required to conduct the Bounds test. The decision is made that there is joint integration between these unknowns.

(F) is computed as its value reached (7.125364), which was more than the table of the higher bound (I1 Bound) of the same parameter, which reached (3.87) and much more than the value of the lower limit (I0 Bound), which is at the level of (3.1) and the economic interpretation of the presence of combined incorporation is consistent with the economic hypothesis and applies to the experience of the Iraqi budget.

Table 6. Outcomes of the bounds test for the model of the relationship between GDP and both community expenditures and money supply

ARDL Long Run Form and Bounds Test
Dependent Variable: D(GDP)
Selected Model: ARDL(1, 2, 1)
Case 2: Restricted Constant and No Trend
Date: 10/04/24 Time: 22:50

Sample: 1990 2022 Included observations: 31				
F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	7.125364	10%	2.63	3.35
K	2	5%	3.1	3.87
		2.5%	3.55	4.38
		1%	4.13	5

Source: Researcher's work based on Eviews12 outputs.

6. Histogram-Normality GDP Test

This assessment is utilized to verify the degree to which the predicted model is free from the difficulty of the normal distribution of residuals. Figure (1) identifies the outcomes of the normal distribution difficulty test for (Jarque-Bera), as we notice that the probability value is (Prob=0.40558), which is higher than (5%), which shows that there is no normal distribution difficulty. Then, here, we must accept the null supposition that states there is no normal distribution problem and reject the alternative hypothesis that there is a normal distribution problem. Then, this test confirms the truthfulness of the outcomes of the ARDL model.

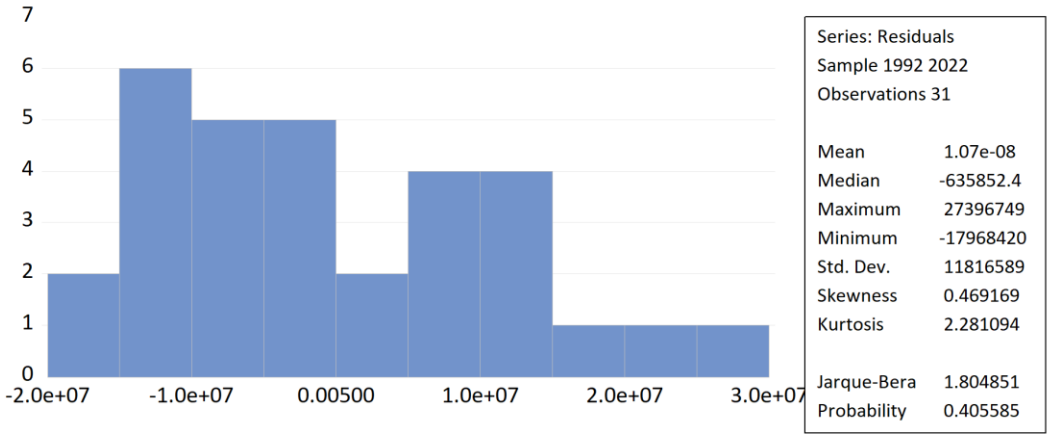

Figure 1. Outcomes of the normal distribution problem test.

7. Serial Correlation LM Test

This assessment is utilized to confirm the degree to which the predicted model is free from the difficulty of autocorrelation of the residuals. Table (7) shows the outcomes of the autocorrelation test, as we observe that the probability value Chi-Square reached (Prob=0.3633), which is higher than (5%), which shows that there is no autocorrelation difficulty. Hence, here, we must accept the null supposition that states that there is no autocorrelation difficulty between the random residuals and reject another assumption, and hence, this assessment improves the exactness of the outcomes of the ARDL model.

Table 7. LM Autocorrelation Table Problem Test Results

Breusch -Godfrey Serial Correlation LM Test:			
Null hypothesis: No serial correlation at up to 2 lags			
F-statistic	0.76876	Prob. F(2,22)	0.4756
Obs*R-squared	2.024985	Prob. Chi-Square(2)	0.3633

Source: Researcher's work based on Eviews12 outputs.

8. Heteroscedasticity GDP Test

This assessment is utilized to confirm the degree to which the predicted model is free from the difficulty of heteroscedasticity. Table (8) identifies the outcomes of the test of heteroscedasticity for ((ARCH, as we observe that the probability value of Chi-Square is (Prob=0.8834), which is higher than (5%), which means that the model is free from the problem of heteroscedasticity. Hence, here we must accept the null hypothesis, which (shows that there is no difficulty of heteroscedasticity between the random residuals and reject the substitute suggestion), hence this assessment improves the exactness of the outcomes of the ARDL model.

Table 8. Outcomes of the ARCH test of the problem of variance difference

Heteroscedasticity Test: ARCH			
F-statistic	0.112113	Prob. F(2,26)	0.8944
Obs*R-squared	0.247959	Prob. Chi-Square(2)	0.8834

Source: Researcher's work based on Eviews12 outputs.

9. Structural stability test for the (ARDL) model

This assessment is used to confirm the structural stability of the (ARDL) model by using the Cumulative Sum of the Recursive (CUSUM) test. Therefore, the structural stability of the model parameters is achieved if the blue (wavy) line in the (CUSUM) test graph locates within the critical red dotted bounds at the (5%) level.

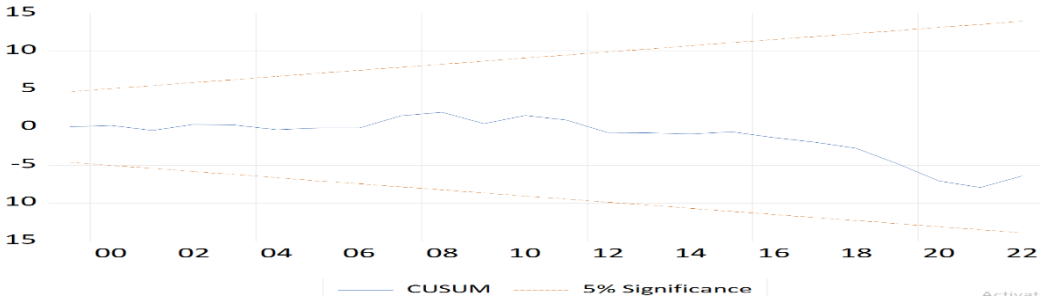

Figure 2. Outcomes of the structural stability test for (CUSUM).

5. Conclusion

The research hypothesis has been confirmed, and we have reached the following conclusions:

1. The strength results of the stability of the ARDL model estimates, in the long run, showed that the model estimates locate within the critical limits of 5% and thus the stability of the parameters in the long run. These results also maintain the accuracy and integrity of the model.
2. Fiscal policy (government spending) significantly influences economic growth in the long run compared to monetary policy in Iraq.
3. Monetary policy stimulates financing and achieves economic stability, but its impact is relatively less than the impact of fiscal policy.
4. Monetary and economic strategies have a complementary impression on each other, as they complement each other to achieve economic goals.
5. The research results verify a long-term association between money supply, administration expenditure, and financial development.

6. Recommendations

1. Decision-makers in Iraq must organize fiscal and monetary policies to achieve the desired economic goals.
2. It is recommended that more public expenditure be directed towards infrastructure projects and development projects to enhance economic growth.

3. The management of money supply and interest charges should be improved to ensure price stability and stimulate investment.
4. There is a need to diversify sources of revenue and decrease dependence on crude oil exports to enhance economic stability and limit the influence of variations in oil expenses on the Iraqi economy.
5. The a need to coordinate fiscal and monetary strategies that would address economic crises in a way that prevents conflict between their objectives and limits the issue of (investment crowding out) that could negate the role of these policies in solving economic problems.

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