

Effects of Interest and Exchange Rate Volatility on Stock Returns: Evidence from the Financial Sector of Tanzania

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Abstract	NG-Journal of Social Development
<p><i>This study analyzes the impact of interest and exchange rate volatility on financial sector stock returns in Tanzania. The study adopted secondary time-series data from 2014 to 2021. In data analysis, the study also utilized the Autoregressive Distributed Lag (ARDL) bound test approach to establish the long and short-term effects of the independent variable of interest on stock returns. Results showed a long-term inverse relationship between interest rates and financial sector stock returns. However, during the specific period from June 2014 to April 2021, interest rates were insignificant in affecting stock returns despite the inverse trend. In contrast, exchange rates significantly affected stock return fluctuations, showing a short-term inverse relationship. The study recommends that the government undertake actions to stabilize exchange rate increases and control interest rate volatility to boost investors' confidence, given</i></p>	<p><i>Vol. 13 Issue 1 (2024) ISSN(p) 0189-5958 ISSN (e) 2814-1105 Home page https://www.ajol.info/index.php/ngjdsd ARTICLE INFO: Keyword: <i>Interest Rate; Exchange Rate; Stock Market Returns; Financial Sector; Tanzania</i> Article History <i>Received 6th March 2024 Accepted: 5th May 2024 DOI: https://dx.doi.org/10.4314/ngjdsd.v13i1.16</i></i></p>

their significant influence on stock market volatility.

1. Introduction

The stock market is regarded as a new form of capital-based organized market where sellers and buyers trade stocks and shares through over-the-counter transactions or on a stock exchange. Listed shares are traded on a stock market, while unlisted shares are exchanged privately over the counter (Hongbin, 2007; Fohlin, 2023). Both in developing and advanced economies, the stock market plays a crucial role in mobilizing resources, leading to industrial and commercial expansion. In today's competitive environment, the stock exchange market involves an organized and standardized financial capital market, where business corporations, companies, governments, and individuals participate by either investing or raising capital (Olweny, 2015). This market operates formally, with various financial instruments traded at set prices and specific times, adhering to the financial policies and laws of the respective country (Massele, et al., 2013). Theoretically, stock markets drive economic growth by enhancing the quality and quantity of investments, thus boosting domestic savings. Specifically, stock markets can promote economic growth by enabling enterprises to raise capital at lower costs (Yartey, 2008).

Trading of stocks and shares is vital for economic growth and development. The stock exchange, serving as a collection point for all transactions, is essential as without a functional stock exchange, capital markets would be illiquid and unable to attract investments. This is because stock markets provide liquidity and promote efficient capital accumulation and allocation (Block & Hirt, 2002). Furthermore, stock exchanges determine precise prices for traded stocks through supply and demand forces, efficiently mobilizing and allocating funds for enterprises to utilize human, material, and managerial resources for production. Governments also generate long-term funds through the stock exchange, aiding in expansion, modernization, and financing new investments (Benigno, 2016). If funds are misallocated and not directed towards productive sectors, like industrial and commercial operations, the rate of economic expansion decreases. The stock exchange market benefits companies by providing equity securities, allowing them perpetual funding for development.

As of 2019, Africa's contribution to the global stock market value was a mere 2%. Currently, the continent has 23 stock exchanges, up from 18 a decade ago. In Tanzania, the Dar es Salaam Stock Exchange (DSE) market capitalization grew from TZS 3,083.37 billion in 2007 to TZS 15,046.23 billion in June 2020, and stock exchange liquidity increased from 117,941 in 2006 to 1,780,915 in 2014. Despite Tanzania's relatively low market capitalization globally, the DSE has made significant progress since its establishment in 1996 (Dar es Salaam Stock Exchange [DSE], 2020). By April 2021, 27 firms were listed on the DSE, attributed to financial market liberalization, technological advancements, and monetary policy initiatives. Understanding the relationships between interest rates, exchange rates, and stock returns has become increasingly important.

Price volatility of securities and returns is often caused by variations in economic factors that deviate from gradual market movements. Tanzania has experienced significant fluctuations in exchange rates over the last five years, similarly reflected in DSE stock prices and returns (Yabu & Kimolo, 2020). Studies in advanced and emerging economies have yielded contrasting findings on the causal relationships of stock market volatility with macroeconomic variables.

For instance, Ernest et al. (2016) concluded that inflation significantly influenced stock returns, while the exchange rate and interest rate were deemed irrelevant. However, the authors also found a significant relationship between the exchange rate and stock market returns, unlike inflation.

If macroeconomic dynamics impact stock market return fluctuations, it would theoretically be feasible to determine the required portfolio distribution and diversification specifics to optimize returns. Particularly in Tanzania, the key factors influencing stock market returns remain unclear as they vary across studies. MacDonald and Nagayasu (2000) identified interest and exchange rates as pivotal macroeconomic factors impacting the economy in numerous ways. Therefore, this analysis aimed to deeply examine the effects of exchange rate and interest rate volatility on financial sector stock returns in Tanzania, focusing on thirteen financial sector-based companies listed on the DSE.

2. Literature Review

The relationship between interest rates and stock returns is crucial in several finance sectors, including asset allocation, risk management, diversification, and the transmission of monetary policy. According to Benigno (2016), financial theory suggests that interest rates influence stock prices through numerous channels. Hasan and Javed (2009) examined the relationship between stock market share prices and variables such as money supply, currency exchange rate, treasury bill rates, and inflation in Pakistan. They observed a negative relationship between interest rates and stock market performance. Similarly, Toraman and Başarir (2014) found that interest rates have a strong and inverse relationship with share prices in 15 industrialized and emerging economies.

Using monthly time-series data from Jordan (2006-2016), Aljarayesh et al. (2018) discovered that interest rates negatively and significantly impact long-term stock prices. Ahmad et al. (2010) found in Pakistan that rising interest rates increase business costs, thereby reducing stock returns. Addo and Sunzuoye (2013) identified a slight negative association between interest rates and stock market returns in Ghana. Chirchir (2014) confirmed an insignificant negative relationship between interest rates and share prices in Kenya, indicating that rising interest rates lead to falling share prices.

Kganyago and Gumbo (2015) used an OLS regression model to analyze data from Zimbabwe (April 2009 - December 2013) and found a significant and substantial inverse relationship between money market interest rates and stock market performance. Liu and Shrestha (2008) found a negative relationship between interest rates and stock prices in China. Uddin and Alam (2010) also observed a substantial inverse relationship in the Dhaka Stock Exchange, Bangladesh. Conversely, Pilinkus and Boguslauskas (2009) concluded that short-term interest rates negatively impact stock market returns.

In studies focusing on the US and Japanese markets, Humpe and Macmillan (2007) demonstrated a long-term negative link between long-term interest rates and stock prices. Alam and Uddin (2009) analyzed data from 15 industrialized and developing nations and found a negative correlation. In Namibia, Eita (2014) used monthly data (1996-2012) and cointegrated vector autoregression, revealing an inverse relationship between interest rates and stock market returns. Ferrer et al. (2016) found that the relationship between interest rate movements and stock returns varies significantly among economies and over time. Meanwhile, Kurihara and

Nezu (2006) pointed out an interdependent relationship between Japan's stock exchange market and interest rates.

Numerous studies have explored the relationship between exchange rates and stock market returns. An exchange rate is essentially the rate at which one currency is traded against another (Lothian, 2001). A sudden shift in exchange rates can significantly impact a country's imports, exports, and overall economy. Abrupt changes in exchange rates affect business returns and profitability, thereby causing stock market volatility. Zarei et al. (2019) argued that exchange rates significantly affect stock index returns, a finding supported by Varshney and Vyas (2018) in IT stocks. Huy (2016) noted a unidirectional causal relationship between stock prices to exchange rates. Kumar (2009) and Cakan and Ejara (2013) found bidirectional direct and nonlinear Granger causality between stock returns and exchange rates.

In the G-7 countries, Nieh and Lee (2001) identified a short-term significant association between stock prices and exchange rates. Adjasi et al. (2008) found an inverse relationship between exchange rate volatility and stock market returns in Ghana. Using a different approach, Katechos (2011) identified a strong relationship between exchange rates and stock prices.

Inci and Lee (2014) employed causal relationship methodology and found evidence of Granger causality between exchange rates and stock returns in both directions in eight countries. Sichoongwe (2016) observed a strong negative relationship between exchange rate volatility and stock market returns in Zambia. Agrawal et al. (2010) found a negative correlation between Nifty returns and exchange rates in India, with Nifty returns leading exchange rates in a one-way relationship. Conversely, Reboredo et al. (2016) and Yousuf et al. (2013) found a positive relationship between stock prices and exchange rates in emerging economies. According to Kenen (2012), the flow-oriented approach shows positive linkages between exchange rates and stock prices. Suriani et al. (2015) found no correlation between exchange rates and stock prices in Pakistan.

Money supply significantly affects economic activity, influencing stock market returns. An increase in the money supply boosts spending and investment by lowering borrowing rates and increasing consumer wealth. This leads to increased profits, manufacturing, and business activity, driving stock values higher (Mohamed & Sohail, 2018). Maskay (2007) confirmed that an increased money supply raises stock prices, supporting critics of the efficient market hypothesis. Mohamed Asmy et al. (2010) found that money supply has a negative influence on stock prices. Hosseini et al. (2011) noted negative impacts on India's stock market but positive impacts on China's. Alatiqi and Fazel (2008) found no substantial long-term causal relationship between money supply and stock prices. Širuček (2014) observed inconsistent results among economists regarding the impact of money supply on stock markets.

Many studies have investigated the relationship between inflation rates and stock market returns. Uwubanmwun and Eghosa (2015) found that inflation has a weak negative effect on stock returns in Nigeria, suggesting that inflation is not a good predictor of stock return fluctuations. Eldomiaty et al. (2020) identified an inverse association between stock prices and inflation rates. Saleem et al. (2013) found that in Pakistan, inflation rates have a negative and significant effect on stock market returns. Despite varying empirical findings, this study will control for the inflation rate to isolate its impact on stock returns.

The significance of stock markets in mobilizing resources is undisputed, as they provide firms with the opportunity to raise capital and enable safe capital transfers. Stock markets offer a

model for guaranteed returns through diversification, encouraging further investment. Companies can expand operations and generate more employment by raising money through stock markets. However, limited literature focuses on macroeconomic factors affecting stock market returns in Tanzania. Yabu and Kimolo (2020) examined exchange rate fluctuations affecting East African countries, while Kapaya (2020) studied stock market development's impact on Tanzania's economic growth, without focusing on macroeconomic variables and stock market returns in the financial sector. Manamba and Salema (2018) conducted a similar study on 10 listed companies but did not analyze data from 13 financial sector companies. This study uses time series analysis (2014-2021) to assess the impact of fluctuating interest rates and exchange rates on stock market returns in Tanzania's financial sector.

3. Material and Methods

The study utilized a time series approach, specifically employing an Autoregressive-Distributed Lag (ARDL) bound testing method to analyze both the long-run and short-run relationships between the studied variables and stock market returns. The analysis was based on a series of data collected from June 2014 to February 2021, ultimately proposing an overall estimated model as follows:

$$SMR = \phi_0 + \sum_{i=1}^k \phi_1 Int_{t-i} + \sum_{i=0}^k \phi_2 Exr_{t-i} + \sum_{i=0}^k \phi_3 Inf_{t-i} + \sum_{i=0}^k \phi_4 Ms_{t-i} + \beta_1 lnInt_{t-1} + \beta_2 Exr_{t-1} + \beta_3 Inf_{t-1} + \beta_4 Ms_{t-1} + \mu_t$$

Where;

$\beta_1 - \beta_4$ are long-run coefficients and $\phi_1 - \phi_4$ are short-run coefficients, the rest of the equations is defined as; SMR stand for Stock Market Returns, *Int* stands for Interest rate, *Exr* stands for Exchange rate, *Ms* stands for Money supply, *inf* stands for inflation and μ stands for an error term.

4. Results and Discussion

This section presents the interpretation and discussion of the findings. Table 1 presents the descriptive statistics.

Table 1: Descriptive Statistics

Variable	Observation	Mean	Standard Deviation	Minimum	Maximum
Exchange rate	82	2164.83	192.31	1650.73	2298.53
Interest rate	82	8.65	5.21	2.20	17.80
Money Supply	82	24,124,880.78	3,489,995.00	17,656,512.22	30,003,247.39
Inflation rate	82	4.52	1.21	3.00	6.80
Stock Index	82	2652.865	554.651	2006.940	4415.220
Stock Return	82	-0.259	6.487	-21.810	25.448

The findings revealed that, out of the 82 monthly observations ranging from June 2014 to February 2021 within the selected DSE official data, the average monthly stock return for financial sector companies registered in the DSE was -0.259, with a standard deviation of 6.487. The minimum recorded value of the monthly stock return was -21.810, while the maximum was 25.448. Similarly, the average monthly interest rate was 8.65%, with a maximum recorded interest rate of 17.80% a minimum of 2.20%, and a standard deviation of 5.21. The exchange

rate data showed a minimum value of 1650.73 and a maximum of 2298.53, with an average value of 2164.83 and a standard deviation of 192.31. The money supply ranged from a minimum value of 17,656,512.22 to a maximum of 30,003,247.39, with an average monthly value of 24,124,880.78 and a standard deviation of 3,489,995.00. Lastly, the mean monthly inflation rate during the observed period was 4.52%, with a maximum rate of 6.80% and a minimum of 3.00%, and a standard deviation of 1.21.

Regarding the findings from the ARDL analysis, Table 2 provides detailed findings regarding the effects of interest and exchange rate volatility on the stock returns.

Table 2 : Results from Autoregressive Distributed Lag Bound Test

Variable	Coefficient	Standard Error	t-Statistic	Prob.*
Stock return (-1)	-1.702***	0.141	-12.040	0
Long run				
Interest rate	-0.132	0.163	-0.810	0.421
Exchange rate	-0.014***	0.005	-3.050	0.003
Money supply	14.263*	8.172	1.750	0.085
Inflation rate	0.093	0.635	1.470	0.146
Short run				
Stock return LD.	0.610***	0.986	6.190	0
Exchange rate D1	-0.056	0.034	-1.650	0.103
Money supply D1	-106.594**	46.888	-2.270	0.026
Money supply.	-68.383	48.053	-1.420	0.159
Constant				
Constant	-365.023**	226.999	1.610	0.112
Number of Observations	78			
R-square	0.704			
Adjusted R square	0.665			
Root MSE	5.485			

*Note: *, **, *** imply significance level at $p < 0.1$, $p < 0.05$, and $p < 0.01$, respectively.*

Based on the results in Table 2, it is quite notable that a range of the studied macroeconomic factors tends to influence stock returns. The stock return also depends on the stock return of the previous period, as well as the interest rate and the exchange rate of macroeconomic variables in previous periods. Specifically, the first lag in stock return was significant at the 1%, 5%, and 10% significance levels; a 1% rise in the first lag of the stock return resulted in a 1.702% drop in the stock return. This indicates that a rise in the return of the financial sector for a given period will result in a fall in stock returns in a subsequent period.

The findings revealed that the interest rate was not significant in both the long run and the short run in affecting the overall level of stock market returns in the financial sector. However, an inverse relationship to the financial sector stock returns was observed, where a negative coefficient of 0.132 implies that for every 1% rise in the interest rate, there is a fall in the financial stock returns, assuming all other factors are held constant. This implies that, while interest rates have a substantial impact on other macroeconomic variables, the effect on stock market returns is indirect, primarily through their influence on factors like money supply. Since interest rates significantly impact many macroeconomic variables, especially in the long run, their unpredictability affects stock returns over short periods less. Kasman et al. (2011) found similar results, showing that interest rates are negatively associated with fluctuations in banking industry stock returns, suggesting interest rates as a major determinant of volatility. Kadir et al. (2011) also identified an inverse relationship between interest rates and stock market returns, though the relationship was statistically insignificant.

The exchange rate was significant in impacting stock market returns in the financial sector. Specifically, the long-run coefficient for the exchange rate was -0.014, implying that, holding other factors constant, a rise in the exchange rate by TZS 1 leads to a drop in financial sector stock returns by 0.014%, indicating an inverse relationship. Exchange rates also showed a short-run negative but insignificant influence on financial sector stock returns' volatilities. The negative coefficient of 0.056 in the first difference suggests that an increase in the exchange rate by TZS 1 results in a 0.056% drop in financial sector stock returns in the short run. This suggests that exchange rates significantly impact stock market returns both in the long run and short run, with fluctuations in exchange rates highly influencing the stock market returns. Exchange rates, considered one of the most volatile macroeconomic variables, particularly impact stock markets due to the presence of major foreign investors. These findings align with those of Zarei et al. (2019), who argued that exchange rates significantly negatively affect stock index returns, and Varshney and Vyas (2018), who also identified an impact of exchange rates on IT stocks. However, the findings contrast with those of Huy (2016), who argued for a unidirectional causative association between stock prices and exchange rates.

5. Conclusion and Recommendations

The target of the analysis was to investigate the impact of interest rate and exchange rate volatility on the financial sector stock returns within the Dar es Salaam Stock Exchange (DSE). Specifically, the study focused on analyzing the association between interest rates and financial sector stock returns, as well as the effect of exchange rates on these returns. Consequently, the study offers major conclusive implications in several spheres.

First, the empirical data demonstrate that the volatility of exchange rates and interest rates substantially affects stock market outcomes. However, the financial industry appears to be affected solely by the long-term and short-term fluctuations of the exchange rate. This finding indicates that the exchange rate, particularly through the actions of foreign investors in financial institutions, has a clearer long-term and short-term impact on stock return patterns. Therefore, it is conclusive that exchange rate volatility and interest rates influence Tanzania's financial sector, including banking and investment, particularly in the stock market. The unpredictability of other market impacts on the financial and banking sectors may further influence stock returns from the stock markets.

The study's findings concur with most prior literature, all of which have discovered an inverse relationship between the studied variables and stock exchange returns. Based on these findings, the study makes several recommendations. For policymakers and policy restructuring agents,

such as government ministries, it is essential to regulate the persistent rise of exchange rate volatility and interest rates to improve investor confidence.

Secondly, the study highlights the need to increase the utilization of hedging tools in stock markets, especially by investors, to eliminate adverse consequences. Additionally, policy actions should focus on stabilizing the movement of the exchange rate, as depreciating the exchange rate decreases stock market returns. Using stabilized exchange rates as a precision policy instrument can attract foreign investments.

Lastly, the study recommends that the government, through the respective ministries and agencies, should take proper initiatives. Implementing appropriate initiatives will help strengthen the profile of capital markets and create a robust stock exchange capable of withstanding market instabilities over time.

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