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-RESEARCH ARTICLE-

MONETARY POLICY, INFLATION, AND BANKING ACTIVITY IN IRAQ: EVIDENCE FROM PANEL ARDL ANALYSIS

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─Abstract─

This research examines the influence of monetary policy on inflation control and its subsequent impact on banking operations in Iraq over the period 2015–2024. Inflation represents a major macroeconomic challenge for the Iraqi economy, undermining price stability, diminishing purchasing power, and impeding the efficiency of financial intermediation. The study explores the relationships between the principal instruments of the Central Bank of Iraq's monetary policy, namely, Money Supply (MS), Interest Rate (IR), and Exchange Rate (EX), and Inflation Rates (INF), while concurrently assessing the repercussions of these relationships on the performance of commercial banks. The analysis utilises a robust quantitative approach based on the Panel Autoregressive Distributed Lag (ARDL) methodology, drawing on official datasets from the Central Bank of Iraq and the annual reports of four selected commercial banks: Bank of Baghdad, Trade Bank of Iraq, Iraqi Investment Bank, and Middle East Bank.

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Methodological procedures include descriptive statistics, the Augmented Dickey–Fuller (ADF) unit root test, Pearson correlation analysis, and multiple linear regression. The findings indicate a statistically significant positive association between money supply and banking activity, whereas inflation and interest rates display significant negative impacts on bank performance. Fluctuations in the exchange rate demonstrate a weak and statistically non-significant influence. These results highlight the necessity of enhancing coordination between monetary and fiscal policies, managing money supply prudently, and advancing banking instruments to strengthen financial stability within Iraq.

Keywords: Monetary Policy, Inflation, Monetary Stability, Money Supply, Interest Rate, Exchange Rate, Banking Activity, Commercial Banks, Central Bank of Iraq, Panel ARDL.

INTRODUCTION

Monetary policy represents one of the most potent tools available to central banks for promoting macroeconomic stability. By systematically adjusting the money supply, interest rates, and exchange rates, central banking authorities aim to contain inflationary pressures, sustain economic growth, and maintain the integrity of the financial system (Mishkin, 2007). The interplay between monetary policy and inflation is a fundamental concern in macroeconomic theory and practice, carrying significant implications for banking operations, credit allocation, investment behaviour, and long-term economic development (Afolabi & Wapji, 2024).

At the global level, central banks have employed both conventional and unconventional instruments to counter inflation. Conventional approaches, chiefly the policy interest rate, influence borrowing costs, thereby affecting aggregate demand and investment patterns (Adrian et al., 2020). In contrast, unconventional strategies, including quantitative easing and forward guidance, have been increasingly utilised in contexts where traditional monetary policy options are constrained (Afolabi & Wapji, 2024). The success of these tools depends on the prevailing economic framework, institutional capacity, and the extent of coordination between monetary and fiscal authorities (Krogstrup & Oman, 2019). For developing and resource-dependent economies, monetary policy is subject to structural limitations that complicate efforts to stabilise prices. Economies heavily reliant on commodity revenues are particularly vulnerable to demand-pull inflation during commodity price surges and deflationary pressures during downturns (Ha et al., 2023). Iraq exemplifies this dynamic, with oil revenues accounting for the vast majority of government income. Consequently, fiscal and monetary conditions are closely tied to fluctuations in global energy markets, with oil price volatility affecting government spending, economic liquidity, inflation expectations, and market confidence (Iraq, 2023).

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Between 2015 and 2024, Iraq experienced pronounced swings in inflation driven by a combination of domestic and external shocks. These included the steep decline in global oil prices during 2015–2016, the economic and security disruptions associated with the conflict with the Islamic State, fiscal strains arising from the COVID-19 pandemic in 2020, and the commodity price surge linked to the Russia–Ukraine conflict in 2022 (Fund, 2022). Each episode underscored the challenges faced by Iraq's monetary policy framework and highlighted the importance of effective central bank intervention in maintaining both price and financial stability. The transmission of monetary policy through the banking sector is well-established. Adjustments in interest rates alter banks' funding costs, net interest margins, and credit supply, which in turn influence broader economic activity (Altavilla et al., 2018). Changes in money supply directly affect the availability of loanable funds, shaping banks' lending capacity and profitability (Cecchetti et al., 2006). Elevated inflation increases credit risk, compresses real returns, and degrades asset quality, thereby threatening banking sector stability (MARTIN, 2022; Stantcheva, 2024). Analysing these transmission channels is crucial for assessing the effectiveness of central bank policy in structurally evolving economies.

The Central Bank of Iraq (CBI) has employed a variety of monetary instruments during the study period, with a marked focus on exchange rate management to anchor price stability. The CBI's foreign exchange auction system serves as a principal mechanism for regulating the supply of hard currency, indirectly influencing domestic price levels and the value of the Iraqi dinar (Iraq, 2022). Interest rate policy has been less flexible due to structural features of Iraq's financial sector, including the predominance of state-owned banks, limited depth in money markets, and weak monetary transmission channels. These institutional characteristics render Iraq a particularly instructive case for understanding monetary policy implementation under conditions of financial underdevelopment.

Despite the significance of this topic, empirical investigations into the quantitative effects of monetary policy on inflation and banking activity in Iraq remain scarce. Existing research often examines either monetary policy or banking performance in isolation, without integrating both within a unified empirical framework. This study addresses this gap by employing a Panel ARDL model to simultaneously evaluate the impact of monetary policy instruments and inflation on a composite banking activity index for four Iraqi commercial banks over 2015–2024. The relevance of this research is threefold. First, it contributes to the empirical literature on monetary economics in resource-dependent economies by providing micro-level insights into how monetary policy decisions affect the banking sector. Second, it equips policymakers at the CBI and the Ministry of Finance with evidence-based evaluations of the effectiveness of current monetary instruments in curbing inflation and supporting banking operations. Third, it informs broader scholarly debates on monetary-financial linkages in low- and middle-income countries, offering lessons potentially applicable to other oil-exporting economies facing analogous structural constraints (Agénor & da Silva, 2019).

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The structure of the paper is as follows. Section 2 outlines the research objectives derived from empirical findings. Section 3 reviews the pertinent theoretical and empirical literature. Section 4 details the research methodology, including the conceptual framework, model specification, and data sources. Section 5 presents and interprets the empirical results. Section 6 concludes with policy recommendations and directions for future research.

Research Objectives

Based on the outcomes of the empirical investigation, this study seeks to achieve the following specific objectives:

1. To analyse the influence of monetary policy instruments, specifically MS, IR, and EX, on the control of inflation and their subsequent impact on the performance of banking activity in Iraq.
2. To quantify the effects of variations in MS on the volume of loans, deposits, and profitability of selected commercial banks through panel data regression methodologies.
3. To explore the linkage between inflationary fluctuations and banking operations, identifying the mechanisms by which price instability constrains financial intermediation and credit expansion.
4. To assess the degree to which EX volatility impacts the banking sector, evaluate the effectiveness of the CBI's EX policy in mitigating the exposure of banks to external currency shocks.

LITERATURE REVIEW

Theoretical Foundations of Monetary Policy

The theoretical underpinnings of contemporary monetary policy derive from classical quantity theory, Keynesian demand management, and the subsequent monetarist critique. The monetarist perspective, championed by Milton Friedman, posits that inflation is primarily a monetary phenomenon, arising when MS growth exceeds that of real output (Rossi, 2022). This principle informed central banking structures throughout the late twentieth century, establishing price stability as the principal mandate of monetary authorities. In modern practice, monetary policy serves as a vital tool for shaping economic outcomes via the management of MS, IR, and EX, with central banks typically targeting multiple objectives simultaneously, including price stability, full employment, and financial system soundness (Buiter, 2014).

The introduction of inflation targeting during the 1990s marked a significant shift in monetary governance. Under this framework, central banks explicitly commit to a defined inflation rate, anchoring expectations and providing a credible nominal reference for pricing decisions (Bernanke et al., 2004). Agénor and da Silva (2019) note that central banks in developing economies encounter substantial difficulties in

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implementing inflation targeting due to structural rigidities, fiscal dominance, and shallow financial markets, which reduce the potency of conventional IR transmission. These considerations are particularly relevant to Iraq, where fiscal dominance continues to constrain monetary policy autonomy. Afolabi and Wapji (2024) provide an extensive review of the new monetary policy instruments introduced following the 2008–2009 global financial crisis. Quantitative easing and forward guidance have demonstrated efficacy in easing financial conditions when policy rates approach their effective lower bound, suggesting that these instruments should be incorporated into standard central bank operations. While primarily applied in advanced economies, their adoption has influenced global capital flows and EX dynamics, thereby indirectly affecting developing economies such as Iraq (Obstfeld, 2019). The capacity of central banks to shape economic outcomes through these non-traditional channels underscores the importance of institutional credibility and effective policy communication in transmitting monetary policy effects (Cecchetti et al., 2006).

Interest rates constitute a central component of monetary policy transmission. Reductions in the policy rate lower borrowing costs, stimulating consumption, investment, and aggregate demand, whereas increases temper demand and help control inflationary pressures. Krogstrup and Oman (2019) emphasise that the efficacy of IR policy is contingent on prevailing economic conditions, including activity levels, expectations, and structural features of financial markets. In resource-dependent economies with limited financial deepening, the interest rate channel may be weakened, prompting greater reliance on EX management and direct credit controls. Jung and Uhlig (2019) further illustrate that monetary policy shocks exert heterogeneous effects across banks depending on their size, capitalisation, and non-performing loan ratios, highlighting the role of bank-specific characteristics in mediating the macroeconomic transmission of monetary policy.

Inflation: Conceptual Dimensions and Determinants

Inflation, conceptualised as a persistent and widespread rise in the general price level accompanied by a corresponding decline in purchasing power, remains one of the most extensively analysed phenomena in macroeconomics (MARTIN, 2022). Its measurement, typically via the consumer price index (CPI), captures the average variation in the prices of a representative basket of goods and services consumed by households. The drivers of inflation are multifactorial, encompassing demand-pull pressures arising from excessive aggregate demand relative to productive capacity, cost-push pressures due to rising input costs such as wages or raw materials, and structural factors rooted in supply constraints, institutional deficiencies, and market distortions (Ha et al., 2023).

The socio-economic consequences of inflation are profound and wide-ranging. Stantcheva (2024) provides survey-based evidence indicating that individuals perceive

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inflation as a tangible threat to their economic well-being rather than a mere abstract macroeconomic indicator. Rising prices are associated with stagnant wages, declining living standards, and perceived economic inequities, linking inflation to political instability and governance challenges. These perceptions reinforce the political urgency of price stability and underscore the reputational implications for central banks. Economically, sustained inflation erodes real incomes, distorts the allocation of resources, discourages long-term investment, and undermines confidence in the monetary system (Forbes, 2019). In emerging and developing economies, inflation determinants often differ from those in advanced economies. Ha et al. (2023) highlight factors particularly pertinent in such contexts, including imported inflation via EX pass-through, volatility in oil and food prices, fiscal imbalances necessitating monetary financing, and weak institutional anchors for inflation expectations. In oil-dependent economies such as Iraq, domestic price dynamics are closely linked to the cycles of oil revenue. High oil prices lead to surges in government expenditure, creating excess liquidity and demand-pull inflation, whereas declining oil revenues necessitate fiscal restraint, potentially imposing contractionary pressures on economic activity.

Globalisation has increasingly influenced domestic inflation outcomes. Forbes (2019) notes that international factors, including commodity price movements, global value chain disruptions, and cross-border monetary spillovers, significantly affect domestic inflation. This suggests that even well-designed domestic monetary policy may be insufficient to contain inflation when global supply shocks are substantial. For Iraq, heavily reliant on imported consumer goods, EX-driven pass-through from global commodity prices constitutes a crucial transmission channel that monetary policy must accommodate. The COVID-19 pandemic and associated global supply chain disruptions exacerbated this dynamic, contributing to broad-based price increases during 2021–2022 (Fund, 2023). Borio et al. (2023) analyse the role of MS growth in explaining the recent global inflation surge, demonstrating that rapid monetary expansion during the pandemic exerted inflationary pressures via wealth effects, aggregate demand stimulation, and expectation adjustments. Their findings provide empirical support for the monetarist proposition that sustained MS growth eventually elevates price levels, particularly when a positive output gap exists. In the Iraqi context, where the CBI implemented substantial MS expansion to support fiscal financing during the study period, this (Fund, 2022).

Banking Activity and Monetary Policy Transmission

Banking activity encompasses the full range of financial intermediation services provided by commercial banks, including deposit mobilisation, credit extension, liquidity management, and investment in financial instruments. Banks play a central role in directing savings towards productive investment, making banking activity a key driver of economic growth and the primary channel through which monetary policy signals are transmitted to the real economy (Mishkin, 2007). The main pathways

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through which monetary policy influences bank behaviour—and consequently macroeconomic outcomes—include the bank lending channel, the balance sheet channel, and the risk-taking channel.

The bank lending channel operates via the impact of monetary policy on the supply of bank loans. Tightening of monetary policy reduces banks' reserves and deposits, constraining their lending capacity. This channel is particularly significant in economies with limited capital market access, where banks constitute the dominant source of external finance for firms and households (Martinez-Miera & Repullo, 2019). Heider et al. (2019) illustrate that negative policy rates, though designed to stimulate lending, can paradoxically restrict credit provision by banks with high deposit bases due to their reluctance to transfer negative rates to depositors, thereby increasing funding costs relative to low-deposit institutions. This highlights the non-linear nature of monetary policy transmission and the potential for unintended outcomes at the extremes of the IR spectrum.

The balance sheet channel functions through monetary policy effects on borrower net worth and collateral values. Rising IR reduces the present value of future cash flows, diminishing borrower net worth, increasing adverse selection and moral hazard, and limiting credit availability (Mishkin, 2007). Conversely, falling IR strengthens borrower balance sheets and facilitates lending. Altavilla et al. (2018) demonstrate that accommodative monetary easing does not necessarily depress bank profitability when macroeconomic endogeneity is controlled, as benefits from reduced loan loss provisions and higher non-interest income can offset net interest margin compression. The risk-taking channel, extensively discussed in post-crisis literature, describes banks' propensity to assume greater credit risk under prolonged low IR environments (Heider et al., 2019; Martinez-Miera & Repullo, 2019). Persistently low rates compress net interest margins and lower returns on safe assets, incentivising banks to pursue higher-yielding but riskier loans. While this may temporarily sustain banking activity, it generates systemic vulnerabilities, often manifesting as elevated non-performing loans when monetary policy eventually tightens. In developing economies with limited supervisory capacity, this risk-taking behaviour is particularly concerning.

In Iraq, the monetary transmission mechanism is weakened by structural constraints. The banking sector is dominated by state-owned banks operating under soft budget constraints and subject to directed credit policies, which restrict the market-driven adjustment of credit supply in response to policy measures (Maneechavakajorn, 2023). Financial inclusion remains low, with substantial portions of the population and MSMEs excluded from formal banking services. These features necessitate a more nuanced evaluation of monetary-banking linkages in Iraq, as conventional transmission models may overstate the responsiveness of banking activity to changes in monetary policy.

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Monetary Policy, Inflation, and Banking in Developing Economies: Empirical Evidence

An expanding body of empirical research has explored the interactions between monetary policy, inflation, and banking performance in developing and emerging market economies, providing insights that complement the literature focused on advanced economies. Agénor and da Silva (2019) argue that central banks in developing countries pursuing integrated inflation targeting face challenges such as fiscal dominance, constrained monetary transmission, and volatile capital flows, necessitating customised policy frameworks rather than direct adoption of models designed for advanced economies. Ha et al. (2023) present cross-country evidence indicating that inflation in developing economies is typically more volatile, persistent, and sensitive to external shocks than in advanced countries, owing to weaker institutions, shallow financial systems, and reliance on commodity exports. These findings have direct implications for monetary policy design in resource-dependent economies like Iraq, suggesting that effective inflation management requires not only well-calibrated IR and MS policies but also institutional reforms to enhance central bank credibility and autonomy.

Gopinath and Itskhoki (2022) examine the dominant currency paradigm in international trade and its impact on EX pass-through to domestic prices. Their results indicate that trade invoiced in dominant currencies, principally the US dollar, produces asymmetric price responses to EX movements, with depreciation exerting a more immediate and pronounced inflationary effect than appreciation. For Iraq, which conducts a substantial portion of international trade in US dollars and receives oil revenues in dollars, EX management is especially important for controlling imported inflation. The CBI's maintenance of a relatively stable dinar-dollar peg during the study period can thus be seen as a deliberate strategy to anchor inflation expectations and mitigate imported price pressures. Obstfeld (2019) highlights the global influence of US monetary policy, showing that Federal Reserve actions generate significant spillovers to emerging and developing economies through capital flow and EX channels.

Consequently, Iraqi policymakers must manage domestic macroeconomic conditions while accounting for the external monetary environment shaped by Federal Reserve decisions. During the study period, US monetary tightening episodes exerted upward pressure on the dollar and downward pressure on commodity prices, complicating the CBI's monetary management objectives. Jordà et al. (2024) provide long-term empirical evidence on the effects of monetary policy, demonstrating that accommodative conditions tend to promote short- to medium-term expansion of the financial sector and asset price inflation, while persistent debt accumulation eventually creates vulnerabilities that manifest as financial crises. These findings emphasise the importance of balancing monetary stimulus with macroprudential safeguards—a challenge particularly acute in Iraq, where the banking sector's regulatory and

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supervisory infrastructure is still developing.

Collectively, the literature establishes a robust theoretical and empirical foundation for analysing the relationship between monetary policy, inflation, and banking activity in Iraq. This study builds upon that foundation by applying panel data techniques tailored to the structural characteristics of the Iraqi banking sector, producing insights that advance both academic understanding and practical policy formulation in monetary economics.

RESEARCH METHODOLOGY

Research Design and Data Sources

This study utilises a quantitative analytical research approach, grounded in positivist epistemology and based on secondary financial and statistical sources. The primary data are drawn from: (i) official monetary statistics published in the CBI's statistical bulletins and annual reports for the period 2015–2024, encompassing MS, IR, EX, and inflation indicators; and (ii) audited annual financial statements of four selected Iraqi commercial banks—Bank of Baghdad, Trade Bank of Iraq, Iraqi Investment Bank, and Middle East Bank—covering total loans, total deposits, liquidity ratios, ROA, and ROE. The selection of these banks was guided by the availability of continuous, complete, and verifiable annual data across the study period, the diversity of ownership structures and operational models, and their combined representativeness of both public and private segments of the Iraqi banking sector. The study constructs a balanced panel dataset comprising four cross-sectional units (banks) observed over ten years (2015–2024), resulting in a total of forty bank-year observations. Although the relatively limited sample imposes constraints on degrees of freedom for estimation, employing panel data techniques allows the analysis to leverage both the temporal and cross-sectional variation in the data, producing more efficient and robust estimates than would be achievable using purely time-series or cross-sectional methods (Baltagi & Maasoumi, 2013).

Variable Definitions and Measurement

The study utilises five primary variables. The dependent variable, Banking Activity Index (BA), is constructed as a composite indicator capturing the total volume of bank credit, deposits, and net profits, expressed in billions of IQD. The independent variables comprise four key monetary and macroeconomic indicators: MS, measured by the broad money aggregate (M2) in billions of IQD; IR, represented by the policy rate set by the CBI and expressed as an annual percentage; EX, quantified as the number of Iraqi dinars per US dollar (IQD/USD); and INF, calculated as the annual percentage change in the CPI. All monetary variables are obtained from CBI statistical publications, whereas BA data are extracted from the audited annual reports of the four selected commercial banks.

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Model Specification and Econometric Framework

To examine the dynamic interrelationships among the study variables, this research utilises the Panel Autoregressive Distributed Lag (Panel ARDL) model, which provides several methodological advantages compared with conventional panel estimators. The Panel ARDL approach accommodates variables integrated of different orders, I(0) and I(1), without necessitating that all series share the same integration order, thereby mitigating the risk of pre-testing bias. Additionally, it enables simultaneous estimation of short-run and long-run relationships within a single framework, capturing the adjustment processes linking monetary policy instruments, INF, and BA over time. The general specification of the Panel ARDL model is presented as follows:

$$BA_{it} = \beta_0 + \beta_1 MS_{it} + \beta_2 IR_{it} + \beta_3 EX_{it} + \beta_4 INF_{it} + \Sigma_{it} \quad \text{(Equation 1)}$$

In the model, BA_{it} represents the banking activity index for bank i at time t, while MS, IR, EX, and INF correspond to money supply, interest rate, exchange rate, and inflation rate, respectively. β_0 denotes the intercept term, and β_1 through β_4 are the estimated coefficients of the explanatory variables. Σ_{it} is the stochastic error term capturing unobserved bank-specific and temporal effects. For any variables that are non-stationary at their level form, first differences (Δ) are applied to achieve stationarity before estimation, in accordance with standard econometric procedures.

Research Hypotheses

The study evaluates the following formal hypotheses:

- H1 (Correlation Hypothesis): There exists a statistically significant correlation between monetary policy instruments (MS, IR, EX) and inflation (INF) on one hand, and banking activity (BA) on the other, for the selected Iraqi banks during the period 2015–2024.
- H2 (Impact Hypothesis): Monetary policy instruments and inflation exert a statistically significant effect on banking activity in Iraq during the period 2015–2024, with money supply expected to have a positive effect, and interest rate and inflation expected to have negative effects on banking performance.

Figure 1 presents the proposed research framework, outlining the conceptual linkages among the study variables. The monetary policy instruments—MS, IR, and EX—affect BA via two interrelated channels: a direct channel, operating through banks' balance sheets and funding conditions, and an indirect channel, mediated by INF, which shapes the macroeconomic and operational environment for banking institutions.

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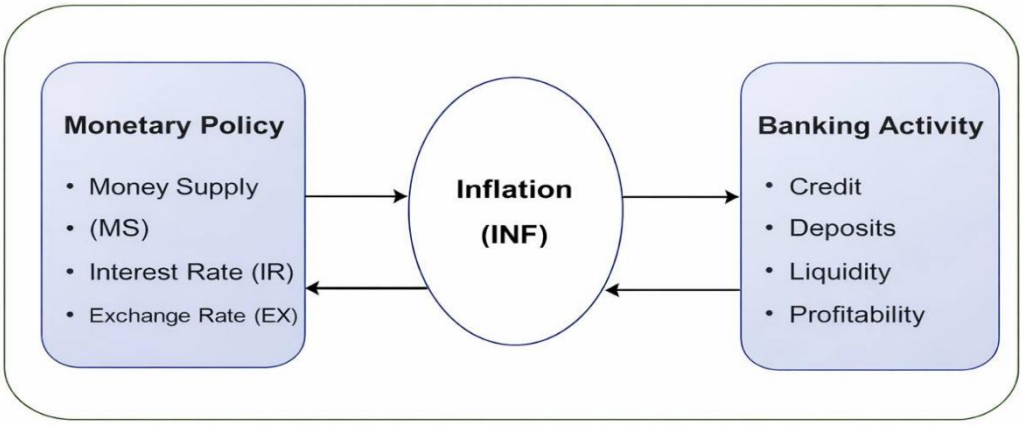

Figure 1: Conceptual Framework – Monetary Policy Instruments, Inflation, and Banking Activity

RESULTS AND DISCUSSION

Descriptive Statistics of Study Variables

Table 1 summarises the descriptive statistics for the primary BA and monetary indicators across the study sample for 2015–2024. The results indicate a generally stable macroeconomic environment, interspersed with periods of heightened volatility linked to external shocks in specific sub-periods. The descriptive statistics reported in Table 1 indicate several notable trends. The average INF over the study period was 1.91%, a comparatively low level that suggests the CBI's monetary management effectively contained inflationary pressures and maintained relative price stability in the context of Iraq's historical experience. This moderate inflationary environment aligns with the CBI's strategy of exchange rate anchoring, utilising the foreign exchange auction mechanism to sustain the dinar–USD parity at approximately 1,284 IQD per USD, a rate that remained largely stable throughout the period.

The observed stability of EX is particularly important given the volatility of global commodity markets and Iraq's structural dependence on oil export revenues, consistent with empirical insights on exchange rate management in resource-dependent economies (Gopinath & Itskhoki, 2022; Iraq, 2023). The mean IR of 5.23% reflects a balanced monetary policy approach by the CBI, aimed at simultaneously supporting economic activity and mitigating inflationary pressures. The broad MS averaged 104,609 billion IQD, indicating sustained monetary expansion consistent with government expenditure needs and economic recovery initiatives. Regarding BA, Bank of Baghdad exhibited the highest activity at 120,000 billion IQD, followed by Iraqi Investment Bank at 110,000 billion IQD, Trade Bank of Iraq at 95,000 billion IQD, and Middle East Bank at 80,000 billion IQD, highlighting differences in scale and market positioning across the sampled institutions within the Iraqi banking sector.

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Table 1: Descriptive Analysis of Banking Activity Variables and Monetary Data for the Study Sample (2015–2024)

Bank	BA (Billion IQD)	MS (Billion IQD)	IR (%)	EX (IQD/USD)	INF (%)
Bank of Baghdad	120,000	104,609	5.23	1,284	1.91
Trade Bank of Iraq	95,000	104,609	5.23	1,284	1.91
Iraqi Investment Bank	110,000	104,609	5.23	1,284	1.91
Middle East Bank	80,000	104,609	5.23	1,284	1.91

Note: BA = Banking Activity Index; MS = Money Supply (M2 Aggregate); IR = Interest Rate (Policy Rate); EX = Exchange Rate (IQD/USD); INF = Inflation Rate (Annual CPI Change). Data Sourced from Central Bank of Iraq (2022, 2023) and Bank Annual Reports.

Stationarity Testing: Augmented Dickey–Fuller Unit Root Test

Before conducting regression analysis, the stationarity of all five study variables was thoroughly assessed using the Augmented Dickey–Fuller (ADF) test. This procedure is critical in panel data econometrics because non-stationary series containing unit roots can produce spurious regression outcomes that misrepresent true economic relationships (Roza et al., 2022). Table 2 presents the ADF test statistics, corresponding p-values, and the integration order determined for each variable.

Table 2: Results of the Augmented Dickey–Fuller (ADF) Unit Root Test (2015–2024)

Variable	Level	ADF Statistic	P-Value	Conclusion
BA	Level	-1.23	0.64	Non-Stationary
BA	Δ (1st Diff.)	-4.12	0.01**	Stationary
MS	Level	-2.05	0.54	Non-Stationary
MS	Δ (1st Diff.)	-3.87	0.02**	Stationary
IR	Level	-3.15	0.03**	Stationary
EX	Level	-3.02	0.04**	Stationary
INF	Level	-1.78	0.42	Non-Stationary
INF	Δ (1st Diff.)	-4.05	0.01**	Stationary

Note: ** denotes statistical significance at the 5% level. Δ denotes the first-difference operator. Critical values follow MacKinnon's (1996) tabulations. BA = Banking Activity; MS = Money Supply; IR = Interest Rate; EX = Exchange Rate; INF = Inflation Rate.

The ADF test outcomes presented in Table 2 indicate a heterogeneous integration order among the five variables, supporting the suitability of the Panel ARDL approach, which accommodates a series of differing integration orders. BA, MS, and INF are non-stationary at their level forms, with p-values of 0.64, 0.54, and 0.42, respectively, signalling the presence of unit roots. Following first differencing, these series attain stationarity, with ADF statistics of -4.12, -3.87, and -4.05 and corresponding p-values of 0.01, 0.02, and 0.01, confirming they are I(1) processes. In contrast, IR and EX are stationary at levels, exhibiting ADF statistics of -3.15 and -3.02 with p-values of 0.03

and 0.04, classifying them as I(0). This combination of I(0) and I(1) variables renders conventional VAR or cointegration methods unsuitable and substantiates the adoption of the Panel ARDL framework as the estimation strategy for this study.

Correlation Analysis

Table 3 presents the Pearson correlation matrix, assessing the bivariate linear relationships among the study variables. This analysis offers initial insights into the direction and magnitude of the associations linking monetary policy instruments, INF, and BA, serving as a preliminary step before conducting regression estimation. The correlation matrix in Table 3 provides several notable observations regarding the bivariate relationships among the study variables. BA demonstrates a strong and statistically significant positive correlation with MS ($r = 0.72$, $p < 0.01$), indicating that expansions in the monetary base, as captured by higher M2 levels, are closely associated with increased banking activity. This outcome aligns with theoretical expectations, whereby greater liquidity in the financial system stimulates credit demand and enlarges the deposit base, allowing banks to extend more loans, expand their balance sheets, and enhance profitability (Borio et al., 2023; Roza et al., 2022).

Table 3: Pearson Correlation Matrix of Study Variables

Variable	BA	MS	IR	EX	INF
BA	1.00	0.72***	-0.45**	-0.38*	-0.65***
MS	0.72***	1.00	-0.30	-0.25	-0.50**
IR	-0.45**	-0.30	1.00	0.12	0.40**
EX	-0.83***	-0.25	0.12	1.00	0.18
INF	-0.65***	-0.50**	0.40**	0.18	1.00

Note: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$. BA = Banking Activity; MS = Money Supply; IR = Interest Rate; EX = Exchange Rate; INF = Inflation Rate.

In contrast, BA is negatively correlated with INF ($r = -0.65$, $p < 0.01$) and IR ($r = -0.45$, $p < 0.05$), consistent with both theory and empirical findings. Elevated INF reduces the real returns on bank assets, heightens credit risk as borrowers' real incomes decline, and creates uncertainty that suppresses lending and investment activity (MARTIN, 2022; Stantcheva, 2024). Higher IR increases the cost of funds for banks when policy tightening is passed through to deposit rates, while simultaneously discouraging borrowing from rate-sensitive clients, thereby limiting both lending volume and profitability (Ha et al., 2023). EX displays a relatively weak negative correlation with BA ($r = -0.38$, $p < 0.10$), suggesting that although fluctuations in the exchange rate exert some adverse effect, their direct influence on BA is considerably smaller than that of other monetary policy indicators.

Regression Analysis: Determinants of Banking Activity

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Table 4 reports the multiple linear regression estimates, quantifying the influence of each monetary policy instrument and INF on BA. In accordance with the stationarity assessment, first differences are applied to BA, MS, and INF to maintain consistency and validity in the estimation procedure. The regression outcomes reported in Table 4 provide robust empirical validation for the study's hypotheses and offer salient insights for policy formulation. The coefficient for MS ($\beta_1 = 0.45$, $t = 3.12$, $p = 0.01$) is positive and statistically significant, indicating that a one-unit increase in the first-differenced money supply corresponds to a 0.45-unit rise in BA, holding all other factors constant. This result aligns with theoretical expectations and extant literature, which suggest that monetary expansion increases the availability of loanable funds, stimulates credit demand, enlarges the deposit base, and enhances bank profitability (Baltagi & Maasoumi, 2013; Borio et al., 2023). In the Iraqi context, this positive MS–BA relationship reflects the government's expansionary fiscal stance throughout the study period, wherein liquidity entered the banking system via public salary disbursements, infrastructure investment, and CBI financing of fiscal deficits (Iraq, 2022).

Table 4: Regression Analysis – Impact of Monetary Policy Variables and Inflation on Banking Activity (BA)

Variable	Coefficient (β)	t-Statistic	P-Value	Conclusion
MS	0.45	3.12	0.01**	Positive & Significant
IR	-0.30	-2.45	0.03**	Negative & Significant
EX	-0.10	-1.20	0.25	Negative & Not Significant
INF	-0.50	-3.50	0.01**	Negative & Significant

Note: ** $p < 0.05$. Dependent variable: Banking Activity Index (BA). Non-stationary variables estimated using first differences (ΔBA, ΔMS, ΔINF). Model: $\Delta BA = \beta_0 + 0.45\Delta MS - 0.30IR - 0.10EX - 0.50\Delta INF + \Sigma$. Data sourced from CBI (2022, 2023) and bank annual reports.

The IR coefficient ($\beta_2 = -0.30$, $t = -2.45$, $p = 0.03$) is negative and statistically significant, confirming that higher interest rates are associated with a contraction in BA. This finding corroborates monetary transmission theory, wherein rate hikes increase banks' funding costs, suppress credit demand from interest-sensitive borrowers, and compress net interest margins when short-term rates rise faster than lending rates (Heider et al., 2019; Martinez-Miera & Repullo, 2019). In Iraq, the cautious application of interest rate policy reflects the structural fragility of the banking sector and its dependency on government deposits. The significant negative impact of IR on BA implies that even moderate rate adjustments can materially restrict banking operations, highlighting the necessity for gradual and transparently communicated policy changes.

The INF coefficient ($\beta_4 = -0.50$, $t = -3.50$, $p = 0.01$) represents the most pronounced negative effect within the model, indicating that inflation constitutes the strongest adverse determinant of BA among the variables examined. This outcome is consistent with literature documenting the deleterious effects of price instability on financial intermediation, including erosion of real asset values, heightened credit risk, increased

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non-performing loans, distorted contract pricing, and uncertainty that dampens long-term lending and investment (Forbes, 2019; Lane, 2021; Stantcheva, 2024). The magnitude of the INF coefficient (0.50) exceeds that of IR (0.30), suggesting that price instability poses a greater threat to banking sector performance in Iraq than the direct cost of interest rate policy. From a policy perspective, the CBI's ability to maintain average inflation at 1.91% during the study period appears to have been a critical factor in sustaining banking sector stability and growth.

The EX-coefficient (β_3 = -0.10, t = -1.20, p = 0.25) is negative but statistically insignificant, indicating that exchange rate movements exerted a limited direct impact on BA during the study period. This result likely reflects the relative stability of the IQD/USD parity maintained via the CBI's foreign exchange auction mechanism, which mitigated exchange rate exposure for banks. Additionally, the modest significance may relate to the limited foreign currency operations conducted by Iraqi banks. Nonetheless, the indirect effects of EX on BA through imported inflation remain pertinent: in an import-dependent economy such as Iraq, exchange rate depreciation can propagate inflationary pressures that subsequently influence banking performance via the inflation channel (Gopinath & Itskhoki, 2022).

CONCLUSION, RECOMMENDATIONS, AND IMPLICATIONS

Conclusion

This study examined the influence of monetary policy on inflation and its implications for banking activity in Iraq over the period 2015–2024, utilising a robust panel data approach applied to four representative commercial banks. The empirical analysis yields four key conclusions that contribute both to theoretical understanding and practical policymaking in the context of monetary economics within resource-dependent developing economies. Firstly, MS is shown to have a positive and statistically significant impact on BA, confirming that monetary expansion strengthens banks' ability to extend credit, mobilise deposits, and generate profits. This outcome emphasises the necessity of careful liquidity management by the CBI, ensuring that monetary growth supports banking sector development without provoking inflationary pressures that could compromise financial stability. Secondly, increases in IR are found to significantly suppress BA, reflecting the contractionary influence of higher rates on credit demand and net interest margins. The moderate magnitude of this effect indicates that the interest rate transmission mechanism in Iraq is partially constrained by structural factors, including the predominance of state-owned banks and the limited depth of financial markets. Thirdly, INF emerges as the principal adverse determinant of BA, with its negative effect exceeding that of IR. This finding underscores the centrality of price stability as a prerequisite for sustainable banking sector growth and highlights the critical role of the CBI in maintaining low and stable inflation throughout the study period. Fourthly, EX fluctuations exert a weak and statistically insignificant

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direct influence on BA, largely attributable to the CBI's effective maintenance of the IQD/USD parity. Nonetheless, indirect effects of EX through the inflation channel remain a potential concern, particularly in scenarios of significant currency depreciation that could transmit to banking sector performance via imported price pressures.

Recommendations

Based on the study's findings, the following policy recommendations are proposed:

1. The CBI should adopt a rule-based and transparent framework for managing MS, aligning monetary expansion with real output growth. Such a framework would prevent excessive liquidity that could trigger inflationary pressures while simultaneously ensuring sufficient credit provision to support banking sector development.
2. IR policy should be implemented with greater gradualism and predictability, accompanied by forward guidance from the CBI regarding the expected path of future rate changes. This transparency would enable banks and borrowers to adjust financial planning accordingly, thereby mitigating the contractionary effects of rate increases on lending and deposit mobilisation.
3. Mechanisms to shield the banking sector from inflationary shocks should be strengthened. Measures may include promoting inflation-indexed financial instruments, developing hedging and derivatives markets, and embedding clear inflation-contingency protocols within banks' risk management frameworks.
4. Institutional coordination between monetary and fiscal authorities should be reinforced. Fiscal dominance, whereby government expenditure patterns substantially shape monetary conditions, constrains the CBI's capacity to independently achieve price stability. Establishing a formal fiscal-monetary coordination council would enhance policy coherence and reduce conflicting macroeconomic pressures.
5. The regulatory and supervisory framework of the banking sector should be enhanced to bolster resilience against monetary policy shocks. This includes stricter capital adequacy standards, improved frameworks for managing non-performing loans, and expanded access for banks to the CBI's monetary policy instruments, supporting both stability and sustainable growth.

Research Implications and Future Directions

The findings of this study hold substantial implications across multiple dimensions. For monetary authorities at the CBI, the results provide a rigorous quantitative foundation for evaluating the inherent trade-offs in monetary policy implementation, particularly the balance between promoting banking activity via MS expansion and ensuring price stability through controlled monetary growth. The dominant influence of inflation on banking sector performance underscores the centrality of the CBI's price stability mandate. It highlights the necessity of sustained institutional commitment to

maintaining low and stable inflation as a prerequisite for long-term financial sector development. From an academic perspective, the study contributes a rare micro-level empirical examination of monetary policy effects on commercial banking within an oil-dependent developing economy. Employing a methodologically robust panel data framework that accounts for bank-specific heterogeneity, the research extends the literature by demonstrating that structural constraints, including fiscal dominance, limited financial market depth, and exchange rate anchoring, significantly shape the channels through which monetary policy affects banking activity. These dynamics diverge meaningfully from the standard predictions of models derived from advanced economies. Future research should broaden the scope to encompass a larger sample of Iraqi banks, extend the temporal coverage to include monetary policy developments beyond 2024, and apply more advanced panel cointegration techniques to assess long-run equilibrium relationships between monetary policy instruments and banking sector performance. Such extensions would further refine the understanding of monetary-banking linkages in resource-dependent developing economies.

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