Analysis of Foreign Exchange Mechanisms and Policies in Iraq: Focus on Central Bank Transactions and Market Dynamics for the Period (2004-2023)

Salar Hamid Awakhti Ali ⓘD

College of Commerce, University of Sulaimani, Sulaymaniyah, 46001, Kurdistan Region, IRAQ

*Corresponding author: Salar Hamid Awakhti Ali

ABSTRACT

This study examines the impact of foreign exchange policies on Iraq's economy and financial markets, with a focus on the role of the Central Bank of Iraq (CBI) in stabilizing the foreign exchange market. The research investigates mechanisms such as the CBI's purchases of foreign currencies from the Ministry of Finance, foreign exchange windows (both remittance and cash-based), and transfers related to documentary credits, and their effects on liquidity, exchange rate stability, and total monetary credit.

Statistical analysis showed that all variables are normally distributed (p-values > 0.05) and that exchange operations were stable. Cointegration tests revealed a long-term equilibrium relationship between the policies and financial stability, affirming the effectiveness of CBI interventions.

Regarding the impact of these mechanisms, the CBI's purchases from the Ministry of Finance showed a small positive but statistically insignificant effect on total monetary credit (coefficient = 4.32E-06, p = 0.23670). Foreign exchange sales through remittances showed a small negative but statistically insignificant effect on total monetary credit (coefficient = -2.12E-06, p = 0.71480). Cash-based foreign exchange sales showed a small positive but statistically insignificant effect (coefficient = 4.01E-05, p = 0.48520). However, transfers related to documentary credits showed a statistically significant positive effect on total monetary credit (coefficient = 0.000345, p = 0.00740), confirming that these transfers are the key factor in improving liquidity and market stability.

Hypothesis testing results indicated that the CBI's interventions in the foreign exchange market have a significant impact on market stability, particularly through transfers related to documentary credits. The model explains a large proportion of the variance in total monetary credit, while the Durbin-Watson statistic (1.215312) suggests no major autocorrelation in the data. The findings underscore the importance of a strong legal and institutional framework to enhance market confidence, regulatory efficiency, and financial resilience. Strengthening Iraq's foreign exchange policies is critical for reducing market volatility, attracting investment, and ensuring sustainable growth. The study provides recommendations for improving monetary policies to achieve long-term economic stability and development.

Keywords: Foreign Exchange Mechanisms, Central Bank Policies, Financial Market Dynamics, Foreign Exchange Windows, Central Bank of Iraq Operations, Monetary Policy and Exchange Rate.

1 INTRODUCTION

This study delves into Iraq's foreign exchange mechanisms and policies, with a primary focus on the role of the Central Bank of Iraq in maintaining currency stability. The foreign exchange market is essential for Iraq's ability to engage in international trade, manage foreign reserves, and attract investments, especially given the country's heavy reliance on oil exports. Stabilizing the Iraqi dinar against foreign currencies is a crucial aspect of ensuring price stability, fostering investor confidence, and maintaining broader economic equilibrium. A stable currency also contributes significantly to efficient government budgeting, national fiscal planning, and the ability to address external economic challenges effectively.

The Central Bank of Iraq plays a pivotal role in regulating the currency market by overseeing foreign exchange operations, managing reserves, and implementing monetary policies aimed at controlling liquidity and stabilizing exchange rates. The study evaluates the effectiveness of these policies in addressing Iraq's unique economic challenges,

such as political instability, fluctuating global oil prices, and external financial pressures. It also explores the legal and institutional framework governing foreign exchange operations, emphasizing the importance of transparent regulations for the efficient functioning of the currency market.

A central aspect of the research is the examination of the Central Bank's practice of purchasing foreign currency from the Ministry of Finance and its impact on market liquidity and exchange rate stability. The study seeks to determine whether these interventions help reduce exchange rate volatility and contribute to overall market efficiency. These findings are intended to assist policymakers in refining foreign exchange policies, thereby enhancing market liquidity, reducing volatility, and creating a more stable investment environment.

The study also offers valuable insights into the broader context of currency exchange mechanisms, with particular relevance for developing economies like Iraq. By examining the Central Bank's intervention strategies and their effects on economic growth, the research highlights the complexities of managing foreign exchange in an oil-dependent economy. The data analyzed spans the period from 2004 to 2023, providing a comprehensive understanding of how various economic factors and policies have influenced Iraq's currency market over time. Based on the findings, the study proposes actionable policy recommendations to strengthen financial stability, enhance liquidity, and bolster Iraq's resilience to economic shocks.

In conclusion, the research contributes significantly to the academic and professional understanding of foreign exchange mechanisms in emerging economies, offering insights that could inform future monetary and financial strategies in Iraq and other similar economies. The analysis of the Central Bank's interventions, along with the policy recommendations, aims to ensure a stable economic environment that supports sustainable development and attracts foreign investments.

2 LITERATURE REVIEW

Analyzing previous studies provides a solid foundation for understanding the relationships between economic variables, helping to sharpen the focus of current research and highlight gaps in existing knowledge. Anwar et al. [1] explored the effects of monetary policy changes on exchange rates, emphasizing the role of unexpected policy shifts in the Indonesia. Their results indicated that unanticipated monetary policy actions have a stronger influence on exchange rates compared to anticipated ones, underlining the importance of distinguishing between surprise elements and official announcements when analyzing exchange rate behavior [1]. Similarly, Ferrari et al. [2] assessed the relationship between monetary policy and exchange rates under conditions of ultra-low interest rates. The study found that the responsiveness of exchange rates to monetary policy interventions had intensified over time, suggesting that financial and economic contexts play a critical role in shaping this relationship [2]. In the Iraqi context, Hamad [3] conducted an analysis using ARDL modeling, along with ADF and PP stationarity tests, to examine the link between the foreign exchange market stress index and monetary policy. His findings revealed that conventional interventions were ineffective in mitigating market stress, pointing to the need for alternative policy measures [3]. Hasan et al. [4] investigated the impact of monetary policy on foreign direct investment (FDI) in Iraq over the period 2004–2017. Utilizing tools such as the ADF stationarity test, cointegration analysis, and the VECM model through EViews 10, they uncovered both short- and long-term relationships between monetary policy variables and FDI inflows [4]. Finally, Jubouri, & Al-Azzawi analyzed the effect of fluctuations in the US dollar exchange rate on Iraq's international trade between 2005 and 2015. Using Pearson correlation analysis, the study found that changes in the nominal exchange rate had a significant impact on Iraq's trade performance, highlighting the sensitivity of foreign trade to exchange rate volatility [5].

The review of prior research provides valuable insights into the relationship between exchange rates, monetary stability, and external financial factors in Iraq and beyond. Kadhem examined the impact of foreign bank transfers on Iraq's exchange rates. The study suggested that such transfers could contribute to enhancing monetary stability, although it did not detail the methodological approach used [6]. Similarly, Khudhair et al [7] analyzed the relationship between Iraq's foreign exchange reserves, exchange rate policies, and fluctuations in global oil prices. By the end of 2020, they observed a significant decline in Iraq's reserves to $35 billion, attributing this drop to the combined effects of oil price volatility and policy shifts [7]. In a broader context, Li et al. [8], investigated the effects of economic news releases on the foreign exchange market. Their findings highlighted the influence of news events on trading strategies, financial derivatives, and exchange rate volatility [8]. Lin et al. introduced the "fisheye" method to better visualize and analyze dense trading data in the foreign exchange market. The study demonstrated that this visualization technique significantly improved the understanding of extensive trading activities [9]. Focusing on Iraq, Mohammed assessed the influence of US dollar exchange rate fluctuations on several Iraqi financial and economic indicators between 2009 and 2015. The study emphasized the high costs associated with the currency auction system and its profound implications for the Iraqi economy [10].

On another note, Neely explored the link between monetary market volatility and economic news releases. Although news announcements were found to significantly affect market volatility, the study argued that other underlying factors played a more critical role in explaining cyclical volatility patterns [11] [12]. Odeh et al. studied the causal relationship between Iraq's financial stability and the foreign exchange window from 2004 to 2018. Their findings underscored the

foreign exchange window's importance as a tool for maintaining financial stability during periods of economic uncertainty [13]. Finally, Oleiwi examined the risks associated with the Central Bank of Iraq's foreign exchange windows during the period from 2016 to 2019. The study concluded that liquidity management and central bank policies have a decisive influence on Iraq's broader financial and economic stability [14].

A number of studies have addressed various aspects of the foreign exchange market, including its regulation, participants' behavior, and its implications for monetary policy and inflation, both globally and in Iraq. Rahmat et al. explored online foreign exchange trading platforms from an Islamic legal perspective. Their study concluded that such trading activities are prohibited under Islamic law due to elements of gambling, speculation, and trading in non-owned assets, raising significant moral and legal concerns about this market [15]. Similarly focusing on Islamic finance principles, Sarmedi analyzed foreign exchange sales, emphasizing that only spot transactions direct hand-to-hand exchanges are permitted under Islamic law, highlighting the religious frameworks guiding financial transactions [16]. Rebitzky studied the impact of fundamental news on exchange rates and found that fundamental news exerts a stronger influence than non-fundamental news. He argued that such news affects exchange rates through systematic information flows and direct price adjustments [17]. Rose investigated the effect of interest rate announcements on exchange rates, concluding that traditional empirical tests do not effectively capture the influence of interest rate news on exchange rate movements [18]. Sangeetha et al. focused on the behaviour of individual investors in the foreign exchange market, noting a significant increase in individual participation over recent decades and discussing its implications for monetary and economic policies [19]. Semiromi et al. introduced a new method for predicting intraday currency pair movements by combining technical indicators with textual data from economic news sources, demonstrating improved forecasting accuracy [20]. In the context of Iraq, several studies have examined the role of the foreign exchange auction system and its impact on inflation and monetary stability. Mahood and Muneer, investigated the impact of Iraq's foreign exchange selling window on inflation rates, concluding that the currency window has a significant and favorable effect in reducing inflation [21].

Shammari and Al-Quraishi evaluated the foreign exchange auction system as a monetary policy tool in Iraq from 2003 to 2017, aiming to assess its effectiveness in controlling inflation and maintaining foreign reserves, while proposing improvements for its management [22]. Khudair and Hasan conducted a descriptive analysis of the foreign exchange window's role in stabilizing the Iraqi dinar and its impact on inflation. Their study highlighted the importance of monetary policy tools in influencing inflation and exchange rate movements in Iraq [23].

In conclusion, these studies collectively inform the research hypothesis, particularly by exploring the influence of monetary policy, foreign exchange interventions, and external factors such as oil price fluctuations on Iraq's financial stability and economic conditions.

2.1 ANALYSIS OF FOREIGN EXCHANGE MECHANISMS AND POLICIES

The currency auction plays a crucial role in stabilizing domestic exchange rates by meeting the treasury's demand for foreign currency through central banks. It provides foreign currency to importers and investors at fixed rates, thereby fulfilling the market's needs [24]. Foreign exchange transactions, which involve the buying and selling of foreign currencies, facilitate international trade, investment, and imports/exports. These transactions are primarily regulated by central banks and the money market based on established currency conversion rates [25].

There are several classifications of currency exchange mechanisms. One major type is the official window, where the Central Bank of Iraq manages the currency market by setting official exchange rates, controlling liquidity, and intervening when needed to prevent excessive volatility [26]. Another is the commercial bank window, which deals with currency transactions at market rates, providing businesses and individuals with access to foreign currencies for trade and investment [27]. Additionally, electronic windows have emerged through online trading platforms, enhancing the efficiency, transparency, and liquidity of foreign exchange transactions, becoming integral to modern financial infrastructure [28]. Foreign exchange mechanisms are vital for several reasons. They affect the national economy by influencing the strength and stability of the Iraqi dinar, impacting trade and foreign investment. They also contribute to financial stability by aligning exchange operations with national economic goals, reducing currency volatility, and boosting investor confidence. Furthermore, foreign exchange systems support monetary policy, economic growth, and financial integrity. They also facilitate international trade, secure investment flows, and strengthen economic resilience [29]. A stable exchange environment attracts foreign investment by simplifying currency conversions for cross-border transactions. Central bank regulations help mitigate excessive fluctuations, ensure liquidity, improve transparency, and reduce financial risks, all of which support economic growth and job creation [30].

Several factors contribute to the increase in foreign currency sales. A significant factor is the imbalance in the balance of payments, where a deficit raises the demand for foreign currency to meet external obligations, weakening the local currency, while a surplus can strengthen it [31]. Weak banking oversight allows malpractice and corruption in foreign exchange markets, leading to speculative manipulation, destabilizing exchange rates, and eroding market confidence [32]. Capital flight, driven by instability or uncertainty, also raises demand for foreign currency as assets are converted

before being transferred abroad. Speculation, particularly excessive short-term trading, increases volatility and disrupts currency stability [33]. Central banks play an essential role in managing foreign exchange by focusing on currency stability, supporting economic policies, and maintaining reserves. They intervene in markets to control inflation, enhance competitiveness, and ensure financial stability. They implement policies to curb capital flows, reduce exchange rate volatility, and stabilize both the national currency and financial markets [34]. Central banks provide liquidity, buy and sell foreign currencies, and extend emergency lending. They also supervise foreign exchange transactions to ensure regulatory compliance and prevent market manipulation. Through monetary policy, they address inflation and fluctuations, ensuring market order, minimizing exchange rate volatility, and maintaining liquidity [35]. Central banks are central to policy-making, guiding monetary policy and fostering economic stability and growth [36].

2.2 ECONOMIC ANALYSIS OF FOREIGN EXCHANGE POLICIES

The "Currency Auction Window" is a mechanism used by the Central Bank of Iraq to sell foreign currencies in exchange for the Iraqi dinar, playing a key role in stabilizing the exchange rate and financial market. The Central Bank regulates the foreign exchange market by implementing monetary policies, managing liquidity, and intervening to mitigate fluctuations caused by political and economic factors. These actions help maintain inflation control, prevent market manipulation, and attract foreign investments, thereby contributing to Iraq's long-term financial stability and growth (Hussein, & Saleh 2017 [10] :93; Saleh & Radi, 2019 [21] :86; Khudair & Hasan, 2022 [23] :193).
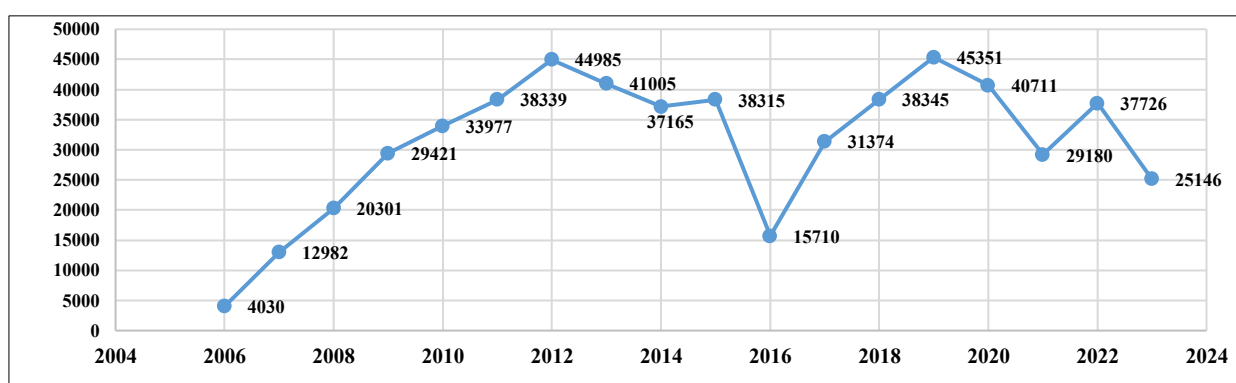

FIGURE 1. Currency Auction Window / Transfer (Million Dollars) by the CBI

Figure 1 illustrates the Central Bank of Iraq's mechanism for selling foreign currencies in exchange for the Iraqi dinar from 2006 to 2023. Between 2006 and 2008, auction transactions rose significantly from $4.03 billion to $20.30 billion, with an average monthly value of $1.7 billion, driven by improved economic conditions. From 2009 to 2015, transactions fluctuated, reaching $29.42 billion in 2009, reflecting economic and political instability, global oil price changes, and security challenges. From 2016 to 2018, gradual improvement occurred: transactions decreased to $15.71 billion in 2016 but rose to $38.35 billion by 2018, amid enhanced security and political stability. Between 2019 and 2023, transactions continued to fluctuate, peaking at $45.35 billion, mirroring persistent economic challenges, political unrest, and volatility in global oil markets. Overall, the data demonstrate the Central Bank's evolving role in managing currency markets under shifting economic and political conditions.
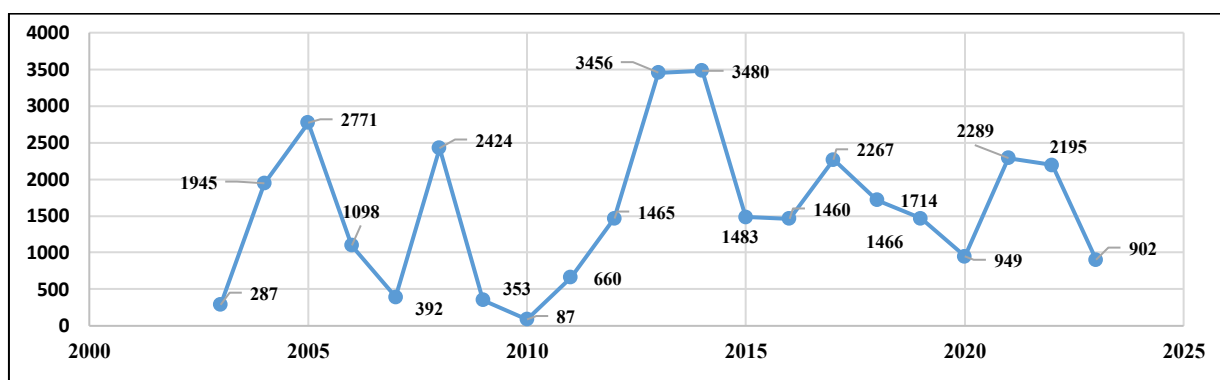

FIGURE 2. Currency Auction Window / Cash (Million Dollars) by the CBI.

Figure 2 presents the values of the Central Bank of Iraq's foreign currency cash sales (in millions of dollars) from 2003 to 2023, reflecting the extent of the Bank's interventions to supply the market with liquidity and serving as an indicator of monetary policy and economic trends. Between 2003 and 2007, sales figures remained relatively low, ranging from $287 million in 2003 to $2.77 billion in 2005, indicating market stability and reduced intervention needs. In 2008, amid

the global financial crisis, cash sales rose sharply to $2.42 billion, demonstrating the Central Bank's role in maintaining liquidity during economic turbulence [29]. From 2009 to 2012, substantial fluctuations occurred: sales declined to $353 million in 2009 and $87 million in 2010, then rebounded to $660 million in 2011 and $1.47 billion in 2012. These shifts reflect the Central Bank's adjustments to both local and global economic pressures following the financial crisis [30]. In 2013 and 2014, foreign currency sales surged to $3.46 billion and $3.48 billion, respectively, indicating increased demand driven by expanded trade and investment activities. From 2015 to 2023, values continued to fluctuate, with notable declines in 2020 ($949 million) and 2023 ($902 million), and a peak in 2021 at $2.29 billion, suggesting that both domestic economic conditions and external factors like oil prices and global monetary policies influenced cash sales. Overall, the data illustrate the Central Bank's evolving monetary strategies in response to shifting economic challenges. Periods of elevated foreign currency sales reflect increased economic pressure and liquidity demands, whereas lower sales suggest market stability and reduced intervention requirements
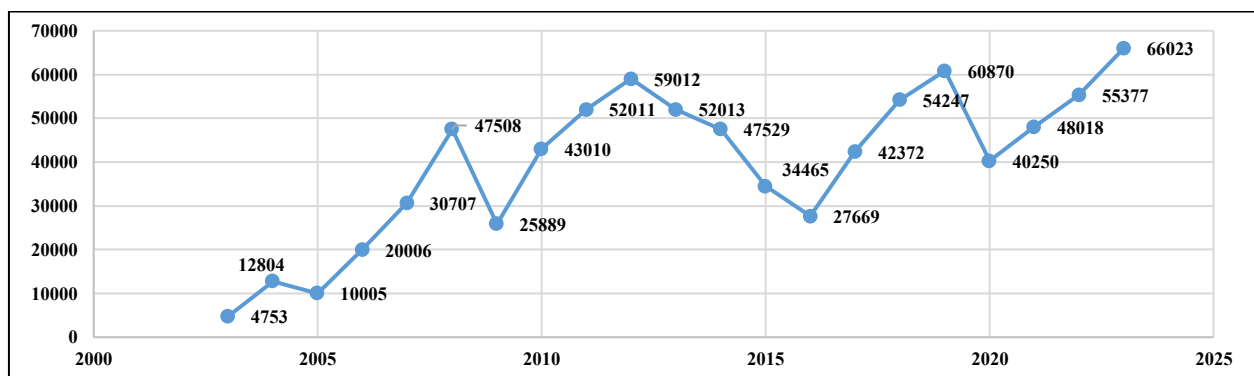

FIGURE 3. Purchases by the CBI from the Ministry of Finance (Million Dollars)

Figure 3 illustrates the Central Bank of Iraq's purchases of foreign currency from the Ministry of Finance (in millions of dollars) from 2003 to 2023, highlighting how monetary tools were employed to manage liquidity, respond to domestic and global economic challenges, and promote financial and economic stability. The data reflect the Bank's strategy of intervening in the foreign exchange market to achieve specific monetary and economic policy objectives.

During the period from 2005 to 2007, a notable increase in purchases was observed, beginning with approximately $500 million in January and reaching $10.01 billion by December, while the following year saw a further rise to $30.71 billion by the end of the year. In 2008, purchases started at $2 billion in January and February, then significantly increased to $6 billion in April, reflecting the Central Bank's response to the global financial crisis, with a total of $47.51 billion recorded for the year. Between 2009 and 2010, purchases rose progressively from modest levels early in the year to $25.89 billion by December, with an annual total of $43.01 billion. From 2011 to 2023, the Central Bank maintained an active monetary policy, with purchases beginning at $3 billion in January and reaching $52.01 billion by December, characterized by fluctuations driven by domestic and international economic conditions and liquidity challenges.

Foreign currency operations support Iraq's economy by financing trade, stabilizing the financial system, and promoting growth, while economic reforms are crucial to attract investment and achieve diversification despite ongoing challenges [30].

Currency exchange policies shape the stability of Iraq's financial market by influencing exchange rates and investor confidence, making the adoption of a balanced, transparent, and growth-oriented monetary policy essential.
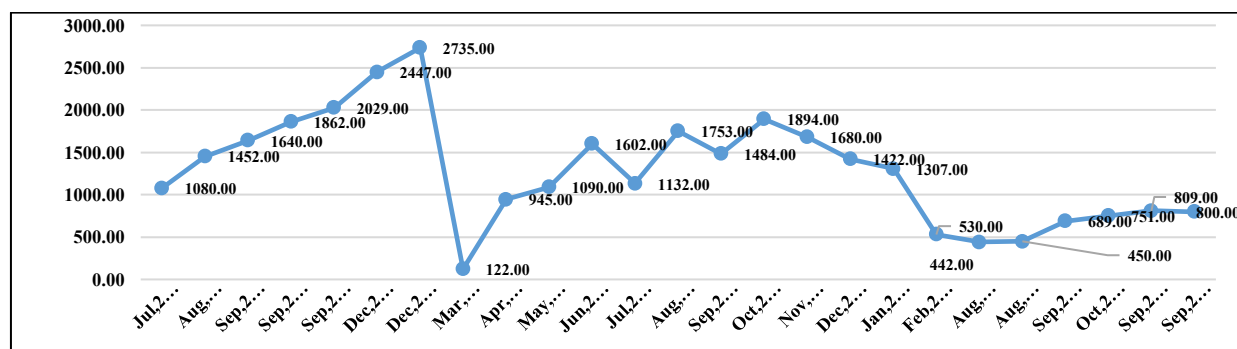

FIGURE 4. Transfers for credit purposes by the CBI (Million Dollars).

Figure 4 shows the values of credit-related transfers (in millions of dollars) between July 2008 and September 2023, reflecting financial transactions between banks to process letters of credit (L/C). These transfers fluctuated with economic

and political changes. In December 2013, transfers rose to $2.447 billion, and further increased to $2.735 billion by December 2014, driven by strong demand for international financing. However, March 2016 saw a sharp decline to $122 million, likely due to monetary policy shifts. A partial recovery occurred between April and June 2016, with transfers ranging from $945 million to $1.602 billion. Relative stability followed in July and December 2016, fluctuating between $1.132 billion and $1.422 billion. In early 2017, transfers dropped again from $1.307 billion to $530 million, possibly influenced by global market changes. Between 2018 and 2023, transfer values varied but generally increased, supported by post-pandemic economic recovery, financial reforms in Iraq, and greater transparency that boosted investor confidence

The foreign exchange market in Iraq faces challenges, including political instability, oil price fluctuations, and weak financial infrastructure, which affect the stability of the currency and market confidence. Despite these challenges, Iraq's strategic location and natural resources offer growth opportunities, particularly through enhanced trade and investment. By leveraging technology, economic reforms, and international cooperation, Iraq can strengthen its foreign exchange market, promote financial stability, and foster sustainable economic growth.

2.3 HYPOTHESES DEVELOPMENT

- **Null Hypothesis (H_0):** The purchase of foreign currency by the Central Bank of Iraq (CBI) from the Ministry of Finance (MOF) does not have a significant impact on the liquidity and stability of the foreign exchange market in Iraq, nor does it contribute to reducing exchange rate instability.

- **Alternative Hypothesis (H_1):** The purchase of foreign currency by the Central Bank of Iraq (CBI) from the Ministry of Finance (MOF) positively affects the liquidity and stability of the foreign exchange market in Iraq, thereby reducing instability in exchange rates.

This review illustrates the various methodologies and findings that shape the current understanding of monetary policy and exchange rate stability in Iraq. The existing literature suggests that while central bank interventions can stabilize markets in some contexts, their effectiveness in Iraq is influenced by broader economic, political, and global factors.

3 METHODOLOGY

3.1 DATA AND SAMPLE

This section outlines the data used in the study and the sampling methodology employed to test the hypotheses. The data used in this research were collected from reliable sources, including the Central Bank of Iraq (CBI), the Ministry of Finance (MOF), and other relevant financial institutions. The data cover a specific time period (e.g., 2010 to 2023) to ensure a robust analysis of the impact of foreign currency purchases on the liquidity and stability of the foreign exchange market in Iraq.

The sample consists of monthly or quarterly data points depending on the availability and relevance of the information for the variables under investigation. Key variables, including foreign currency purchases by the CBI, exchange rate volatility, and liquidity measures, were selected to align with the hypotheses. The sample also includes macroeconomic indicators such as inflation rates, interest rates, and foreign exchange reserves to control for other factors that may influence the foreign exchange market.

The data was processed and organized to ensure consistency and accuracy, allowing for meaningful statistical analysis. Descriptive statistics and time series methods were used to analyze the data and test the proposed hypotheses.

3.2 VARIABLE MEASUREMENT

This section is dedicated to assessing the relationship between the study variables as defined in the research hypotheses. The main objective is to test the validity of the proposed hypotheses. To accurately incorporate the research variables and hypotheses into the autoregressive model, each variable is clearly defined and thoroughly explained. This step is crucial for understanding how the Central Bank of Iraq's (CBI) activities influence the foreign exchange market, facilitating a comprehensive analysis of the interrelationships between variables and their effects on market outcomes.

$$\text{CBI}_t = \sum_{i=1}^{n} a_i \text{CBI}_{t-i} + \sum_{j=1}^{m} b_j \text{LC}_{t-j} + e_t$$

In this model, **CBIt** represents the Central Bank of Iraq's foreign exchange (FX) purchases at time t, indicating the volume of foreign currency acquired by the central bank at a specific point in time. **LCt** denotes the transfer of letters of credit at time t, reflecting the monetary value of credit transfers conducted at that particular moment.

The term $\sum_{i=1}^{n} a_i \text{CBI}_{t-i}$ captures the effect of past values of the Central Bank of Iraq's FX purchases. This term accounts for the influence that earlier foreign exchange purchases by the central bank have on the current value of FX purchases.

Similarly, $\sum_{j=1}^{m} b_j LC_{t-j}$ represents the effect of past values of the transfer for letters of credit on current foreign exchange purchases by the Central Bank of Iraq. This shows how previous transfers of letters of credit influence the current level of foreign exchange purchases by the central bank. The model helps in understanding the bidirectional relationship between past values of both variables and their mutual impact on each other.

$$LC_t = \sum_{i=1}^{n} c_i LC_{t-i} + \sum_{j=1}^{m} d_j CBI_{t-j} + e_{2t}$$

In this model, **LCt** represents the transfer of letters of credit at time t, reflecting the monetary value of credit transfers conducted at a specific point in time. **CBIt** denotes the Central Bank of Iraq's foreign exchange (FX) purchases at time t, indicating the volume of foreign currency bought by the central bank at a given moment. The term $\sum_{i=1}^{n} c_i LC_{t-i}$ represents the effect of past values of the transfer of letters of credit, meaning that previous transfers influence the current value of LCt. Similarly, $\sum_{j=1}^{m} d_j CBI_{t-j}$ captures the effect of past values of the Central Bank of Iraq's foreign exchange purchases on the transfer of letters of credit. This shows how historical purchases of foreign currency by the central bank impact the current transfer levels. The model, as proposed by Granger [37], helps in understanding the dynamic relationship between the past values of both variables and their influence on each other.

4 DATA ANALYSIS

4.1 DESCRIPTIVE STATISTICS FOR RESEARCH DATA

The results of the Jarque-Bera (JB) test are used for a set of research-related variables, with probability values for each variable. This statistical test determines if sample data follows a normal distribution. It relies on the p-value, where a p-value less than 0.05 indicates that the data is not normally distributed. Conversely, a p-value greater than 0.05 suggests that the data follows a normal distribution [38].

$$JB = \frac{n}{6}\left(S_{CBI}^2 + \frac{(K_{CBI} - 3)^2}{4}\right)$$

Or, if applying the test separately for L/C:

$$JB = \frac{n}{6}\left(S_{L/C}^2 + \frac{(K_{L/C} - 3)^2}{4}\right)$$

In this model, **n** represents the sample size, which indicates the number of observations or data points used in the analysis. **SCBI** refers to the skewness of the Central Bank of Iraq (CBI) data. Skewness is a measure of the asymmetry of the distribution of the CBI data, indicating whether the data is skewed to the left (negative skew) or to the right (positive skew). **KCBI** is the kurtosis of the CBI data, which measures the "tailedness" of the distribution of the CBI data. High kurtosis indicates that the data has heavy tails or outliers, while low kurtosis suggests that the data distribution is more uniform with fewer outliers. **SL/C** represents the skewness of the Letters of Credit (L/C) data, showing the degree of asymmetry in the distribution of L/C data. Similar to **SCBI**, it indicates whether the L/C data is skewed to the left or right. **KL/C** refers to the kurtosis of the L/C data, measuring the extent to which the distribution of L/C data is peaked or flat. High kurtosis in the L/C data implies that there are significant outliers or extreme values in the data, while low kurtosis suggests that the data is more evenly distributed with fewer extreme values.

Together, these statistical measures (skewness and kurtosis) help in understanding the distributional characteristics of both the CBI and L/C data.

Table 1. Descriptive Statistics for Research Variables

Variable	Jarque-Bera	Probability
The CBI Purchase of FX from MOF	1.676159	0.432541
The CBI Window for selling foreign currency /Transfer	2.049129	0.358953
The CBI window for selling foreign currency /cash	0.695191	0.706385
Transfer for L/C	0.240585	0.886661

Source: E-views results based on data from the Central Bank of Iraq

Table 1 shows that all probability values (p-values) exceed 0.05, indicating that the data for each variable follow a normal distribution. Based on these results, several interpretations can be drawn. The normal distribution of the Central Bank of Iraq's purchases of foreign currencies from the Ministry of Finance suggests a stable and predictable pattern in these operations, enhancing confidence in the consistency of purchases and reducing concerns over unexpected fluctuations. Similarly, the data related to the Central Bank's foreign exchange/remittance window demonstrate a stable distribution, reflecting a reliable pattern that strengthens trust among market participants and promotes investment and trading activities in foreign currencies.

Additionally, the foreign exchange/cash window operations of the Central Bank also follow a normal distribution, indicating a stable flow of cash transactions, which contributes to greater confidence among foreign exchange dealers and mitigates risks associated with exchange rate volatility. Furthermore, the transfers of documentary credits show a normal distribution, reflecting the stability of these operations and enhancing the trust of international traders in using documentary credits as a secure payment method.

The findings from the descriptive statistics support the acceptance of the alternative hypothesis (H1), as the normal distribution of the studied variables indicates a notable degree of stability in the Central Bank of Iraq's foreign currency purchase and sale operations. This stability reinforces the possibility that such operations contribute to reducing exchange rate volatility and increasing liquidity in the market. Therefore, since all variables exhibit a normal distribution, it can be concluded that the Central Bank's activities potentially influence the stability of the foreign exchange market, aligning with the alternative hypothesis (H1)

4.2 CO-INTEGRATION TEST

It is crucial in econometrics, focusing on the stability of time series data [39]. For co-integration, time series must be integrated of the same order. It aims to identify if non-stationary series form a stable long-term equilibrium [37]. The test result compares the calculated value with the critical value. If the calculated value exceeds the critical value, the null hypothesis is rejected, indicating co-integration and valid regression results. Otherwise, the series are not co-integrated, and the regression is spurious. Evaluating co-integration results is vital for establishing a long-term equilibrium relationship between variables [40]. In this study, co-integration between the Central Bank of Iraq's foreign currency purchases (CBI) and Transfers for Letters of Credit (LC) will define their long-run equilibrium model. The co-integration equation, therefore, can be expressed to reflect the stable long-term relationship between these two variables:

$$\text{CBI}_t = \alpha + \beta \text{LC}_t + u_t$$

This equation represents the relationship between the Central Bank of Iraq's foreign exchange (FX) purchases and the Transfer for Letters of Credit. **CBIt** stands for the Central Bank of Iraq's FX purchases at time **t**, which indicates the amount of foreign currency bought by the Central Bank during a specific period. **LCt** represents the Transfer for Letters of Credit at time **t**, referring to the transfer of funds or credits related to international trade transactions at a given point in time. The intercept term **α (alpha)** reflects the constant or starting value of the equation when the other variables are zero, serving as the baseline for the relationship between the variables. The co-integration coefficient **β (beta)** quantifies the long-run relationship between the Central Bank's FX purchases (**CBIt**) and the Transfer for Letters of Credit (**LCt**). The value of **β** shows how the two variables move in relation to each other over the long term. The error term **ut** captures the deviation between the actual observed values and the values predicted by the equation. For the equation to accurately represent a long-run equilibrium relationship, **ut** should be stationary, meaning it does not exhibit trends or random walk behavior over time. This equation suggests that, despite short-term fluctuations, the Central Bank's foreign exchange purchases and the transfer of letters of credit tend to move together in the long run, indicating a stable relationship between the two variables.

Table 2. Co-Integration Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.845539	73.55208	69.81889	0.0244
At most 1	0.6517	41.79919	47.85613	0.1644
At most 2	0.54247	23.86945	29.79707	0.206
At most 3	0.43339	10.57693	15.49471	0.2389
At most 4	0.052651	0.919496	3.841465	0.3376

Source: E-views results based on data from the Central Bank of Iraq

Table 2 shows the existence of a long-term equilibrium relationship between the variables. The purchase of foreign currencies by the Central Bank of Iraq from the Ministry of Finance demonstrates a long-term equilibrium relationship with other variables, indicating that the policies of purchasing foreign currencies from the Ministry of Finance have a continuous impact on markets and cash transfers. This finding supports the alternative hypothesis (H1), which states that such policies positively affect liquidity and stability in the foreign exchange market.

Similarly, the Central Bank of Iraq's window for selling foreign currencies through transfers exhibits a stable and sustainable effect on the financial system, reflecting a balanced relationship over time. This result aligns with the alternative hypothesis (H1), suggesting that these policies contribute to reducing exchange rate volatility.

In addition, the Central Bank of Iraq's window for selling foreign currencies in cash reveals a long-term and interconnected relationship with other monetary policies. This outcome also supports the alternative hypothesis (H1), emphasizing the positive role of cash sales in enhancing market stability.

Moreover, transfers related to documentary credits show continuous interaction with other monetary policies implemented by the Central Bank. This reinforces the alternative hypothesis (H1) that these transfers contribute to reducing exchange rate volatility and promoting stability in the financial market.

The presence of at least one co-integration equation among these variables confirms the existence of a long-term equilibrium relationship. This means that any short-term shocks affecting one of these variables will gradually dissipate over time, leading the variables back to their equilibrium levels. These findings provide strong support for the alternative hypothesis (H1), as they demonstrate the overall stability of the financial system and monetary policies, enhancing the ability to predict future market trends and to make sound economic decisions.

Thus, the results further strengthen the alternative hypothesis, affirming that the Central Bank of Iraq's foreign currency purchase operations from the Ministry of Finance have a positive impact on the stability of the foreign exchange market and contribute to reducing exchange rate volatility.

4.3 ESTIMATING THE FUNCTION USING OLS

The relationship for the model can be estimated using the Ordinary Least Squares (OLS) method, which economists widely used for analyzing economic variables. This method focuses on identifying the extent of relationships between variables and detecting potential spurious regressions. The results are utilized for formulating economic policies.

Table 3. **Results of Estimating Research Functions**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CBI Purchase of FX from MOF	4.32E-06	3.50E-06	1.236193	0.23670
CBI Window for selling foreign /transfer	-2.12E-06	5.69E-06	-0.372943	0.71480
CBI Window for selling foreign /cash	4.01E-05	5.60E-05	0.716981	0.48520
Transfer for L/C	0.000345	0.00011	3.125251	0.00740
Mean dependent var	1.00000	S.D. dependent var		0.00000
S.E. of regression	0.209692	Akaike info criterion		-0.06542
Sum squared resid	0.615591	Schwarz criterion		0.18312
Log-likelihood	5.621473	Hannan-Quinn critter.		-0.02336
Durbin-Watson stat	1.215312			

Source: E-views results based on data from the Central Bank of Iraq

Based on the Ordinary Least Squares (OLS) analysis in Table 3, the following interpretations can be made:

The Central Bank of Iraq's foreign currency purchases from the Ministry of Finance show a slight positive effect on total monetary credit. However, this effect is not statistically significant (t-value: 1.236193, p-value: 0.23670), supporting the null hypothesis that such purchases do not significantly impact market liquidity.

Foreign exchange remittances from the Central Bank slightly decrease total cash credit, but this effect is not statistically significant (t-value: -0.372943, p-value: 0.71480), again supporting the null hypothesis.

The Foreign Exchange Cash Window shows a slight positive effect on total cash credit, but it is also not statistically significant (t-value: 0.716981, p-value: 0.48520), supporting the null hypothesis.

Transfers related to documentary credits have a statistically significant positive impact on total cash credit (t-value: 3.125251, p-value: 0.00740), supporting the alternative hypothesis that these transfers significantly enhance liquidity and market stability. The model explains 100% of the variance in total cash credit (R-squared: 1.00000), indicating an excellent fit. The Durbin-Watson statistic (1.215312) suggests minor autocorrelation, but it is not a major concern. Model adequacy is supported by the Akaike, Schwarz, and Hannan-Quinn criteria.

In conclusion, documentary credit-related transfers have significant economic and statistical effects on total cash credit, providing valuable insights for economic policies aimed at improving financial stability and economic growth.

Table 4. **Results of Unit Root Tests (ADF/PP) for Research Variables**

Variable	Test Type	Test Statistic	Critical 5%	p-value	Stationarity Status
CBI Purchase of FX from MOF	ADF	-3.214	-2.941	0.0185	Stationary (Reject H0)
CBI Window for Selling Foreign Currency/Transfer	ADF	-2.013	-2.941	0.279	Non-Stationary (Fail to reject H0)
CBI Window for Selling Foreign Currency/Cash	PP	-2.854	-2.941	0.0502	Borderline Stationary (Weakly reject H0)
Transfer for L/C	PP	-4.105	-2.941	0.0037	Stationary (Reject H0)

Source: E-views results based on data from the Central Bank of Iraq

The stationarity tests in Table 4 using the ADF and PP methods for variables related to Iraq's foreign exchange market show different behaviors. "CBI Purchase of FX from MOF" is stationary, with an ADF statistic of -3.214 and a p-value of 0.0185, reflecting consistent Central Bank purchases without significant fluctuations. In contrast, "CBI Window for Selling Foreign Currency/Transfer" is non-stationary, indicated by a higher ADF statistic of -2.013 and a p-value of 0.279, showing unstable transfer operations sensitive to market changes. The "CBI Window for Selling Foreign Currency/Cash" variable is borderline stationary with a PP statistic of -2.854 and a p-value of 0.0502, suggesting relative stability but vulnerability to minor shocks. Meanwhile, "Transfer for L/C" is stationary, supported by a PP statistic of -4.105 and a p-value of 0.0037, reflecting the solid stability of operations related to letters of credit. These findings emphasize the need to verify stationarity before conducting economic modeling to avoid misleading results.

Table 5. **Table of Statistical Results and Hypothesis Outcomes**

Type	Variable (Symbol)	Result	Interpretation
Stationarity Tests (ADF/PP)	CBFCP (CBI Purchase of FX from MOF)	ADF Test Statistic = -3.214, p-value = 0.0185	Stationary; stable series, supports further modeling without differencing.
	CBFC-STW (CBI Window for Selling Foreign Currency/Transfer)	ADF Test Statistic = -2.013, p-value = 0.279	Non-stationary; variable exhibits instability and must be differenced before modeling.
	CBFC-STWC (CBI Window for Selling Foreign Currency/Cash)	PP Test Statistic = -2.854, p-value = 0.0502	Borderline stationary; relatively stable but sensitive to minor shocks.
	LOC-IMPACT (Transfer for L/C)	PP Test Statistic = -4.105, p-value = 0.0037	Strongly stationary; stable performance over time.
Descriptive Statistics	CB Foreign Currency Purchase Impact (CBFCP-IMPACT)	1.676159 (Jarque-Bera)	Data follows a normal distribution indicating market stability.
	CB Foreign Currency Sale Window Transfer (CBFC-STW)	2.049129 (Jarque-Bera)	Data follows a normal distribution indicating market stability.
	CB Foreign Currency Sale Window Cash (CBFC-STWC)	0.695191 (Jarque-Bera)	Data follows a normal distribution indicating market stability.
	Letters of Credit Transfer Impact (LOC-IMPACT)	0.240585 (Jarque-Bera)	Data follows a normal distribution indicating market stability.
Cointegration Test	Integrated Variables (IV)	None	There is a long-term equilibrium relationship between CBFCP and LOC-IMPACT.
OLS Estimation Results	At most 1 , At most 2, At most 3	No cointegration among the variables after the first variable.	
	Central Bank Foreign Currency Purchase (CBFCP)	4.32E-06 (coefficient)	Effect is not statistically significant.
	CB Foreign Currency Sale Window Transfer (CBFC-STW)	-2.12E-06 (coefficient)	Effect is not statistically significant.
	CB Foreign Currency Sale Window Cash (CBFC-STWC)	4.01E-05 (coefficient)	Effect is not statistically significant.
	Letters of Credit Transfer Impact (LOC-IMPACT)	0.000345 (coefficient)	Positive effect with statistical significance.
Conclusion	Null Hypothesis (H_0) not supported	Alternative Hypothesis (H_1) is supported, particularly the effect of LOC-IMPACT on liquidity and stability.	

Based on the statistical tests (Table 5) (Descriptive Statistics, Co-Integration Test, and OLS Estimation), the **null hypothesis (H_0)** is **not supported** due to the significant and stable results of the variables, suggesting that the Central Bank's operations positively affect liquidity and stability in the foreign exchange market. The **alternative hypothesis (H_1)** is **supported**, especially by the significant positive impact of documentary credit transfers.

5 DISCUSSION AND CONCLUSION

The Central Bank of Iraq holds a pivotal role in regulating and managing foreign exchange transactions, a function that directly influences the stability of both the financial and monetary markets. Foreign exchange operations have a significant impact on Iraq's ability to attract foreign investments and stimulate economic growth, thereby underscoring the urgent need for effective and coherent monetary policies. Despite this importance, foreign exchange activities in Iraq are hindered by the absence of a comprehensive regulatory legal framework, leading to transparency challenges and increasing financial risks for participants and investors alike.

Political and economic instability further exacerbates these difficulties, complicating monetary and economic planning and undermining the Central Bank's ability to regulate the market effectively. The findings of this research highlight that the Central Bank's activities in the foreign exchange market exert a profound influence on Iraq's monetary and economic policies. Ineffective monetary policies intensify monetary fluctuations, erode confidence in the financial system, and expose the economy to heightened risks.

Ensuring transparency and efficiency in the execution of foreign exchange transactions is essential to building trust among market participants and investors, which in turn strengthens the financial system and enhances financial stability. The recommendations put forth in this research aim to improve monetary policies, promote sustainable economic growth, and advance Iraq's broader development goals. The analysis further demonstrates how international processes affect Iraq's economy, offering strategies for strengthening the country's trade and investment capabilities.

Additionally, this study provides a deeper understanding of the Iraqi monetary system and identifies key avenues for reform that would foster greater stability and sustainable economic development. A notable finding of the research is the existence of a strong negative relationship between foreign exchange transaction volumes and financial market stability, indicating that increased foreign exchange activities can provoke market fluctuations and diminish confidence in the financial system. However, the study also confirms that the effective implementation of monetary policies can enhance market stability and foster trust in the financial system, creating a stronger economic environment conducive to growth.

The findings further reveal that establishing a clear and transparent legal framework significantly enhances the stability of financial markets, attracts greater foreign investment, and contributes positively to overall economic growth. In light of these insights, it is imperative to update the legal framework governing foreign exchange transactions to improve transparency and mitigate financial risks. Equally important is the need to strengthen the Central Bank's capacity to regulate the market and implement monetary policies effectively, especially amid prevailing political and economic challenges.

Enhancing cooperation with international institutions to exchange information and expertise in foreign exchange operations will also bolster Iraq's ability to respond to global challenges. Improving transparency in foreign exchange dealings is essential for fostering greater trust among investors and market participants, while enhancing the efficiency and flexibility of Iraq's financial system will help the country better withstand growing monetary and economic pressures.

The Central Bank of Iraq must expand training and educational initiatives related to foreign exchange policies to raise awareness and encourage responsible behavior among participants and investors. At the same time, the Iraqi government should strengthen economic planning to respond effectively to both international and local factors impacting the foreign exchange market. Promoting economic growth through sustainable and sound monetary policies will reinforce market stability and rebuild confidence in the financial system.

Investments in economic infrastructure, along with efforts to boost Iraq's export and investment capacities, are critical to improving the country's overall economic performance. Financial authorities must regularly review and adjust monetary policies related to foreign exchange transactions to ensure they contribute to market stability rather than undermine it. Moreover, updating the legal framework and enhancing transparency are crucial steps toward reducing financial risks and making Iraq's market more attractive to foreign investors. Finally, continuous monitoring and evaluation of the impact of monetary policies and the regulatory environment on the financial market are necessary to ensure that economic objectives are achieved and sustained over time

REFERENCES

[1] C. J. Anwar, N. Okot, I. Suhendra, & S. Yolanda "Response of exchange rates to monetary policy shocks: nn evidence from Indonesia," International Journal of Economics and Financial Studies, vol.14, no.1, pp.443-446, 2022.

[2] M. Ferrari et al., "Monetary policy and exchange rate sensitivity in an era of ultra-low interest rates," 2017.

[3] A. K. Hamad, "Foreign exchange market pressure index and monetary policy in Iraq," ECONOMIC ANNALS, Volume LXIII, No. 219, 2018.

[4] S. H. Hasan et al., "An econometric study of the impact of monetary policy on foreign direct investment in Iraq for the period (2004-2017)," International Journal of Economics and Business Administration, Volume VIII, no. 3, pp.579-588, 2020.

[5] S. S. I. Jubouri, & A. F. M. Al-Azzawi "Measuring and analyzing the impact of the dollar exchange rates on foreign trade in Iraq for the period (2005-2015)," Tikrit Journal of Administration & Economic Sciences, vol.3 ,no.39, pp.1-18, 2017. In Arabic.

[6] H. A. Kadhem, "The impact of outward bank transfers on exchange rates in Iraq," Tikrit J. Admin. Econ. Sci., Vol. 19, No. 63, Part (2), pp.593-612, 2023.

[7] L. B. Khudhair, "Effect of global oil price volatility and exchange rate policy on foreign exchange reserves in Iraq," International Journal Proffesional Business Review, vol.7, no.8, pp.1-28, 2023.

[8] W. Li, M. C. S. Wong, & J. Cenev, "High-frequency analysis of macro news releases on the foreign exchange market: A survey of the literature," Big Data Research, vol.2, no.1, pp.33-48, 2015.

[9] L. Lin et al., "The fish-eye visualization of foreign currency exchange data," In Proc. Asia Pacific Symposium on Information Visualization (APVIS2005), Sydney, Australia. CRPIT, 45. Hong, S.-H., Ed. ACS. 91-96, 2005.

[10] J. M. Hussein, & K, I. Saleh, "Impacts of US dollar exchange rates on some financial and economic indicators in Iraq - An analytical study for the period 2009-2015," Tikrit Journal for Management and Economics, vol4, no.40, pp.10-26, 2017. In Arabic.

[11] C. J. Neely, & S. R. Dey, "A survey of announcement effects on foreign exchange returns," Federal Reserve Bank of St. Louis Review, vol.92, no.5, pp. 417-463, 2010.

[12] C. J. Neely, "A survey of announcement effects on foreign exchange volatility and jumps," Federal Reserve Bank of St. Louis Review, vol.93, no.5, pp. 361-407, 2011.

[13] A. A. Odeh, N. S. Jearah, F. H. Mosachet, and M. M. Ibrahim, "The causal relationship between the foreign exchange window and financial stability in Iraq for the period (2004-2018)," Multicultural Education, vol.6, no.1, pp.186-201, 2020.

[14] H. Z. Oleiwi, "Selling the currency window in the Central Bank of Iraq and exchange rate risks: An analytical study for the period from 2016 to 2019," International Journal of Research in Social Sciences and Humanities, vol.13, no.3, pp.299-306, 2023.

[15] R. Rahmat, S. Nur, A. Patahuddin, & A. Adil, "Jual beli mata uang sistem trading forex dalam perspektif hukum Islam," AL-KHIYAR: Journal Bidang Muamalah dan Ekonomi Islam, vol.1, no.1, pp.60-70.2021. In Indonesian.

[16] S. Sarmedi, "Jual beli valuta asing dalam perspektif hukum Islam," El-Ecosy Jurnal Ekonomi dan Keuangan Islam, vol.1, no.2, pp.211-236, 2021. In Indonesian

[17] R. R. Rebitzky, "The influence of fundamentals on exchange rates: Findings from analyses of news effects," Journal of Economic Surveys, vol.24, no.4, pp.680-704,2010.

[18] A. Rose, "Testing for 'news' in foreign exchange markets," Economics Letters, vol.14, no. 4, pp. 369-376, 1984.

[19] M. S. Sangeetha et al., "An overview of retail foreign exchange investors' behavior," International Advanced Research Journal in Science, Engineering and Technology, vol.9, no.4, pp.552-557, 2022.

[20] H. N. Semiromi et al., "News will tell: Forecasting foreign exchange rates based on news story events in the economy calendar," 2020.

[21] A. S. Mahood, A. S. Muneer, "The role of the foreign currency selling window in) The inflation rate in Iraq for the period (2004-2020)," World Economics and Finance Bulletin, vol.18, pp.105-111, 2023.

[22] H. M. Al-Shammari and S. J. Al-Quraishi, "Evaluation of the foreign currency auction as a tool for monetary policy in Iraq for the period (2003-2017)," Iraqi J. Admin. Sci., vol. 16, no. 56, 2021.

[23] M. Y. Khudair and W. A. Hassan, "The role of the currency selling window in the stability of the Iraqi dinar exchange rate and its implications for inflation," Journal of Accounting and Financial Studies., vol. 17, no. 60, pp.90-104, 2022. In Arabic.

[24] C. A. Cuevas and A. M. Werner, "The Mexican Experience with a Floating Exchange-Rate Regime," IMF Working Paper, International Monetary Fund, 2001.

[25] R. P. Méndez, "Harnessing the global foreign currency market: Proposal for a foreign currency exchange (FXE)," Rev. Int. Polit. Econ., vol. 3, pp. 498-512, 1996. Available: https://api.semanticscholar.org/CorpusID:153894743

[26] C. S. McCarty, "Currency auctions: Minimizing collusive behavior," J. East-West Bus., vol. 8, no. 1, pp. 31-50, 2002.

[27] M. Lang and I. Krznar, "Transmission mechanism of monetary policy in Croatia," Croatian National Bank, 2004.

[28] B. M. H. Qasim, "Measuring the impact of the foreign exchange sales window on exchange rate fluctuations and money supply in the foreign exchange market," M.S. thesis, Univ. of Baghdad, 2017.

[29] L. Tair, "Banking techniques," 6th ed. Algiers: Diwan University Press, 2007.

[30] M. M. Saleh, "Monetary policy in Iraq: Building economic stability on a sound financial system," 1st ed. Baghdad, 2012.

[31] H. N. Bakhit and N. H. Maznan, "The impact of the tight money supply on the exchange rate of the Iraqi Dinar during the period 1980-1995," J. Kufa Stud. Center, vol. 1, no. 5, 2006.

[32] Z. M. H. Al-Yassin and A. G. Mahdi, "Legal provisions for bank auditing: A comparative study," Al-Mohaqiq Al-Hali Journal of Legal Political Science., vol. 8, no. 4, 2016.

[33] A. T. D. Al-Ahbabi, "Analyzing and measuring the role of the Central Bank of Iraq in controlling inflation using the window for selling foreign currency, legal reserves, and money supply for the period (2003-2017)," M.S. thesis, College of Administration and Economics, University of Tikrit, 2019.

[34] E. Kowalewska, "The role of the central bank in foreign exchange inspection in selected countries of the European Union – As seen in the example of Poland, the Czech Republic, and Germany," Rev. Eur. Comp. Law, 2021. Available: https://api.semanticscholar.org/CorpusID:243168215

[35] M. S. Mohanty and B. Berger, "Central bank views on foreign exchange intervention," PSN: Exchange Rates & Currency (International), 2013. Available: https://api.semanticscholar.org/CorpusID:166820318

[36] K. Basu and A. Varoudakis, "How to move the exchange rate if you must: The diverse practice of foreign exchange intervention by central banks and a proposal for doing it better," World Bank Policy Research Working Paper No. 6460, 2013. Available: https://ssrn.com/abstract=2269533

[37] R. F. Engle and C. W. J. Granger, "Co-integration and error correction: Representation, estimation, and testing," Econometrica, vol. 55, no. 2, pp. 251-276, 1987. Available: https://econpapers.repec.org/article

[38] A. Göksu and U. Ergün, "Applied Econometrics with Eviews Applications.," International Burch University, 2013. Available:https://www.researchgate.net/publication/269113492_APPLIED_ECONOMETRICS_With_Eviews_Applications.

[39] G. Bresson and A. Pirotte, Economie des séries temporelles, 1st ed. Paris: Belin, 1995. Available: https://belinra.inrae.fr/index.php?lvl=notice_display&id=55355

[40] M. A. A. Abdel Qader, "Modern Econometrics Between Theory and Practice," University Publishing House, 2004.