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INTEREST RATE AND FOREIGN DIRECT INVESTMENT IN ZIMBABWE: AN EMPIRICAL INVESTIGATION

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ABSTRACT

This study empirically investigated the relationship between interest rates and Foreign Direct Investment (FDI) in Zimbabwe using monthly data from 2012 to 2024 obtained from the World Bank. The study employed Autoregressive Distributed Lag (ARDL) model, where Foreign Direct Investment (FDI) net inflows (% of GDP) was treated as the independent variable, while the real interest rate (%) was the dependent variable. The ARDL results revealed that current FDI had a significant negative effect on interest rates ($\beta = -55.4364$, $p < 0.01$), implying that increased FDI inflows reduce interest rates in the short run. However, lagged FDI values at one and two months exerted significant positive effects on interest rates, suggesting delayed monetary adjustments following capital inflows. Lagged interest rates were also positive and statistically significant, confirming persistence in interest rate movements over time. The adjusted R-squared of 0.5177 indicates that approximately 51.8% of variations in interest rates were explained by the model. The study recommends strengthening macroeconomic stability and adopting investment-friendly monetary policies to attract sustainable FDI inflows while maintaining interest rate stability in Zimbabwe.

KEY WORDS: ***ARDL, Real interest rate, foreign direct investment, Zimbabwe***

INTRODUCTION

Foreign Direct Investment (FDI) is an important driver of economic growth, particularly in developing economies. It contributes to employment creation, capital formation, technological advancement, skills transfer, and increased productivity. FDI has become one of the major sources of external finance for developing economies, particularly in countries experiencing low domestic savings and capital shortages (World Bank, 2023). For developing countries such as Zimbabwe, attracting FDI remains a key economic objective due to its potential to stimulate industrial development and economic recovery (World Bank, 2025; UNCTAD, 2023). Over the years, Zimbabwe has implemented various economic and monetary policy reforms aimed at improving the investment climate and attracting foreign investors. Despite these efforts, FDI inflows into the country have remained volatile, reflecting the influence of both domestic and external macroeconomic conditions.

The relationship between foreign direct investment and interest rates has attracted considerable attention in economic literature. According to the loanable funds theory, increased inflows of foreign capital expand the supply of funds in the financial system, which may lead to lower interest rates due to improved liquidity conditions (Krugman & Obstfeld, 2018). Lower interest rates are expected to encourage domestic investment and economic expansion. However, the effectiveness of FDI in influencing interest rates may depend on factors such as inflation, exchange rate stability, financial sector development, and monetary policy effectiveness (Todaro & Smith, 2020). In economies characterized by persistent macroeconomic instability, the impact of FDI on interest rates may be limited.

Zimbabwe presents an important case for examining the relationship between FDI and interest rates because the country has experienced significant economic and financial instability over the past decade. Between 2012 and 2024, Zimbabwe experienced high inflation rates, exchange rate volatility, liquidity shortages, and changes in monetary policy frameworks (Reserve Bank of Zimbabwe, 2023). During the same period, the government implemented policies intended to attract foreign direct investment to revive industrial production, improve infrastructure, and stimulate economic growth (Zimbabwe Investment and Development Agency, 2022). Despite these efforts, lending interest rates remained highly volatile and often excessively high, negatively affecting private sector borrowing and investment.

Empirical studies on the relationship between FDI and macroeconomic variables have produced mixed findings. Some studies argue that increased foreign capital inflows improve liquidity and reduce borrowing costs, while others suggest that macroeconomic instability may offset the potential benefits of FDI (Alfaro et al., 2004). In Zimbabwe, limited studies have specifically focused on the influence of foreign direct

investment on interest rates using recent data covering the period after dollarization and during renewed inflationary pressures. This creates a gap in the literature that requires further investigation.

This study therefore seeks to examine the influence of foreign direct investment on interest rates in Zimbabwe using World Bank data from 2012 to 2024. The study specifically analyzes trends in FDI inflows and interest rates, evaluates the relationship between the two variables, and determines whether foreign direct investment significantly influences interest rate movements in Zimbabwe. By focusing on recent data, the study contributes to the growing literature on FDI and macroeconomic performance in developing economies, particularly within the context of Zimbabwe's evolving financial environment.

LITERATURE REVIEW

Foreign Direct Investment (FDI) refers to an investment made by a firm or individual from one country into business interests located in another country with the intention of establishing a lasting management interest and control (International Monetary Fund, 2009). FDI is considered an important source of external finance for developing countries because it promotes economic growth through capital inflows, employment creation, technological transfer, managerial skills development, and increased productivity (Borensztein, De Gregorio & Lee, 1998). Developing economies often rely on FDI to supplement domestic savings and stimulate industrial development.

In Zimbabwe, FDI has been viewed as a critical component for economic recovery and sustainable growth, especially following periods of economic instability. However, the country has experienced inconsistent FDI inflows due to macroeconomic instability, exchange rate volatility, inflation, and policy uncertainty (World Bank, 2025). As a result, understanding the determinants of FDI inflows remains important for policy formulation and economic planning.

Interest rates represent the cost of borrowing money or the return on savings and investments. According to Keynesian economic theory, interest rates influence investment decisions by affecting the cost of capital. Higher interest rates increase borrowing costs, thereby discouraging private investment, while lower interest rates encourage borrowing and investment activities (Keynes, 1936).

The relationship between interest rates and FDI is explained through investment theory, which suggests that foreign investors consider financing costs and expected profitability when making investment decisions. Stable and lower interest rates may create a favorable investment environment, whereas high and volatile interest rates may discourage foreign investors due to increased financial uncertainty and operational costs (Mankiw, 2019).

The Eclectic Paradigm Theory, also known as the OLI Framework, was developed by Dunning (1993). The theory explains that multinational corporations engage in foreign investment based on three advantages: Ownership advantages, Location advantages, and Internalization advantages. Location advantages include macroeconomic conditions such as interest rates, inflation, political stability, and market potential. According to this theory, countries with stable macroeconomic conditions and favorable financial environments are more likely to attract FDI. In the context of Zimbabwe, interest rates form part of the location-specific advantages that may influence foreign investors' decisions. Persistently high interest rates may reduce investment attractiveness by increasing production and financing costs.

Keynes (1936) argued that investment expenditure is inversely related to interest rates. The theory states that when interest rates rise, the cost of borrowing capital increases, thereby discouraging investment. Conversely, low interest rates stimulate investment by reducing financing costs. Although Keynesian theory mainly focuses on domestic investment, it is also applicable to FDI because foreign investors consider the cost of capital and profitability in host countries before committing investments.

Several empirical studies have examined the determinants of FDI in both developed and developing economies. Many studies identify interest rates as an important macroeconomic factor influencing foreign investment decisions. Asiedu (2002) investigated the determinants of FDI in African countries and found that macroeconomic stability, infrastructure development, and openness to trade significantly influence FDI inflows. The study further revealed that unstable macroeconomic conditions discourage foreign investors from investing in African economies.

A study by Anyanwu (2012) examined the determinants of FDI inflows in Africa using panel data analysis. The findings indicated that market size, trade openness, infrastructure, and macroeconomic stability positively affect FDI inflows, while high inflation and financial instability negatively influence investment decisions. The study emphasized the importance of stable financial conditions in attracting foreign capital.

In a study focusing on developing economies, Vijayakumar, Sridharan, and Rao (2010) found that macroeconomic variables such as interest rates, inflation, and exchange rates significantly affect FDI inflows. The study concluded that high interest rates increase the cost of capital and discourage foreign investment.

Empirical evidence from Southern Africa also supports the relationship between interest rates and FDI. Ndikumana and Verick (2008) observed that macroeconomic instability and weak financial systems reduce the attractiveness of African economies to foreign investors. Their study highlighted that countries with stable interest rates and sound monetary policies are more likely to attract sustainable FDI inflows.

In Zimbabwe, studies on FDI determinants have mainly focused on political instability, inflation, and exchange rate movements. For example, Mlambo and Oshikoya (2001) found that economic instability and policy inconsistency negatively affected foreign investment inflows into Zimbabwe. However, limited studies have specifically examined the relationship between interest rates and FDI using monthly data covering recent economic developments from 2012 to 2024.

Furthermore, most previous studies relied on annual data, which may fail to capture short-term fluctuations and dynamic

interactions between interest rates and FDI. This study therefore seeks to fill this gap by using monthly data to examine both the short-run and long-run relationship between interest rates and FDI in Zimbabwe.

Although extensive literature exists on the determinants of FDI, limited empirical studies have specifically investigated the relationship between interest rates and FDI inflows in Zimbabwe using recent monthly data. Most studies have concentrated on broader macroeconomic variables such as inflation, exchange rates, and political stability while giving limited attention to interest rates as an independent determinant of FDI. In addition, many earlier studies used annual data, which may not adequately capture short-run variations and dynamic relationships between variables.

Therefore, this study contributes to the existing literature by examining the relationship between of interest rates and FDI in Zimbabwe using monthly data from 2012 to 2024. The study aims to provide updated empirical evidence on the relationship between interest rates and FDI and offer policy recommendations for improving Zimbabwe's investment climate

DATA AND METHODS

We adopt a quantitative time-series research design grounded in econometric analysis to empirically investigate the relation of Interest rates and Foreign Direct Investment in Zimbabwe employing a Autoregression distributed Lags (ARDL) model. The choice of a quantitative design is justified by the need to rigorously analyze numerical macroeconomic indicators and their intertemporal dynamics, which are best captured through econometric modeling (Gujarati & Porter, 2009; Wooldridge, 2019; Nahabwe & Kagarura, 2025).

We utilize secondary monthly data spanning the period 2012 to 2024, sourced from the World Development Indicators (WDI) database of the World Bank (World Bank, 2025). The two primary variables of interest are, Foreign direct investment (FDI), net inflows (% of GDP), the independent variable and Real interest rate (%), the dependent variable. Given the relatively small sample size (13 annual observations), the data was transformed into monthly series using quadratic match-sum interpolation, a technique suited for maintaining aggregate consistency in temporal disaggregation (Chow & Lin, 1971; Lütkepohl, 2005; Kagarura & Nahabwe, 2025). This results in a monthly time series spanning from January 2012 to December 2024, yielding 156 observations for each variable.

We used purposive sampling, targeting Zimbabwe because it has the highest interest rates on African Continent and also because of economic and financial developments which happened in the study period (2012-2024) including liquidity constraints, currency reforms, inflationary pressures, exchange rate fluctuations, and changes in monetary policy frameworks. Such developments had a substantial impact on domestic interest rates and the general investment environment (World Bank, 2025). This contextual uniqueness presents a compelling case for empirical inquiry, particularly on how the interest rates relates to Foreign Direct Investment.

We employed Autoregressive Distributed Lag (ARDL) bounds testing approach, developed by Pesaran et al. (2001), to examine the short-run and long-run relationships between the variables. ARDL model is preferred for its flexibility in handling time-series data that is integrated at different orders, i.e., I(0) or I(1), but not I(2). It also accommodates small-sample properties, making it ideal given the moderate number of quarterly observations derived from the annual data (Nkoro & Uko, 2016; Nahabwe & Kagarura, 2025). The general ARDL (p, q) model used is specified as:

$$\Delta Interest\ Rate_t = \sum_{i=1}^{p} \beta_i \Delta Interest\ Rate_{t-i} + \sum_{j=1}^{q} \gamma_i \Delta FDI_t + \varepsilon_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where;
Δ denotes the first difference operator
FDI_t is Foreign direct investment, net inflows (% of GDP)
$Interest\ Rates_t$ is Real interest rate (%)
ε_t is the white noise error term (Wooldridge, 2019; Nahabwe & Kagarura, 2025)

We computed descriptive statistics such as mean, standard deviation, skewness, and kurtosis to provide an overview of the distributional characteristics of the data (Brooks, 2019; Nahabwe & Kagarura, 2025). To ensure the validity of time-series analysis and avoid spurious regression, we tested for stationarity using both the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests, which are standard procedures for identifying the order of integration of each variable (Dickey & Fuller, 1979; Phillips & Perron, 1988; Nahabwe & Kagarura, 2025).

To ensure the reliability and adequacy of the model, several diagnostic tests were conducted (Campbell et al., 2015; Nahabwe & Kagarura, 2025). If the Breusch-Pagan-Godfrey test for heteroskedasticity fails to reject the null hypothesis of homoskedasticity, it indicates constant variance of residuals (Ohaegbulem & Iheaka, 2024; Nahabwe & Kagarura, 2025). The Breusch-Godfrey Serial Correlation LM test detects evidence of autocorrelation, confirming whether the residuals are independent (Chaudhary et al., 2022).

Normality of Residuals test is also conducted to determine whether the error terms in a regression model are approximately normally distributed. This assumption is important because many inferential statistics used in regression analysis—such as t-tests, F-tests, and confidence intervals—are derived under the assumption of normally distributed disturbances (Gujarati & Porter, 2009; Nahabwe & Kagarura, 2025). Normality ensures that the sampling distributions of the estimators are normal, which makes t-tests and F-tests valid in small samples (Wooldridge, 2019; Nahabwe & Maniple, 2025). Similarly, if residuals are normally distributed, confidence intervals and significance tests provide accurate statistical conclusions (Greene, 2018; Nahabwe & Kagarura, 2025).

Overall, the ARDL framework is appropriate for this study as it captured the dynamic interactions between education and youth unemployment without imposing restrictive assumptions about variable integration orders (Mazorodze & Siddiq, 2018). The use of monthly data enhances the degrees of freedom and allows for more reliable inference, particularly in the context of limited original observations (Leone et al., 2019; Nahabwe & Kagarura, 2025)

RESULTS AND THEIR DISCUSSION

We present and interprets empirical results of the study, guided by the core research objective of assessing the relationship between Interest Rates and Foreign direct investment in Zimbabwe using monthly data from 2012 to 2024. The analysis begins with descriptive statistics to understand the basic features and distributional properties of the key variables: Interest Rates and Foreign Direct Investment. Interest rates exhibits a high mean value of 36,77%, reflecting Zimbabwe's persistent macroeconomic instability and Standard deviation of 33.01 indicates considerable volatility, with values ranging from a minimum of 4.06% to a peak of 89.91% highlighting significant fluctuations in monetary conditions and borrowing costs within the economy.

Foreign Direct Investment, in contrast, appears relatively stable, with a mean of 1.33% and standard deviation of 0.65, ranging from 0.444% to 2.461%. This suggests comparatively moderate fluctuations in foreign capital inflows during the study period (Nahabwe & et al., 2025). Skewness values for both series are positive (0.32 for interest rates, 0.104 for FDI), suggesting that both distributions are moderately right-skewed (Brooks, 2019). The kurtosis values of 1.476 for interest rates and 1.572 for Foreign Direct Investment imply that both variables are platykurtic in nature, meaning their distributions are flatter than the normal distribution and are characterized by relatively fewer extreme values or outliers. This suggests that the variables have thinner tails and a lower peak compared to a normal distribution (Gujarati & Porter, 2009; Brooks, 2019; Nahabwe & Maniple, 2025).

The Jarque–Bera statistics for both series are statistically significant at the 1% level ($p < 0.01$), confirming the non-normality of the distributions. This finding justifies the use of robust time series estimation techniques such as Autoregressive Distributed Lag Model (ARDL), which is less sensitive to violations of the normality assumption (Brooks, 2019; Gujarati & Porter, 2009: Nahabwe & Kagarura, 2025). These initial descriptive results provide a strong foundation for investigating the relationship between interest rates and Foreign Direct Investment, thereby motivating further econometric inquiry in the subsequent sections of the study.

Stationarity of interest Rates and FDI time series is tested using the Augmented Dickey-Fuller (ADF) test (Appendix 2 - 4). Results indicate that both series are non-stationary at levels ($p > 0.05$), implying the presence of unit roots. However, after first differencing both series became stationary ($p < 0.05$), satisfying the requirement for ARDL modeling (Gujarati & Porter, 2009; Dickey & Fuller, 1979; Nahabwe & Kagarura, 2025). This transformation ensures that the statistical properties of the series remain constant over time, thus avoiding spurious regression results (Enders, 2014).

The ARDL model estimation results (Appendix 6) are presented as follows:

$$\widehat{Interest\ Rate}_t = 0.041214 + 0.266965 Interest\ Rate_{t-1} + 0.204316 Interest\ Rate_{t-2} - 55.43640 FDI_t + 18.48439 FDI_{t-1} + 14.70683 FDI_{t-2} \quad \ldots\ldots\ldots\

Diagnostic tests were conducted to examine the reliability and robustness of the estimated ARDL model. The normality test results (Appendix 7) revealed a kurtosis value of 22.17 with a probability value of 0.00, indicating that the residuals were not normally distributed. The high kurtosis value suggests the presence of extreme observations and heavy tails in the residual distribution, which is common in macroeconomic and financial time-series data affected by volatility and economic shocks (Nahabwe & Kagarura, 2025). Nevertheless, the ARDL framework remains robust even when residuals deviate from normality, particularly in large samples (Gujarati & Porter, 2009; Kagarura & Nahabwe, 2025).

The Breusch-Pagan-Godfrey heteroskedasticity test (Appendix 8) rejected the null hypothesis of homoskedasticity because the probability values of the F-statistic (0.0053) and Observed R-squared (0.0067) were below the 5% significance level. This indicates the presence of heteroskedasticity in the residuals, implying that the variance of the error terms was not constant over time (Kagarura & Nahabwe, 2025). The existence of heteroskedasticity may be attributed to macroeconomic instability, exchange rate fluctuations, inflation volatility, and structural economic shocks experienced in Zimbabwe during the study period. Similar observations were made by Engle (1982), who noted that financial and macroeconomic data frequently exhibit volatility clustering and non-constant variance.

Despite the presence of heteroskedasticity, the Breusch-Godfrey Serial Correlation LM test (Appendix 9) confirmed the absence of serial correlation in the residuals. The probability values associated with the F-statistic (0.4253) and Obsserved R-squared (0.4026) exceeded the 5% significance level, leading to failure to reject the null hypothesis of no serial correlation. This indicates that the residuals were independently distributed and that the ARDL model was dynamically well specified (Nahabwe & Kagarura, 2025). The absence of autocorrelation strengthens the reliability of the estimated coefficients and validates the statistical inferences derived from the model. These findings support the assertions of Pesaran et al. (2001), who argued that properly specified ARDL models should exhibit serially uncorrelated residuals for consistent estimation and reliable inference.

A major contribution of this study lies in the use of high-frequency monthly data from 2012 to 2024, which enabled the capture of short-run fluctuations and dynamic responses more effectively than annual data commonly used in earlier studies. Additionally, unlike most previous studies that examined the effect of interest rates on FDI, this study reversed the relationship by investigating how FDI inflows influence interest rate dynamics in Zimbabwe. The study therefore provides new empirical evidence on the monetary implications of foreign capital inflows in a fragile and highly volatile economy.

LIMITATIONS

Despite providing important empirical evidence on the relationship between interest rates and Foreign Direct Investment (FDI) in Zimbabwe, this study was subject to several limitations related to data, model specification, and econometric procedures that may have influenced the findings.

Firstly, the study relied entirely on secondary monthly time-series data obtained from the World Bank covering the period 2012–2024. Although secondary data are widely used in macroeconomic studies, they may contain measurement errors, reporting inconsistencies, revisions, and missing observations that can affect estimation accuracy and reliability (Gujarati & Porter, 2009). In the context of Zimbabwe, macroeconomic statistics have often been affected by structural economic instability, exchange rate distortions, inflation volatility, and policy inconsistencies, which may reduce data precision.

Secondly, the study employed the Autoregressive Distributed Lag (ARDL) model, which is appropriate for analyzing dynamic short-run and long-run relationships among variables integrated of mixed orders I(0) and I(1). However, the ARDL framework assumes parameter stability and linearity in relationships among variables (Pesaran et al., 2001). In reality, the relationship between FDI and interest rates in Zimbabwe may be nonlinear due to structural breaks, financial crises, exchange rate reforms, and changing monetary policy regimes. Failure to explicitly account for these structural shifts may have affected the robustness of the estimated coefficients.

Thirdly, the study focused only on Foreign Direct Investment as the principal explanatory variable affecting interest rates. However, interest rate movements are influenced by numerous macroeconomic factors such as inflation, money supply, exchange rates, public debt, monetary policy rates, and economic growth (Mishkin, 2007). Excluding some of these variables may have resulted in omitted variable bias, thereby limiting the comprehensiveness of the model.

Additionally, the diagnostic tests revealed the presence of heteroskedasticity in the residuals. Heteroskedasticity implies non-constant error variance, which may affect the efficiency of estimators and the reliability of hypothesis testing if not properly corrected (Wooldridge, 2019). Although the ARDL model remained statistically significant and free from serial correlation, the existence of heteroskedasticity suggests that some degree of volatility clustering and instability existed within the data.

Furthermore, the study utilized aggregate national-level data, which may conceal sector-specific variations in FDI inflows and their differential effects on interest rates. FDI directed toward mining, manufacturing, agriculture, or services may affect financial markets differently. Consequently, the findings may not fully capture sectoral heterogeneity within the Zimbabwean economy.

Finally, the study concentrated on Zimbabwe alone, which limits the generalizability of the findings to other developing economies with different institutional, monetary, and financial structures. While the findings provide useful insights into Zimbabwe's macroeconomic environment, caution should be exercised when extending the conclusions to other countries without considering country-specific conditions.

CONCLUSION

This study examined the dynamic relationship between interest rates and Foreign Direct Investment (FDI) in Zimbabwe within the context of a financially volatile and structurally constrained economy. The findings demonstrate that foreign capital inflows

remain an important macroeconomic factor influencing monetary conditions and financial market behavior in Zimbabwe. The study further establishes that the interaction between FDI and interest rates is not static but evolves over time through complex short-run adjustments and delayed market responses.

The study highlights the importance of maintaining macroeconomic stability, credible monetary policy frameworks, and a conducive investment climate in order to maximize the benefits of foreign investment while minimizing financial market distortions. The observed dynamics imply that policy authorities should carefully manage capital inflows to ensure that increased investment translates into sustainable financial sector development and broader economic stability.

Overall, the study contributes to the existing literature by providing recent high-frequency evidence on the monetary implications of FDI inflows in Zimbabwe. It also extends empirical understanding by reversing the conventional approach that often treats interest rates as determinants of FDI, instead demonstrating that FDI itself can significantly shape domestic monetary conditions in developing economies.

RECOMMENDATIONS

Based on the findings of this study, several policy, programmatic, and research recommendations are proposed to enhance the effectiveness of Foreign Direct Investment (FDI) in stabilizing interest rates and promoting macroeconomic stability in Zimbabwe.

The government and monetary authorities should strengthen macroeconomic stability through prudent monetary and fiscal policy coordination. Stable inflation, predictable exchange rate management, and disciplined public expenditure are essential for sustaining favorable interest rate conditions and attracting productive foreign investment. According to Mishkin (2007), stable macroeconomic environments improve investor confidence and enhance the effectiveness of monetary policy transmission mechanisms.

The Reserve Bank of Zimbabwe should adopt investment-supportive monetary policies that balance liquidity management with financial stability objectives. Since FDI inflows initially reduce borrowing costs but may generate delayed upward pressure on interest rates, monetary authorities should carefully monitor capital inflow dynamics to avoid excessive market volatility. Flexible and responsive policy frameworks are particularly important in economies exposed to external shocks and inflationary pressures (Taylor, 1993).

Additionally, the government should strengthen institutional quality, investor protection frameworks, and regulatory transparency in order to attract long-term and productivity-enhancing FDI. Improvements in governance, property rights protection, and policy consistency can increase investor confidence and reduce speculative capital movements that destabilize financial markets (Asiedu, 2002).

Financial sector development programs should be strengthened to improve the efficiency of financial intermediation in Zimbabwe. Expanding access to credit, strengthening banking sector resilience, and promoting capital market development can help ensure that foreign investment inflows translate into sustainable reductions in borrowing costs and increased domestic investment.

The government should also implement targeted investment promotion programs aimed at attracting sector-specific FDI into productive sectors such as manufacturing, agriculture, mining, and infrastructure development. Productive FDI has greater potential to generate employment, improve productive capacity, and stabilize macroeconomic conditions compared to short-term speculative investments (Borensztein, De Gregorio, & Lee, 1998).

Furthermore, economic authorities should enhance macroeconomic data collection, monitoring, and transparency systems to improve policy formulation and forecasting accuracy. Reliable and timely economic data are critical for effective monetary management and investment planning, especially in economies experiencing financial volatility.

Future studies should incorporate additional macroeconomic variables such as inflation, exchange rates, money supply, public debt, and economic growth to provide a more comprehensive understanding of interest rate dynamics in Zimbabwe. Since interest rates are influenced by multiple interacting factors, broader models may yield deeper policy insights.

Researchers could also explore nonlinear and asymmetric relationships between FDI and interest rates using advanced econometric techniques such as Threshold ARDL, Nonlinear ARDL (NARDL), or Vector Error Correction Models (VECM). Such approaches may better capture structural breaks, policy regime shifts, and asymmetric responses in financially unstable economies.

In addition, future research may conduct comparative studies across multiple African economies in order to assess whether the Zimbabwean experience differs from other developing countries with similar macroeconomic characteristics. Sectoral studies examining the effects of FDI across manufacturing, mining, agriculture, and services sectors would also provide more detailed insights into the channels through which foreign investment affects financial markets.

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APPENDICES

Appendix 1: Descriptive statistics

	Real interest rate (%)	Foreign direct investment, net inflows (% of GDP)
Mean	36.77122	1.332804
Median	27.96592	1.25806
Maximum	89.90806	2.461183
Minimum	-4.062969	0.444901
Std. Dev.	33.01618	0.654357
Skewness	0.320968	0.104814
Kurtosis	1.47621	1.572157
Jarque-Bera	17.77112	13.53742
Probability	0.000138	0.001149
Sum	5736.31	207.9173
Sum Sq. Dev.	168960.6	66.36836
Observations	156	156

Appendix 2: Unit root test, Real interest rate (in Level)

Null Hypothesis: INTEREST_RATE has a unit root
Exogenous: None
Lag Length: 13 (Automatic - based on SIC, maxlag=13)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.511792	0.8250
Test critical values:	1% level	-2.581349	
	5% level	-1.943090	
	10% level	-1.615220	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INTEREST_RATE)
Method: Least Squares
Date: 05/01/26 Time: 18:35
Sample (adjusted): 2013M03 2024M12
Included observations: 142 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INTEREST_RATE(-1)	0.004822	0.009423	0.511792	0.6097
D(INTEREST_RATE(-1))	0.266820	0.087688	3.042822	0.0028
D(INTEREST_RATE(-2))	0.088398	0.065741	1.344637	0.1811
D(INTEREST_RATE(-3))	0.066136	0.066204	0.998972	0.3197
D(INTEREST_RATE(-4))	0.049254	0.066462	0.741079	0.4600
D(INTEREST_RATE(-5))	0.036602	0.066605	0.549533	0.5836
D(INTEREST_RATE(-6))	0.027293	0.066682	0.409305	0.6830
D(INTEREST_RATE(-7))	0.020654	0.066718	0.309571	0.7574
D(INTEREST_RATE(-8))	0.016181	0.066724	0.242514	0.8088
D(INTEREST_RATE(-9))	0.013514	0.066695	0.202623	0.8398
D(INTEREST_RATE(-10))	0.012409	0.066615	0.186282	0.8525
D(INTEREST_RATE(-11))	0.012727	0.066444	0.191549	0.8484
D(INTEREST_RATE(-12))	-0.695364	0.066110	-10.51824	0.0000
D(INTEREST_RATE(-13))	0.210344	0.087472	2.404689	0.0176

R-squared	0.542181	Mean dependent var	0.628975

Adjusted R-squared	0.495684	S.D. dependent var	6.706151
S.E. of regression	4.762387	Akaike info criterion	6.052761
Sum squared resid	2903.082	Schwarz criterion	6.344181
Log likelihood	-415.7461	Hannan-Quinn criter.	6.171182
Durbin-Watson stat	2.055979		

Appendix 3: Unit root test, Real interest rate (in First difference)

Null Hypothesis: D(INTEREST_RATE) has a unit root
Exogenous: None
Lag Length: 12 (Automatic - based on SIC, maxlag=13)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.210903	0.0000
Test critical values:	1% level	-2.581349	
	5% level	-1.943090	
	10% level	-1.615220	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INTEREST_RATE,2)
Method: Least Squares
Date: 05/01/26 Time: 18:35
Sample (adjusted): 2013M03 2024M12
Included observations: 142 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INTEREST_RATE(-1))	-0.825047	0.158331	-5.210903	0.0000
D(INTEREST_RATE(-1),2)	0.100195	0.129918	0.771218	0.4420
D(INTEREST_RATE(-2),2)	0.191292	0.126464	1.512622	0.1328
D(INTEREST_RATE(-3),2)	0.260054	0.123376	2.107814	0.0370
D(INTEREST_RATE(-4),2)	0.311902	0.120826	2.581419	0.0110
D(INTEREST_RATE(-5),2)	0.351108	0.118765	2.956324	0.0037
D(INTEREST_RATE(-6),2)	0.381058	0.117012	3.256573	0.0014
D(INTEREST_RATE(-7),2)	0.404472	0.115292	3.508239	0.0006
D(INTEREST_RATE(-8),2)	0.423574	0.113238	3.740564	0.0003
D(INTEREST_RATE(-9),2)	0.440240	0.110348	3.989557	0.0001
D(INTEREST_RATE(-10),2)	0.456125	0.105875	4.308132	0.0000
D(INTEREST_RATE(-11),2)	0.472764	0.098561	4.796666	0.0000
D(INTEREST_RATE(-12),2)	-0.218103	0.085902	-2.538977	0.0123

R-squared	0.680423	Mean dependent var	0.005852
Adjusted R-squared	0.650695	S.D. dependent var	8.034824
S.E. of regression	4.748744	Akaike info criterion	6.040721
Sum squared resid	2909.023	Schwarz criterion	6.311325
Log likelihood	-415.8912	Hannan-Quinn criter.	6.150684
Durbin-Watson stat	2.060890		

Appendix 4: Unit root test, Foreign Direct Investment (in Level)

Null Hypothesis: FOREIGN_DIRECT_INVESTMENT has a unit root
Exogenous: None
Lag Length: 13 (Automatic - based on SIC, maxlag=13)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.367891	0.1585
Test critical values:	1% level	-2.581349	
	5% level	-1.943090	
	10% level	-1.615220	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FOREIGN_DIRECT_INVESTMENT)
Method: Least Squares
Date: 05/01/26 Time: 18:36
Sample (adjusted): 2013M03 2024M12
Included observations: 142 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FOREIGN_DIRECT_INVESTMENT(-1)	-0.005181	0.003787	-1.367891	0.1737
D(FOREIGN_DIRECT_INVESTMENT(-1))	0.344576	0.085570	4.026842	0.0001
D(FOREIGN_DIRECT_INVESTMENT(-2))	0.133526	0.071692	1.862495	0.0648
D(FOREIGN_DIRECT_INVESTMENT(-3))	0.099965	0.072648	1.376020	0.1712
D(FOREIGN_DIRECT_INVESTMENT(-4))	0.074711	0.073165	1.021121	0.3091
D(FOREIGN_DIRECT_INVESTMENT(-5))	0.055960	0.073437	0.762014	0.4475
D(FOREIGN_DIRECT_INVESTMENT(-6))	0.042331	0.073569	0.575395	0.5660
D(FOREIGN_DIRECT_INVESTMENT(-7))	0.032776	0.073612	0.445256	0.6569
D(FOREIGN_DIRECT_INVESTMENT(-8))	0.026521	0.073586	0.360408	0.7191
D(FOREIGN_DIRECT_INVESTMENT(-9))	0.023015	0.073483	0.313203	0.7546
D(FOREIGN_DIRECT_INVESTMENT(-10))	0.021897	0.073266	0.298867	0.7655
D(FOREIGN_DIRECT_INVESTMENT(-11))	0.022970	0.072859	0.315263	0.7531
D(FOREIGN_DIRECT_INVESTMENT(-12))	-0.629898	0.072118	-8.734263	0.0000
D(FOREIGN_DIRECT_INVESTMENT(-13))	0.254319	0.086766	2.931078	0.0040

R-squared	0.536592	Mean dependent var	-0.010227
Adjusted R-squared	0.489527	S.D. dependent var	0.089140
S.E. of regression	0.063688	Akaike info criterion	-2.576258
Sum squared resid	0.519187	Schwarz criterion	-2.284838
Log likelihood	196.9143	Hannan-Quinn criter.	-2.457837
Durbin-Watson stat	2.070005		

Appendix 5: Unit root test, Foreign Direct Investment (in First difference)

Null Hypothesis: D(FOREIGN_DIRECT_INVESTMENT) has a unit root
Exogenous: None
Lag Length: 12 (Automatic - based on SIC, maxlag=13)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.679914	0.0003
Test critical values:	1% level	-2.581349	
	5% level	-1.943090	
	10% level	-1.615220	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FOREIGN_DIRECT_INVESTMENT,2)
Method: Least Squares
Date: 05/01/26 Time: 18:37
Sample (adjusted): 2013M03 2024M12
Included observations: 142 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FOREIGN_DIRECT_INVESTMENT(-1))	-0.500164	0.135917	-3.679914	0.0003
D(FOREIGN_DIRECT_INVESTMENT(-1),2)	-0.144913	0.123697	-1.171522	0.2435
D(FOREIGN_DIRECT_INVESTMENT(-2),2)	-0.009036	0.123791	-0.072998	0.9419
D(FOREIGN_DIRECT_INVESTMENT(-3),2)	0.091358	0.122604	0.745146	0.4575
D(FOREIGN_DIRECT_INVESTMENT(-4),2)	0.165103	0.121143	1.362880	0.1753
D(FOREIGN_DIRECT_INVESTMENT(-5),2)	0.219106	0.119775	1.829320	0.0697
D(FOREIGN_DIRECT_INVESTMENT(-6),2)	0.258803	0.118526	2.183503	0.0308
D(FOREIGN_DIRECT_INVESTMENT(-7),2)	0.288512	0.117220	2.461285	0.0152
D(FOREIGN_DIRECT_INVESTMENT(-8),2)	0.311734	0.115523	2.698451	0.0079
D(FOREIGN_DIRECT_INVESTMENT(-9),2)	0.331387	0.112917	2.934789	0.0040
D(FOREIGN_DIRECT_INVESTMENT(-10),2)	0.350016	0.108562	3.224121	0.0016
D(FOREIGN_DIRECT_INVESTMENT(-11),2)	0.369968	0.100947	3.664968	0.0004
D(FOREIGN_DIRECT_INVESTMENT(-12),2)	-0.262528	0.086850	-3.022767	0.0030

R-squared	0.603865	Mean dependent var	-0.001070
Adjusted R-squared	0.567016	S.D. dependent var	0.097114
S.E. of regression	0.063903	Akaike info criterion	-2.575830
Sum squared resid	0.526777	Schwarz criterion	-2.305226
Log likelihood	195.8839	Hannan-Quinn criter.	-2.465867
Durbin-Watson stat	2.073320		

Appendix 6: Results of the ARDL model

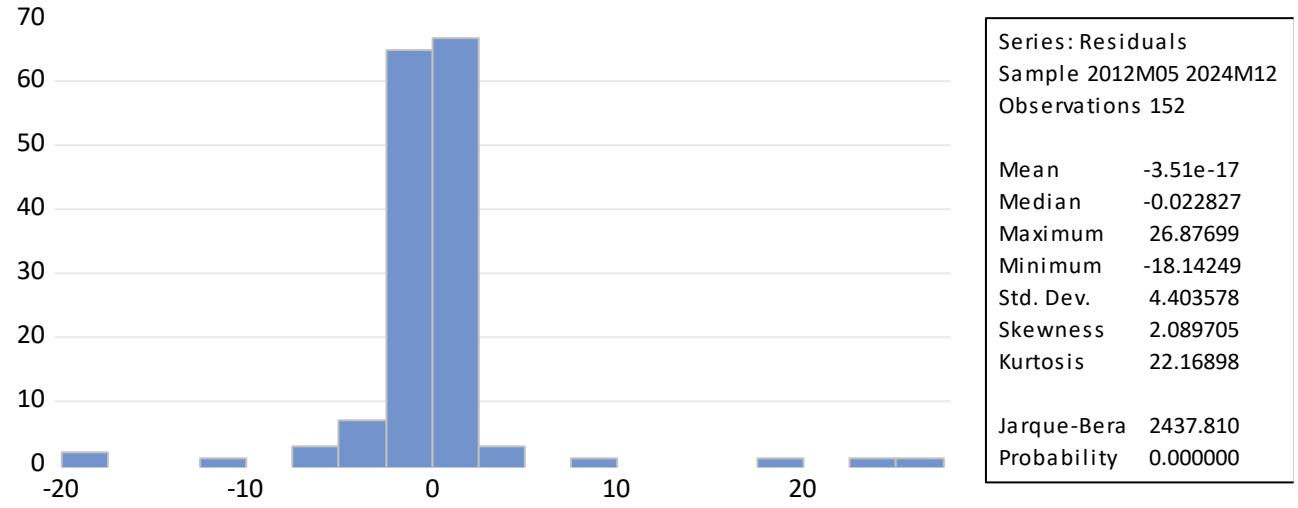
Dependent Variable: D(INTEREST_RATE)
Method: ARDL
Date: 05/01/26 Time: 18:47
Sample: 2012M05 2024M12
Included observations: 152
Dependent lags: 4 (Automatic)
Automatic-lag linear regressors (4 max. lags): D(FOREIGN_DIRECT_INVE
STMENT)
Deterministics: Restricted constant and no trend (Case 2)
Model selection method: Akaike info criterion (AIC)
Number of models evaluated: 20
Selected model: ARDL(3,3)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
D(INTEREST_RATE(-1))	0.266965	0.082373	3.240914	0.0015
D(INTEREST_RATE(-2))	0.204316	0.083578	2.444615	0.0157
D(INTEREST_RATE(-3))	0.157370	0.082217	1.914072	0.0576
D(FOREIGN_DIRECT_INVESTMENT)	-55.43640	4.877374	-11.36603	0.0000
D(FOREIGN_DIRECT_INVESTMENT(-1))	18.48439	6.795069	2.720265	0.0073
D(FOREIGN_DIRECT_INVESTMENT(-2))	14.70683	6.894651	2.133078	0.0346
D(FOREIGN_DIRECT_INVESTMENT(-3))	12.11123	6.770316	1.788873	0.0757
C	0.041214	0.370759	0.111160	0.9116

R-squared	0.540055	Mean dependent var	0.523427
Adjusted R-squared	0.517696	S.D. dependent var	6.493107
S.E. of regression	4.509339	Akaike info criterion	5.901374
Sum squared resid	2928.116	Schwarz criterion	6.060526
Log likelihood	-440.5045	Hannan-Quinn criter.	5.966027
F-statistic	24.15438	Durbin-Watson stat	2.030890
Prob(F-statistic)	0.000000		

*Note: p-values and any subsequent test results do not account for model selection.

Appendix 7: Normality of Residuals



Appendix 8: Heteroskedasticity test

Heteroskedasticity Test: Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

F-statistic	3.032364	Prob. F(7,144)	0.0053
Obs*R-squared	19.52734	Prob. Chi-Square(7)	0.0067
Scaled explained SS	185.5030	Prob. Chi-Square(7)	0.0000

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 05/01/26 Time: 18:51
Sample (adjusted): 2012M05 2024M12
Included observations: 152 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	22.30974	6.989646	3.191827	0.0017
D(INTEREST_RATE(-1))	0.768671	1.552926	0.494982	0.6214
D(INTEREST_RATE(-2))	0.478758	1.575632	0.303851	0.7617
D(INTEREST_RATE(-3))	0.305539	1.549985	0.197124	0.8440
D(FOREIGN_DIRECT_INVESTMENT)	387.2762	91.94958	4.211833	0.0000
D(FOREIGN_DIRECT_INVESTMENT(-1))	-9.547907	128.1025	-0.074533	0.9407
D(FOREIGN_DIRECT_INVESTMENT(-2))	-16.84993	129.9798	-0.129635	0.8970
D(FOREIGN_DIRECT_INVESTMENT(-3))	-17.55879	127.6358	-0.137569	0.8908

R-squared	0.128469	Mean dependent var	19.26392
Adjusted R-squared	0.086103	S.D. dependent var	88.92586
S.E. of regression	85.01129	Akaike info criterion	11.77464
Sum squared resid	1040676.	Schwarz criterion	11.93379
Log likelihood	-886.8727	Hannan-Quinn criter.	11.83929
F-statistic	3.032364	Durbin-Watson stat	2.044381
Prob(F-statistic)	0.005278		

Appendix 9: Serial Correlation LM Test

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

F-statistic	0.860226	Prob. F(2,142)	0.4253
Obs*R-squared	1.819564	Prob. Chi-Square(2)	0.4026

Test Equation:
Dependent Variable: RESID
Method: ARDL
Date: 05/01/26 Time: 18:52
Sample (adjusted): 2012M05 2024M12
Included observations: 152 after adjustments
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INTEREST_RATE(-1))	0.131628	0.919526	0.143148	0.8864
D(INTEREST_RATE(-2))	0.215676	0.713783	0.302159	0.7630
D(INTEREST_RATE(-3))	-0.142681	0.149353	-0.955327	0.3410
D(FOREIGN_DIRECT_INVESTMENT)	-0.142465	4.883928	-0.029170	0.9768
D(FOREIGN_DIRECT_INVESTMENT(-1))	6.939410	51.15030	0.135667	0.8923
D(FOREIGN_DIRECT_INVESTMENT(-2))	10.84552	42.96270	0.252440	0.8011
D(FOREIGN_DIRECT_INVESTMENT(-3))	-10.25289	11.39501	-0.899770	0.3698
C	-0.013771	0.371771	-0.037041	0.9705
RESID(-1)	-0.152542	0.916289	-0.166478	0.8680

RESID(-2)	-0.283698	0.499162	-0.568349	0.5707

R-squared	0.011971	Mean dependent var	-3.51E-17
Adjusted R-squared	-0.050651	S.D. dependent var	4.403578
S.E. of regression	4.513723	Akaike info criterion	5.915647
Sum squared resid	2893.065	Schwarz criterion	6.114587
Log likelihood	-439.5892	Hannan-Quinn criter.	5.996463
F-statistic	0.191161	Durbin-Watson stat	1.999474
Prob(F-statistic)	0.994811		