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THE IMPACT OF EXCHANGE RATE AND INTEREST RATE FLUCTUATIONS ON THE FINANCIAL ASSETS PORTFOLIO: A CASE OF IRAQI COMMERCIAL BANKS

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ABSTRACT

This paper aims to bridge a gap in the literature by examining the impact of exchange rate and interest rate fluctuations on the financial asset prices of Iraqi commercial banks, as opposed to companies. It is the first study conducted in an emerging market with an economy heavily reliant on oil exports and closely tied to international transactions requiring foreign currencies, making this study unique. Covering an extended period from 2005 to 2022, the study employs multiple methodologies to provide a comprehensive understanding of the risks associated with these fluctuations and their impact on the returns of stocks, bonds, treasury bills, and commercial papers for ten private Iraqi commercial banks listed on the Iraq Stock Exchange. A structural equation model based on partial least squares regression (PLS-SEM) was used, employing Smart PLS and SPSS software to analyze the relationship between independent and dependent variables. The study found that exchange rates had no significant effect on stocks, but negatively affected bonds and positively impacted treasury bills and commercial papers. Interest rates on savings deposits showed no significant impact on stocks, treasury bills, or commercial papers, but had a negative effect on bonds. Higher fixed deposit rates negatively influenced all types of assets. Additionally, a positive relationship was found between inflation and deposit interest rates, but there was no clear effect of inflation on exchange rates. Gross domestic product (GDP) was negatively associated with exchange rates and deposit interest rates, suggesting that economic growth leads to lower interest rates. These findings offer insights into portfolio managers in risk management and investment diversification. The study is valuable for investors, managers, and governments as it predicts the effects of exchange rate and interest rate fluctuations on financial assets and bank valuations. Furthermore, the study proposes future research on real assets, such as real estate and commodities, and additional variables like bank certificates and loan types.

KEYWORDS: Exchange Rate; Interest Rates; Financial Assets portfolio; Commercial Bank.

1. INTRODUCTION

1.1. Background

Exchange and interest rates are vital tools for commercial banks, impacting deposit levels and, consequently, the national economy's development by influencing credit volume and investments (Abdel Moneim & Nizar, 2011). Fluctuations in these rates affect individual investment choices, with rising interest rates encouraging savings but potentially discouraging large purchases (Central Bank of Iraq, 2018). Monetary policy, driven by the central bank and commercial banks, aims for economic growth, reduced unemployment, stable prices, and higher exports. At the micro level, this policy shapes economic behavior by promoting profit-maximizing strategies at minimal costs, supporting the broader economy (Idrisi, (2021); Janabi & Arslan, (2009)).

These dynamics can lead to slower economic growth rates, decreased investment, and reduced spending across various types, directly impacting productive sectors, the labor market, and financial markets. This, in turn, affects financial asset markets, including stocks, bonds, treasury bills, and other commercial papers, as well as real assets such as real estate, metals, commodities, and economic projects. Conversely, a policy of lowering interest rates would have the opposite effect (Naknoi, 2005).

Similarly, exchange rates impact individuals directly, as an increase or decrease in exchange rates will raise or lower individuals' real income, thus limiting their investment capacity and affecting financial markets and, consequently, financial asset markets (Central Bank of Iraq, 2006). This largely depends on the economy's resilience and its vulnerability to external influences, as a less robust economy is more controlled by external factors through exchange rates due to its reliance on foreign markets to meet its needs (Ani & Ali, 2022).

Global trends over the past two decades have emphasized the importance of markets, investment operations, establishing banking markets, and economic openness (Pilbeam, 2013). In response, Iraqi commercial banks have entered a new phase of diversifying investment sources, positioning themselves as channels for mobilizing savings and providing the necessary financing for financial assets, prompting a need to study the impact of exchange rate and interest rate fluctuations on these assets to maximize their value and minimize risks (Hakim, 2017).

1.2. Literature Reviews

Theoretically, The exchange rate refers to exchanging national currencies with foreign currencies at a specific price in the exchange market, linking the national economy to global markets by settling international transactions (Abd.Kadir et al., (2011); Carter et al., (2003)). The interest rate is known by the commercial bank as the payment made or received on borrowed or lent money. It's often calculated annually as a percentage of the principal amount, serving as a reward for savers and a cost for borrowers, representing the price of deferred purchasing power (Fleih & Kanawi, (2023); Omar et al., (2018); Eiteman et al., (2019)). A portfolio of financial assets can be defined as a collection of assets, including stocks and bonds, aimed at maximizing returns while balancing risk, catering to both conservative and speculative investors (Ross, Westerfield, & Jordan, 2021).

Empirically, the significance of exchange rate and interest rate fluctuations for the Iraqi economy can be observed through practical studies that analyze their impact on financial institutions and economic activity in Iraq. Studies indicate that exchange rate fluctuations have substantially affected overall economic activity in Iraq due to the political and security conditions in the past two decades. For instance, the stock, bond, and other securities prices of Iraqi banks have been notably impacted by exchange rate changes. The Central Bank of Iraq (2020) has indicated that exchange rate instability leads to volatility in financial securities prices for Iraqi banks and companies, reflecting these fluctuations' impact on the financial sector's performance.

Interest rate changes also influence the borrowing and investment capabilities of individuals and companies in the Iraqi economy. Higher interest rates reduce borrowing capacity, leading to decreased investment and consumption spending, which could negatively affect economic growth. Aziz (2016) found that interest rate fluctuations directly impacted Iraqi financial institutions, as banks faced significant challenges in managing non-performing loans due to the rising costs of borrowing. Another analytical study by Muslim (2019) indicated that Iraqi dinar exchange rate fluctuations might cause unexpected losses for financial institutions, hindering their plans and affecting their objectives. The study concluded that there is a mixed effect on general stock price indices in some sectors, such as tourism and hospitality, with evidence of a long-term relationship between exchange rates and stock prices in this sector. Similarly, Salem (2013) found that exchange rates affect general stock price indices on the Iraq Stock Exchange, though the impact varies by sector

and time period.

Additionally, a study by Miami and Noor (2023) highlighted a positive relationship between inflation rates and exchange rates in Iraq. As inflation rises in the Iraqi market, the value of the Iraqi dinar declines, and the exchange rate of the US dollar against the dinar increases. This underscores the importance of exchange rate stability in controlling inflation rates and achieving economic stability. Practical experiences suggest that investment diversification and implementing hedging strategies can reduce the risks faced by Iraqi banks due to exchange rate and interest rate fluctuations (Tarasenko, 2021). Reilly and Brown (2018) emphasized that diversification is an effective way to mitigate risks, especially for banks heavily reliant on foreign currency transactions. These empirical experiences underscore the significant impact of exchange rate and interest rate fluctuations on the Iraqi economy, highlighting the need for effective monetary policies and diversified investments to mitigate the negative effects of these fluctuations.

2. METHODOLOGY

The impact of exchange rate and interest rate fluctuations will be determined in this study through three experimental research models adopted to test the hypotheses. The first model is part of the empirical work aimed at investigating the relationship between exchange rate fluctuations (parallel market rate) and the financial asset portfolio components in Iraqi commercial banks. The second model examines the relationship between interest rates (savings deposit rates and fixed deposit rates) and the financial asset portfolio components in Iraqi commercial banks, based on publications from the Central Bank of Iraq and the annual financial reports of Iraqi banks. Lastly, the third model studies the impact of inflation rate concentration and Gross Domestic Product (GDP) as a control variable between exchange rates and interest rates (savings deposits and fixed deposits).

2.1. Research Model

The formulation of an econometric model requires, as a first step, identifying the economic variables involved as part of the process of describing and formulating the econometric model. In the second step, a mathematical connection is established between the variables based on economic theory, allowing for the empirical study of the model. **The variables included in the model can be outlined as follows:**

Table 1: Measures Of Variables.

Variables	Indicators	Model Description	Scale	Source
Exchange Rate	Exchange Rate	Independent Variable	$\Delta\delta = \frac{S - S_{t-1}}{S_{t-1}}$	Madura, J.(2017). International Financial Management (Vol. 13th.ed.). USA: South – Western College Publishing.
Interest Rate	Interest Rate Saving Deposit	Independent Variable	Inert = IN – IF	Idrisi, A.-S. (2021). Macroeconomics. Basra, Iraq: University of Basra.
	Interest Rate Fixed Deposit	Independent Variable		

Table 1: Measures Of Variables.

Financial Assets Portfolio	Stocks	Dependent Variable	Ln STK = a + b1LnER+SDR+b2 FDR	Adhari, A. (2010). Econometrics (Theory and Solutions) - Application using the Minitab program, Relase 14. Iraq: Dar Jarir, University of Kufa.
	Bonds	Dependent Variable	Ln BND = a + b1LnER+SDR+b2 FDR	
	Treasury Bills	Dependent Variable	Ln T-Bills = a + b1LnER+SDR+b2 FDR	
	Commercial Paper	Dependent Variable	Ln CP = a + b1Ln ER+SDR+b2 FDR	
Macroeconomic variable	Inflation Rate	Control Variable	The annual change in the consumer price index.	Imeri et al., 2020; Ledhem & Mekidiche, 2020; Suseno, 2020; Ali et al., 2018
	GDP	Control Variable	Annual GDP growth rate	

Based on the variables included in the econometric model to determine the impact of independent variables on dependent variables, as well as the effect of control variables on the independent variables, the Multiple Linear Regression (MLR) model was employed. MLR is used when there is a single dependent variable but multiple independent variables. The relationship between the dependent and independent variables is assumed to be linear with a constant effect, aimed at achieving the best estimates using a semi-logarithmic form (Bryman & Bell, 2011). This distinguishes MLR

from Simple Linear Regression, which is applied when there is one dependent and one independent variable, assuming a linear relationship between them. MLR also differs from polynomial regression, which is used when the relationship between the dependent and independent variable is non-linear, requiring multiple terms of the independent variables (such as quadratic or cubic) to represent the relationship.

Smart PLS and Structural Equation Modeling (SEM) were used to examine the relationship between independent variables (IV) and dependent variables (DV). SmartPLS was utilized to check data consistency. The data was exported in Excel to comma-separated values (CSV) files and later used for analysis in Smart PLS 4.0.

2.2. Sampling Design

According to Singh (2007), the sampling process involves selecting units from the population to accurately represent it and estimate its parameters effectively, enabling the sample to reflect the population accurately. This process is essential for providing effective and relevant results for research projects. Additionally, Sekaran and Bougie (2010) explained that sampling helps reduce error risks and addresses limitations such as time, human resources, and budget constraints. The sampling design process includes four steps: defining the population, the time period, the unit of analysis, and the data collection method. These steps are interconnected and applied across all aspects of the research, including this study.

2.2.1. Population

The research population comprises Iraqi commercial banks listed on the Iraq Stock Exchange, representing the real-world context to which the study's results can be generalized. This population was chosen due to the strategic role of the banking sector in the economy, acting as a key intermediary for financial flows and economic activity. In Iraq, this role is particularly significant given the economy's dependence on oil revenues denominated in U.S. dollars, which heightens its sensitivity to fluctuations in exchange and interest rates. The selection of this population is therefore justified by its relevance to examining the impact of macroeconomic dynamics on bank performance and its contribution to understanding financial stability and policy enhancement within a volatile economic environment.

2.2.2. Time Period

The study covers the period from 2005 to 2022, a time marked by events and changes that affected the global economy in general and the Iraqi economy specifically. This period is characterized by a technological revolution in the banking sector and a shift toward global electronic financial transactions, which led to significant changes in exchange rates and interest rates within the banking sector.

2.2.3. Unit of Analysis

The sample size consists of 10 private commercial banks according to the sequence of the date of establishment, and their number is (25 banks), starting with the Bank of Baghdad, which was established in 1992, and ending with the Mosul Development Bank, which was established in 2001, where the total sample of banks selected for the study constituted (66.1%) of the total private commercial banking sector in Iraq in terms of the number of branches, while the rest of the banks, which number (15 banks) and represent (33.9%) of the private commercial banks, were not adopted in the sample because most of them are newly established, as they were established from 2006 and above, in addition to the lack of sufficient data for some of these banks, This violates the principle of temporal consistency between sample units, and weakens the accuracy of quantitative analysis and systematic comparison between the selected banks. while the data of the selected sample starts from 2005 to 2023 in a unified manner as an important criterion for comparison during these years (Central Bank of Iraq, 2023).

2.2.4. Data Collection Method

Data for this paper were gathered through secondary sources, specifically the annual financial reports of Iraqi commercial banks available via the Central Bank of Iraq and the Iraq Stock Exchange. Additionally, previous studies, books, and academic research relevant to the study's topic were utilized to support the analysis and enrich the theoretical context.

2.3. Research Paper Design

The research paper was designed using a longitudinal (panel data) approach, which allows tracking the same institutions' data over an extended period and collecting it at different time points to study changes (Bryman & Bell, 2011). This design is suitable for analyzing variables that change over time and helps identify causal relationships and track growth trajectories (Easterby, Thorpe, Jackson,, & Lowe, 2012).

Panel data combines the characteristics of cross-

sectional and time-series data, enabling deeper research questions and the use of advanced analytical techniques, such as fixed and random effects models, to control for unobserved variance (Srikanth, 2018).

The study focuses on analyzing the relationship between exchange rates and interest rates (savings and fixed deposits) as independent variables and the financial asset portfolio components of Iraqi banks as dependent variables, during the period 2005-2022. Additionally, inflation rate and Gross Domestic Product (GDP) are included as control variables.

2.4. Statistical Data Analysis

Descriptive statistics were generated for variables such as mean, median, standard deviation, minimum and maximum values, and frequency to examine the pattern and normality of financial reports for commercial banks using Smart PLS 4.0. Then, a PLS-SEM approach was applied to verify path coefficients by analyzing the algorithm through SPSS and Smart PLS 4.0 (Hair Jr., J.F., et al. , 2014). Multivariate regression models based on cross-sectional panel data, also known as longitudinal data, were used. Necessary tests were conducted, and in the final phase, the study examined the importance of the control variable's role using estimated coefficients of the models. This paper is classified as applied research, as its findings may be beneficial for investors, shareholders, executives of commercial banks, and other users of financial data.

Multivariate analysis revolves around first-generation techniques like linear regression and exploration techniques, and second-generation techniques such as Structural Equation Modeling (SEM), which is more effective in causal analysis and prediction (Henseler, Hubona, & Pauline, 2016). The analysis relies on the PLS-SEM method due to its predictive accuracy and suitability for exploratory studies (Mahadzirah, Asyraf , Zainudin , & Morliyati , 2019). To assess multicollinearity among the independent variables, correlation coefficients and the Variance Inflation Factor (VIF) were used, where a VIF greater than 5 indicates multicollinearity (Léon, 2008). Structural model evaluations include the coefficient of determination (R^2), path estimates, predictive relevance (Q^2), and Root Mean Square Error (RMSE) to determine the model's predictive accuracy and evaluate relationships among variables.

3. RESULTS AND DISCUSSION

This section provides a complementary analysis using PLS-SEM to explore the relationship between the independent variables (exchange rate and interest rate, represented by the savings and fixed deposit rates) and the dependent variable (financial asset portfolio), which includes stocks, bonds, treasury bills, and commercial papers. Additionally, inflation rate and Gross Domestic Product (GDP) are included as control variables to mitigate the impact of external factors, contributing to a more accurate understanding of the dynamics within Iraqi banks.

3.1. Descriptive Analysis

Descriptive analysis was conducted in this study using Smart PLS 4.0, focusing on a set of variables to effectively summarize and describe the data. The key statistical measures obtained included the minimum and maximum values, providing insights into the data range, along with the mean, which indicates the central tendency, and the standard deviation, measuring the dispersion or variability of the data around the mean. These statistical summaries helped in understanding the fundamental patterns and distributions of the variables under study.

Table 2: Descriptive Statistics.

Name	N	Mean	Minimum	Maximum	Standard deviation	kurtosis	Skewness
Exchange Rate	180	3.106	3.073	3.174	0.035	-0.426	1.122
Interest Rate Saving deposit	180	6.888	0	17.07	3.231	0.828	0.533
Interest Rate Fixed deposit	180	9.621	3	13	1.257	8.425	-2.355
Stocks	180	10.112	8.358	11.692	0.753	-0.135	-0.035
Bonds	180	10.161	6.652	11.362	0.725	1.281	-0.391
Treasury Bills	180	9.513	8.016	11.973	0.842	0.797	0.886
Commercial Paper	180	1.157	-0.101	10.035	2.769	5.764	2.759
Inflation Rate	180	10.165	-0.101	11.42	3.208	5.853	-2.782
GDP	180	11.197	10.7	11.42	0.198	0.482	-1.192
Valid N (listwise)	180						

The results showed variation across the variables under study. The exchange rate ranged from 3.073 to 3.174, with a mean of 3.106 and a standard deviation of 0.035, indicating relative stability. The interest rate on savings deposits ranged from 0 to 17.07, with a mean of 6.888 and a relatively high standard

deviation of 3.231, reflecting significant variability. In contrast, the interest rate on fixed deposits ranged from 3 to 13, with a mean of 9.621 and a low standard deviation of 1.257.

For bank stocks, values ranged from 8.358 to 11.692, with a mean of 10.112 and a standard deviation of 0.753, indicating limited variability. Bonds ranged from 6.652 to 11.362, with a mean of 10.161 and a standard deviation of 0.725, showing limited variation. Treasury bills ranged from 8.016 to 11.973, with a mean of 9.513 and a standard deviation of 0.842, also indicating minor variation. However, commercial papers exhibited a broader range from -0.101 to 10.035, with a mean of 1.157 and a high standard deviation of 2.769, suggesting substantial variability.

As for inflation, it ranged from -0.101 to 11.42, with a mean of 10.165 and a standard deviation of 3.208, while the GDP ranged from 10.7 to 11.42, with a mean of 11.197 and a standard deviation of 0.198, reflecting relative stability.

This descriptive analysis provides a detailed understanding of the distribution and characteristics of the variables, contributing to the interpretation of subsequent analyses and deepening the understanding of data variability.

3.2. Outlier Assessment

Outliers significantly impact the accuracy of statistical analyses. As noted by Lewis & Barnett (1977), attention to outlier's dates back centuries, beginning with Boscovich's exclusion of extreme measurements in 1750 to improve the accuracy of his estimates. This focus on outliers arises from their potential negative impact when ignored, leading to bias and distortion in analysis results (Hair, Page, & Brunsveld, 2020). Outliers can be univariate or multivariate (Sekaran & Bougie, 2010) and are detected using Z-scores or visualizations such as histograms and box plots.

The results of the outlier assessment in Table 2 show the minimum and maximum standardized values (Z-scores) for each variable, using the threshold of ±3.29 as recommended by Tabachnick & Fidell (2007). Most variables, such as fixed deposit interest rate, stocks, bonds, treasury bills, commercial papers, inflation rate, and GDP, fall within this range, indicating no significant outliers. However, the exchange rate recorded a maximum Z-score of 3.174, suggesting a high outlier. Additionally, the savings deposit interest rate recorded a Z-score close to the upper limit at 17.07, indicating a potential low outlier.

3.3. Skewness And Kurtosis

Skewness and kurtosis are measures that describe the shape of data distribution and assess how closely it approximates a normal distribution, which aids in hypothesis testing (Hair, Page, and Brunsveld, (2020); Tabachnick and Fidell, (2007). Although PLS-SEM can produce accurate estimates even with non-normal distributions, Hair Jr., et al. (2014) recommend conducting normality tests, as high skewness or kurtosis can increase standard error estimates and reduce statistical significance.

As shown in Table 2, skewness values range from -0.426 to 8.425, and kurtosis values range from -2.782 to 2.759. These values indicate the degree of asymmetry and peakedness in the data distribution, providing insights into the normality of the variables under study.

3.4. Pls-Sem Data Analysis

The research model was evaluated using PLS-SEM techniques through Smart PLS 4.0. The study began by assessing the reliability and validity of the measurement model, followed by evaluating the structural model and analyzing the significance of path coefficients. In PLS-SEM, the measurement model deals with the relationships between constructs and their indicator variables, distinguishing between reflective and formative constructs, each of which requires separate analysis and evaluation based on different conceptual standards (Hair, Page, & Brunsveld, 2020).

3.4.1. Correlation

Correlation describes the strength and direction of the relationship between variables (Saunders, , Lewis,, & Thornhill, , 2016). It indicates how one variable change concerning another (Tabachnick & Fidell, 2007). Multicollinearity refers to a situation where two or more exogenous latent constructs are highly correlated (Sekaran & Bougie, 2010). The correlation coefficients were found to range between -0.994 and 0.677. According to Hair, Ringle, and Sarstedt (2013), a correlation coefficient above 0.90 indicates multicollinearity among exogenous latent constructs. Therefore, multicollinearity was not present in the aggregated data.

Table 3: Results Of the Correlation Test.

	Exchange Rate	**Interest Rate Saving deposit**	**Interest Rate Fixed deposit**	**Stocks**	**Bonds**	**Treasury Bills**	**Commercial Paper**	**Inflation Rate**	**GDP**
Exchange Rate	1	0	0	0	0	0	0	0	0

Interest Rate Saving deposit	-0.238	1	0	0	0	0	0	0	0
Interest Rate Fixed deposit	0.214	0.094	1	0	0	0	0	0	0
Stocks	-0.069	-0.042	-0.087	1	0	0	0	0	0
Bonds	-0.182	-0.132	-0.238	0.068	1	0	0	0	0
Treasury Bills	0.104	-0.14	-0.372	-0.072	0.375	1	0	0	0
Commercial Paper	-0.003	-0.121	-0.65	0.047	0.345	0.677	1	0	0
Inflation Rate	0.02	0.112	0.664	-0.038	-0.352	-0.662	-0.994	1	0
GDP	-0.346	-0.211	-0.105	0.224	0.047	0.192	-0.031	0.076	1

3.4.2. *Variance Inflation Factors (Vif)*

According to Hair, Ringle, and Sarstedt (2020), the VIF should be less than 5, and tolerance values should be greater than 0.20. Table 4.5 presents the VIF and tolerance test results. These values are critical in assessing multicollinearity among the independent variables, as high VIF values can indicate redundancy and potential issues with the stability of the regression model's coefficients.

Table 4: (VIF) Test.

Name	VIF
Exchange Rate	1.128
Interest Rate Saving deposit	1.086
Interest Rate Fixed deposit	1.073
Inflation Rate	1.006
GDP	1.006

Table 4 shows the Variance Inflation Factor (VIF) values for the different independent variables in the PLS-SEM model to assess multicollinearity. All values are below the threshold of 5, indicating that multicollinearity is not a significant concern in the model. The highest VIF values were for "Inflation" and "GDP" at 1.006, "Exchange Rate" at 1.128, "Interest Rate on Savings Deposits" at 1.086, and "Interest Rate on Fixed Deposits" at 1.073. All values fall below the critical level, confirming the absence of multicollinearity issues.

3.4.3. *Structural Model Evaluation*

Information on the significance level of the paths in the structural model can be obtained by evaluating the structural model to test the extent to which the empirical data supports the research framework. This evaluation helps test the hypothesized relationships between variables (Hair, Page, & Brunsveld, 2020). The structural model was assessed using the evaluation method proposed by Hair, Ringle, and Sarstedt (2013). Figure 1 illustrates the direct relationships between variables generated through Smart PLS 4.0. This assessment provides insights into the strength and direction of each relationship within the model, supporting the analysis of hypothesized connections and confirming the model's reliability and validity in representing the data.

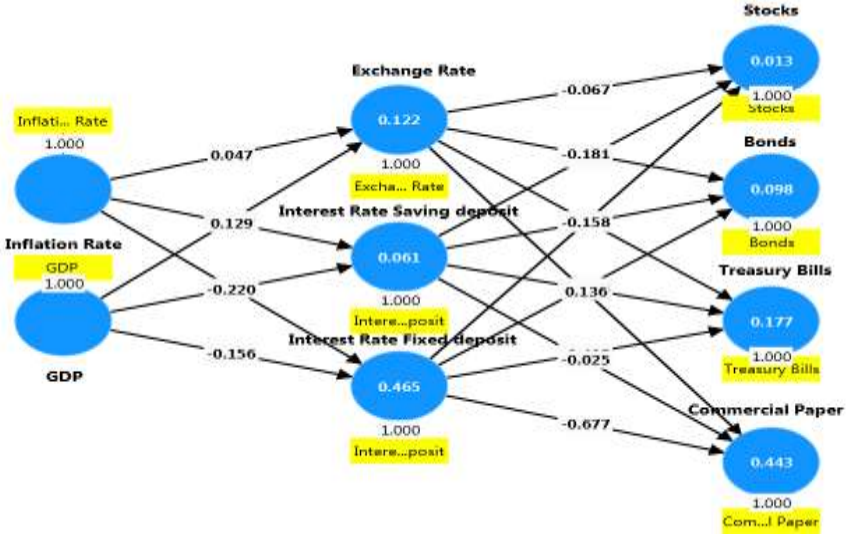

Figure 1: Direct Relationship.
Source: Author Illustration

Table 5 below presents the results of the direct relationships involving the independent variables, which include the exchange rate, savings deposit interest rate, and fixed deposit interest rate. These indicators are analyzed in relation to the dependent variables: stocks, bonds, treasury bills, and commercial papers. Additionally, the table outlines the direct relationship between inflation and GDP.

These results provide a comprehensive view of how each independent variable directly influences the components of the financial asset portfolio, offering valuable insights into the role of economic indicators in the performance of these assets.

Table 6: Direct Relationship Between the Variables.

	Standard Beta	Standard Deviation	T statistics	P values	Significant
Exchange Rate -> Stocks	-0.067	0.092	0.731	0.232	Not Significant
Exchange Rate -> Bonds	-0.181	0.083	2.189	0.014	Significant
Exchange Rate -> Treasury Bills	0.177	0.078	2.261	0.012	Significant
Exchange Rate -> Commercial Paper	0.136	0.056	2.447	0.007	Significant
Interest Rate Saving deposit -> Stocks	-0.052	0.076	0.688	0.246	Not Significant
Interest Rate Saving deposit -> Bonds	-0.158	0.074	2.137	0.016	Significant
Interest Rate Saving deposit -> Treasury Bills	-0.06	0.062	0.959	0.169	Not Significant
Interest Rate Saving deposit -> Commercial Paper	-0.025	0.027	0.92	0.179	Not Significant
Interest Rate Fixed deposit -> Stocks	-0.068	0.053	1.292	0.098	Significant
Interest Rate Fixed deposit -> Bonds	-0.184	0.067	2.753	0.003	Significant
Interest Rate Fixed deposit -> Treasury Bills	-0.405	0.089	4.534	0.000	Significant
Interest Rate Fixed deposit -> Commercial Paper	-0.677	0.111	6.09	0.000	Significant
Inflation Rate -> Exchange Rate	0.047	0.058	0.796	0.213	Not Significant
Inflation Rate -> Interest Rate Saving deposit	0.129	0.038	3.406	0.000	Significant
Inflation Rate -> Interest Rate Fixed deposit	0.676	0.109	6.22	0.000	Significant
GDP -> Exchange Rate	-0.349	0.093	3.749	0.000	Significant
GDP -> Interest Rate Saving deposit	-0.22	0.071	3.089	0.001	Significant
GDP -> Interest Rate Fixed deposit	-0.156	0.071	2.18	0.015	Significant

The relationships between the independent variables (exchange rate and interest rate), the dependent variable (financial asset portfolio), and the control variables (inflation and GDP) were tested, revealing varying levels of statistical significance.

For the exchange rate:

- There was a significant negative relationship with bonds (coefficient = -0.181, p = 0.014).
- A significant positive relationship was found with treasury bills (coefficient = 0.177, p = 0.012) and commercial papers (coefficient = 0.136, p = 0.007).
- However, the relationship with stocks was not significant (coefficient = -0.067, p = 0.232).
- For the savings deposit interest rate:
- There was a significant negative relationship with bonds (coefficient = -0.158, p = 0.016).
- The relationships with stocks, treasury bills, and commercial papers were not significant.
- For the fixed deposit interest rate:
- Significant relationships were found with stocks (coefficient = -0.068, p = 0.098), bonds (coefficient = -0.184, p = 0.003), treasury bills (coefficient = -0.405, p = 0), and commercial papers (coefficient = -0.677, p = 0).
- Regarding the control variables:
- Inflation showed significant relationships with both the savings deposit interest rate (coefficient = 0.129, p = 0) and the fixed deposit interest rate (coefficient = 0.676, p = 0).
- GDP had significant negative relationships with the exchange rate (coefficient = -0.349, p = 0), savings deposit interest rate (coefficient = -0.22, p = 0.001), and fixed deposit interest rate (coefficient = -0.156, p = 0.015).

These results highlight the varied impacts of exchange rate and interest rate fluctuations on different components of the financial asset portfolio, with control variables such as inflation and GDP also influencing these relationships significantly.

3.5. Coefficient of Determination (R^2)

The coefficient of determination, R^2, is used to assess how well the model's predictions align with actual data. It reflects the proportion of variance in the dependent variable that can be explained by the independent variables. Values closer to 1 indicate a

higher predictive accuracy, with thresholds indicating that values of 0.02 are considered weak, 0.13 moderate, and 0.26 substantial (Hair, Page, and Brunsveld, (2020); Jacob, (1988)). These R^2 values provide insight into the model's effectiveness in capturing the relationship between the independent and dependent variables in this study.

Table 7: Coefficient Of Determination R^2.

Name	R-square	R-square adjusted
Stocks	0.031	-0.004
Bonds	0.098	0.082
Treasury Bills	0.177	0.163
Commercial Paper	0.443	0.433

Table 7 presents the R-square and adjusted R-square values for the financial indicators: stocks (STK), bonds (BND), treasury bills (T-Bills), and commercial papers (CP). According to Jacob (1988), an R^2 value of 0.02 is considered weak, 0.13 moderate, and 0.26 substantial.

The R^2 values for STK (0.031) and BND (0.098) exceeded the weak threshold of 0.02 but remained below the moderate level. T-Bills, with an R^2 of 0.177, surpassed the moderate threshold, while CP achieved a substantial level with an R^2 of 0.443, exceeding the 0.26 threshold.

These results indicate varying levels of predictive accuracy across the financial indicators, with CP demonstrating the strongest explanatory power among the variables.

3.6. Predictive Models

These are statistical measures used to evaluate the predictive quality in a modeling framework using SmartPLS. They include: Predictive Importance (Q2), Root Mean Square Error (RMSE), and Mean Absolute Error (MAE). As follows:

Table 8: Expected Pls Results Q^2, Rmse, Mae.

Name	Q^2predict	RMSE	MAE
Stocks	-0.016	0.97	0.506
Bonds	0.085	0.635	0.817
Treasury Bills	0.161	0.968	0.813
Commercial Paper	0.422	1.163	0.886

The table provides predictive quality metrics for Structural Equation Modeling (SEM) using Partial Least Squares (PLS-SEM) through Q^2predict, RMSE (Root Mean Square Error), and MAE (Mean Absolute Error) for four financial measures: stocks (STK), bonds (BND), treasury bills (T-Bills), and commercial papers (CP).

Q^2predict values indicate the predictive relevance of the model, with values above zero showing some predictive validity. The Q^2predict for STK is -0.016, indicating a negative predictive relevance level. BND has a Q^2predict value of 0.085, indicating better predictive capability than STK. The Q^2predict for T-Bills is 0.161, reflecting a high predictive level. CP has a Q^2predict of 0.422, indicating a very high predictive level.

The RMSE values, measuring the absolute accuracy of the model, are as follows: (STK=0.97), (BND=0.635), (T-Bills=0.968), (CP=1.163). These values represent the average prediction error size, with BND showing the lowest RMSE, indicating the highest accuracy among the four measures.

The MAE values, representing average absolute errors, are as follows: (STK=0.506), (BND=0.817), (T-Bills=0.813), (CP=0.886). These values indicate the average size of prediction errors, with STK having the lowest MAE, indicating the smallest prediction error among the four measures.

4. CONCLUSION

This paper aims to analyze the impact of exchange rate and interest rate fluctuations on the financial asset portfolios of Iraqi commercial banks, a key pillar of economic growth. Using data from 10 Iraqi banks over the period from 2005 to 2022 and based on Structural Equation Modeling (PLS-SEM), the results revealed varied effects of exchange rates and interest rates on portfolio components, including stocks, bonds, treasury bills, and commercial papers.

The paper found that the impact of exchange rates on commercial bank stocks was not statistically significant, partly due to political and economic tensions that may overshadow the effect of exchange rates. However, the relationship between exchange rates and bonds was negative and significant, while it was positive with treasury bills and commercial papers, reflecting these instruments' sensitivity to exchange rate fluctuations due to sovereign risks and

monetary policies.

Interest rates on savings deposits showed an insignificant relationship with stocks, treasury bills, and commercial papers, due to government intervention and excess liquidity in the banking market, as Iraq's economy heavily relies on oil revenues, which may reduce the influence of interest rates on these financial instruments. In contrast, fixed deposit interest rates had a significant negative impact on the asset portfolio, as rising rates led investors to seek guaranteed returns, reducing demand for stocks and bonds.

Regarding control variables, the results indicated a positive relationship between inflation and interest rates, as banks tend to raise rates to maintain purchasing power amid the erosion of money value due to inflation. GDP, on the other hand, showed a negative relationship with exchange rates and interest rates, as economic growth strengthens the national currency and reduces the need for high-interest rates.

The study recommends that future research expand the sample geographically to include more Iraqi commercial banks, as well as compare different banking environments, such as Islamic versus traditional banks, or compare Iraqi banks with those in countries with varied economic contexts to enhance the generalizability of the findings. It is also suggested to explore the effects of additional factors, such as the portfolio of real assets (real estate, metals, and commodities), and to analyze the impact of technological innovations like artificial intelligence in forecasting exchange rates and interest rate fluctuations and in accurately assessing risk. Additionally, it is important to study the relationship between commodity prices, such as gold and oil, and exchange and interest rates, as well as their impact on financial portfolio management strategies. Future studies could also examine the impact of geopolitical events on the banking sector and sustainable investment trends, such as green bonds and carbon certificates, to achieve both financial and environmental sustainability in returns.

In conclusion, this research paper underscores the importance of building a resilient and robust investment portfolio for Iraqi banks to withstand financial market fluctuations, enhancing banking sector stability and supporting financial sustainability.

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