# Analysis of the relationship between the exchange rate and the stock price index in Iraq using the ARDL methodology for the period (2017-2024)

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**Abstract:**

The research aims to determine the relationship between the exchange rate system and the general index of stock prices in the Iraq Stock Exchange based on the joint integration method (ARDL) and the error correction model, after testing the stability of the series under study using the approved tests based on monthly data during the period (2017-2024). The research reached several conclusions confirming the existence of an equilibrium relationship between the studied variables. Using the joint integration technique, it became clear that in the long term, when the exchange rate increases by (1%), it contributes to the rise of (3.945467) of the general index of stock prices. The estimated error correction coefficient indicates that for any deviation in this relationship in the short term from the equilibrium in the long term, the error correction model will restore the balance quickly by (1.8%) in the short term.

**Keywords:** Stock prices, exchange rate, joint integration approach, financial market.

**JEL Classification:** G14, G12, E52.

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## 1. Introduction:

Financial markets are a mirror that reflects the general economic situation, which makes their stability a measure of the success of economic policies. Therefore, analyzing the state of instability in financial markets, represented by the increasing risks of fluctuations in their performance indicators, prompts us to identify the factors causing these fluctuations and how their effects are transmitted to them, as they are affected by Stock markets, like other markets, are subject to various factors and events from inside or outside the market. The financial market is considered a highly efficient market if stock prices and other indicators respond quickly to every new piece of information received by market participants, whether this information is financial, economic, or any other event (Ho, 2009). Stabilizing the exchange rate is one of the most important and urgent steps in the monetary policy followed in various countries. There are many factors that affect stock markets, such as local and foreign news. Some news or announcements are company-specific or affect a particular sector, while others affect the market as a whole. Exchange rate volatility is one of the macroeconomic factors that can affect the stock market (Singh & Padmakumari, 2020). In order to maintain the sustainability of financial stability and achieve its goal, most countries seek to move forward towards different policies aimed at avoiding crises resulting from sharp fluctuations that affect currencies from time to time. This requirement is becoming more urgent in developing countries. It can be said that exchange rates are one of the most important variables that lead to fluctuations in stock indices, the risks of which arise as a result of fluctuations in the exchange rates of the local currency against foreign currencies, as their impact varies according to the system followed and prevailing in a country from fixed to medium and flexible, as each system has positives and negatives according to the current economic conditions and urgent developments. Therefore, this research came to focus on the relationship between exchange rate systems and stock indices in the financial markets in the Iraqi economy.

Exchange rate stability and stock market growth are two economic goals that both developed and developing economies seek to achieve, because they are indicators that reflect the financial strength of the economy. The stock market plays a crucial role in economic growth by investing savings and redirecting them towards more productive economic areas, as well as enhancing investor confidence, facilitating capital allocation and encouraging investment. It also enables companies to obtain long-term capital, and can therefore be considered a mirror that reflects the strength of the productive sector and the stability of the financial system. Exchange rate stability also has a positive impact on consumption, saving and investment decisions (Fedorowicz & Zalcewicz, 2024).

The general index of stock prices is a numerical value that measures changes in financial markets as a vital axis in contemporary economic systems because it is the main source of financing that developed countries rely on to implement and develop their financial and economic policies, especially capitalist systems, through which the savings of some economic units are collected that achieve financial surpluses that they may not need at a certain time and wish to invest this surplus by purchasing shares of some companies instead of keeping them in the form of cash representing surplus capital and directing these savings to other economic units that suffer from a deficit in their financial resources and seek to request these surpluses to continue their economic activity, which leads to increased production and the development of the goods and services market in countries. Systems that rely on the activity of the public and private sectors may also resort to collecting capital from financial markets for economic development and at the same time use it in the process of evaluating those economies (Bhandari et al., 2022). Therefore, the two variables were addressed in the current paper to know the nature of the relationship between them, their trends and the most important effects they cause. To address the study problem represented by the unexpected fluctuations in the Iraqi dinar exchange rate, which leads to unexpected losses in the activity of financial institutions, as well as to disrupt their plans and disrupt the achievement of their set goals, in addition to covering the aspects related to its subject, this study addressed two main aspects: the first is the conceptual and cognitive aspect, and then clarifying what the nature of the relationship between foreign exchange markets and financial markets includes. The research aims to know the impact of the Iraqi dinar exchange rate on the general index of stock prices listed on the Iraq Stock Exchange and clarify the type of relationship between them.

The paper is organized as follows. Review the literature and explain the methodological issues. Discuss the theoretical links between stock markets and exchange rates within the cointegration methodology. Test the direction of the relationship through some hypotheses regarding the type of channel linking stock markets and foreign exchange, through the ARDL model of the long-run relationship between stock market and foreign exchange rate. Discuss and present the empirical results, and summarize the discussion of the results and the policy implications.

**2 .Literature Review:**

Several research studies can be addressed that have examined the form and nature of the relationship between the exchange rate and the financial market in recent periods. These studies focused on the dynamic relationship of the stock market with the exchange rate.

A study reveals (Zarei et al., 2019) There is a significant effect of exchange rate on stock index returns using data from seven selected countries practicing free floating exchange rate regimes. The research used the parity and asset pricing theories, within the framework of monetary economics to price international assets. By using a system that seems to provide statistically significant evidence of the effect of exchange rate on stock index returns in selected countries. These results fall under the arbitrage pricing

approach of the international capital asset pricing model which also used the theoretical parity framework in determining the exchange rate.

And search (Muktadir-al-Mukit, 2013) On the effects of exchange rates and interest rates on stock market performance using monthly time series data of Bangladesh economy, during the period 1997-2010. This study uses econometric techniques to measure the long and short-run relationship between variables using cointegration concept, error correction model, and analysis of variance. Causal relationships have been investigated using Granger causality test. Using the cointegration technique it is observed that in the long run, a one percent increase in exchange rate and interest rate contributes to a 1.04 percent increase and 1.71 percent decrease in market index respectively. Granger causality analysis indicates that there is unidirectional causal relationship from market index to exchange rate and from interest rate to market index.

And it is used (Alginaid, 2017) Johansson integrated to test the possibility of cointegration and Granger causality to estimate the causal relationship between the stock market index and monetary indicators (exchange rate and M2) during the global financial crisis for Nigeria, using monthly data for the period 2001-2011. The results showed that there was no long-run relationship before and during the crisis. Granger causality tests showed that there was one-way causality running from $M_2$ to ASI before the crisis. During the crisis period, there was an absence of causality between the variables. This suggests that ASI shows a response to $M_2$. Thus the absence of a direct correlation between ASI and exchange rate shows that the market is inefficient.

The paper (Maheen, 2013) investigated the relationship between the stock market and the exchange market in Pakistan. KSE 100 Index has been used as a proxy for stock prices while the Pakistani Rupee to US Dollar (Rs/US$) currency rate is taken for the exchange rate exposure. Data were used on a monthly basis for the period from January 2004 to December 2009. The results indicated that there is no relationship between the two variables and they are both independent of each other.

A study (Mfugale & Olomi, 2023) examined the impact of exchange rate and inflation on stock market (Nifty-50) returns in India using monthly data extending from April 2013 to February 2024. A distributed lag (ARDL) cointegration and error correction approach was applied. The results showed a weak correlation between stock market returns and both inflation and the exchange rate in the long term. With a relationship between stock market returns and both inflation and the exchange rate in the short term.

The article (Benchimol et al., 2023) demonstrated that stock markets respond more strongly to monetary policy changes during periods of high uncertainty. And that policy uncertainty asymmetrically affects the transmission of positive and negative monetary policy surprises to stock market prices. The effect of high uncertainty is stronger in the case of expansionary shocks than in contractionary shocks.

This research, (Hassanain, 2017) discussed the interaction between stock prices and real and nominal exchange rates in the Gulf Cooperation Council countries. economies (including only Kuwait (KW) and Saudi Arabia (SA). It took into account the real and nominal exchange rates of the US dollar in terms of the Saudi riyal and the Kuwaiti dinar and the values of the Saudi and Kuwaiti stock market indices. To investigate the relationship between the volatility of stock prices in these markets and the major differences in global currencies in light of their alternative exchange rate arrangements, the real exchange rate is not important in the case of Kuwait, but it is important in the case of the Kingdom of Saudi Arabia.

A study (Manasseh et al., 2019) examined the interactions of stock prices (SP) and exchange rates (ER). Using a multivariate VAR-GARCH model using monthly data from January 2000 to October 2014. The results of the Engel, Granger, and Johansson cointegration test showed a long-run stable relationship between SP and ER. The results of the variance equation indicated that there is a two-way volatility transmission effect between SP and ERs, which indicates that past innovations in the stock market have a significant impact on the future volatility of foreign currency, and vice versa.

The paper (T., 2021) considered the impact of exchange rate volatility on volatility in stock market returns from the India perspective for the period from January 2010 to December 2015, applying ARCH and GARCH estimation. Daily data of BSE SENSEX returns, USD/GBR exchange rates Pound/Rupee and EUR/Rupee are used. It is estimated that the volatility of the EUR/Rupee exchange rate has a significant positive impact on the return volatility of the BSE SENSEX index, while for the impact of the US Dollar/Rupee and the GBP/Rupee exchange rate, the volatility is largely negative.

Therefore, the exchange rate market and the stock market have positive and negative effects. Some studies show that the stock market affects the foreign exchange rate while others also note that the foreign exchange rate affects the stock market. Therefore, the causal relationship between exchange market fluctuations and stock markets is uncertain and needs further study. Accordingly, for all of the above, the paper attempts to answer the following questions. Analyze the nature of the relationship between stock prices and foreign exchange markets in Iraq? Are there effects of changing the relationship in recent years after the stock markets were opened to foreign investment? What is the direction of the relationship between these markets? Answers to these questions include the implications for implementing exchange rate policy, foreign exchange control, and understanding the dynamic linkages between stock prices and foreign exchange rates.

## 3. Data And Methodology:

The research analyzes the impact of the exchange rate on the stock price index in the Iraqi economy. The data set consists of monthly time series of the Iraq Stock Exchange (the general level of stock prices)

including a total of 98 monthly observations from January 2017 to May 2024. These data were obtained from the monthly economic reports of the Iraq Stock Exchange. In addition, Exchange rate data from the monthly reports published by the website of the Central Bank of Iraq. This data provides a valuable set of information for the researcher to analyze the relationship between the general index of stock prices and the exchange rate. To answer the research problems raised previously, the following hypotheses were adopted:

**Hypothesis$_1$:** There is a statistically significant relationship between changes in the exchange rate and the general stock price index.

**Hypothesis$_2$:** There is no statistically significant relationship between changes in the exchange rate and the general stock price index.

The autoregressive distributed lag model (ARDL) was used, as it is a relatively recent method that was used by Pesaran in the field of econometrics (Wong, 2018). The ARDL model takes the lag time difference into account, and the explanatory variables are distributed over periods that the ARDL model combines into a number of lags distributed within limits (parameters) that correspond to the number of explanatory variables, as the explanatory economic factors under study take a period of time to influence the dependent variable distributed between Short and long term, therefore the ARDL test can be applied (Alabdulrazag & Alrajhi, 2016). The ARDL test relies on Fisher's statistic, to determine the complementary relationship of the dependent variable and the independent variables in the long and short term in the same equation, in addition to determining the size of the effect of each of the independent variables on the dependent variable (Nkoro & Uko, 2016). Through the research, we will attempt to explain the change in the exchange rate index on the stock price index in the Iraqi economy. The general model of the study is represented by the following formula:

**SP = f (ER) ............ (1)**

Through equations, it is possible to estimate the ARDL model to measure the short- and long-term relationship, as follows:

$$\Delta \text{SP}_t = C + \sum_{t-1}^{n} \propto_1 \mathbf{SP}_{t-1} + \sum_{t-1}^{n} \propto_2 \mathbf{ER}_{t-1} + \sum_{t-1}^{n} \beta_1 \mathbf{ER}_{t-1} + \mu_t \dots (2)$$

**Where:**

SP: General level of stock prices.

ER: Exchange rate.

$\Delta$: First difference of the variable. C: Constant term. N: Upper limit of the optimal lag period.

$\propto_1, \propto_2$: Slope in the short run.

$\beta_1$: Slope in the long run.

$\mu_t$: Random error term.

**Exchange rate (ER):** The exchange rate expresses the price of one unit of the national currency denominated in units of a specific foreign currency (Lothian, 2002. An exchange rate represents how one country's currency is valued in another country. That is, it is the unit price of the local currency expressed in foreign currency. Whenever the exchange rate rises or the value of the local currency depreciates, this effect is a concern for investors because they lose confidence in the economy which affects the performance of financial markets. The exchange rate can also motivate investors to invest in local currencies when the prices of foreign goods and services become high due to a higher exchange rate. In this case, the performance of financial markets is likely to increase (Ramos, 2016). There are several exchange rate systems that a country may choose to operate under. At the end, the currency can be freely, and at the other end be pegged to another currency. There are two policies in this range: free and fixed exchange, although the nuances can be significant. Under a free exchange rate system, the value of a currency is determined by market forces of demand and supply of foreign exchange. This is a common type among major advanced economy systems because it can contribute to macroeconomic stability by smoothing out shocks and allowing monetary policy to focus on targeting domestic economic conditions. Under the fixed peg system, the central bank links the value of its currency to the currency of another country. The exchange rate is controlled by intervening in the foreign exchange market buying and selling currencies to reduce volatility and keep the currency close to its target (Hamilton, 2018).

**Stock Prices (SP):** The general stock price index is a measure of stock market performance that shows the daily price movements of stocks on the stock exchange. Shares are a document that represents a share in the company's capital, granted by the company to its shareholders. That is, it is a technology that gives a more comprehensive view of the development of financial market prices at a specific time, and the computational basis is usually a limited indicator that includes a sample of traded values that contain a large representation of the market under study (Garcia-milà, 2012). In developing countries, such as Iraq, the stock market can stimulate economic growth by enabling companies to raise capital at lower prices. Stock markets perform an essential function in providing the necessary linkages between companies that need funds to start new businesses or expand their existing operations and investors who have excess funds to invest in such companies (Raju, 2017).

## 4. Results And Discussion:

### 1.4: Unit Root Test for Time Series Stability of Model Variables:

Estimating the relationship between variables within a time series framework, first requires knowing the extent of their stability, to avoid false regression resulting from the presence of a unit root in the variables

under study. Among these tests, the most common is Dickey Fuller Augment. A time series is stationary when its mean is constant and its variance is constant over time (Im et al., 2012). The variance value must depend on the gap or slowdown between the two time periods and not the actual time in which the variance is calculated. The stability of the variance of values over time is expressed by the following relationship:

$$\mathbf{Var}(Y_t) = \mathbf{E}(Y_t - \mu)^2 = \sigma^2 \dots \dots .. (3)$$

Over time, the arithmetic mean of the values remains constant, according to the following relationship:

$$E(Y_t) = \ \mu \ = 0 \dots \dots . (4)$$

The value of the variance of the two time periods according to their slowness takes the following relationship:

$$\gamma_k = \mathbf{E}[(Y_t - \mu)(Y_{t+k} - \mu)] \dots \dots .. (5)$$

If the previous conditions are not met, the series will be non-stationary (Corlett & Aigner, 1972). The results of the Augment Dickey-Fuller test are summarized in the following table:

**Table 1: Augmented Dickey-Fuller (ADF) Unit Root Test of The Model**

|  |  | At level | | | 1<sup>st</sup> difference | | |
|---|---|---|---|---|---|---|---|
|  |  | None | Intercept | Trend & Intercept | None | Intercept | Trend & Intercept |
| Prob 5% | SP | 0.9776 | 0.9288 | 0.6193 | 0.0000 | 0.0000 | 0.0000 |
|  | EX | 0.6033 | 0.8632 | 0.0895 | 0.0003 | 0.0023 | 0.0000 |

**Source: Extracted from Stata$_{17}$ output**

 It is clear from Table (1) that the exchange rate variable and the general level of stock prices at the level are not stable in all unit root tests in terms of the probability value (prob) that was greater than 5%, so the null hypothesis will be accepted. When the first difference ($I_1$) is taken through the Augmented Dickey-Fuller test for the dependent and independent variables, the series becomes stationary at a significance level of 5%, i.e. a prob value smaller than a significance level of 5%, so we accept the alternative hypothesis and reject the null hypothesis. Therefore, according to the conditions of the ARDL test, it is possible to use the model, which is more suitable and provides better results than other cointegration methods.

## 2.4: Analysis Of The Relationship Between The General Level of Stock Prices And The Exchange Rate (F-Bound Test):

To detect the presence of cointegration between variables, the ARDL model uses the F-Bound test, which is the first step in this model (Kripfganz & Schneider, 2023). Table (2) shows that the value of the F-statistic (0.975) is higher than the upper limit ($I_1$) at the 5% significance level and all other levels (1%, 2.5%, 10%), which means that there is cointegration between the variables. Therefore, the null hypothesis is rejected, and the alternative hypothesis is accepted, which confirms the existence of a long-term balanced relationship in at least one direction between the variables.

**Table 2: F - Bound test of the model**

| ARDL Bounds Test | | | | |
|---|---|---|---|---|
| Date: 15/08/24   Time: 09:32 | | | | |
| Sample: 2017m2 thru 2024m5 | | | | |
| Included observations: 88 | | | | |
| Null Hypothesis: No long-run relationships exist | | | | |
| | | | | |
| Test Statistic | Value | k | | |
| F-statistic | 0.975 | 1 | | |
| | | | | |
| Critical Value Bounds | | | | |
| Significance | $I_0$ Bound | | $I_1$ Bound | |
| 10% | 4.04 | | 4.78 | |
| 5% | 4.94 | | 5.73 | |
| 2.5% | 5.77 | | 6.68 | |
| 1% | 6.84 | | 7.84 | |

**Source: Extracted from Stata$_{17}$ output.**

## 3.4: Analysis of the Model Estimation Goodness Test:

There are a number of tests, in Table (3), that show whether the model contains or is free of standard problems. The interpretation coefficient $R^2$ reached (32.9). This means that the exchange rate of the Iraqi dinar contributes and explains approximately 32% of the changes in the general index of stock prices, and the remaining percentage goes back to Random variables that cannot be controlled or are not included in the regression model. The estimated model is statistically acceptable, and the value of the test F-statistic was (0.92) and the p-value was (0.04357), which is less than the 5% level of significance.

Hence, the alternative hypothesis was accepted with the significance of the estimated model as a whole, and the null hypothesis was rejected.

 The model does not suffer from the problem of serial correlation according to the (Breusch-Godfrey) test, as the probability value (Prob. Chai Square) reached (0.1863) and is not significant at 5%, thus the alternative hypothesis is rejected and the null hypothesis is accepted, i.e. the absence of serial correlation, meaning the values are independent of each other. The model does not suffer from the problem of instability of variance as shown by the (Breusch − Pagan) test, where the (Prob) value for it is (0.0831), which is greater than (5%), which means accepting the null hypothesis and rejecting the alternative hypothesis. The estimated model is also well-described as shown by the (Ramsey Regression Equation Specification Error Test), where the statistical value of the F test is (2.26) and it's (P-value) is (0.0884), which is greater than (5%), which means rejecting the null hypothesis and accepting the alternative hypothesis, i.e. the estimated model does not suffer from the problem of description error.

Table 3: Model Quality Test of the Model

| Source | SS | df | MS | Number of obs | = 85 |
|--------|------|------|------|----------------|--------|
| Model | 2761.63445 | 1 | 920.5448181002. | F (3, 81) | = 0.92 |
| Residual | 81170.6455 | 81 | 10673 | Prob > F | = 0.04357 |
| | | | | R-squared | = 0.3219 |
| | | | | Root MSE | = 31.656 |
| Total | 83932.28 | 82 | 999.193809 | | |

| Breusch−Godfrey LM test for autocorrelation | | | | |
|-----------|-------|------|--------------|--|
| lags(p) | chi2 | df | Prob > chi2 | |
| 1 | 1.747 | 1 | 0.1863 | |

| Parameters | Test values |
|------------|-------------|
| Breusch−Pagan/Cook−Weisberg test for heteroskedasticity | chi2(1) =  3.00 |
| Variable: Fitted values of residual term | Prob > chi2 = 0.0831 |
| Ramsey RESET test for omitted variables | F(3, 78) =  2.26 |
| Omitted: Powers of fitted values of residual term | Prob > F = 0.0884 |
| Durbin−Watson d-statistic (4 ,      85) = 1.995972 | |

Source: Extracted from Stata$_{17}$ output.

**4.4: ARDL Test Estimation Analysis of The Model:**

To detect the existence of a long-term cointegration relationship in the model (the general level of stock prices and the exchange rate), the model was tested through the cointegration technique and the ARDL model. Table (4) indicates the presence of a long-term significant relationship between the research variables, as the statistical value of (t) is greater than the tabular one. In addition, the value of (P - Value) is less than (5%), which means rejecting the null hypothesis and accepting the alternative hypothesis. When the exchange rate (EX) rises by (1%), it will lead to an increase in the general level of stock prices (SP) by (3.945467). This means that any change in the exchange rate by a certain percentage will lead to a change in the general level of stock prices by about (394.5%). Of that percentage, it is due to the equal flexibility of the exchange rate toward stock prices in Iraq. The opposite happens in the case of a decline, and if any imbalance occurs in this relationship in the short term from the balance in the long term, the error correction model will restore balance at a speed of (-.010861) per month, which means that (1.8%) of the imbalance in the last month will be Corrected in the current month.

**Table 4: Estimators (short-term and long-term) and the error correction parameter of the model**

| ARDL (1  0) regression | | | | | | |
|---|---|---|---|---|---|---|
| Sample: 2017m2 thru 2024m5 | | | Number of obs  = 88 | | | |
| R-squared      = 0.9340 | | | | | | |
| Adj R-squared   = 0.9325 | | | | | | |
| Log likelihood = -424.99212 | | | Root MSE      = 32.5759 | | | |
|  | D.SP | Coefficient | Std. err. | t | P>|t| | [95% conf. interval] |
| ADJ | | | | | | |
| | SP   L1. | -.010861 | .0292932 | -0.37 | 0.0412 | -.0691036 | .0473817 |
| LR | EX | 3.945467 | 10.433 | 0.38 | 0.016 | -16.79813 | 24.68907 |
| SR | | | | | | |
| | __cons | -46.30307 | 39.78067 | -1.16 | 0.0248 | -125.3977 | 32.79156 |

**Source: Extracted from Stata$_{17}$ output.**

## 5. Conclusions:

   By testing the time series, we find that it is unstable in level and stable in the first difference. The data indicate the fluctuation of the exchange rate of the Iraqi dinar during the research period, which demonstrates the weakness of the Central Bank's measures in reducing exchange rate fluctuations, thus affecting the general level of stock prices in the Iraqi stock market. The results of the statistical analysis showed the existence of a long-term equilibrium relationship between the exchange rate and the general level of stock prices in Iraq at a rate of (394.5%). This matches the financial analysis of the stock market and the positive role of the exchange rate towards stock prices. Through the research, we achieved proof of the null hypothesis, which states that there is a positive, statistically significant relationship between the exchange rate and the general level of stock prices. In conclusion, this study indicates that investors should know exchange rate policies and their changes when making investment decisions if they are certain of the fair return they expect

**References:**

1. Alabdulrazag, B., & Alrajhi, A. (2016). The validity of environmental kuznets curve hypotheis in the Kingdom of Saudi Arabia: ARDL bounds testing approach to cointegration. *International Review of Management and Business Research*, *5*(4), 1450–1464. www.irmbrjournal.com

2. Alginaid, A. (2017). Causal Relationship between Stock Market Index and Exchange Rate: Evidence from Sudan. *SSRN Electronic Journal*, *4*(2), 87–110. https://doi.org/10.2139/ssrn.3064910

3. Benchimol, J., Saadon, Y., & Segev, N. (2023). Stock market reactions to monetary policy surprises under uncertainty. *International Review of Financial Analysis*, *89*(October), 1–32. https://doi.org/10.1016/j.irfa.2023.102783

4. Bhandari, H. N., Rimal, B., Pokhrel, N. R., Rimal, R., Dahal, K. R., & Khatri, R. K. C. (2022). Predicting stock market index using LSTM. *Machine Learning with Applications*, *9*(May), 100320. https://doi.org/10.1016/j.mlwa.2022.100320

5. Corlett, W. J., & Aigner, D. J. (1972). Basic Econometrics. In *The Economic Journal* (Vol. 82, Issue 326). https://doi.org/10.2307/2230043

6. Fedorowicz, M., & Zalcewicz, A. (2024). Challenges Posed to the EU Financial Market by the Implementation of the Concept of Sustainable Financing. *Bialostockie Studia Prawnicze*, *29*(1), 47–59. https://doi.org/10.15290/bsp.2024.29.01.03

7. Garcia-milà, T. (2012). *Stock Prices and Exchange Rate Dynamics. (unpublished thesis), City university business school, London.*

8. Hamilton, A. (2018). Understanding Exchange Rates and Why They Are Important. *Reserve Bank of Australia Bulletin*, *December 2018*, 1–18. https://www.rba.gov.au/publications/bulletin/2018/dec/pdf/understanding-exchange-rates-and-why-they-are-important.pdf

9. Hassanain, K. (2017). International Journal of Economics and Financial Issues Stock Prices and Real Exchange Rate Movements in the Gulf Cooperation Council. *International Journal of Economics and Financial Issues*, *7*(1), 92–96. http:www.econjournals.com

10. Ho, N. (2009). Financial Integration: Concepts and Impacts. *Macao Monetary Research Bulletin*, 69–84. http://www.amcm.gov.mo/publication/quarterly/Jan2009/Financial Integration_en.pdf

11. Im, K. S., Lee, J., & Tieslau, M. (2012). More Powerful Unit Root Tests with Non-Normal Errors. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.1523243

12. Kripfganz, S., & Schneider, D. C. (2023). ardl: Estimating autoregressive distributed lag and equilibrium correction models. *Stata Journal*, *23*(4), 983–1019. https://doi.org/10.1177/1536867X231212434

13. Lothian, J. R. (2002). Exchange rates. *Power Engineer*, *6*(3), 18.

14. Maheen, M. (2013). Impact of Foreign Exchange rate on stock prices. *IOSR Journal of Business and Management*, *7*(3), 45–51. https://doi.org/10.9790/487x-0734551

15. Manasseh, C. O., Chukwu, N. O., Abada, F. C., Ogbuabor, J. E., Lawal, A. I., & Onyeka, K. A. (2019). Interactions between stock prices and exchange rates: An application of multivariate VAR-GARCH model. *Cogent Economics and Finance*, *7*(1). https://doi.org/10.1080/23322039.2019.1681573

16. Mfugale, N., & Olomi, W. (2023). The Impact of Inflation and Exchange Rate on Stock Market Returns in Tanzania. *European Journal of Theoretical and Applied Sciences*, *1*(6), 1019–1026. https://doi.org/10.59324/ejtas.2023.1(6).99

17. Muktadir-al-Mukit, D. (2013). Effects of Interest Rate and Exchange Rate on Volatility of Market Index at Dhaka Stock Exchange. *Journal of Business and Technology (Dhaka)*, *7*(2), 1–18. https://doi.org/10.3329/jbt.v7i2.16451

18. Nkoro, E., & Uko, A. K. (2016). Autoregressive Distributed Lag (ARDL) cointegration technique: application and interpretation. *Journal of Statistical and Econometric Methods*, *5*(4), 63–91.

19. Raju, M. A. (2017). Impact of macroeconomic variables on the stock performance of select companies in manufacturing industry. *International Journal of Economic Research*, *14*(8), 321–328.

20. Ramos, A. L. S. C. (2016). The Effects Of Exchange Rate, Interest Rate And Inflation On The Performance Of Mutual Fund In Ghana. 39–37, *66*.

21. Singh, G., & Padmakumari, L. (2020). Stock market reaction to inflation announcement in the Indian stock market: A sectoral analysis. *Cogent Economics and Finance*, *8*(1). https://doi.org/10.1080/23322039.2020.1723827

22. T., L. (2021). Relationship Between Exchange Rate and Stock Market Volatilities in India. *International Journal of Finance Research*, *2*(4), 244–259. https://doi.org/10.47747/ijfr.v2i4.443

23. Wong, K. (2018). *Peasaran et al . ( 2001 ) Bound Test and ARDL cointegration Test PART A COINTEGRATION TEST – ARDL BOUNDS TEST. January*.

24. Zarei, A., Ariff, M., & Bhatti, M. I. (2019). The impact of exchange rates on stock market returns: new evidence from seven free-floating currencies. *European Journal of Finance*, *25*(14), 1277–1288. https://doi.org/10.1080/1351847X.2019.1589550