

Investigating the impact of monetary policy instability on economic growth in Iraq.

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Abstract: Sustainable economic growth is one of the fundamental goals of macroeconomic policymaking in developing countries, and achieving it requires the implementation of stable and efficient monetary policies. Due to its heavy dependence on oil revenues, macroeconomic fluctuations, and instability in monetary policies, the Iraqi economy has faced numerous challenges in achieving sustainable economic growth over the past decades. Therefore, the main objective of this study is to examine the impact of monetary policy instability on economic growth in Iraq. For this purpose, the monetary policy instability index has been extracted using liquidity growth fluctuations and the generalized conditional variance heterogeneity (GARCH) model. The data used include annual time series of the Iraqi economy during the period 1975 to 2024, which have been collected from reputable international databases, especially the World Bank. In order to examine the short-term and long-term relationships between the research variables, the autoregressive distributed lag (ARDL) model was used. Before estimating the model, unit root and cointegration tests were conducted, the results of which confirmed the existence of a long-term relationship between the model variables. Also, the results of diagnostic tests and coefficient stability tests (CUSUM and CUSUMSQ) show that the estimated model has appropriate validity and stability. The empirical findings of the study show that monetary policy instability has a negative and significant effect on Iraq's economic growth in the short and long term. This result indicates that increasing monetary uncertainty limits economic growth by reducing investment, disrupting economic decision-making, and weakening productive activities. Also, the results show that gross fixed capital formation and labor force have a positive and significant effect on economic growth in the long term, while natural resource rents do not have a significant effect on Iraq's economic growth. Accordingly, reducing monetary policy instability, enhancing the credibility and independence of the central bank, and adopting stable and predictable monetary policies can play an important role in strengthening sustainable economic growth in Iraq. The findings of this study can provide a suitable basis for designing and implementing monetary policies to promote macroeconomic stability and economic growth in Iraq.

Keywords: Monetary policy instability, economic growth, Iraq, model ARDL, model GARCH

1. Introduction

Sustainable economic growth is one of the most important macro-policy objectives in all countries, especially developing economies, and plays a decisive role in promoting welfare, increasing employment, reducing poverty, and improving living standards (Smith, 1776; Solow, 1956; Kuznets, 1971; Todaro, 2000). Classical and neoclassical theories of economic growth, capital accumulation, increased productivity, and macroeconomic stability have been identified as the most important determinants of long-term growth (Harrod, 1939; Domar, 1946; Solow, 1956; Romer, 1986). Meanwhile, monetary policies, as one of the main tools of macroeconomic management, play an important role in controlling inflation, regulating liquidity, establishing financial stability, and providing a suitable environment for investment and economic growth (Keynes, 1936; Friedman, 1968; Mishkin, 2016). Therefore, the quality of monetary policy design and implementation can have significant effects on the economic performance of countries (Fatas & Mihov, 2009; Chugunov et al., 2021).



One of the most important challenges of monetary policy is its instability and unpredictability. When monetary policies are accompanied by frequent fluctuations, uncertainty in the economic environment increases and economic agents' decision-making is disrupted. This situation can limit economic growth by increasing investment risk, reducing capital formation, increasing financing costs, reducing the credibility of monetary policymakers, and weakening productive activities (Lensink et al., 1999; Niehans, 1987; Mishkin, 2016). In addition, theoretical and empirical studies show that monetary policy fluctuations can affect interest rates, exchange rates, inflation expectations, and capital flows, and through these channels, they can also affect economic growth (Dornbusch & Giovannini, 1990; Faust & Rogers, 2003; Bluedorn & Bowdler, 2011; Yoon, 2020).

In recent decades, the importance of monetary policy stability has received more attention from economists than ever before. The experience of the global financial crisis as well as the shocks caused by the COVID-19 pandemic showed that instability in macroeconomic policies can increase the vulnerability of economies and disrupt the process of economic growth (Allen et al., 2009; Inoue, 2016; Wang et al., 2023). For this reason, recent research emphasizes the necessity of designing transparent, stable and predictable monetary policies and believes that reducing monetary uncertainty can pave the way for increased investment, improved performance of the real sector of the economy and achieving sustainable economic growth (Gil et al., 2023; Serletis, 2024; Pérez Rojo & Rodríguez, 2024).

The Iraqi economy is a prime example of an economy that has faced widespread economic and political instability over the past few decades. Heavy dependence on oil revenues, fluctuations in global oil prices, wars, internal insecurity, economic sanctions, and external shocks have caused the country's macroeconomic variables, especially monetary variables, to experience significant fluctuations. These conditions have placed many constraints on the implementation of monetary policies and made it difficult to manage inflation, liquidity, and macroeconomic stability (Sachs & Warner, 2001; Sabri & Saeed, 2021). In such an economy, increased monetary policy instability can exacerbate uncertainty, reduce private sector investment, and disrupt economic growth.

From a theoretical perspective, various economic perspectives emphasize the importance of monetary policy in economic growth. The monetarism school believes that controlling the growth of the money supply and establishing monetary stability is a necessary condition for achieving price stability and economic growth (Friedman, 1968). In contrast, Keynesian economists emphasize the role of monetary policy in stimulating aggregate demand, investment, and employment (Keynes, 1936). New theories also state that monetary policy affects economic growth by influencing interest rates, financial markets, exchange rates, and economic expectations (Chari & Kehoe, 1999; Fujiwara & Wang, 2017; Moosavi Mohseni & Cao, 2020). Therefore, monetary policy stability is considered one of the essential prerequisites for achieving sustainable economic growth.

Despite the proliferation of studies on monetary policy, most empirical research has focused on the effects of conventional monetary policy instruments such as interest rates, money supply, or inflation on economic growth, and few studies have directly measured monetary policy volatility and examined its effects on economic growth, especially in the Iraqi economy (Batini et al., 2003; Simwaka, 2004; Noman & Khudri, 2015). In addition, most previous studies have examined monetary policy volatility indirectly, while extracting a monetary policy volatility index using conditional variance heteroskedasticity (GARCH) models can provide a more accurate picture of the extent of monetary uncertainty.

Accordingly, the main objective of this study is to examine the impact of monetary policy instability on Iraq's economic growth during the period 1975 to 2024. In this regard, first, the monetary policy instability index was calculated based on liquidity growth fluctuations and using the model GARCH extracted and then its short-term and long-term effects on economic growth are evaluated using the autoregressive distribution lag (ARDL) model. It is expected that the findings of this study, while expanding the literature on monetary economics in natural resource-dependent economies, will provide new empirical evidence about the Iraqi economy and can be a suitable guide for policymakers in this country to reduce monetary uncertainty, promote macroeconomic stability, and achieve sustainable economic growth. (Fatas & Mihov, 2009; Chugunov et al., 2021; Gil et al., 2023).

2. Theoretical foundations

Monetary policies, as one of the key tools of macroeconomic management, play an important role in influencing economic growth. These policies affect economic variables such as investment, consumption, and production by regulating the money supply, interest rates, and liquidity. However, the relationship between monetary policies and economic growth strongly depends on the theoretical frameworks, economic conditions, and institutional structure of a country. This section comprehensively reviews the theoretical relationship between monetary policies and economic growth based on existing economic theories, including classical, Keynesian, monetarism, and economic growth models, with an emphasis on their application to economies such as Iraq.

2.1 Theoretical frameworks of monetary policy and economic growth

The relationship between monetary policy and economic growth has been analyzed in different ways by different schools of economics. Each school focuses on specific mechanisms for transmitting the effects of monetary policy to economic growth. These perspectives are examined in detail below.

Classic view

In the classical view, the economy naturally moves towards full employment, and monetary policies affect only nominal variables, such as the price level, and have no effect on real variables, such as output and economic growth in the long run (Smith, 1776; Ricardo, 1817). According to the quantity theory of money, which is rooted in this school, an increase in the money supply only leads to an increase in prices and has no effect on real output under conditions of full employment. This view assumes that the velocity of money and real output are constant in the long run, so monetary policies cannot foster sustainable economic growth. However, in the short run, if there are idle resources, expansionary monetary policies may increase output, but this effect is temporary and turns into inflation in the long run. In economies like Iraq, which face structural constraints and dependence on oil revenues, the classical view explains that unstable monetary policies, such as excessive money supply expansion to finance budget deficits, can lead to high inflation without generating sustainable economic growth. This is especially prominent in conditions of institutional weakness and a lack of central bank independence.

Keynesian perspective

Keynesianism emphasizes the role of monetary policy in stimulating aggregate demand and economic growth in the short run (Keynes, 1936). According to this view, expansionary monetary policy reduces interest rates by increasing the money supply, which stimulates investment and consumption and increases aggregate demand. In situations where the economy has idle resources, this increase in demand can lead to growth in real output. However, the effectiveness of monetary policy depends on the sensitivity of investment and consumption to changes in interest rates. In situations such as a liquidity trap, where a decrease in interest rates has a limited effect on spending, monetary policy may be ineffective.

In the Iraqi economy, where financial markets are underdeveloped and the private sector is weak, the Keynesian perspective may have limited application, as the transmission channel from interest rates to investment and economic growth is not very effective due to the lack of a strong financial infrastructure. However, expansionary monetary policies can stimulate aggregate demand in the non-oil sector in the short run by increasing liquidity, provided that they are coordinated with fiscal policies.

The monetarist perspective

Monetarists, led by Milton Friedman, believe that monetary policy plays a central role in economic growth by controlling the money supply (Friedman, 1968). According to the modern quantity theory of money, an increase in the money supply can increase real output in the short run by stimulating aggregate demand, especially in economies with idle resources. However, in the long run, this increase only leads to inflation and has no effect on real output. Monetarists emphasize that inflation is always a monetary phenomenon and is caused by faster growth in the money supply than growth in output. Therefore, they propose that monetary policy should be implemented according to a fixed rule, such that the growth of the money supply is proportional to the growth of real output in order to maintain

price stability. In the Iraqi economy, the monetarism perspective is particularly important due to its dependence on oil revenues and its impact on the monetary base. The increase in the money supply resulting from the injection of oil revenues can stimulate economic growth in the short term, but in the long term, it leads to high inflation without being coordinated with output growth. Weak governance and the lack of central bank independence can exacerbate this problem, as monetary policies may be subject to political pressures to finance budget deficits.

Neoclassic growth models

The neoclassical growth model, developed by Robert Solow, assumes that long-term economic growth is determined primarily by technological progress (exogenously) (Solow, 1956). In this model, monetary policies have a limited impact on long-term growth, as they only affect nominal variables. However, in the short run, monetary policies can accelerate capital accumulation and contribute to economic growth by reducing interest rates and stimulating investment. This effect is particularly significant in economies with idle resources. In the Iraqi economy, the neoclassical model explains that expansionary monetary policies can boost economic growth in the short run by increasing investment in non-oil sectors. However, in the long run, without technological progress and improved infrastructure, these policies cannot generate sustainable growth. Dependence on oil and the weakness of the private sector limit the effectiveness of these policies.

Endogenous growth models

Endogenous growth models, developed by Paul Romer and Robert Lucas, emphasize the role of domestic factors such as human capital, research and development, and innovation in economic growth (Romer, 1986; Lucas, 1988). In these models, monetary policy can indirectly enhance economic growth through its effects on investment in research and development and education. For example, expansionary monetary policy, by reducing financing costs, can facilitate investment in technology and education and increase productivity. Monetary stability, also created through appropriate monetary policy, can provide a favorable environment for long-term investment by reducing uncertainty. In the Iraqi economy, endogenous growth models show that monetary policy can help reduce oil dependence and foster sustainable growth by supporting investment in human capital and technology. However, these effects depend heavily on the quality of governance and the ability of institutions to direct resources to productive sectors.

2.2 Mechanisms of transmitting monetary policy to economic growth

Monetary policy affects economic growth through a variety of channels. These channels include:

Interest rate channel

Expansionary monetary policy reduces the cost of financing by reducing interest rates and stimulates investment in productive sectors. This increase in investment can lead to physical capital accumulation and production growth. In contrast, contractionary policy reduces investment by increasing interest rates and limits growth. In the Iraqi economy, this channel has limited effectiveness due to the underdevelopment of financial markets and the weakness of the private sector.

Aggregate demand channel

An increase in the money supply boosts aggregate demand through increased consumption and investment. In economies with idle resources, this increased demand can increase real output. In Iraq, this channel can be effective in the short run, but in the long run, without developing productive infrastructure, it leads to inflation.

Expectations Channel

Monetary policies can change investment and consumption behavior by influencing economic actors' expectations. Credible and transparent monetary policy can increase confidence in the economy and encourage long-term investment. In Iraq, weak governance and political instability can create negative expectations and reduce the effectiveness of monetary policies.

Financial Stability Channel

Monetary policies that maintain price and financial market stability provide a favorable environment for economic growth. Monetary instability, such as high inflation or severe liquidity fluctuations, can reduce investment and disrupt growth. In Iraq, monetary policy instability resulting from the injection of oil revenues and a budget deficit weaken this channel.

2.3 Monetary Policy and Economic Growth in a Less Developed Economy (Iraq)

In a less developed economy like Iraq, where international interactions are limited due to its dependence on oil and institutional constraints, monetary policy affects economic growth mainly through the domestic components of the monetary base. Expansionary monetary policy can stimulate aggregate demand by increasing liquidity and boost output growth in the short run. However, the heavy reliance on oil revenues, which constitute the bulk of the monetary base, limits the independence of the central bank and turns monetary policy into a tool for financing budget deficits. This can lead to monetary instability and high inflation, which undermines sustainable economic growth. From a monetarist perspective, tight control of the money supply is essential to prevent inflation and support sustainable growth. In Iraq, this is challenging due to political pressures and the weak independence of the central bank. The Keynesian perspective suggests that monetary policy can boost growth in the short run by stimulating aggregate demand, but this effect is limited due to the lack of developed financial markets. Endogenous growth models suggest that monetary policy can facilitate long-term growth by supporting investment in technology and human capital, provided that it is accompanied by improved governance.

3. Experimental evidence

Wang et al. (2023) studied the role of fiscal and monetary policies in China's economic recovery after the COVID-19 pandemic. Using a difference-in-difference (DID) model and quarterly data from listed industrial companies, this study examined the effects of fiscal and monetary policies on economic growth and energy consumption in different regions of China. The findings of this study showed that economic growth increased by 0.21% in the western region of China and by 0.15% in the southern and central regions. On the other hand, fiscal policies directly affected the increase in household demand and employment. These results indicate that the Chinese government has been able to create a sustainable economic recovery in the post-COVID-19 period by implementing appropriate fiscal policies, especially in more remote areas that have benefited the most from these policies. The study also examined the key role of provincial economic spillovers and fiscal policies in stimulating economic growth.

Gil et al. (2023) examines the role of interest rate feedback rules on economic growth within a model of endogenous growth and physical capital accumulation and research and development (R&D). The study emphasizes that active and passive monetary policy rules can shape the transition dynamics of the economy. These rules address structural changes in monetary policy, including target interest rates, and ultimately lead to short-term economic growth. The study also emphasizes the importance of capital accumulation and its key role in the economic growth process. More active monetary rules, especially during recessions, can provide stronger stimuli for economic growth, while more passive rules may lead to reduced volatility.

Study Serletis (2024) examines monetary policy strategies in New Keynesian models, pointing to the importance of money in stabilizing prices and achieving more favorable economic outcomes. This study examines New Keynesian models in terms of how monetary policy interacts with business cycles and how it affects macroeconomic variables. The results show that New Keynesian models, due to their limited focus on the role of money in the economy, cannot cover all aspects of business cycles and monetary policy transmission. Hence, this research emphasizes the need for broader approaches to analyzing the effects of monetary policy, and specifically points to the role of monetary aggregates as a key policy transmission mechanism.

Pérez Rojo and Rodríguez (2024) study monetary policy shocks in the Peruvian economy using time-varying parametric models and Bayesian estimation. The study focuses specifically on the inflation targeting regime in Peru and finds that the volatility of monetary policy shocks is reduced under this regime. The interest rate response to

aggregate supply shocks is also faster than that to aggregate demand and exchange rate shocks. The study highlights the importance of stable monetary regimes in reducing macroeconomic volatility and provides recommendations for improving monetary policy, especially in the face of large economic shocks such as currency crises.

Moosavi Mohseni and Cao (2020) study examined the impact of monetary policy within the framework of neoclassical growth models by adding the bond market as a third asset. The findings of this study showed that monetary policy in the three-asset model can have dual effects on economic growth. On the one hand, public expectations about interest rates and monetary policies can play a key role in the transmission mechanism of monetary policy. On the other hand, the study showed that government interventions through fiscal policy may lead to a reduction in the effectiveness of monetary policy, especially when inflation expectations are strong.

By emphasizing greater detail and using more sophisticated methods such as VAR and parametric models, these analyses provide a better understanding of the effects of fiscal and monetary policies on different economies and will be very useful for economic researchers and policymakers.

By reviewing previous studies, it can be found that the innovation of this study in examining the impact of monetary policy instability on economic growth in Iraq is not only due to its focus on a less-considered topic in the economic literature, but also due to the need for a deeper understanding of the specific economic, social, and political characteristics of this country. Also, this study will examine the role and importance of governance quality on the relationship between monetary policy instability and economic growth, which has not been addressed in empirical studies conducted in Iraq so far. While many previous studies have addressed the impact of monetary policy on economic growth in developed and developing countries, few studies have paid attention to the specific analysis of monetary policy instability and its consequences on economic growth in Iraq. For example, research conducted on developed countries, such as the United States and the European Union, has typically examined the impact of stable and accommodative monetary policies on economic growth and has concluded that instability in monetary policies can lead to severe economic fluctuations and reduced investment. Also, similar studies in developing countries, such as Brazil and India, have shown that monetary policy instability can lead to increased inflation rates and reduced economic growth rates (Wang et al., 2023), but in the case of Iraq, due to specific characteristics such as dependence on oil revenues, political instability, and fragile economic conditions, the impact of monetary policy instability may be significantly different. This research can analyze the complex relationships between monetary policy fluctuations, economic instability, and its effects on economic growth. With this approach, this study can be considered a milestone in the Iraqi economic literature and pave the way for future research in this area. The results of this research can help Iraqi policymakers to better understand the effects of monetary policy instability on economic growth, adopt more effective strategies to manage monetary policies and improve the country's economic situation. This innovation can lead to strengthening the country's ability to face economic challenges and sustainable development.

4. Presenting the model and explaining the variables

In order to empirically examine the impact of monetary policy instability on economic growth in Iraq, this study uses a developed economic growth model. The dependent variable of the model is economic growth, and other variables are selected based on the theoretical literature on growth and the structural conditions of the Iraqi economy.

The general form of the research model is defined as follows:

$$GGDP_t = \alpha_0 + \alpha_1 GFC_t + \alpha_2 L_t + \alpha_3 NRR_t + \alpha_4 MPI_t + \alpha_5 (MPI_t \times GOV_t) + \varepsilon_t$$

Where t represents the time period (1990-2023) and ε_t is the random disturbance term.

Economic growth (GGDP)

Economic growth, as the dependent variable of the model, represents the growth rate of real GDP and is used as a standard indicator to measure the country's macroeconomic performance. In this study, Iraq's economic growth was calculated based on changes in real GDP and the relevant data were extracted from the World Bank database.

Gross fixed capital formation (GFC)

Gross domestic fixed capital formation is included as a proxy for physical capital stock in the model. This variable includes investment in infrastructure, machinery, equipment, and other fixed assets and plays a key role in increasing production capacity and economic growth. Based on neoclassical and endogenous growth theories, an increase in fixed capital formation is expected to have a positive and significant effect on economic growth. Data for this variable are extracted from the World Bank.

Labor (L)

Labor represents the human factor of production and is included in the model as one of the main inputs to the economic growth process. This variable represents the size of the active labor force or the employed population in the Iraqi economy, and its increase is expected to have a positive effect on economic growth through the expansion of production capacity. Data on labor force are also obtained from the World Bank.

Natural Resource Rent (NRR)

Natural resource rents represent the share of revenues from the exploitation of natural resources (including oil, gas, and other resources) in the economy. Given the oil-based structure of the Iraqi economy, this variable plays an important role in explaining fluctuations in economic growth. However, according to the “resource curse” literature, the effect of natural resource rents on economic growth can be positive or negative, depending on the quality of institutions and policies. Data for this variable are extracted from the World Bank.

Monetary Policy Instability (MPI)

Monetary policy instability, as one of the key explanatory variables in this study, cannot be directly observed and needs to be extracted through econometric methods. In this regard, ARCH/ GARCH conditional variance heteroscedasticity models are used. It is used to estimate monetary policy volatility. The estimated conditional variance from these models is considered as an indicator of monetary policy volatility (MPI) and is introduced into the economic growth model. This approach allows the separation of the effect of the level of monetary policy from the effect of volatility and uncertainty arising from it.

Good Governance Index (GOV)

The quality of governance in this study is measured as a composite index. This index is derived from a combination of six main governance components including Corruption Control, Government Effectiveness, Political Stability and Absence of Violence, Regulatory Quality, Rule of Law, and Voice and Accountability. To prevent collinearity and reduce the dimensionality of the data, the governance index is constructed using the Principal Component Analysis (PCA) method. It should be noted that the governance index is not entered into the model as a separate independent variable. In order to examine the moderating role of governance quality in the relationship between monetary policy instability and economic growth, an interactive variable of the product of the monetary policy instability index and the good governance index is included in the model. This variable allows for an empirical test of the hypothesis that improving institutional quality can reduce the negative effects of monetary policy instability on economic growth in Iraq. All data used in this study, including economic growth, gross fixed capital formation, labor force, natural resource rents, and governance indicators, are extracted from the World Bank database and are consistent with the period under study (1990-2024) in terms of time consistency and statistical coverage.

Interactive variable of good governance index and monetary policy instability ($MPI \times GOV$)

Given the simultaneous behavior of the indicators of monetary policy instability and good governance, this study considers the role of governance quality as a moderating factor in the relationship between monetary policy instability and economic growth. The inclusion of the interactive variable of the product of monetary policy instability and the index of good governance provides the opportunity to empirically examine whether improving institutional quality can reduce the negative effects of monetary policy fluctuations on economic growth. From an analytical perspective, in conditions where the quality of governance is low, monetary policy instability is expected to have a

stronger negative impact on economic growth by increasing uncertainty, weakening investment expectations, and distorting resource allocation. In contrast, improving governance by enhancing transparency, increasing institutional accountability, and promoting the rule of law can moderate the transmission channel of monetary shocks to the real economy and reduce the severity of the negative effects of monetary policy instability. For this reason, the coefficient of the interactive variable in the economic growth model is expected to have a different sign than the direct coefficient of monetary policy instability.

In the context of the Iraqi economy, where institutional reforms have often been unstable and fragile, the role of the interaction variable is doubly important. The observed fluctuations in the good governance index suggest that even temporary institutional improvements can mitigate the negative effects of monetary policy instability in some periods, although the lack of institutional stability has prevented this moderating effect from fully materializing. From this perspective, the interaction variable analysis not only provides an empirical test of the second hypothesis of the study, but also establishes a direct link between institutional evidence, monetary policy behavior, and economic growth performance.

Calculating the monetary policy instability variable

In order to derive the monetary policy instability index, the growth rate It is used as a proxy variable for monetary policy. Given the presence of severe fluctuations and clustering behavior of variance in Iraqi liquidity growth, the conditional variance heteroskedasticity model is used. The estimated model is of the type GARCH. It is normally distributed and estimated using the maximum likelihood (ML) method.

The model equations are defined as follows:

Average equation:

$$M2GROWTH_t = \mu + \varepsilon_t$$

$$\varepsilon_t | \Omega_{t-1} \sim N(0, h_t)$$

Conditional variance equation:

$$h_t = \omega + \alpha_1 \varepsilon_{t-1}^2 + \alpha_2 \varepsilon_{t-2}^2$$

where h_t is the conditional variance and ε_t is the disturbance term. The estimated conditional variance (vh_t) is used as an indicator of monetary policy instability in the rest of the study.

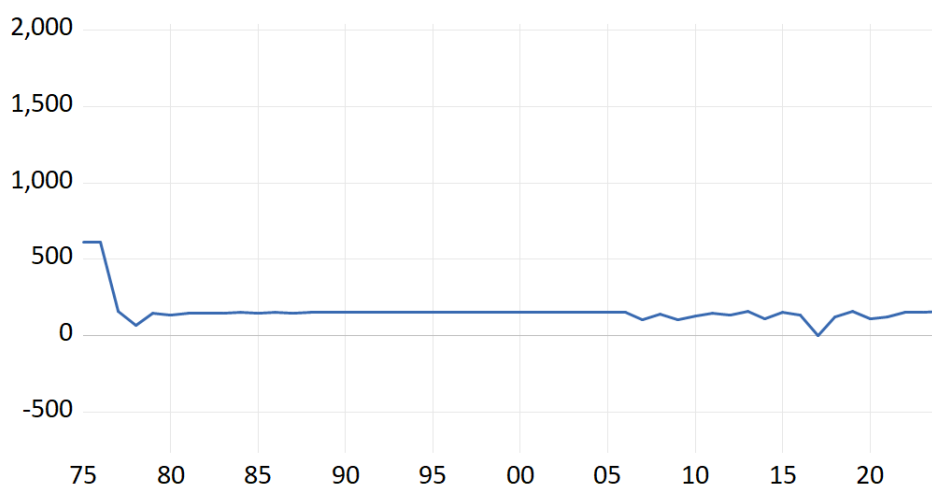
Table 4-1-Model estimation results GARCH To grow liquidity

Variable	Coefficient	Standard error	z -statistic	Significance level
GARCH	1.8084	0.1799	10.0476	0.0000
Variance equation				
C (ω)	155.3213	48.3937	3.2095	0.0013
RESID(- 1) ² (α_1)	0.0192	0.1395	0.1378	0.8904
RESID(- 2) ² (α_2)	-0.1601	0.0728	-2.1985	0.0279
Index	Amount			
Number of observations	50			

Log Likelihood	-188.9644	
Akaike Criterion	7.7186	
Schwarz Criterion	7.8715	
Durbin-Watson	0.8333	

The results of Table (4-1) show that liquidity growth in the Iraqi economy has significant fluctuations and asymmetric behavior of the conditional variance, which is determined by the use of models. GARCH The coefficient of the constant component of the variance equation (ω) is positive and significant at the 1 percent level, indicating the presence of a basic level of monetary policy instability in the Iraqi economy. This result is consistent with the structural conditions of the Iraqi economy, including heavy dependence on oil revenues, chronic budget deficits, and weak coordination of monetary and fiscal policies. The coefficient of the first-interval ARCH term (α_1), although positive, is not statistically significant. This result indicates that short-term liquidity growth shocks do not have a persistent effect on monetary policy fluctuations. In contrast, the second-interval ARCH coefficient (α_2) is negative and significant at the 5 percent level. This finding suggests that past liquidity growth shocks with a time lag have had a moderating effect on current monetary policy fluctuations. This behavior could reflect the unstable and unsystematic responses of monetary policymakers in the face of previous shocks. The coefficient of the conditional root of variance ($\sqrt{\text{GARCH}}$) in the mean equation is positive and highly significant, indicating that monetary policy fluctuations play a significant role in explaining the behavior of liquidity growth. This result confirms that changes in liquidity growth in Iraq are sensitive not only to the level of monetary policy, but also to its degree of uncertainty and instability. Overall, the results from the model GARCH It indicates the existence of significant instability in Iraq's monetary policy during the period under study. The conditional variance extracted from this model as an indicator of monetary policy instability is entered into the economic growth model in the rest of the research to examine its effects on economic growth and the moderating role of governance quality. The graph related to the uncertainty and instability of monetary policies in Iraq during the period 1975 to 2024 is as follows:

Chart 1-Monetary policy instability in Iraq



Monetary policy volatility graph extracted from the conditional variance of the model GARCH The growth of liquidity reflects the nonlinear and regime-driven behavior of monetary policy in the Iraqi economy during the period under review. In the early years of the sample, the very high level of volatility observed in the monetary instability index indicates the lack of a coherent monetary policy framework and the unstable responses of the central bank to macroeconomic shocks. These extreme fluctuations may reflect the weakness of monetary institutions, the high dependence of monetary policy on government fiscal developments, and the inability to control liquidity growth in the face of structural shocks. The rapid decline in the index later in this period reflects intermittent efforts to contain monetary volatility, but this decline is not considered to mean the establishment of sustainable stability in monetary policy.

In the middle part of the period under study, the monetary policy instability index moves around a relatively stable level with a narrower range of fluctuations. This seemingly stable behavior, rather than indicating an improvement in the quality of monetary policy, indicates the continuation of an unstable but uniform monetary regime. In other words, monetary policy in this period, although it has moved away from severe short-term fluctuations, is still at a level of structural uncertainty that can affect economic growth through investment channels, expectations, and resource allocation. The continuation of this pattern suggests that institutional reforms and strengthening of monetary governance have not been fundamentally achieved during this period, and monetary policy has remained largely reactive and unpredictable.

In the final years of the sample, the behavior of the monetary policy volatility index changes again, with more erratic fluctuations and intermittent spikes. The sharp declines and sudden increases in the index during this period indicate an increased sensitivity of monetary policy to external and internal shocks, including oil shocks, political developments, and government fiscal pressures. This pattern suggests that in the absence of strong institutional governance, monetary policy has become a source of uncertainty in the economy rather than a stabilizing one. The increased range of fluctuations during this period could lead to a weakening of economic confidence and an increase in instability in investment and production decisions. Overall, the time course of the monetary policy instability index suggests that monetary uncertainty in the Iraqi economy is not a transient phenomenon, but rather structural and persistent in nature. The persistence of high levels of instability, even in periods when the range of fluctuations has decreased, confirms the fact that monetary policy in Iraq is strongly influenced by weak governance, dependence on natural resources, and exogenous shocks. These features provide a context in which the negative effects of monetary policy instability on economic growth can be exacerbated; which justifies the need to examine the moderating role of governance quality in the economic growth model from an empirical and policy perspective.

Comparing the time course of the monetary policy instability index with the good governance index shows that these two variables in the Iraqi economy have behaved strongly depending on institutional and political conditions. In periods when the good governance index is at very low and negative levels, monetary policy instability is observed at its highest levels. This simultaneity indicates that institutional weakness, government inefficiency, and the absence of the rule of law have undermined the necessary space for implementing stable and predictable monetary policy and have turned monetary policy into a reactive and short-term tool. In such circumstances, monetary policymakers have been forced to respond to financial, political, and budgetary shocks in a short-term manner, rather than focusing on long-term stabilization goals.

In contrast, from the points where the good governance index has improved relatively and entered the range close to zero and then positive, the pattern of monetary policy instability also changes. Although monetary policy fluctuations have not been completely eliminated, their form has changed from severe and disruptive fluctuations to intermittent and irregular fluctuations. This development shows that even a relative improvement in the quality of governance can reduce the intensity and scope of monetary policy instability, although institutional fragility has prevented the establishment of lasting stability. In other words, poor governance not only increases the level of monetary policy instability, but also exacerbates the transmission of its effects to the real sector of the economy. This co-movement and simultaneous change of institutional and monetary regimes indicates that monetary policy instability in Iraq is not a phenomenon independent of the institutional context and is strongly influenced by the quality

of governance. Therefore, analyzing the effect of monetary policy instability on economic growth without considering the role of governance will provide an incomplete and misleading picture of the reality of the Iraqi economy.

5. ARDL pattern

In the form of a symmetrical approach ARDL, the current research model in the form of ECM-ARDL (for testing cointegration and extracting short-run and long-run relationships) is presented in equation (1). In this model, GGDP It represents economic growth and is considered as the dependent variable. GFC Gross fixed capital formation (as a proxy for the capital stock), L labor, and NRR Natural resource rents are entered into the model as control variables. Also MPI Monetary policy instability index (extracted from the model) GARCH It is based on the growth of liquidity M2) and the variable (MPI×GOV) is the interactive variable of monetary policy instability and the Good Governance Index (GOV), which GOV is a combination of six governance components (corruption control, government effectiveness, political stability and lack of violence, regulatory quality, rule of law and accountability) with the method PCA It has been extracted. Due to the research design, the GOV index is not entered into the model as a separate independent variable, and its role is only considered through the interactive variable.

Form The ARDL-ECM research can be expressed as follows:

$$\Delta GGDP_t = \varphi_0 + \varphi GGDP_{t-1} + \gamma GFC_{t-1} + \omega L_{t-1} + \delta NRR_{t-1} + \theta MPI_{t-1} + \lambda(MPI * GOV)_{t-1} + \sum_{i=1}^{p-1} \varphi_i \Delta GGDP_{t-i} + \sum_{i=0}^{q-1} \alpha_i \Delta GFC_{t-i} + \sum_{i=0}^{r-1} \beta_i \Delta L_{t-i} + \sum_{i=0}^{s-1} \delta_i \Delta NRR_{t-i} + \sum_{i=0}^{u-1} \theta_i \Delta MPI_{t-i} + \sum_{i=0}^{n-1} \lambda_i \Delta (MPI * GOV)_{t-i} + \varepsilon_t$$

In equation (1), the coefficients corresponding to the level variables with a one-period lag are (GGDP_{t-1}, GFC_{t-1}, L_{t-1}, NRR_{t-1}, MPI_{t-1} and (MPI×GOV)_{t-1}) They form the long-term component of the model and are the basis for testing the existence of a cointegration relationship in the Bounds Test framework. The differential parts also show the short-term dynamics.

5.1 Descriptive statistics of model variables

A summary of the most important descriptive statistics of the variables used in this study is shown in Table (5-2).

Table 5-2-Descriptive statistics of model variables

	Natural resource rent	M2 growth	Monetary policy instability	Good governance	Gross fixed capital formation to GDP	GDP growth	Labor force
Average	39.48002	22.30604	159.7813	-0.283336	16.68232	6.938448	6568295.
Middle	39.45481	27.56060	151.3446	0.541838	14.90141	4.251062	5693506.
Maximum	67.44300	38.99911	615.8060	1.890340	51.40900	57.81783	12008181
Minimum	9.499349	-9.099587	1.400864	-3.683612	0.734465	-64.04711	4129531.
Standard deviations	14.83470	10.98452	97.74780	1.941895	11.96983	18.46815	2424816.
Skewness	-0.089490	-1.179541	4.065802	-0.630272	0.968829	-0.537029	0.809241
Elongation	2.106091	3.460524	19.89666	1.821662	3.921075	7.576208	2.288403

Statistics Jark for you	1.731473	12.03614	732.5422	4.342118	9.589372	46.03183	6.512196
Probability	0.420742	0.002434	0.000000	0.114057	0.008274	0.000000	0.038538
Number of observation s	50	50	50	35	50	50	50

Table (5-1) presents the descriptive statistics of the variables used in the research model for the period 1975 to 2024 (and for the good governance index from 1990 to 2024) and provides an initial picture of the behavior, dispersion, and distributional characteristics of the data. Examination of these statistics shows that the model variables are heterogeneous in terms of scale, range of fluctuation, and statistical distribution, which reinforces the need to use flexible econometric methods.

The average natural resource rent is about 39.48 percent of GDP, which indicates the high dependence of the Iraqi economy on revenues from natural resources, especially oil, during the period under review. The significant gap between the minimum (about 9.5 percent) and the maximum (more than 67 percent) of this variable indicates the strong fluctuations of natural resource revenues over time. The relatively high standard deviation of natural resource rent also confirms this instability. The skewness close to zero and the kurtosis less than 3 indicate that the distribution of this variable is somewhat close to a normal distribution, which is consistent with the insignificant value of the Jarek-Bara statistic and does not reject the assumption of normality.

The average growth of liquidity (M2) is 22.31 percent, which indicates expansionary monetary policies and high growth of liquidity in the Iraqi economy during the period under review. However, the presence of negative values of liquidity growth and its relatively wide fluctuation range indicate the instability of monetary policy and irregular responses of monetary policymakers to economic shocks. The negative skewness and significance of the Jarek-Bara statistic indicate that the distribution of liquidity growth is far from normality, which is one of the signs of the existence of variance heterogeneity and nonlinear behavior in this variable.

The monetary policy instability index, which is derived from the conditional variance of the model GARCH. The liquidity growth is extracted, has a mean of about 159.78 and a very high maximum of 615.81. The high standard deviation and very high skewness (close to 20) indicate the presence of extreme values and clustering of fluctuations in this variable. The very high value of the Jarek-Bara statistic and its significance indicate that the distribution of this indicator is very far from normality. These features confirm that the instability of monetary policy in the Iraqi economy is structural, unstable and nonlinear in nature, and the use of the conditional variance index to measure it is fully justified.

The good governance index, which is derived from the combination of six institutional components using the principal components analysis method, has a negative mean of -0.28. This negative value indicates institutional weakness and low quality of governance in a significant part of the period under study. The wide range of fluctuations of the index, from very negative values to positive values, indicates regime changes and the instability of institutional reforms in the Iraqi economy. Despite these fluctuations, the distribution of this index is not statistically significantly different from the normal distribution, which is confirmed by the non-significance of the Jarek-Bara statistic. The limited number of observations of this variable to 35 observations also reflects the difference in the time period in which governance data are available.

Gross fixed capital formation to GDP has an average of about 16.68 percent, indicating a relatively low level of investment in the Iraqi economy. The wide range of fluctuations of this variable, from less than one percent to more than 51 percent, indicates the strong impact of investment on economic, political, and institutional shocks. Positive skewness and a skewness higher than 3 indicate that the distribution of this variable has a higher skewness and deviation from normality, which is consistent with the significance of the Jarek-Bara statistic.

The average economic growth is about 6.94 percent, but the very wide range of its changes, from severe negative growth to very high growth, indicates the instability of Iraq's economic performance during the period under review. The high standard deviation and high skewness indicate the presence of severe shocks and asymmetric behavior of economic growth. The significance of the Jarek-Bara statistic also confirms the non-normality of the distribution of economic growth, which highlights the importance of using dynamic time series methods.

Finally, the labor force variable, with an average of about 6.57 million people and a relatively wide range of changes, reflects the increasing trend of the economically active population in Iraq. The positive skewness and significance of the Jarek-Bara statistic indicate that the distribution of this variable is also far from normality, which could be due to structural changes in the labor market and demographic developments.

Overall, the results of descriptive statistics show that most of the variables used in the model do not follow a normal distribution and have severe fluctuations and nonlinear behavior. These features, along with the difference in scale and range of changes of the variables, make the use of the model ARDL To examine short-term and long-term relationships, as well as to apply models GARCH It justifies the extraction of monetary policy instability. In addition, simultaneous fluctuations in the monetary policy instability index and good governance provide the necessary context for examining the moderating role of governance in the relationship between monetary policy and economic growth.

5.2 Checking the stationarity of variables and unit root test

In time series analysis, examining the stationarity of variables is a basic prerequisite for estimating any econometric model and performing causality and cointegration tests. If the stationary characteristics of the data are not taken into account, the estimation results can be biased and misleading inferences can be made. Therefore, before estimating the model and testing short-run and long-run relationships, the degree of cointegration of the research variables is examined.

In this study, the Autoregressive Distributional Lags (ARDL) approach and the Bounds Test are used to examine the existence of a long-run relationship. The basic assumption of this approach is that the variables under study have a maximum cointegration of order zero $I(0)$ or one $I(1)$ and none of the variables have a cointegration of order two $I(2)$. If even one of the variables is $I(2)$, the F-statistic presented in the bounds test will not be valid and the results of the cointegration test will not be reliable. (Pesaran et al., 2001; Bahmani-Oskooee, 2004). Therefore, a careful examination of the degree of stationarity of variables is an essential step in choosing the correct estimation method.

Given the criticisms of conventional unit root tests, the tests used in this study are divided into two general categories: conventional unit root tests and unit root tests with structural failure. Conventional tests include the Generalized Dickey-Fuller (ADF), Phillips-Perron (PP), and the KPSS, the Dickey – Fuller generalized least squares (DF-GLS) test proposed by Elliott et al. (1996), and the Ng–Perron test. Among these tests, the Ng–Perron test has higher power and accuracy due to the correction of the power and bias problems of traditional tests, especially in small samples, and produces more reliable results than tests such as ADF, DF-GLS and KPSS It offers (Shahbaz, 2012).

However, the results of the Ng–Perron test can also be biased if there is a structural failure in the time series. Since the Iraqi economy has faced numerous structural shocks, political instability, and regime changes during the period under review, the possibility of structural failure in the research variables is high. For this reason, in order to ensure the results of conventional unit root tests and to more accurately identify the degree of accumulation of variables, unit root tests with consideration of structural failure have also been used.

In this regard, the unit root test The Zivot –Andrews and Clemente– Montañés –Reyes tests have been used. Zivot-Andrews considers the possibility of a structural break in the trend or width of the time series as endogenous, while Clemente et al. 's test considers the possibility of two structural breaks simultaneously. Using these tests simultaneously increases the accuracy in identifying the stationary behavior of the variables and reduces the probability of error in identifying the degree of accumulation.

The results of unit root tests for all research variables are presented in Table (4-3). As can be seen, the degree of stationarity of the variables based on the results of DF-GLS, Ng–Perron and KPSS are reported in separate columns. Based on the results of conventional tests and tests with structural failure, all research variables are stationary at the I(0) level or with a difference of I(1) and none of the variables has cointegration of order two. These results, using the approach ARDL And conducting the bounds test to examine the existence of a long-term relationship between research variables makes it econometrically justified and valid.

Table 5-3-Unit root test of variables

Variable	Ng-Perron test						DF-GLS test			Kwiatkowski-Phillips-Schmidt-Shin test		
	Optimal pause	MZa	MZt	MSB	MPT	Degree of accumulation	DF-GLS statistic	Optimal pause	Degree of accumulation	KPSS	Optimal pause	Degree of accumulation
Labor force	0	0.13631	0.08239	0.57035	23.1766	I(0)	- 0.301159	0	I(1)	0.777365	3	I(0)
GDP growth	0	- 3.99632	- 1.20365	0.33544	6.25466	I(0)	- 1.959028	0	I(0)	0.760513	3	I(0)
Natural resource rent	0	1.42342	0.66713	0.47561	21.4327	I(0)	0.445105	0	I(1)	0.529878	2	I(0)
Good governance	0	- 4.75134	- 1.53940	0.33354	5.10229	I(0)	- 2.019353	0	I(0)	0.128036	2	I(1)
Gross fixed capital formation to GDP	0	- 2.44657	- 1.01705	0.42456	9.51531	I(0)	- 1.541584	0	I(1)	0.662436	3	I(0)
M2 growth	0	- 0.17596	- 0.13482	0.75158	3.30973	I(0)	- 0.968154	0	I(1)	0.515398	3	I(0)
Monetary policy instability	0	- 3.44632	- 1.36365	0.36744	3.25466	I(0)	- 1.849028	0	I(0)	0.660513	3	I(0)

The results of the unit root test of the research variables using the Ng–Perron, DF-GLS and KPSS It is reported in Table (5-2). The simultaneous use of these three tests allows for a more accurate assessment of the degree of stationarity of the variables, because each of these tests takes a different approach to the stationarity test from a statistical perspective and underlying assumptions. While the Ng–Perron and DF-GLS tests examine the null hypothesis of the existence of a unit root, the KPSS It is designed based on the assumption of zero stationarity and is therefore a suitable complement to conventional unit root tests.

According to the results of the Ng–Perron test, all the variables under study, including labor force, economic growth, natural resource rent, good governance index, gross fixed capital formation to GDP, liquidity growth (M2), and monetary policy instability index, are at a stationary level and all have a degree of accumulation of I(0). These results indicate that from the perspective of this test, shocks to the variables do not have long-term persistent effects and the time series tend to return to their mean.

In contrast, the results of the DF-GLS test show that some variables, including labor, natural resource rent, gross fixed capital formation to GDP, and liquidity growth, are non-stationary and stationary with a first-order difference, while variables such as economic growth, good governance, and the monetary policy instability index are found to be stationary. This difference in results reflects the sensitivity of the DF-GLS test to the data structure and

the presence of structural shocks and fluctuations in the Iraqi economy, which is consistent with the characteristics of the economy under study.

Test results KPSS It also shows that most variables, including labor force, economic growth, natural resource rent, gross fixed capital formation to GDP, liquidity growth, and the monetary policy instability index, are at the stable level, while the good governance index is determined to be at the unstable level and has a degree of accumulation of $I(1)$ based on this test. This result may reflect structural fluctuations and regime changes in the quality of governance in Iraq during the period under review.

In general, comparing the results of the three tests shows that although in some cases there are differences in the detection of the degree of stationarity of the variables, all research variables have a maximum degree of integration of one and no variable has a cointegration of order two $I(2)$. This result is very important from an econometric point of view, because one of the basic assumptions of using the autoregressive distribution lags (ARDL) approach and the bounds test is the absence of $I(2)$ variables in the model.

Therefore, considering the combination of variables $I(0)$ and $I(1)$ as well as the difference in the results of unit root tests, the use of the model ARDL As a flexible approach that allows for the simultaneous estimation of short-term and long-term relationships, it is considered fully justified and appropriate. In addition, the structural fluctuations observed in variables such as liquidity growth, monetary policy instability, and the good governance index reinforce the importance of using this method to analyze the dynamics of the Iraqi economy. In summary, the results of the unit root test indicate that the necessary conditions for performing the bounds test and estimating the model are met. ARDL This research provides and can confidently examine the long-term and short-term relationships between monetary policy instability, good governance, and economic growth in Iraq.

5.3 Determining optimal intervals, cointegration test results, and diagnostic statistics

According to Sims' approach in autoregressive models, the appropriate selection of variables and the determination of the optimal number of lags are of fundamental importance, because the incorrect selection of lags can lead to bias in the estimation of coefficients and reduce the validity of the experimental results. Since increasing the number of lags increases the number of estimable parameters and reduces the degrees of freedom, it is essential to observe the principle of parsimony in determining the lag structure of the models. In this framework, information criteria are used as standard tools for selecting the optimal lag in dynamic models. (Lütkepohl, 1991; Lütkepohl, 2006; Brooks, 2008). Information criteria determine the optimal model cut by comparing the benefits of adding more cuts — in terms of reducing the variance of the disturbance terms — against the cost of losing degrees of freedom. In this study, the Akaike Information Criteria (AIC), Schwartz-Bazin (SBC), and Hannan-Quinn (HQC) were used to select the optimal cut.

After examining the degree of stationarity of the variables and ensuring the absence of second-order cointegration variables, selecting the optimal lag is a prerequisite for estimating the model. ARDL and the Bounds Test is used to examine the existence of a long-term relationship between variables. Previous studies show that the Schwarz-Bayesian criterion tends to select less than optimal intervals in small samples, while the Akaike criterion is more flexible and in many cases provides better performance in limited samples. The Hannan-Quinn criterion is also between the two aforementioned criteria in terms of strictness in selecting intervals. Given the limited time period examined in this study, the Akaike information criterion has been selected as the main criterion for determining the optimal interval of the model. After determining the optimal intervals, the bounds test Pesaran et al. (2001) was conducted to investigate the existence of a long-run relationship between the research variables. The results of this test are reported in the relevant table and show that the value of the F-statistic calculated in the research model has exceeded the critical values of the upper bounds at the 95% confidence level. This result indicates the rejection of the hypothesis of no cointegration and the confirmation of the existence of a long-run relationship between the variables in the model.

In order to increase the confidence in the results of the bounds test and considering the possibility of structural failures in the economy under study, the Gregory and Hansen (1996) cointegration test has also been used. This test has higher power compared to cointegration tests based on residuals and allows for the consideration of structural failures in the long-run relationship. The results of this test, which are reported in the same table, confirm the existence of a long-run cointegration relationship between the research variables. In addition to the cointegration tests, a set of diagnostic tests has also been conducted to assess the classical assumptions of the estimated models. These tests include examining the autocorrelation of the error terms, the heteroscedasticity of the variance, the normality of the disturbance components, and the stability of the model coefficients. The results of these tests show that the classical assumptions of the models are not violated and the estimated models are statistically stable and reliable. As a result, the estimated coefficients and the obtained results have the ability to be economically interpreted and used in analyzing the short-term and long-term relationships between the research variables.

Table 5-4-Results of the long-term relationship test and others Statistics Hey Diagnostic

Estimated model	Optimal pause length	Boys' F-statistics	Normality test	Heterogeneity of variance test statistic	Autocorrelation test	Code statement test	DW - statistics	F-stat	R-Bar-Squared	Gregory test statistic Hansen
GGDP = f((NRR), INSTABILITY, GOODGOVERNANCE, (GFCGDP), (L), INSTABILITY, *GOODGOVERNANCE)	(1, 0, 0, 1, 0, 0, 0)	24881/10*	0 / 875 (./518)	1 / 65 (0 / 43)	2 / 41 (114/0)	0 / 618 (0/445)	2 / 35	1/187	1 / 266	70/6**

Source: Research calculations (*, **, and *** indicate significance at the 1, 5, and 10 percent error levels, respectively.)

The results of the long-run relationship test and the diagnostic statistics of the estimated model are reported in Table (4-6). The model under study considers economic growth as a function of natural resource rent, monetary policy instability, good governance index (interactively), gross fixed capital formation to GDP and labor. The optimal lag structure of the model is chosen as (1, 1, 0, 1, 0, 1), which is determined based on the Akaike information criterion and indicates the existence of different short-term dynamics in the explanatory variables. This lag structure indicates that some variables affect economic growth with a time lag, while the effect of others is mainly simultaneous or short-term.

F-statistic of the test of bounds Pesaran et al. (2001) is equal to 10.2488, which significantly exceeds the critical value of the upper bounds at the standard error levels. This result indicates the rejection of the null hypothesis of no long-run relationship and the confirmation of the existence of cointegration among the variables in the model. In other words, strong statistical evidence indicates that there is a stable long-run equilibrium relationship between economic growth, monetary policy instability, natural resource rents, investment, labor and the moderating role of governance. This finding, using the model ARDL And it makes the extraction of long-term and short-term coefficients econometrically justified.

To assess the validity of the cointegration results and control for the possibility of structural failures, the Gregory and Hansen test is also used. The value of this test statistic is 6.70 and is significant at the 95% confidence level. This result confirms that the identified long-term relationship holds even when considering the possibility of

structural failure in the coefficients or width from the origin. Therefore, the results of the bounds test are also confirmed from the perspective of structural stability. Further, the diagnostic statistics of the model indicate the good fit and econometric validity of the results. The normality test of the error terms shows a value of 0.875 with a probability of 0.518, which indicates that the assumption of normality of the residuals is not rejected. This result indicates that the distribution of errors has acceptable normality and one of the important assumptions of the classical regression model is valid.

The variance heterogeneity test also confirms the absence of variance heterogeneity with a statistic of 1.65 and a probability value of 0.43. This result indicates that the variance of the error terms is constant over time and the estimated coefficients have the necessary efficiency. Also, the autocorrelation test with a statistic of 2.41 and a probability of 0.114 indicates the absence of serial autocorrelation in the residuals. This indicates that the selected lag structure has correctly covered the time dynamics of the model.

RESET test with a statistic of 0.618 and a probability value of 0.445 also indicate that the functional form of the model is correctly specified and that no important variable has been omitted from the model. Consequently, there is no evidence of misspecification or incorrect functional form. The Durbin-Watson statistic is 2.35, which is close to the optimal value, and this result also confirms the absence of first-order autocorrelation in the error terms. The overall F-statistic value of the model (1.187) and the adjusted coefficient of determination (R-Bar-Squared) of 0.266 indicate that the explanatory variables have been able to explain a significant part of the changes in economic growth. Although the adjusted coefficient of determination is not very high, this level of explanatory power is acceptable and expected given the nature of macro time series, the presence of multiple structural shocks, and the severe fluctuations of the Iraqi economy.

In summary, the results of Table (4-5) simultaneously confirm the existence of a stable long-run relationship between the model variables and the validity of classical econometric assumptions. These findings indicate that the model ARDL The estimate is statistically valid, structurally stable, and analytically appropriate for examining the effect of monetary policy instability and the moderating role of governance on Iraqi economic growth. Accordingly, we can confidently interpret the long-run and short-run coefficients of the model.

In this part of the research, estimates of the short-run and long-run coefficients of the model are presented.

Table 5-5-Model estimation results ARDL (Short-term, long-term and error-correction form) Dependent variable: Economic growth (GGDP)

Short-term results and the error correction equation (Conditional ECM)				
Variable	Coefficient	Standard error	t -statistic	Significance level
Width from origin (C)	50.7909	273.5632	0.1857	0.8541
Economic growth with a one-period lag (GGDP (-1))	-0.1432	0.0154	-9.2848	0.0000 ***
Natural Resource Rent (LOG(NRR))	0.1178	0.0991	1.1888	0.2453
Monetary policy instability	-0.0326	0.0156	-2.0873	0.0418 **
Good governance with interruption (GOODGOVERNANCE (-1))	0.9117	0.3364	2.7104	0.0302 **

Gross fixed capital formation to GDP (LOG(GFCGDP))	1.4059	6.6116	0.2126	0.8333
Labor (LOG(L))	5.4779	17.6298	0.3107	0.7585
The interactive variable of good governance and monetary policy instability	0.20256	0.05742	3.5264	0.0027***
Good Governance Changes (ΔGOODGOVERNANCE)	0.8912	0.5301	-1.6813	0.1047 *
Long-term results (Levels Equation)				
Variable	Long-term coefficient	Standard error	t -statistic	Significance level
Natural Resource Rent (LOG(NRR))	0.8228	0.6924	1.1883	0.2455
Monetary policy instability	-0.0228	0.0081	-2.8093	0.0202 **
Good governance	0.6368	0.2336	2.7256	0.0211 **
Gross fixed capital formation to GDP (LOG(GFCGDP))	0.9819	0.4638	2.1169	0.0408 **
Labor (LOG(L))	0.3826	0.1228	3.1143	0.0027 ***
The interactive variable of good governance and monetary policy instability	0.141283	0.0400	3.5276	0.0013***
Error Correction Sentence (ECT = GGDP (-1))		-0.1432	0.0000 ***	

The results presented in Table (5-5) indicate the existence of a stable long-run relationship between economic growth, monetary policy instability, governance quality, real factors of production and the interactive variable of governance and monetary policy instability in the Iraqi economy. The negative and significant coefficient of the error correction term confirms that after the occurrence of short-term shocks, the economic system returns to the long-term equilibrium path, which indicates the dynamic adaptation of the variables in the long run. The coefficient of the error correction term is -0.143 and is significant at the one percent level, indicating that about 14 percent of the imbalance created is adjusted in each time period. This result indicates that the adjustment process to long-run equilibrium exists in the Iraqi economy, but its pace is relatively gradual; an issue that is consistent with the fragile institutional structure, dependence on natural resources, and high sensitivity to political and economic shocks in this country.

In the short run, monetary policy instability has a significant negative effect on economic growth. This result suggests that monetary policy volatility and uncertainty reduce economic growth by dampening private sector

expectations, increasing investment risk, and disrupting production decisions. In other words, even if the level of monetary policy is expansionary in the short run, its instability can have significant negative effects on economic activity. The short-term results also show that good governance has a positive and significant effect on economic growth with a one-period lag. This finding suggests that improving institutional quality, albeit with a time lag, can increase the effectiveness of policies and provide a more suitable environment for economic activities. On the other hand, short-term changes in good governance have a weaker effect and are only significant at the 10% level of error, indicating that the impact of institutional reforms appears more in the medium and long term horizon than in the short term. One of the key findings of this study is the significance and positive sign of the interaction variable between good governance and monetary policy instability in the short run. This result suggests that higher quality of governance can moderate the negative effects of monetary policy instability on economic growth. In other words, when institutions are more efficient, transparency is higher, and government accountability is stronger, the economy will have a greater capacity to absorb shocks from monetary policy fluctuations.

In the long run, the model results provide a clearer picture of the mechanisms of economic growth in Iraq. Monetary policy instability has a significant negative effect on economic growth, confirming that monetary uncertainty in the long run is also one of the main obstacles to sustainable growth. This result suggests that even in the long run, monetary policy instability can limit economic growth by reducing investment, weakening productivity, and increasing macroeconomic risk. In contrast, good governance has a positive and significant effect on economic growth in the long run. This finding suggests that improving institutional quality, by strengthening the rule of law, reducing corruption, and increasing government effectiveness, provides the necessary basis for sustainable economic growth. The positive role of good governance in the long run indicates that institutional reforms can be one of the most important policy tools to improve Iraq's economic performance. Gross fixed capital formation to GDP and labor also have a positive and significant effect on economic growth in the long run. These results are consistent with economic growth theories and show that physical capital accumulation and labor force growth continue to be fundamental factors of economic growth in Iraq. The significance of these variables in the long run and their lack of significance in the short run indicate that the impact of real factors of production takes time and is visible in the long run. Natural resource rents do not show a significant effect on economic growth in the long run. This result may confirm the fact that revenues from natural resources in the Iraqi economy have not necessarily led to sustainable growth and, in the absence of effective governance and appropriate policymaking, have failed to play an effective role in promoting economic growth. This finding is consistent with the "resource curse" literature. Finally, the interaction variable of good governance and monetary policy instability also has a positive and significant effect on economic growth in the long run. This result confirms that higher institutional quality can reduce the negative effects of monetary policy instability not only in the short run but also in the long run. In other words, good governance plays the role of an institutional shock absorber that reduces the severity of the negative effects of monetary uncertainty on economic growth.

Overall, the results of this study show that monetary policy instability is one of the factors inhibiting economic growth in Iraq, but the severity of this effect is significantly dependent on the quality of governance. Improving governance can both directly enhance economic growth and indirectly, by moderating the negative effects of monetary policy instability, pave the way for more sustainable economic growth.

Results obtained from model estimation ARDL It shows that the identified relationships between monetary policy instability, good governance, and economic growth are highly consistent with the main predictions of macroeconomic and institutional economics theories. From a theoretical perspective, the negative and significant effect of monetary policy instability on economic growth, both in the short and long run, is consistent with the theoretical framework of macro uncertainty. According to uncertainty-based theories, severe and unpredictable fluctuations in monetary policy increase macro risk, weaken rational expectations, and reduce private investment. In this framework, even when monetary policy is nominally expansionary, its instability can limit economic growth through the expectations and cost of capital channels. The negative result of monetary policy instability in this study confirms exactly this theoretical mechanism.

From the perspective of Keynesian and post-Keynesian theories, stable monetary policy is one of the prerequisites for maintaining aggregate demand and stability of economic activities. In this view, severe fluctuations in monetary policy can disrupt the effective interest rate, reduce investment, and weaken production. Therefore, the observation of the negative effect of monetary policy instability on economic growth in Iraq is also consistent with this theoretical framework, especially in an economy where financial markets are not deep enough and monetary policy transmission channels are fragile.

The positive and significant effects of good governance on economic growth in the long run are consistent with theories of modern institutional economics. According to institutional perspectives, the quality of institutions plays a key role in facilitating economic growth by securing property rights, reducing transaction costs, increasing transparency, and improving government efficiency. Theorists such as North and Acemoglu emphasize that without effective institutions, economic policies — even if technically sound — cannot lead to sustainable outcomes. The findings of this study, which show that good governance enhances economic growth in the long run, are fully consistent with this theoretical framework.

From the perspective of neoclassical growth theories and endogenous growth, a positive and significant effect of gross fixed capital formation and labor force on economic growth in the long run can also be expected. In the Solow model, physical capital accumulation and labor force increase are the main factors in increasing the level of production, although their effect in the short run may be limited. In endogenous growth theories, investment and labor force strengthen economic growth in the long run by increasing production capacity, productivity, and endogenous learning. The lack of significance of these variables in the short run and their significance in the long run in the results of this study are fully consistent with the logic of these theories.

The result of the lack of significance of natural resource rents in the long run can be interpreted within the framework of the “resource curse” theory. According to this theory, the abundance of natural resources does not necessarily lead to economic growth and, in the absence of efficient institutions, can lead to resource misallocation, increased rent-seeking, and weakening of the productive sectors of the economy. The findings of this study show that in the Iraqi economy, natural resource revenues alone have not been able to play an effective role in sustainable economic growth; a result that is fully consistent with the theoretical predictions of the resource curse.

The most important theoretical innovation of this study lies in confirming the moderating role of good governance in the relationship between monetary policy instability and economic growth. The positive and significant sign of the interactive variable of good governance and monetary policy instability is consistent with the institutional-macro perspective, which emphasizes that strong institutions can reduce the severity of the negative effects of policy shocks. In the theoretical framework, good governance plays a shock absorber role against monetary policy instability by increasing the credibility of the policymaker, improving the coordination of monetary and fiscal policies, and reducing institutional uncertainty. The empirical results of this study clearly confirm this theoretical prediction.

Overall, the high consistency of the empirical results with macroeconomic, economic growth, and institutional economics theories indicates that the findings of this study are not only statistically valid, but also theoretically coherent and defensible. This theoretical consistency strengthens the analytical validity of the results and indicates that improving governance and reducing monetary policy volatility can be considered, within the framework of theoretical foundations of economics, as two essential pillars for achieving sustainable economic growth in Iraq.

Results from model estimation ARDL It shows that the identified relationships between monetary policy instability, good governance and economic growth are remarkably consistent with the theoretical predictions of macroeconomics and institutional economics. The significant and negative effect of monetary policy instability on economic growth in the long run is consistent with theories based on macro uncertainty. According to this theoretical framework, severe and unpredictable monetary policy fluctuations reduce economic growth by increasing macro risk, weakening expectations and postponing investment decisions. This mechanism is especially intensified in economies with shallow financial markets and high dependence on government policies, such as Iraq. Empirical evidence

presented by Lensink et al. (1999) also shows that uncertainty can significantly weaken economic growth; a result that is consistent with the findings of this study on the negative effect of monetary policy instability.

From an institutional economics perspective, the positive and significant effect of good governance on economic growth in the long run is consistent with views that consider the quality of institutions as a necessary condition for sustainable growth. Institutional theories emphasize that efficient institutions provide the necessary basis for the effectiveness of macroeconomic policies by securing property rights, reducing transaction costs, and increasing the credibility of policymakers. In this regard, the results of this study, which show that good governance directly enhances economic growth, are consistent with recent empirical evidence. For example, Pastpipatkul (2025) shows that higher institutional quality can increase the efficiency of macroeconomic policies and lead to sustainable economic growth.

The most important finding of this study is the significance and positive sign of the interaction variable of good governance and monetary policy instability. This result indicates that good governance plays a moderating role in the relationship between monetary policy instability and economic growth. From a theoretical perspective, this result is consistent with the view that strong institutions act as shock absorbers for policy shocks. In conditions where the quality of governance is higher, even if monetary policy is accompanied by fluctuations, the credibility of the policymaker and institutional transparency cause the negative effects of these fluctuations to be transmitted to the real sector of the economy with less intensity. This view is consistent with the results of studies such as Zorell (2024) agrees, showing that institutional quality can reduce the severity of the negative effects of monetary shocks on growth risks. Also Ekeocha et al. (2023) show in a panel study for African countries that the negative effects of policy uncertainty on economic performance are strongly dependent on the quality of governance institutions.

The positive effect of gross fixed capital formation and labor on economic growth in the long run is also consistent with neoclassical and endogenous growth theories. These theories consider physical capital and labor to be fundamental factors in increasing production capacity and economic growth. The significance of these variables in the long run and their lack of significance in the short run indicate that the impact of real factors of production is gradual in nature and becomes apparent over a long-term time horizon; a result that is consistent with theoretical predictions.

In contrast, the lack of significance of natural resource rents in the long run can be interpreted within the framework of the “resource curse” theory. According to this theory, the abundance of natural resources does not necessarily lead to economic growth and, in the case of institutional weakness, can lead to rent-seeking, resource misallocation, and the weakening of productive sectors of the economy (Sachs & Warner, 2001). In the Iraqi economy, which has faced severe oil price fluctuations, political shocks, and institutional weakness, the combination of the short-term positive effects of resource rents through government spending and its long-term negative effects can lead to a non-significant net effect. This result is not only inconsistent with the theoretical literature, but also indicates the importance of the role of institutions in determining how natural resources affect economic growth.

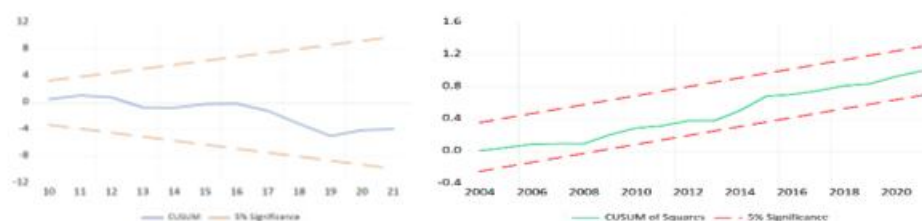
Overall, the results of this study are highly consistent with theoretical predictions of macroeconomics, economic growth, and institutional economics, and are also consistent with a significant portion of previous empirical evidence. This theoretical and empirical consistency indicates that monetary policy instability in the absence of effective governance can be one of the main obstacles to economic growth, while improving the quality of governance not only directly enhances growth, but also creates the basis for more sustainable economic growth by moderating the negative effects of monetary uncertainty.

5.6 Model stability test

to examine the stability of the estimated parameters in ARDL estimation in order to ensure the obtained results. In order to test the stability of the estimated parameters, the sum of the regression residuals (CUSUM) and the sum of the squares of the regression residuals (CUSUMSQ) tests of the regression residuals of the model were used. Based

on the results of these tests, no instability was found. There is no parameter in the estimated model, and the estimated parameters have the necessary stability to make policy recommendations.

Chart 5-3-Coefficient stability test CUSUM and CUSUMSQ in model estimation



Source: Research calculations

Based on the test chart CUSUM, the cumulative statistical path of the regression residuals, is always within the 5% confidence bands throughout the entire period under study, and no significant deviations from these limits are observed. This result indicates that the estimated coefficients of the model are stable over time and there are no sudden structural changes or significant parameter failures that could question the validity of the coefficients. In other words, the estimated relationship between economic growth and the explanatory variables in the model framework ARDL The sample remained stable throughout the period.

Also the test results CUSUMSQ which is more sensitive to sudden changes in error variance and severe instabilities, confirms the stability of the model. As can be seen in the corresponding graph, the statistic CUSUMSQ is also within the 5% confidence bands in all periods, and no evidence of severe fluctuations or structural instability is observed in the model coefficients. This indicates that not only the mean of the coefficients, but also their variances have been relatively stable over time.

Overall, the test results CUSUM and CUSUMSQ It simultaneously shows that the model ARDL The estimated model has good parameter stability and the estimated coefficients are not unstable under the influence of severe structural changes or temporary shocks. This finding is of great methodological importance, as it shows that the results obtained are reliable and can be used to interpret economic relationships and provide policy recommendations. Especially in an economy like Iraq, which has faced numerous political and economic fluctuations during the period under review, confirming the stability of the model significantly strengthens the analytical validity of the research results.

6. Summary and Conclusion

The main objective of this study was to investigate the impact of monetary policy instability on Iraq's economic growth during the period 1975 to 2024. To achieve this goal, first, the monetary policy instability index was calculated using liquidity growth fluctuations and the model. GARCH was extracted and then the short-run and long-run relationship between monetary policy instability and economic growth was examined using the autoregressive distribution lag (ARDL) model. The results of the stationarity, cointegration and diagnostic tests also showed that the model has the necessary validity and stability.

The results of the study show that there is a long-term relationship between the variables of the model and the coefficient of the error correction term is negative and significant, which indicates the gradual return of the economy to the long-term equilibrium path after the occurrence of shocks. Also, the empirical findings showed that the instability of monetary policies in the short and long term has a negative and significant effect on the economic growth of Iraq. This result shows that the increase in uncertainty caused by monetary policy fluctuations, through reducing investment, weakening economic expectations and increasing the risk of production activities, limits economic growth.

The results also showed that gross fixed capital formation and labor have a positive and significant effect on economic growth, which is consistent with the theoretical foundations of economic growth. In contrast, natural resource rents have not had a significant effect on Iraq's economic growth, which indicates that relying solely on oil revenues, without properly directing these resources towards productive activities, cannot guarantee sustainable economic growth. Based on the results obtained, the main hypothesis of the study, namely the existence of a negative and significant effect of monetary policy instability on economic growth in Iraq, was confirmed. In general, the findings of this study show that establishing stability in monetary policies is one of the basic prerequisites for achieving sustainable economic growth in Iraq, and reducing monetary uncertainty can play an important role in improving the investment climate, increasing production, and strengthening economic growth.

According to the results of this study, the most important policy recommendation is for the Central Bank of Iraq to adopt stable, transparent, and predictable monetary policies, because reducing monetary policy volatility can Reduce economic uncertainty and provide a suitable environment for increased investment and economic growth. Also, strengthening the independence and credibility of the central bank and avoiding short-term interventions in monetary decisions will play an important role in increasing the effectiveness of monetary policies. On the other hand, greater coordination between monetary and fiscal policies, especially in the context of the Iraqi economy's dependence on oil revenues, can prevent severe macroeconomic fluctuations. In addition, directing oil revenues towards productive investments, infrastructure development, and increasing production capacities, instead of covering current expenses, can To pave the way for sustainable economic growth. Overall, establishing stability in monetary policies, promoting coordination of macroeconomic policies, and efficient use of oil resources are among the most important requirements for achieving sustainable economic growth in Iraq.

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