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Research Paper

The Role of Monetary Sterilization Mechanisms in Achieving Monetary Stability in Iraq: An Econometric Analysis

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ABSTRACT

Achieving monetary stability remains a critical challenge for Iraq, primarily due to its heavy reliance on oil revenues and heightened vulnerability to external financial shocks. The volatility of global oil prices and frequent fiscal imbalances have complicated the Central Bank of Iraq's (CBI) efforts to maintain monetary equilibrium. This study investigates the effectiveness of the monetary sterilization mechanism in stabilizing Iraq's monetary environment between 2004 and 2023. Using annual data from official sources, primarily the CBI, the research employs an econometric approach, integrating a deductive methodology with descriptive analysis and quantitative modelling. The study estimates the sterilization coefficient and evaluates its impact on key monetary indicators, including inflation and exchange rate stability. The findings reveal that sterilization policies have a statistically significant effect on short-term monetary stability, mitigating immediate price and currency volatility. However, the long-term impact is statistically insignificant, largely due to structural economic limitations, such as the predominance of oil exports, shallow financial markets, and restricted monetary policy tools. The empirical results suggest that Iraq practices partial rather than full sterilization, leading to residual inflationary and deflationary pressures. The study recommends developing more diverse and sustainable monetary policy instruments, strengthening coordination between monetary and fiscal policies, and promoting economic diversification to achieve enduring monetary stability.

Introduction

Monetary sterilization is a fundamental tool of monetary policy, particularly in economies experiencing significant foreign capital inflows. The effectiveness of these

policies directly impacts liquidity levels, monetary stability, and economic growth (Bergant et al., 2024; Şahin, 2025). Many emerging economies struggle to balance the benefits of foreign exchange inflows with the risks of excessive liquidity expansion and inflationary pressures (Miranda-Agrippino & Rey, 2020). Iraq presents a particularly relevant case due to its rentier economic structure, which heavily relies on crude oil exports as the primary source of public revenue (Farhan et al., 2022). Large foreign financial inflows resulting from oil revenues often pose challenges to monetary stability, requiring intervention by the Central Bank of Iraq (CBI) through sterilization mechanisms (Cavallino & Sandri, 2018).

The role of monetary sterilization in achieving monetary stability is particularly critical for oil-exporting economies like Iraq, where fluctuations in global oil prices can lead to volatile capital inflows. These inflows, if left unmanaged, may contribute to excessive liquidity, exchange rate instability, and inflationary pressures (Frayyeh et al., 2022; Obstfeld, 2022). The Central Bank of Iraq has implemented various sterilization techniques, including open market operations and foreign exchange interventions, to mitigate these effects and maintain monetary stability (Georgieva, 2021). However, Iraq's monetary policy landscape is characterized by structural limitations, including a rigid exchange rate regime, a highly dollarized economy, and underdeveloped financial markets, which weaken policy transmission mechanisms (Masciandaro & Romelli, 2019). These structural barriers raise questions about the long-term effectiveness and sustainability of sterilization policies, especially given Iraq's heavy dependence on oil revenues as a primary source of foreign exchange.

Despite extensive research on monetary sterilization and its role in stabilizing economies, the case of Iraq remains underexplored. Most existing studies on monetary sterilization focus on economies with well-developed financial markets and diverse monetary policy instruments (Ferrari et al., 2021; Khalaf et al., 2023). In contrast, Iraq's monetary system operates within a highly dollarized environment with a rigid exchange rate regime and a financial sector that remains underdeveloped (Hofmann et al., 2021). While previous research has examined the role of monetary sterilization in various economies, limited empirical evidence exists on the extent to which Iraq's sterilization efforts have contributed to monetary stability. Furthermore, existing Iraqi studies have primarily provided descriptive analyses rather than employing advanced econometric techniques to quantify the impact of sterilization policies on monetary stability (Ghafour & Aziz, 2023; Al-Khazraji & Bayda, 2021). Many studies have explored sterilization's role in economic balance but have not specifically analyzed its relationship with monetary stability using rigorous econometric models such as the Autoregressive Distributed Lag (ARDL) model.

This present study aims to fill this gap by providing a comprehensive econometric analysis of the effectiveness of Iraq's monetary sterilization policies in achieving monetary stability over the period 2004–2023. By employing the ARDL model, the study will assess both the short-term and long-term impact of sterilization mechanisms on monetary stability. This approach allows for a deeper understanding of whether sterilization policies have been effective in neutralizing foreign exchange inflows and maintaining price stability, or whether additional monetary tools are required to achieve sustainable stability. The research will specifically examine key monetary stability indicators such as inflation, exchange rate volatility, and money supply fluctuations to provide a more precise assessment of sterilization effectiveness.

To achieve these objectives, this study addresses the following key research questions: (1) To what extent has the Central Bank of Iraq implemented monetary sterilization to manage foreign capital inflows? (2) What is the impact of monetary sterilization policies on Iraq's monetary stability in the short and long run? And (3) How effective are Iraq's sterilization mechanisms compared to those in other oil-exporting economies? These questions serve as a foundation for evaluating the effectiveness of Iraq's sterilization policy and its broader implications for monetary stability.

This study contributes to the existing literature in several ways. First, it quantifies the impact of monetary sterilization on Iraq's monetary stability using an econometric approach, providing empirical evidence on the relationship between sterilization and stability. Second, it extends previous research by incorporating both long-term and short-term analysis, addressing the effectiveness and limitations of Iraq's monetary sterilization policies over an extended period. Finally, the study offers policy recommendations for improving sterilization mechanisms, helping Iraq's monetary authorities design more effective policies for managing capital inflows and achieving sustainable monetary stability. By addressing these research gaps, this study provides a roadmap for policymakers to enhance monetary policy effectiveness and offers empirical insights for scholars studying monetary sterilization in resource-dependent economies.

Literature Review

A wealth of theoretical and applied research has explored the effects of monetary sterilization on economic variables, yielding diverse outcomes contingent on the specific conditions of each country and the econometric methods employed (Wu, 2023; Yousif et al., 2024). While some studies highlight the importance of sterilization in fostering macroeconomic stability (Kuzior, 2024; Roman, 2025), others emphasize its constraints (Anam et al., 2024; Chen et al., 2024), especially in economies plagued by structural imbalances or fragile financial systems. These contrasting perspectives reflect the multifaceted nature of sterilization as a policy tool and its varying impact across different economic contexts.

For instance, a study by Ghafour and Aziz (2023) investigated the effects of monetary sterilization on Iraq's economic equilibrium during the period from 2004 to 2021. By combining the Autoregressive Distributed Lag (ARDL) model with the Kaldor Square method, the study provided both quantitative and descriptive insights into how the Central Bank of Iraq (CBI) sought to neutralize the negative consequences of foreign financial inflows. The findings indicated that sterilization policies were instrumental in improving Iraq's economic balance by facilitating the withdrawal of foreign reserves, thereby stabilizing the monetary base.

Similarly, Badawi (2024) analyzed the role of monetary sterilization in enhancing the effectiveness of fiscal policy in Egypt. Utilizing a deductive approach and time series data from 1991 to 2020, the study explored how sterilization mitigated inflation and contributed to macroeconomic stability. The results revealed that monetary sterilization played a critical role in strengthening fiscal policy, particularly in controlling inflationary pressures, which are often a significant challenge in developing economies.

In another notable study, Koo (2024) examined whether South Korea's monetary policy could maintain its autonomy in the face of international capital flows. Covering the

period from 1990 to 2020, the research focused on how U.S. interest rates, balance of payments imbalances, and exchange rate fluctuations influenced South Korea's monetary policy. By employing Taylor's Rule and estimating the sterilization coefficient, the study concluded that South Korea's monetary policy was largely shaped by external monetary conditions, with exchange rate movements acting as a pivotal factor in maintaining a degree of policy autonomy for the Bank of Korea.

Further adding to the literature, Hoang et al. (2020) assessed the efficiency of sterilization measures in Vietnam, particularly in the context of the global financial crisis (2008–2009). Using the Two-Stage Least Squares (2SLS) method, the study found that the State Bank of Vietnam faced challenges in fully neutralizing capital inflows, which led to excess liquidity and inflationary pressures. The findings also indicated that the global financial crisis weakened the effectiveness of sterilization policies in managing domestic money supply, highlighting the vulnerability of such measures in times of global economic turmoil.

A broader review of the existing literature reveals that while much of the research has focused on the relationship between monetary sterilization and inflation, as well as its interaction with fiscal policy, studies on Iraq have generally adopted a descriptive approach. These studies, such as those by Al-Khazraji and Bayda (2021) and Ouda (2023), have primarily focused on the sterilization tools used by the Central Bank of Iraq, but have not utilized advanced econometric models to quantify the impact of sterilization on monetary stability. To date, no study has specifically employed modern econometric techniques to analyze the effects of monetary sterilization on monetary stability in Iraq. This research aims to address this gap by offering an empirical analysis of how sterilization policies have influenced Iraq's monetary stability, thereby contributing significantly to the ongoing discourse on monetary policy in resource-dependent economies.

Method

Research Design

This study adopts a deductive approach, integrating economic literature with empirical analysis to explore the relationship between monetary sterilization and monetary stability in Iraq. The research utilizes both descriptive and econometric methods, employing the Autoregressive Distributed Lag (ARDL) model to measure the short- and long-term impact of sterilization policy rates on monetary stability. The ARDL approach is chosen for its flexibility in handling variables with different integration orders (I(0) and I(1)), making it particularly suitable for the mixed stationarity characteristics often observed in macroeconomic time series data.

Sample and Data Sources

The research relies on annual data spanning the period 2004–2023. This period was selected to capture Iraq's post-2003 economic transformation and the corresponding evolution of monetary policy. Data were primarily sourced from the Central Bank of Iraq's (CBI) statistical bulletins, the Iraqi Ministry of Planning, the World Bank, and the International Monetary Fund (IMF). These sources provide reliable data on key variables such as net foreign and domestic assets, money supply, GDP, inflation, and exchange rates. Cross-verification across sources was conducted to ensure data accuracy and consistency.

Data Collection

This study collects data on monetary sterilization and stability indicators. The degree of monetary sterilization is measured using the relative approach, calculated as:

$$\Delta \text{ DNA} = \beta \, \Delta \text{ NFA} \quad \ldots\ldots (1)$$

Where:

Δ DNA: Change in net domestic assets of the central bank
Δ NFA: Change in net foreign assets of the central bank
β: Sterilization coefficient

The sterilization coefficient's value indicates the degree of sterilization:
β = -1: Complete sterilization (no impact of foreign inflows on the monetary base)
-1 < β < 0: Partial sterilization (partial impact of foreign inflows on the monetary base)
β = 0: No sterilization (full impact of foreign inflows on the monetary base)

Monetary stability is assessed using the ratio of money supply changes to GDP changes:

$$B = \frac{\Delta M/M}{\Delta Y/Y} \quad \ldots\ldots (2)$$

Where:

B = Monetary stability coefficient
ΔM/M = Change in the money supply
ΔY/Y = Change in GDP

This indicator reflects the relationship between money supply growth and economic output, but additional measures (e.g., inflation rate, exchange rate volatility) will be included to capture a broader view of monetary stability.

Data Analysis

The ARDL model is used to estimate short- and long-term relationships between monetary sterilization and monetary stability. The model's suitability is confirmed through stationarity tests (Augmented Dickey-Fuller and Phillips-Perron). The ARDL bounds test is employed to check for long-run cointegration, while model diagnostics, including serial correlation, heteroskedasticity, and normality tests, ensure result validity. To enhance robustness, impulse response functions (IRFs) and variance decomposition analysis are applied to assess how monetary stability reacts to shocks in sterilization policy over time. This multi-faceted econometric approach provides a comprehensive understanding of Iraq's monetary sterilization mechanisms and their effectiveness in maintaining stability.

Results

Monetary Sterilization in Iraq 2004-2023

Since 2004, following the political and economic transition in Iraq, the Central Bank of Iraq began implementing a monetary sterilization policy through intervention in the foreign

exchange market by selling U.S. dollars. However, this intervention did not match the volume of local currency issued by the bank itself, due to the large monetary injections made annually alongside the government's control over its revenues from dollar inflows derived from oil sales to finance the general budget and meet public expenditures. Despite this, the Central Bank of Iraq, through these interventions, aims to reduce the local money supply by increasing demand for the local currency while offering U.S. dollars in exchange. This process contributes to lowering inflation rates, which is the primary objective of Iraq's monetary policy (Ghafour & Aziz, 2023). Table 1 presents monetary sterilization coefficient in Iraq as determined using relative approach.

Table 1. Monetary Sterilization Coefficient in Iraq 2004-2023 (Billion IQD)

Year	Net Foreign Assets at the Central Bank	Net Domestic Assets at the Central Bank	Change in Net Foreign Assets	Change in Net Domestic Assets	Monetary Sterilization Coefficient
2004	10,742	1,477	-	-	-
2005	17,366	-3,571	6,624	-5,048	-0.8
2006	25,716	-8,196	8,350	-4,625	-0.6
2007	38,217	-9,409	12,501	-1,213	-0.1
2008	58,841	-15,982	20,624	-6,573	-0.3
2009	49,792	-4,522	-9,049	11,460	-1.3
2010	53,810	-3,398	4,018	1,124	0.3
2011	69,379	-10,681	15,569	-7,283	-0.5
2012	79,968	-16,577	10,589	-5,896	-0.6
2013	90,648	-15,352	10,680	1,225	0.1
2014	75,446	-9,215	-15,202	6,137	-0.4
2015	63,506	-5,618	-11,940	3,587	-0.3
2016	52,618	9,973	-10,888	15,591	-1.4
2017	57,326	3,180	4,708	-6,793	-1.4
2018	76,368	-9,207	19,042	-12,387	-0.7
2019	80,362	-2,109	3,994	-11,316	-2.8
2020	78,882	9,979	-1,480	12,088	-8.1
2021	93,090	17,047	14,208	7,068	0.5
2022	140,636	4,605	47,546	-12,442	-0.3
2023	145,898	19,714	6,624	15,109	2.3
Average Sterilization Coefficient					**-0.8**

*Source: Statistical Bulletins of Central Bank of Iraq 2004-2023

As observed in Table 1, the monetary sterilization coefficient in Iraq remained between zero and one for the majority of the study period, indicating that the Central Bank of Iraq primarily implemented partial sterilization. For instance, in 2005, the sterilization coefficient was -0.8, signifying that an increase of one unit in the monetary base due to net foreign assets was offset by net domestic assets by 0.8 units, suggesting the adoption of an expansionary monetary policy by the Central Bank. The average sterilization coefficient for the study period was -0.8, further implying that partial sterilization was employed to counterbalance changes in net foreign assets affecting the monetary base. In economies that pursue expansionary monetary policies alongside targeted inflation rates to stimulate domestic credit, partial sterilization is typically favoured over complete sterilization, a

scenario that applies to Iraq (Al-Khazraji & Bayda, 2021). However, in 2009, 2016, 2017, and 2020, the sterilization coefficient was negative and greater than one, indicating excessive sterilization during these years, where the changes in net domestic assets exceeded those in net foreign assets, necessitating intervention by the Central Bank to counterbalance the decline in foreign reserves and stabilize the monetary base. In contrast, in 2010, 2021, and 2023, the sterilization coefficient was positive, suggesting no significant sterilization effect by the Central Bank, meaning that the monetary base was fully influenced by the increase in net foreign assets, with changes in net domestic assets failing to offset the impact of the foreign inflows.

Monetary Stability in Iraq 2004-2023

Monetary stability is a key objective of monetary policy, and in Iraq, this goal has become increasingly central following the political transition of 2003 and the subsequent enactment of a new Central Bank Law, which empowered the monetary authority to intensify efforts towards achieving this stability. Historically, Iraq's monetary policy was heavily influenced by fiscal policy, which constrained the ability to achieve independent monetary control. However, the Iraqi economy faces significant challenges in maintaining monetary stability, primarily due to a mismatch between the growth in money supply and the actual growth of GDP. This imbalance stems from a combination of internal economic difficulties and Iraq's rentier economy, which is heavily dependent on oil revenues. Such dependency exposes the country to the volatility of global oil markets and the broader economic crises that may follow. The monetary stability coefficient, which measures the difference between the change in money supply and the change in GDP, serves as a useful tool in assessing inflationary and deflationary trends over the study period, offering insights into the effectiveness of monetary policies in stabilizing the economy amidst these challenges. Table 2 illustrates monetary stability coefficient in Iraqi economy.

The monetary stability index in Iraq fluctuated significantly over the study period, largely in response to changes in the money supply and broader economic conditions. In 2005, the index registered a low value of 0.5, signaling deflationary pressures. However, it rose sharply in 2006 to 1.5, reflecting inflationary conditions due to a faster increase in money supply compared to GDP growth. The index continued to rise in 2007 to 1.7, driven by higher oil revenues amidst global price increases and worsened by poor security and economic conditions. The index then dropped in 2008 to 0.7 and further declined to -1.8 in 2009, as a result of the global financial crisis and a decrease in oil prices. The index began to improve in 2011 with rising oil revenues, reaching a peak of stability by 2013 before falling again in 2014 due to political instability and a global drop in oil prices.

Between 2015 and 2018, the index gradually improved, despite low values, due to the government's efforts to control money supply and the recovery of oil prices. However, the ongoing effects of the ISIS conflict and fiscal policies focused on war expenditures contributed to deflationary pressures. The index dropped significantly again in 2019 and 2020 to -3.8 and -0.9, respectively, due to the economic repercussions of the COVID-19 pandemic. A recovery occurred in 2021 and 2022, with the index improving to 0.4 and 0.7, driven by a rise in global oil prices and the devaluation of the Iraqi dinar. Despite this, the monetary stability index declined once more in 2023, reflecting a drop in oil prices and the

expansionary fiscal policies, including higher public spending, which increased the fiscal deficit and added pressure on monetary stability.

Table 2. Monetary Stability Index in Iraq 2004-2023

Year	Broad Money Supply (M2) (Billion IQD)	Annual Growth Rate of M2 (%)	GDP at Current Prices (Billion IQD)	Annual GDP Growth Rate (%)	Monetary Stability Index
2004	12,254	-	53,235	-	-
2005	14,684	19.8	73,533	38.1	0.5
2006	21,080	43.5	95,588	29.9	1.5
2007	26,956	27.8	111,456	16.6	1.7
2008	34,920	29.5	157,026	40.8	0.7
2009	45,438	30.1	130,642	-16.8	-1.8
2010	60,386	32.8	162,065	24.0	1.4
2011	72,180	19.5	217,327	34.0	0.6
2012	75,466	4.5	254,225	16.9	0.3
2013	87,679	16.1	273,588	7.61	2.1
2014	90,728	3.4	266,420	-2.61	-1.3
2015	82,595	-8.9	194,681	-26.92	0.3
2016	88,082	6.6	196,924	1.15	5.7
2017	89,441	1.5	221,666	12.5	0.1
2018	95,391	6.6	268,919	21.3	0.3
2019	103,441	8.4	262,917	-2.2	-3.8
2020	119,906	15.9	215,662	-17.9	-0.9
2021	139,886	16.6	301,153	39.6	0.4
2022	168,291	20.3	383,064	27.1	0.7
2023	180,973	7.5	330,046	-13.8	-0.5
Average Monetary Stability Index					**0.4**

*Source: Statistical Bulletins of Central Bank of Iraq 2004-2023

Relationship between Monetary Stability and Monetary Sterilization in Iraq 2004-2023

The relationship between monetary sterilization and monetary stability in Iraq from 2004 to 2023 reveals the challenges faced by the Central Bank of Iraq in managing foreign capital inflows and maintaining a stable monetary environment. As shown in Table 1, complete sterilization was never achieved, as the monetary sterilization coefficient never reached -1, the threshold for full neutralization of the impact of foreign inflows on the monetary base. Instead, the average sterilization coefficient hovered around -0.8, indicating that the Central Bank engaged in partial sterilization. This partial sterilization suggests that while Iraq's monetary authorities actively intervened to mitigate the effects of foreign capital inflows, they did not entirely isolate these inflows from influencing the monetary base. This limited sterilization indicates a deliberate strategy aimed at preventing excessive inflation or deflation, though it fell short of achieving complete isolation of external factors. The policy aimed to strike a balance between stabilizing the economy and avoiding the potential adverse effects of full sterilization, which could hinder economic growth by constricting domestic liquidity.

In line with these partial sterilization efforts, Table 2 reveals that monetary stability in Iraq was similarly elusive. The monetary stability index, which fluctuated significantly

between negative and positive values, did not consistently reach the level of one, which would signify full stability. Instead, the index showed notable volatility, reflecting periods of both inflationary and deflationary pressures. The average value of the monetary stability index was 0.4, signalling that while Iraq's monetary policy had some success in stabilizing the economy, it was not fully effective in maintaining long-term monetary stability. The fluctuations in the index can be attributed to a variety of factors, including external economic shocks, such as global oil price fluctuations, and internal economic challenges, including security instability, government spending patterns, and oil revenue dependency. These external and internal pressures have often disrupted the effectiveness of sterilization policies, causing significant swings in inflation and exchange rates that monetary sterilization alone could not fully counteract.

Ultimately, the relationship between monetary sterilization and monetary stability in Iraq indicates that partial sterilization has had a limited but positive impact on mitigating some of the negative consequences of foreign capital inflows, such as inflation and currency depreciation. While partial sterilization helps reduce volatility in the monetary base, it is not sufficient on its own to achieve comprehensive monetary stability. The lack of consistent success in achieving full stability underscores the need for complementary economic policies that address structural issues within Iraq's economy, such as its heavy reliance on oil revenues, underdeveloped financial markets, and fiscal policies. For monetary stability to be achieved in a more sustainable manner, Iraq must not only enhance its sterilization policies but also diversify its economic base, improve fiscal discipline, and develop more robust financial institutions. Without these broader structural reforms, monetary sterilization will remain an important, though incomplete, tool for achieving stability, and Iraq's economy will continue to face significant challenges in maintaining long-term monetary equilibrium.

The Impact of Monetary Sterilization Policy on Monetary Stability in Iraq 2004-2023

To measure and analyze the impact of monetary sterilization policy on monetary stability in Iraq in both the short and long run, the study utilized annual data for the selected variables, relying on official data and statistics from the Central Bank of Iraq. Given the relatively short time frame of the study and to avoid econometric issues such as autocorrelation and heteroskedasticity, the data was converted into semi-annual data to better assess the degree of monetary stability achieved through monetary sterilization policy in Iraq.

The study adopted a linear model to measure the effect of monetary sterilization policy on monetary stability in Iraq during the period 2004-2023. The study model was formulated as follows:

$$Stab = f(Ster) \quad \ldots\ldots(3)$$

Where:

Stab = Monetary Stability
Ster = Monetary Sterilization

The selection of the study model is guided by the nature of the variables and their degree of integration. In this study, the Autoregressive Distributed Lag (ARDL) model is employed to examine the impact of monetary sterilization policy on monetary stability in Iraq, both in the short and long run. The ARDL model has gained significant popularity in recent years due to several key advantages that make it particularly suitable for this analysis. First, it provides efficient estimates for both short-run and long-run parameters, allowing for a comprehensive understanding of the dynamics between the variables. Second, the ARDL model enables the simultaneous estimation of both long-run and short-run relationships, facilitating a more holistic view of how monetary sterilization affects stability over different time horizons. Additionally, the ARDL model is flexible in handling variables with varying lag structures, making it well-suited for complex datasets where different variables may respond at different speeds. Another key advantage is its applicability to time series variables that are either stationary at level I~(0), first-differenced I~(1), or a mixture of both, though it is not applicable if the variables are integrated at I~(2) or higher, as outlined by Pesaran et al. (2001). Therefore, the ARDL model is an appropriate tool for investigating the impact of monetary sterilization on monetary stability in Iraq, enabling the study to explore both short-term and long-term effects, as formulated below:

$$\Delta \text{stab}_t = C + \beta_1 \text{stab}_{t-1} + \beta_2\ \text{ster}_{t-1} + \sum_{i=1}^{p-1} \lambda_{1i}\, \Delta stab_{t-1} + \sum_{i=1}^{q1}\ \lambda_{2i}\, \Delta \text{ster}_{1t-i} \quad \text{.....(4)}$$

Augmented Dickey-Fuller (ADF) Unit Root Test

This study utilized both the Augmented Dickey-Fuller (ADF) test and the Phillips-Perron (PP) test, as they are among the most accurate methods for detecting stationarity in time series data. Table 3 presents the results of both tests under three different scenarios: the case with a constant term only (With Constant), the case with a constant term and a time trend (Constant & Trend), and the case without a constant term or a time trend (Without Constant & Trend). The results indicate that the time series data for both monetary sterilization (Ster) and monetary stability (Stab) are stationary at level I(0) in both tests. It can be concluded that the PP test has a higher accuracy and better testing power compared to the ADF test, particularly when the sample size is small. If discrepancies arise between the two tests, it is generally preferable to rely on the PP test results (Greene, 2003).

Table 3. Unit Root Test Results According to ADF and PP

UNIT ROOT TEST TABLE (PP)				**UNIT ROOT TEST TABLE (ADF)**			
		At Level				**At Level**	
		STAB	STER			STAB	STER
With Constant	t-Statistic	-3.9842	-3.2685	With Constant	t-Statistic	-3.9808	-3.2685
	Prob.	***0.0077***	***0.0323***		***Prob.***	***0.0078***	***0.0323***
		***	**			***	**
With Constant & Trend	t-Statistic	-4.3447	-3.1596	With Constant & Trend	t-Statistic	-4.0699	-3.1557
	Prob.	***0.0152***	***0.1233***		***Prob.***	***0.0253***	***0.1241***
		**	n0			**	n0

UNIT ROOT TEST TABLE (PP)				UNIT ROOT TEST TABLE (ADF)			
	At Level				**At Level**		
Without Constant & Trend	t-Statistic	-3.9056	-2.9460	Without Constant & Trend	t-Statistic	-3.9165	-2.9649
	Prob.	***0.0006***	***0.0057***		***Prob.***	***0.0006***	***0.0054***
		***	***			***	***
	At First Difference				**At First Difference**		
		d(STAB)	d(STER)			d(STAB)	d(STER)
With Constant	t-Statistic	-15.3684	-6.5681	With Constant	t-Statistic	-6.0170	-5.8825
	Prob.	***0.0000***	***0.0001***		***Prob.***	***0.0002***	***0.0002***
		***	***			***	***
With Constant & Trend	t-Statistic	-14.6164	-6.6556	With Constant & Trend	t-Statistic	-3.8358	-5.7903
	Prob.	***0.0001***	***0.0003***		***Prob.***	***0.0467***	***0.0012***
		***	***			**	***
Without Constant & Trend	t-Statistic	-14.2116	-6.8302	Without Constant & Trend	t-Statistic	-6.2087	-6.0552
	Prob.	***0.0001***	***0.0000***		***Prob.***	***0.0000***	***0.0000***
		***	***			***	***

*Source: EViews 12

Preliminary Estimation of ARDL Model

After completing the stationarity tests for the time series variables, the use of cointegration methodology based on the Autoregressive Distributed Lag (ARDL) model became feasible. Before estimating the relationship between the study variables, it was necessary to determine the optimal lag length for these variables, which involved conducting a preliminary estimation of the ARDL model and selecting the optimal order. According to Figure 1, which illustrates the relationship order between the model variables based on the Akaike Information Criterion (AIC), the optimal equation among the 20 tested models is the one with an order of (2,0), as it yielded the lowest AIC value.

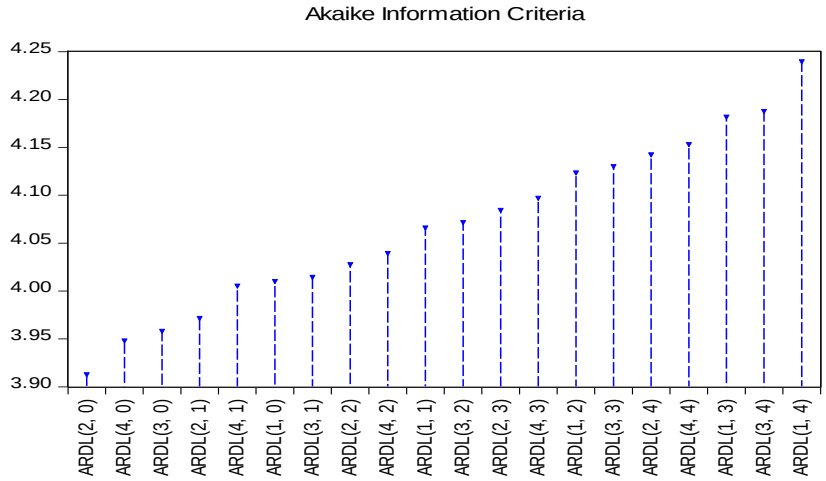

Figure 1. Selection of the Optimal Model

Moreover, Table 4 presents the preliminary estimation results of the ARDL model, which reveal that the coefficient of determination (R^2) reached 36%, indicating that monetary sterilization explains 36% of the variations in monetary stability, while the remaining portion is attributed to the influence of other variables not included in the model. This suggests that monetary sterilization policy alone is insufficient to achieve full monetary stability, consistent with the analytical aspect of the study. Furthermore, the F-statistic value of 6.166292 demonstrates the statistical significance of the model used to estimate both short-term and long-term parameters.

Table 4. Preliminary Estimation Results of ARDL Model – Poverty in Iraqi Economy

Dependent Variable: STAB				
Method: ARDL				
Sample (adjusted): 2006S1 2023S2				
Selected Model: ARDL(2, 0)				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.***
STAB(-1)	0.636456	0.164681	3.864777	0.0005
STAB(-2)	-0.395956	0.170037	-2.328644	0.0264
STER	0.182316	0.143394	1.271433	0.2127
C	0.478784	0.316153	1.514404	0.1397
R-squared	0.366319	Mean dependent var		0.416667
Adjusted R-squared	0.306911	S.D. dependent var		1.898646
S.E. of regression	1.580660	Akaike info criterion		3.858001
Sum squared resid	79.95156	Schwarz criterion		4.033948
Log likelihood	-65.44402	Hannan-Quinn criter.		3.919411
F-statistic	6.166192	Durbin-Watson stat		1.885392
Prob(F-statistic)	0.001982			

*Source: EViews 12

Bounds Test for Cointegration

The next step in analyzing the ARDL model is to test for the existence of a long-run equilibrium relationship. To do so, the Bounds Test, proposed by Pesaran et al. (2001), is conducted to determine whether a cointegration relationship exists among the study variables. Table 5 presents the results of the Bounds Test for cointegration, where the computed F-statistic value of 6.092814 exceeds both the upper bound of the critical values I(1) and the lower bound I(0) for the F-statistic, considering the sample size, degrees of freedom, and significance level. This result indicates the presence of a cointegration relationship among the study variables.

Table 5. Bounds Test for Cointegration

ARDL Long Run Form and Bounds Test		
Test Statistic	Value	k
F-statistic	6.092814	1
I(0)	I(1)	Significance
3.02	3.51	10%
3.62	4.16	5%

ARDL Long Run Form and Bounds Test		
4.18	4.79	2.5%
4.94	5.58	1%

*Source: EViews 12

Estimation of Short-run and Long-run Parameters and Error Correction Mechanism (ECM)

After confirming the existence of a long-run equilibrium relationship based on the Bounds Test, it is necessary to obtain the long- and short-run estimates of the parameters in the estimated model, along with the error correction mechanism (ECM). Table 6 indicates the presence of cointegration between the dependent and independent variables, which is confirmed by the error correction term CointEq(-1) for this model, valued at (-0.759500), with an associated probability value of (Prob = 0.0001). This implies that the two fundamental conditions for this coefficient—its negative sign and statistical significance—are met (Alam, 2012). This result suggests that 75% of short-run errors are automatically corrected over time to reach long-run equilibrium.

Table 6. Estimation of Short-run and Long-run Parameters and Error Correction Mechanism (ECM)

Short Run Coeffcients & Error Correction Regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob
D(Ster(-1)	0.395956	0.163683	2.419041	0.0214
CointEq(-1)*	-0.759500	0.172343	-4.406909	0.0001
Long Run Coeffcients				
Variable	Coefficient	Std. Error	t-Statistic	Prob
Ster	0.240048	0.173724	1.381774	0.1766
C	0.630394	0.378805	1.664162	0.1058

*Source: EViews 12

The estimation results in Table 6 reveal a significant positive relationship between monetary stability and monetary sterilization in the short run. Specifically, a 1% increase in the monetary sterilization coefficient leads to a 0.39% increase in monetary stability. This finding supports economic theory and the study's hypothesis, suggesting that monetary sterilization helps reduce excess liquidity resulting from oil sales, thereby alleviating inflationary pressures. Additionally, sterilization contributes to maintaining a stable exchange rate for the Iraqi dinar against the US dollar, which is crucial in Iraq, given the close linkage of the dinar's exchange rate to the dollar.

However, the results also indicate an insignificant positive relationship between monetary stability and sterilization in the long run, suggesting that monetary sterilization does not effectively contribute to long-term monetary stability in Iraq. Several factors may explain this weak long-term effect. First, sterilization policy alone is insufficient to control inflationary pressures or exchange rate fluctuations in the long term. Second, the Iraqi economy has experienced multiple structural challenges, including oil price fluctuations, security and political instability, and changes in government spending, which likely exert a greater influence on monetary stability than sterilization policies. Additionally, Iraq's underdeveloped financial system poses significant challenges for the effective implementation of monetary policy, limiting the impact of sterilization. Lastly, Iraq's heavy dependence on oil revenues creates substantial

revenue volatility, further diminishing the long-term effectiveness of monetary sterilization in achieving sustained monetary stability.

Diagnostic Tests of the Model

To ensure the quality of the estimated model and its freedom from econometric issues, the following diagnostic tests were conducted. First, Serial Correlation LM Test was administered, and the results indicate the absence of autocorrelation in the residuals, as the computed F-statistic value is 1.227844 with a probability of 0.3072, which is greater than 5%. Additionally, the Chi-square statistic has a probability value of 0.2562, confirming that the model does not suffer from the problem of autocorrelation (see Table 7).

Table 7. Results of Breusch-Godfrey Serial Correlation LM Test

Breusch-Godfrey Serial Correlation LM Test			
F-statistic	1.227844	Prob. F(2,30)	0.3072
Obs*R-squared	2.723861	Prob. Chi-Square(2)	0.2562

*Source: EViews 12

Second, heteroskedasticity test was further conducted, and the results in Table 8 indicate that the model is free from the heteroskedasticity problem. The computed F-statistic value is 0.358216, which is greater than 5%, confirming that the model does not suffer from heteroskedasticity. This strengthens the acceptability of the model's results.

Table 8. Heteroskedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.358216	Prob. F(3,32)	0.7835
Obs*R-squared	1.169697	Prob. Chi-Square(3)	0.7603

Third, a histogram normality test was also carried out. Table 9 shows that the residuals in the estimated model follow a normal distribution. The Jarque-Bera (JB) test value is 5.618049 with a probability value of 0.0602, which means that the null hypothesis stating that the residuals are normally distributed can be accepted.

Table 9. Histogram Normality Test

Histogram Normality test	**Jarque-Bera Value**	**Probability**
Jarque-Bera	5.618049	0.0602

Ramsey RESET Test for Functional Form Adequacy

Table 10 indicates that the F-statistic value is 0.843102 with an associated probability of 0.3656. Additionally, the t-statistic value is 0.918206 with the same probability value (0.3656), both of which are greater than 5%. This leads to accepting the null hypothesis, which states that the functional form (linear) used in the estimated model is correct.

Table 10. Ramsey RESET Test for ARDL Model

Ramsey RESET Test Omitted Variables: Squares of fitted values			
	Value	**df**	**Probability**
t-statistic	0.918206	31	0.3656
F-statistic	0.843102	(1, 31)	0.3656

Structural Stability Test of the Model

In order to ensure that the data used in this study is free from any structural changes over time and to assess the stability and consistency of long-term and short-term parameters, it is necessary to use an appropriate test. Two tests have been employed: the cumulative sum of the recursive residuals (CUSUM) and the cumulative sum of squared recursive residuals (CUSUMSQ). According to these tests, if the graph of both tests remains within the critical boundaries at the 5% significance level, the null hypothesis is accepted, indicating that all parameters are stable.

The test results are illustrated in Figure 2 and Figure 3, which clearly reveal both the cumulative sum of squared residuals (CUSUMSQ) and the cumulative sum of residuals (CUSUM). These appear as a central line within the critical region boundaries (upper and lower limits), indicating structural stability between the short-term and long-term results. Additionally, these statistical tests confirm the stability of the long-term and short-term coefficients of the ARDL model used in this study.

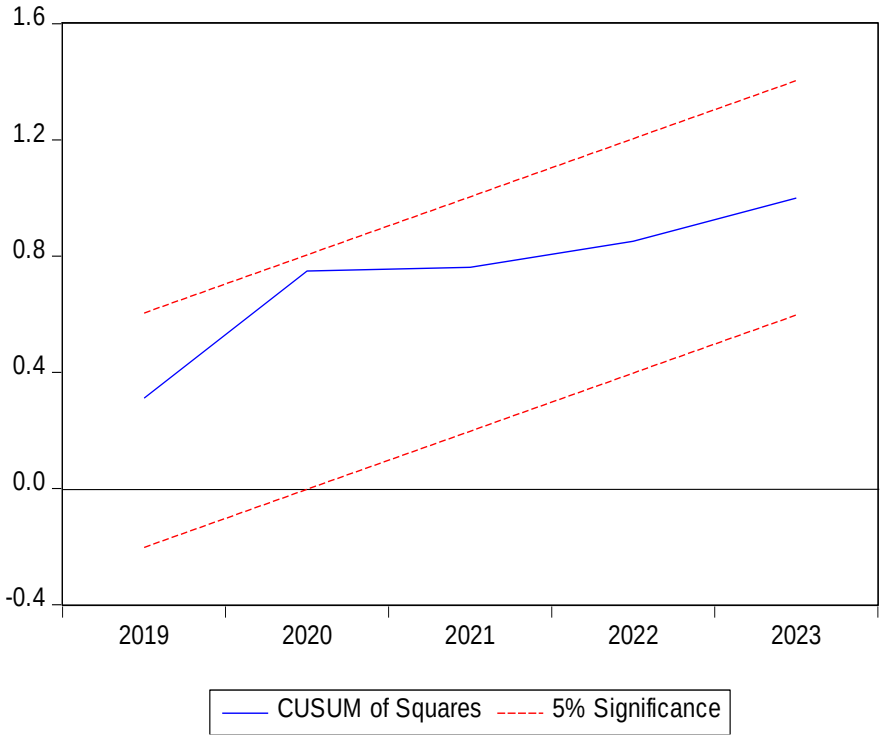

Figure 2. The Cumulative Sum of Squares of Recursive Residuals (CUSUMSQ)

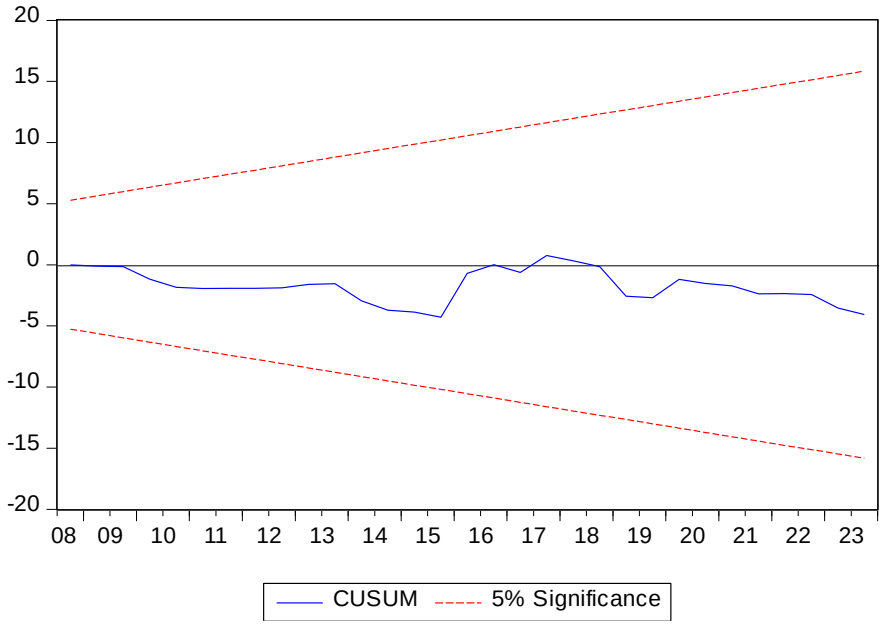

Figure 3. The Cumulative Sum of Recursive Residuals (CUSUM)

Discussion

The empirical analysis provides robust evidence supporting the relationship between monetary sterilization and monetary stability in Iraq. The results of the ARDL model indicate that sterilization policies are effective in achieving short-term monetary stability, enabling the Central Bank of Iraq to manage liquidity fluctuations caused by oil revenue volatility. These findings align with studies such as Arslan et al. (2020), which highlight the short-term benefits of sterilization in resource-dependent economies. The study suggests that sterilization serves as a crucial tool for absorbing excess liquidity, preventing inflationary pressures, and stabilizing exchange rate fluctuations in the immediate term, as pointed out by Ali (2024) and Mohammed (2024). However, the results also indicate that while monetary sterilization maintains a positive relationship with monetary stability, its long-term effectiveness is statistically insignificant. The error correction mechanism suggests that Iraq's monetary system responds swiftly to sterilization policies in the short run, but their impact diminishes over time. This is consistent with Fratzscher et al. (2019) and Murad and Bouabid (2023), who found that sterilized foreign exchange interventions in emerging economies tend to lose effectiveness due to structural inefficiencies, limited financial market depth, and constraints in monetary transmission mechanisms. The Iraqi context further exacerbates these challenges due to its dependence on oil revenues and the limited diversification of its financial system.

Given these findings, the Central Bank of Iraq should avoid over-reliance on sterilization as a standalone tool for long-term monetary stability. Instead, a more diversified policy approach is required (Abdulhadi & Abbas, 2022; Cavallino, 2019). Enhancing the effectiveness of sterilization instruments requires expanding beyond foreign exchange interventions by strengthening open market operations, developing long-term government bond markets, and improving interbank lending mechanisms (Degasperi et al., 2020). Additionally, greater coordination between monetary and fiscal policies is essential, as monetary stability is significantly influenced by government spending patterns and oil

revenue management (Djedajet & Ayad, 2017; Gopinath & Stein, 2021). Closer collaboration between the Central Bank and fiscal authorities can help align sterilization efforts with broader macroeconomic objectives, reducing inflationary risks from expansionary fiscal policies. Another crucial factor is financial market development (Ghadeer & Khudhair, 2022). Iraq's underdeveloped banking and capital markets limit the transmission of sterilization policies, thereby weakening their long-term impact. Encouraging private sector investment, improving banking regulations, and promoting non-oil sector growth would enhance monetary policy effectiveness (Hassan, 2023). Furthermore, given Iraq's vulnerability to external shocks, the Central Bank should explore alternative reserve management strategies, including stabilization funds, to cushion the economy against oil price fluctuations. Implementing a more flexible exchange rate regime may also help absorb external shocks more efficiently, reducing reliance on sterilization measures.

While this study highlights a positive short-term relationship between sterilization and monetary stability, alternative interpretations merit consideration. The statistically insignificant long-term effect may not necessarily indicate ineffectiveness but rather inefficiencies in implementation mechanisms (Fabris, 2024). A more structured approach, integrating interest rate policies with sterilization measures, could enhance long-term effectiveness. Additionally, other macroeconomic variables such as fiscal discipline, foreign investment, and trade policies likely exert significant influence on monetary stability (Dinh et al., 2024). Although sterilization is identified as a key factor, future research should control for these additional macroeconomic variables to isolate sterilization's independent impact more precisely. The findings also suggest that monetary policy alone is insufficient to ensure stability in an oil-dependent economy. Structural economic reforms, including revenue diversification, non-oil sector development, and institutional strengthening, are necessary for sustainable stability.

The findings of this study have both theoretical and practical implications. Theoretically, the study enhances the understanding of monetary sterilization in resource-dependent economies, particularly in Iraq, reinforcing the short-term benefits of sterilization for managing liquidity fluctuations and stabilizing exchange rates, as well as highlighting its limitations for long-term stability due to structural inefficiencies and limited financial market depth. This supports the idea that relying solely on sterilization is insufficient for sustained stability, especially in economies dependent on volatile resources like oil. Practically, the findings suggest that while sterilization can be effective in the short run, policymakers must avoid over-reliance on it for long-term stability. A diversified approach, including strengthening open market operations, developing government bond markets, enhancing interbank lending mechanisms, and coordinating monetary and fiscal policies, is essential for effective monetary management. Additionally, developing financial markets, implementing institutional reforms, and introducing strategies like stabilization funds and a flexible exchange rate regime are critical for enhancing Iraq's monetary system's resilience against external shocks.

Conclusion

Drawing on the results and discussion, the findings of this study highlight the effectiveness of monetary sterilization in achieving short-term monetary stability in Iraq. The Central Bank of Iraq has been successful in managing liquidity fluctuations caused by

foreign financial inflows, particularly due to oil revenue volatility, through sterilization policies. The results of the econometric analysis, specifically the ARDL model, indicate that sterilization plays a critical role in stabilizing exchange rates and mitigating inflationary pressures in the short run. However, the study also reveals that the long-term effectiveness of sterilization is statistically insignificant. While sterilization policies maintain a positive relationship with monetary stability, their impact diminishes over time. This trend can be attributed to deeper structural issues in the Iraqi economy, such as its heavy reliance on oil revenues, limited diversification of monetary policy tools, and underdeveloped financial markets. As such, although sterilization can provide immediate relief from liquidity imbalances, it is insufficient as a long-term solution to Iraq's broader monetary stability challenges. Furthermore, the study suggests that partial sterilization, rather than full neutralization of foreign inflows, has been the strategy employed by the Central Bank of Iraq. This limited approach underscores the constraints of sterilization policies, as they fail to fully address the underlying economic vulnerabilities of the country. The findings of this study thus stress the importance of considering a more comprehensive set of policy tools to achieve lasting monetary stability in Iraq.

This study highlights the need for a more diversified and sustainable approach to Iraq's monetary policy. While monetary sterilization provides short-term stabilization, it is insufficient as a long-term solution. To enhance sterilization's effectiveness, the Central Bank of Iraq should expand its policy toolkit, including issuing long-term government bonds, strengthening open market operations, and improving interbank lending mechanisms. The study also emphasizes the importance of coordinating monetary and fiscal policies, as fiscal factors like government spending and oil revenue management significantly affect liquidity and inflation. Aligning these policies would improve Iraq's macroeconomic framework. Additionally, developing Iraq's financial markets is crucial for ensuring that sterilization measures are effectively transmitted across the economy. Strengthening banking and capital markets would help make monetary policy more sustainable. Given Iraq's vulnerability to external shocks, the study recommends exploring strategies such as stabilization funds and a flexible exchange rate regime to mitigate the impact of oil price fluctuations and global financial volatility. These measures would reduce dependence on sterilization and enhance resilience to external shocks. Future research should further examine these strategies and other determinants of monetary stability, such as government spending, exchange rate management, and trade policies, to provide insights for more effective policy design.

Authors' Declaration

The authors made substantial contributions to the conception and design of the study. The authors took responsibility for data analysis, interpretation and discussion of results. The authors read and approved the final manuscript.

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References

Abdulhadi, A. A. A., & Abbas, S. H. (2022). Athar Al-Siyasah Al-Naqdiyah Fi Tahqiq Al-Istiqrar Al-Naqdi Fi Al-Iraq: Dirasah Tahliliyah Lil-Muddah 2004-2020 [The impact of monetary policy on achieving monetary stability in Iraq - an analytical study for the period 2004-2020]. *The Iraqi Journal of Economic Sciences, 73*, 227-245. https://ecournal.uomustansiriyah.edu.iq/index.php/ecournal/article/view/706

Alam, S. (2012). A reassessment of Pakistan's aggregate import demand function: An application of ARDL approach. *The Journal of Developing Areas, 46*(1), 371-388. https://doi.org/10.1353/jda.2012.0016

Al-Khazraji, T. A., & Bayda, S. Q. (2021). Dawr Al-Ihtiyatat Al-Ajnabiyah Fi Taf'il Āliyat Al-Ta'qīm Al-Naqdi Fi Al-Iraq Lima Ba'd 2003 [The Role of Foreign Reserves in Activating the Monetary Sterilization Mechanism in Iraq Post-2003]. *Al-Warith Scientific Journal, 3*(5), 90-110. https://www.iraqoaj.net/iasj/article/213709

Ali, T. S. H. (2024). The efficiency of monetary and financial policies tools in enhancing financial sustainability in the Iraqi economy-(2010-2021) analytical study. *Economic and Administrative Studies Journal, 3*(2), 70-89. https://doi.org/10.58564/EASJ/3.2.2024.6

Anam, B. E., Ijim, U. A., Ironbar, V. E., Otu, A. P., Duke, O. O., & Achuk Eba, M. B. (2024). Economic recovery and growth plan, economic sustainability plan and national development plan (2021-2025): The Nigerian experience under President Muhammadu Buhari. *Cogent Social Sciences, 10*(1), 2289600. https://doi.org/10.1080/23311886.2023.2289600

Arslan, Y., & Cantú, C. (2019). The size of foreign exchange reserves. *BIS Paper, (104a)*. https://www.bis.org/publ/bppdf/bispap104a_rh.pdf

Badawi, N. F. A. (2024). Athar Al-Ta'qīm Al-Naqdi Ala Fa'aliyat Al-Siyasah Al-Maliyah Fi Misr [The Impact of Monetary Sterilization on the Effectiveness of Fiscal Policy in Egypt]. *The Scientific Journal for Commercial Research and Studies, 38*(2), 124-129.

Bergant, K., Grigoli, F., Hansen, N. J., & Sandri, D. (2024). Dampening global financial shocks: Can macroprudential regulation help (more than capital controls)? *Journal of Money, Credit and Banking, 56*(6), 1405-1438. https://doi.org/10.1111/jmcb.13089

Cavallino, P. (2019). Capital flows and foreign exchange intervention. *American Economic Journal: Macroeconomics, 11*(2), 127-170. https://www.aeaweb.org/articles?id=10.1257/mac.20160065

Cavallino, P., & Sandri, M. D. (2018). The expansionary lower bound: Contractionary monetary easing and the trilemma. International Monetary Fund Working Papers. https://www.imf.org/en/Publications/WP/Issues/2018/11/02/The-Expansionary-Lower-Bound-Contractionary-Monetary-Easing-and-the-Trilemma-46307

Chen, Y., Lyulyov, O., Pimonenko, T., & Kwilinski, A. (2024). Green development of the country: Role of macroeconomic stability. *Energy & Environment, 35*(5), 2273-2295. https://doi.org/10.1177/0958305X231151679

Degasperi, R., Hong, S., & Ricco, G. (2020). The global transmission of US monetary policy. *Journal of Monetary Economics, 118*, 45-60. https://ideas.repec.org/p/crs/wpaper/2023-02.html

Dinh, L. Q., Oanh, T. T. K., & Ha, N. T. H. (2024). Financial stability and sustainable development: perspectives from fiscal and monetary policy. *International Journal of Finance & Economics*, https://doi.org/10.1002/ijfe.2981.

Djedaiet, A., & Ayad, H. (2017). Hard currency inflows and sterilization policy in Algeria: An ARDL approach. *Theoretical & Applied Economics, 24*(3), 45-63. http://store.ectap.ro/articole/1296.pdf

Farhan, M. N., Hussein, A. T., & Majeed, O. H. (2022). The impact of monetary policy on monetary stability in Iraq for the period (2004-2018). *Eurasian Journal of History, Geography and Economics, 7*, 4-14. www.geniusjournals.org

Fabris, N. (2024). Monetary policy between stability and growth. *Journal of Central Banking Theory and Practice, 13*(1), 27-42. https://doi.org/10.2478/jcbtp-2024-0002

Ferrari, M., Kearns, J., & Schrimpf, A. (2021). Monetary policy's rising FX impact in the era of ultra-low rates. *Journal of Banking & Finance, 129*, 106142. https://doi.org/10.1016/j.jbankfin.2021.106142

Fratzscher, M., Gloede, O., Menkhoff, L., Sarno, L., & Stöhr, T. (2019). When is foreign exchange intervention effective? Evidence from 33 countries. *American Economic Journal: Macroeconomics, 11*(1), 132-156. https://www.aeaweb.org/articles?id=10.1257/mac.20150317

Frayyeh, J. S., Battal, A. H., & Hamad, A. A. (2022). Evaluation of the role of monetary policy in achieving monetary and economic stability in Iraq for the period (2004-2020). *Tikrit Journal of Administrative and Economic Sciences, 18*(58, 1), 304-328. https://doi.org/10.25130/tjaes.18.58.1.17

Georgieva, K. (2021). The great divergence: A fork in the road for the global economy. *International Monetary Fund*. https://www.imf.org/en/Blogs/Articles/2021/02/24/blog-the-great-divergence-a-fork-in-the-road-for-the-global-economy

Ghadeer, Y. H., & Khudhair, L. B. (2022). The Role of Monetary Policy Tools on Stability of Iraqi Economy: A Macroeconomic Analysis (2004-2018). *Webology, 19*(1), 2341-2356. https://koreascience.kr/article/JAKO202115563482887.page

Ghafour, N. M., & Aziz, D. R. (2023). Qiyas Wa Tahlil Athar Siyasat Al-Ta'qīm Al-Naqdi Ala Tawaazun Al-Iqtisad Al-Iraqi Khilal Al-Muddah 2004-2021 Bistikhdam Murabba' Kaldor [Measuring and Analyzing the Impact of Monetary Sterilization Policy on Iraq's Economic Balance during the Period 2004-2021 Using Kaldor's Square]. *Journal of Business Economics, 5*(6), 137-157. https://www.iraqoaj.net/iasj/article/302511

Gopinath, G., & Stein, J. C. (2021). Banking, trade, and the making of a dominant currency. *The Quarterly Journal of Economics, 136*(2), 783-830. https://ideas.repec.org/a/oup/qjecon/v136y2021i2p783-830..html

Hassan, A. R. (2023). Measuring the impact of monetary policy on monetary stability in Iraq for the period 2004-2021 using the joint integration methodology. University of Kirkuk *Journal For Administrative and Economic Science, 13*(2). https://www.iraqoaj.net/iasj/download/3bc270315cb68848

Hoang, H. T. T., Nguyen, P. T. K., & Nguyen, P. T. (2020). Efficiency of sterilization policies by the State Bank of Vietnam. The Journal of Asian Finance, Economics and Business, 7(10), 87-94. https://doi.org/10.13106/jafeb.2020.vol7.no10.087

Hofmann, B., Shim, I., & Shin, H. S. (2021). Emerging market economy exchange rates and local currency bond markets amid the COVID-19 pandemic. *Bank for International Settlement*. https://www.bis.org/publ/bisbull05.htm

Khalaf, H. H., Al-Azzawi, A. A. H., & Taha, Z. E. (2023). Sustainability of the banking system and the role of monetary policy: Financial liberation in Iraq. *Heritage and Sustainable Development, 5*(1), 119-134. https://doi.org/10.37868/hsd.v5i1.175

Koo, S. B. (2024). Can Korea protect itself from international capital flows? Estimates of monetary sterilization. *Journal of Economic Development, 49*(2), 139-157. https://ideas.repec.org/a/ris/jecdev/0090.html

Kuzior, A., Vysochyna, A., Augustyniak, W., & Remsei, S. (2024). Forecasting of macroeconomic stability post-pandemic recovery: The case of European countries. *Journal of International Studies, 17*(4), 56-79. https://doi.org/10.14254/2071- 8330.2024/17-4/4

Masciandaro, D., & Romelli, D. (2019). Peaks and troughs: Economics and political economy of central bank independence cycles. *Journal of Financial Stability, 45*, 100707. https://doi.org/10.1093/oxfordhb/9780190626198.013.3

Miranda-Agrippino, S., & Rey, H. (2020). US monetary policy and the global financial cycle. *The Review of Economic Studies, 87*(6), 2754-2776. https://doi.org/10.1093/restud/rdaa019

Mohammed, A. E. H. K. (2024). The role of the Central Bank of Iraq in leading monetary policy and financial and economic stability in Iraq (an analytical study in economic legislation). *Journal of Legal and Economic Research, 14*(89.), 1-33.

Murad, E. I. H., & Bouabid, A. (2023). The Impact of Monetary Policy on Economic Stability in Light of the COVID-19 Pandemic in Oil-Producing Countries: the Case Of Iraq. *International Journal of Professional Business Review, 8*(7), 1-20. https://dialnet.unirioja.es/servlet/articulo?codigo=9060786

Obstfeld, M. (2022). Uncoordinated monetary policies risk a historic global slowdown. *Peterson Institute for International Economics*. https://www.piie.com/blogs/realtime-economics/2022/uncoordinated-monetary-policies-risk-historic-global-slowdown

Ouda, M. M. (2023). Siyasat Al-Ta'qīm Al-Naqdi Wa Dawruha Fi Al-Hadd Min Al-Tadakhkhum Fi Al-Iraq Lil-Muddah 2005-2019 [Monetary Sterilization Policy and Its Role in Controlling Inflation in Iraq for the Period 2005-2019]. *Journal of Business Economics for Applied Research,* 6(1), 937-947. https://www.iraqoaj.net/iasj/article/321916

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics, 16*(3), 289-326. https://doi.org/10.1002/jae.616

Roman, N. A. (2025). Relationships and Dynamic Feedback Effects between Financial Market Risks and Macroeconomic Stability Variables in Jordan. *Jordan Journal of Economic Sciences, 12*(1), 1-21. https://doi.org/10.35516/jjes.v12i1.2122

Şahin, A. (2025). The Role of Monetary and Fiscal Policies in Ensuring Financial Stability. *Optimum Ekonomi ve Yönetim Bilimleri Dergisi, 12*(1), 25-46. https://doi.org/10.17541/optimum.1555924

Wu, Y. (2023). Monetary sterilization response to the movements in exchange rates and official net foreign assets: a case of China. Review of Quantitative *Finance and Accounting, 60*(2), 821-838. https://doi.org/10.1007/s11156-022-01113-4

Yousif, A. S., Abdulkareem, Q. K., & Salih, V. S. (2024). Measuring the Impact of Structural Changes to the Components of Monetary Sterilization on the Exchange Rate after Applying the Electronic Platform in Iraq for the Period (2021-2024). *Journal of Ecohumanism, 3*(8), 13022-13033. https://doi.org/10.62754/joe.v3i8.6123