The Debt Conundrum and Monetary Policy Implications on Exchange Rate In South Africa

Molele, SB
North West University, South Africa
&
Mashishi NP
University of Limpopo, South Africa

Abstract

The relentless dance of South Africa's exchange rate performance and rising external debt calls for an in-depth examination of their intertwined dynamics, considering monetary policy implications. The country's significant external debt burden increased the risk of currency depreciation, inflationary pressures and economic uncertainty, posing major challenges for market participants, and hindering foreign investment. This study investigated the relationship between external debt, domestic and global interest rates, and inflation on the exchange rate in the context of South Africa for the period 1992 to 2023. The study employed a quantitative methodology utilizing the Autoregressive Distributed Lag (ARDL) model to account for the relationships. Additionally, short-run causality and dynamic shock analysis were utilized. The results indicated that high external debt levels significantly depreciated the exchange rate, a phenomenon intensified by rising domestic interest rates and inflation, while fluctuations in the global interest rates add further to the movement of the Rand. The external debt, inflation and domestic interest rates had a positive and significant effect on the exchange rate in the long run. Moreover, external debt and global interest rate had a positive and significant short run effects on exchange rate. Additionally, when all variables were combined, a short-run causality existed. Furthermore, only external debt and global interest rates had a short-run causality effect on exchange rates. Moreover, shocks in external debt and inflation led to depreciation, and the domestic and global interest rate had a positive shock effect on exchange rate. The findings highlighted the critical need for effective external debt management and sound monetary policies to maintain exchange rate stability in South Africa. The Rand fluctuations have a sound impact on international financial markets, affects investor sentiment, capital flows, and currency valuations in other countries. As South Africa serves as a case study for many emerging African economies.

Keywords: Exchange Rate, External Debt, Inflation rate, Interest rates, South Africa.

INTRODUCTION

In the realm of economic policy, the interplay between debt dynamics and monetary policy decisions holds significant implications, particularly on foreign exchange rates (Carstens, 2019). This relationship underscores how changes in monetary policy, such as interest rate adjustments, can affect investor perceptions of a country's debt sustainability and fiscal health, consequently influencing exchange rate movements. Central banks' efforts to manage debt levels through monetary policy tools are crucial in shaping exchange rate dynamics (Saliya, 2023). The

confluence of factors, often referred to as the "debt conundrum" underscores the intricate relationship between fiscal responsibility, monetary policy effectiveness, and exchange rate dynamics (Sciortino, 2024). Exchange rate pressures stem from both global and domestic factors. For instance, the US federal reserve policy stunts on its interest rates action have a bearing on other emerging countries like South Africa (Padayachee, 2019). As the exchange rate plays a pivotal role in shaping the economic landscape, it also presents of challenges for policymakers and market participants (Ntinda, 2023). The South African Rand depreciated significantly over the last thirty years, which can be partly explained by the country's current account deficit. In 1994 the Rand was trading at R3.61 to the US Dollar, and 29 years later, it weakened to R18.40 to the greenback (Greyling, 2023).

The South African Rand was marked by considerable depreciation from 2013 to 2022, influenced by domestic economic challenges like power shortages, political uncertainty, weak economic growth, and global economic stress, notably during the 2020 COVID-19 pandemic. The persistent volatility of the South African Rand (ZAR) has been a critical issue, hindering foreign investment and economic growth (Bishop, 2024). Economic instability and inflation have made it harder to lift people out of poverty, and increasing inequality, making it difficult to achieve inclusive growth. Pillah and Djebah (2024) explained the real problem to be within devising a coherent and effective policy framework that addresses the interconnected challenges of debt sustainability, monetary policy effectiveness, and exchange rate stability. Failure to address these issues holistically could exacerbate South Africa's economic vulnerabilities. The article structure follows as such: Theoretical and empirical stands, methodology, results, and conclude accordingly.

The aim was to investigate the impact of debt and monetary policy implications of interest rates from both domestic and global, and inflation on South Africa's exchange rate from 1992 to 2023. To achieve this aim, several research objectives were pursued: (1) to analyse the relationship between external debt and exchange rates; (2) to examine how inflation, domestic interest rates, and an externally, global interest rates affect exchange rates; (3) to determine any causal relationships among exchange rates, external debt, and monetary policy variables; (4) to assess how sensitive exchange rates is to shocks in these areas; (5) to suggest policy recommendations for maintaining the exchange rate stability. This introductory section gave an overview of the research framework. The subsequent sections include literature review to assess the theoretical and empirical perspective. This is followed by the research methods and subsequently relate the results before concluding accordingly and provide policy recommendations.

LITERATURE REVIEW

The investigation of the relationship between variables used in this study calls a scrutiny of several theories and empirical literature which are relevant.

Theoretical framework

This section presents the theories under exchange rate theory that support the relationship between exchange rate, external debt, inflation, domestic and global interest rate. According to Chu and Hemming (1991), Interest Rate Parity (IRP) theory indicates that exchange rates adjust to equalize returns on assets in different currencies. External debt affects exchange rates by influencing interest rate differentials between countries. This aligns well with the Monetary approach to exchange rate theory on the role of monetary policy in determining exchange rates. High levels of external debt may prompt central banks to adopt tighter monetary policies to contain inflationary pressures, leading to higher domestic interest rates and currency appreciation (Frenkel, 2019; Davis, 2017).

Building on this foundation, Portfolio Balance Theory suggests that as a country accumulates external debt, it increases the supply of its bonds denominated in its currency. This can lead to a decrease in bond prices and an increase in yields, attracting foreign investors who need domestic currency to purchase these bonds, thereby leading to currency appreciation (Bossone, 2022). Msomi *et al*. (2024) proceeds with the Interest Rate and Inflation Differentials theory which suggests that changes in domestic interest rates resulting from monetary policy decisions can affect exchange rates. Higher interest rates tend to attract foreign investment, leading to increased demand for the domestic currency and appreciation.

Empirical literature

On the empirical front about the relationship between external debt levels and exchange rates has been extensively researched in international finance, with empirical studies consistently demonstrating that higher external debt tends to exert downward pressure on a country's exchange rate (Zhou, 2021; Dawood *et al*., 2021; Garcia & Martenez, 2020). These studies were in the context of emerging economies and developing countries like Brazil, Turkey, India and Asian nations. Transitioning to the interplay between domestic and global real interest rates and inflation, Geerolf (2020) found an inverse relationship between inflation and exchange rates from 1995 to 2018 using FAVAR models. Moreover, Kunofiwa and Ndou (2022) demonstrated that increases in domestic real interest rates lead to an appreciation of the South African Rand.

Exploring the causal relationships among these variables provides deeper insights into economic dynamics. Aprilia *et al*. (2024) revealed that higher external debt levels cause currency depreciation from 2008 to 2021 using a Markov regime switching model. Additional studies employing Granger causality tests confirm bidirectional causality between exchange rates and inflation while establishing that increased external debt levels lead to currency depreciation over various time frames (Lim *et al*., 2017; Murwirapachena *et al*., 2015). Finally, the sensitivity of exchange rates to economic shocks is critical for understanding a country's competitiveness in the global market. Research indicated that exchange rates are highly responsive to shocks in debt levels, domestic and global interest rates, and inflation (Buthelezi, 2024; Glenbocki *et al*., 2024).

Ndou (2022) utilized Johansen cointegration and Engle-Granger approaches and highlighted that the South African Rand is particularly sensitive to changes in domestic interest rates and inflation; however, it also reacts strongly to shifts in global real interest rates.

RESEARCH METHODOLOGY

Data and Model Specification

Building on the insights gained from the literature review, the methodology section outlines the quantitative approach employed to analyse the relationship between exchange rates and various economic factors, utilizing annual time series data from 1992 to 2023.

Where, is a constant, is the proxy for official exchange rate as a percentage (LCU per US$, period average), represents natural logarithm of external debt, is the Inflation rate as annual percentage (Consumer price Index), stands for global interest rate (United States real interest rate), represents the domestic interest rate (South African real interest rate), are estimation parameters, is the stochastic the error term and t stands for the Period (1992-2023).

EMPERICAL RESULTS AND DISCUSSIONS

Following the methodology, this section presents and discusses the results of data analysis from the adopted methodology.

Correlation analysis

Table 1 shows a strong positive correlation between exchange rate and external debt, and weak negative correlations with inflation and domestic interest rates. Global interest rates show a moderate negative correlation with the exchange rate. The strongest correlations among the variables is between external debt and global interest rates (-0.689916), and between domestic and global interest rates (0.696283), suggesting that multicollinearity is not an issue.

Table 1: Correlation analysis

	EXR	LExt debt	Inf	Domestic i	Global i
EXR	1				
Ext debt	0,908753	1			
INF	-0,331106	-0,551951	1		
Domestic i	-0,361383	-0,389065	0,104404	1	
Global i	-0,609878	-0,689916	0,303718	0,696283	1

**Source: The author's compilation using E-views 12 SV (x64).*

Unit root Results

The formal tests, ADF and PP, providing a rigorous statistical framework for assessing the presence of unit roots are related below in table 2.

Table 2: ADF and PP results

Series	Model	ADF	PP	Conclusion
		T-Stats		
EXR	Constant	0,165336	0,701780	Non-stationary
(EXR)	Constant	-4,686027*	-4,606458*	Stationary
DEBT	Constant	-3,147145**	-2,903756***	Stationary
(DEBT)	Constant	-4,459895*	-4,695509*	
INF	Constant	-3,577436**	-4,977647*	Stationary
(INF)	Constant	-5,790962*	-9,288371*	
DOMESTIC I	Constant	-2,524760	-2,581474	Non-stationary
(DOMESTIC I)	Constant	-6, 000796*	-6,215784*	Stationary
GLOBAL I	Constant	-1,588874	-1,588874	Non-stationary
(GLOBAL I)	Constant	-5,094857*	-5,081184*	Stationary

Note: **rejection of the null hypotheses denoted by *, ** and *** represent significance at 1%, 5% or 10%**

Source: The author's compilation using E-views 12 SV (x64).

The results on table 2 indicate that external debt and inflation are stationary at level I (0), and exchange rate, domestic and global interest rates are stationary at 1st difference or order I (1). Thus, called for the Autoregressive Distributed Lag (ARDL), as it accommodates variables integrated at different orders.

Optimal lag selection

The next procedure, the lag selection mechanism is employed to identify the appropriate number of lags to include in the model.

Table 3: Lag selection criterion

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-249,4789	NA	16,0546	16,9652	17,1988	17,0399
1	-143,7667	169,1395	0,07595	11,5845	12,9857*	12,0327
2	-102,9834	51,6588*	0,03084*	10,5322*	13,1011	11,3540*

Source: The author's compilation using E-views 12 SV (x64).

Table 3 shows lag selection results. The Hannan-Quinn Criterion (HQC) is consistent and reliable, especially with large samples. HQC adjusts for sample size, improving model accuracy (Claeskens & Hjort, 2008). Thus, two lags are chosen based on HQC.

Cointegration Bounds Test Results

The next procedure prior to estimation is the bound cointegration test used to determine whether a long-run equilibrium relationship exists among the integrated variables.

Table 4: Cointegration-bound test

Critical value bounds		F-stats = 7,598739	
		No of independent variables k=5	
Significance	Lower bounds I (0)	Significance	Upper bounds I (1)
10%	2,2	10%	3,09
5%	2,56	5%	3,49
2,5%	2,88	2,5%	3,87
1%	3,29	1%	4,37

Source: The author's compilation using E-views 12 SV (x64).

In reference to table 4, the calculated F-stat is 7.598739 which is greater than the upper bound critical value of 4.37 at 1% level of significance. The results shows that there is cointegration between the variables exchange rate, external debt, inflation, domestic and global interest rates.

ARDL Long-run results

Table 5 presents the long-run relationships established. This mechanism provides insights into the equilibrium relationships among the variables and serves as a basis for further analysis addressing the first objective**.**

Table 5: Long-run coefficients

Variable	Coefficient	Std. error	T-stat	P-value
Ext debt	12,44366	1,9821	6,2777	0,0000
INF	0,855339	0,4450	1,9217	0,0608
Domestic i	1,164683	0,4584	2,5403	0,0200
Global i	-0,982453	0,7494	-1,3108	0,2055
C.	-61,11687	12,205	-5,0071	0,001

*Source: The author's compilation using E-views 12 SV (x64).

The findings from Table 5 reveal that both external debt and inflation have a positive and significant impact on the exchange rate, meaning increases in these variables lead to currency depreciation. A 1 unit rise in external debt raises the exchange rate by about 12.44 units, reflecting investor concerns over debt sustainability, supported by Zhou (2021). Similarly, a 1 unit increase in inflation leads to a 0.86 unit increase in the exchange rate, as high inflation reduces purchasing power and investor confidence, aligning with the Interest Rate and Inflation Differentials theory and findings by Geerolf (2020). These relationships suggest that rising debt and inflation can intensify exchange rate volatility, potentially worsening economic instability and making monetary management more challenging.

Additionally, domestic interest rates show a positive and significant effect on the exchange rate, where a 1 unit increase leads to a 1.16 unit increase, indicating that higher domestic rates can attract foreign capital and support currency appreciation. This aligns with the Interest Rate and Inflation Differentials theory and findings by Kunofiwa *et al.* (2019). However, rising rates may also raise borrowing costs, slowing growth in a highly indebted economy. In contrast, global interest rates show a negative but statistically insignificant relationship with the exchange rate, suggesting that local factors outweigh global conditions in shaping exchange rate dynamics. This complexity emphasizes the importance of carefully balancing domestic monetary policies to achieve currency and economic stability.

Short-run and ECM Results

The short-run coefficients and ECM analyse the short-run dynamics and describes how deviations from the long-run equilibrium are corrected over time. This mechanism helps researchers understand the immediate effects of changes in the independent variables on the dependent variable.

Table 6: ECM and short-run coefficients

Variable	Coefficient	Std. error	T-stats	P-value
D(Ext Debt)	10.5929	1.5215	6,9620	0,0000
D(Domestic i)	-0,0190	0,0498	-0,3821	0,7066
D(Global i)	0,1871	0,0886	62,112	0,0481
CointEq(-1)*	-0,2997	0,0394	-7,588	0,0000
R-squared	0,808001			
Adjusted R-squared	0,768001			
F-stats	7,598739			
Prob (F-stats)	0.0000			
Durbin- Watson Stat	2,442337			

**Source: The author's compilation using E-views 12 SV (x64).*

The short-run results in Table 6 reveal a positive and statistically significant relationship between external debt and the exchange rate, where a unit increase in external debt raises the exchange rate by approximately 10.59 units, consistent with long-run findings. In contrast, the domestic interest rate has a negative but statistically insignificant effect on the exchange rate, indicating that short-run changes in interest rates do not meaningfully influence currency value. This deviates from conventional theory, which suggests higher interest rates should attract capital and appreciate the currency. The insignificance highlights the limited short-run effectiveness of domestic monetary policy in managing exchange rate fluctuations and points to other factors playing a stronger role in exchange rate dynamics.

On the other hand, global interest rates exhibit a positive and significant short-run impact on the exchange rate, where a unit increase leads to a 0.187-unit rise, suggesting capital outflows and currency depreciation as investors seek higher global returns. This aligns with interest rate parity theory and underscores the vulnerability of the domestic exchange rate to external financial conditions. The error correction mechanism (ECM) is negative and statistically significant, with a

coefficient of -0.299744, indicating that roughly 30% of disequilibrium is corrected each period, confirming the model's capacity to revert to long-run equilibrium. The high R^2 (80.8%) reflects strong model fit, though the adjusted R^2 and signs of overfitting advise cautious interpretation. Still, the F-statistic and Durbin-Watson test support the model's overall validity.

Wald Test Results

The Wald test assesses short-run causality between variables, providing insights into the immediate effects of shocks or policy changes on economic indicators. This mechanism is particularly useful for understanding the dynamic relationships between variables and guides the selection of appropriate policy interventions.

Table 7: Short-run causality under ARDL

Variables	P-value	Decision rule
All the variables	0,0000	Existence of short-run causality
External debt and exchange rate	0,0000	Existence of short-run causality
Inflation and exchange rate	0,5951	Absence of short-run causality
Domestic real interest rate and exchange rate	0,1229	Absence of short-run causality
Global real interest rate and exchange rate	0,0000	Existence of short-run causality

**Source: The author's compilation using E-views 13 (x64).*

Table 7 results indicate the existence of short-run causality for all variables when all variables are combined. The combined effect of these variables suggests that they interact dynamically, creating a complex web of influences that can rapidly alter currency values. Separately, the results revealed that short-term fluctuations in external debt and global interest rates have a significant impact on exchange rates and currency stability, aligning with Interest Rate Parity theory. Specifically, an increase in external debt can lead to a depreciation of the currency as investors become wary of potential repayment difficulties, signalling heightened risk. Similarly, a rise in global interest rates can also cause currency depreciation, particularly in emerging markets, as investors shift their capital towards higher-yielding assets.

Dynamics Shocks Response Results

The dynamic shocks examined how exchange rate respond over time to unexpected changes or shocks in the system. This mechanism provides insights into the resilience of the currency and helps researchers anticipate potential challenges and opportunities.

Figure 1: Dynamics shocks

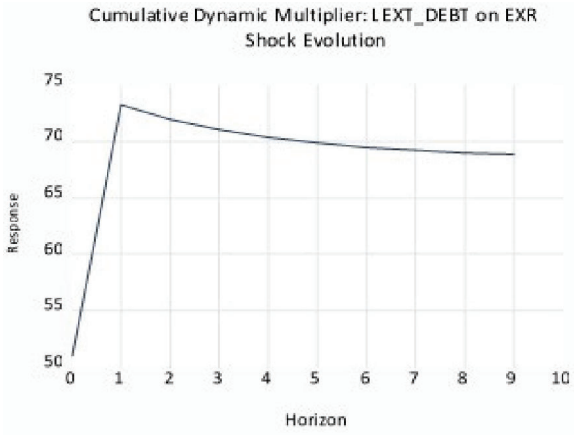
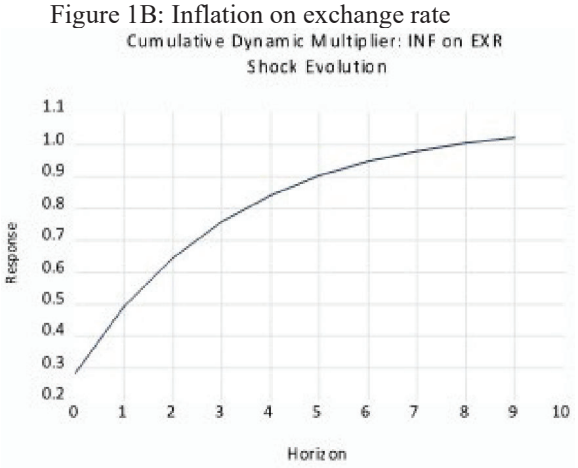


Figure 1A: External debt on exchange rate

Figure 1B: Inflation on exchange rate



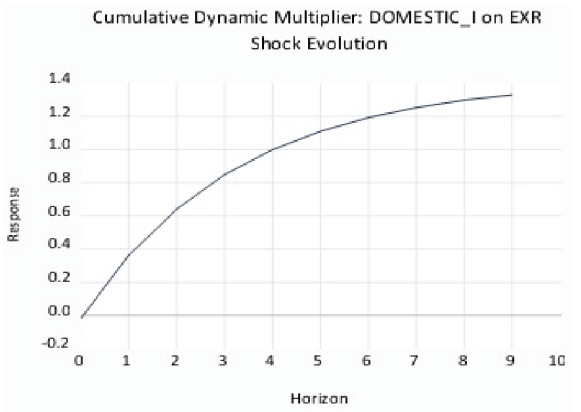


Figure 1C: Domestic interest rate on exchange rate

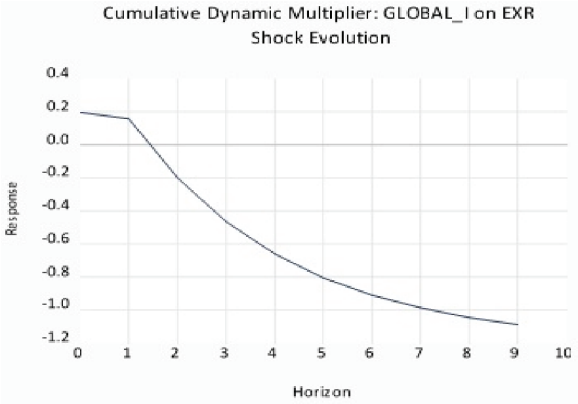


Figure 1D: Global interest rate on exchange rate

**Source: The author's compilation using E-views 13 (x64).*

Figure 1 shows that figure 1A, 1B, and 1C show a positive response of exchange rate to the shock dynamics in external dent, inflation and domestic interest rate, respectively, whereas figure 1D indicates a negative response of the exchange rate to the global interest rate shocks. The results in figure 1A indicate that external debt significantly influence currency depreciation. Specifically, increases in external debt are associated with immediate depreciation, followed by a potential stabilization phase. This suggests that while external debt pressures the exchange rate downward, there may be a subsequent adjustment period where the effects stabilize.

Additionally, figure 1B indicate that inflation significantly contribute to the currency depreciation, highlighting the interconnectedness of these economic factors. Moreover, the domestic real interest rate exerts a positive shock effect on the exchange rate, in line according to Inflation Differentials theory. This implies that when domestic interest rates rise, it may lead to an appreciation of the local currency, as higher rates can attract foreign capital, increasing

demand for the currency. Furthermore, 1D shows a negative response of the exchange rate to the global interest rate.

Diagnostic and Stability Tests Results

The diagnostic tests validate the assumptions of the model, ensuring the reliability of the results and improving the accuracy of forecasts. This mechanism involves a series of tests that assess the properties of the residuals, such as autocorrelation, heteroscedasticity, and normality.

Table 8: Diagnostic and stability testing

Test	Null hypothesis	P-Value	Conclusion
Jarque-Bera	Residuals are normally distributed	0,961279	Do not reject H0, PV > 0,05
LM	No serial correlation	0.2333	Do not reject H0, PV > 0,05
Breusch-Pagan-Godfrey	No heteroskedasticity	0,5944	Do not reject H0, PV > 0,05
Harvey	No heteroskedasticity	0,1954	Do not reject H0, PV > 0,05
Ramsey-RESET	No misspecification	0,3582	Do not reject H0, PV > 0,05

**Source: The author's compilation using E-views 12 SV (x64).*

Table 8 shows the summary of diagnostic and stability tests estimated. The results indicate that the estimated results passed the diagnostic and stability testing as all P-values are above the 0.05 level of significance. Implying that the model is not violated. Evidenced by the CUSUM and CUSUM of Squares show that the model is stable as the blue line(s) lies within the 0.05 critical line(s) in figure 2E and 2F.

Figure 2E: CUSUM

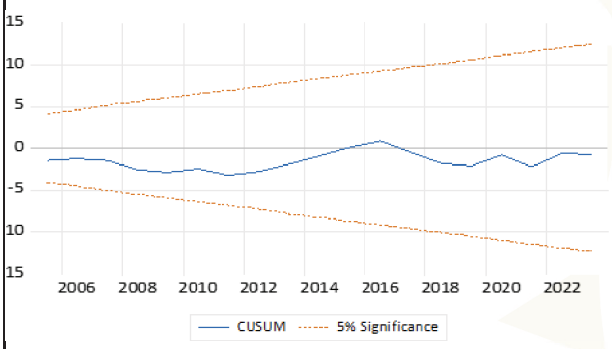
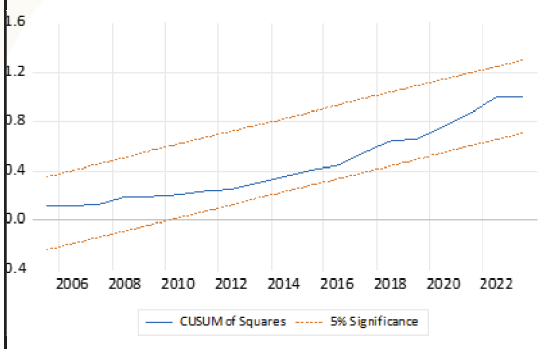


Figure 2F: CUSUM of Squares



CONCLUSION

The aim of this study was to investigate the impact of the debt conundrum and monetary policy implications on the exchange rate in South Africa from 1992 to 2023. The findings revealed that external debt and inflation have a significant depreciating effect on the domestic currency, both in the short and long run. High levels of external debt raise investor concerns about a country's ability to repay, prompting capital flight and increased demand for foreign currency. Likewise, sustained inflation erodes the purchasing power of the domestic currency, leading to depreciation. The findings also show that global interest rates negatively impact exchange rates in the short run, as higher global rates attract capital away from economies with relatively lower rates. However, in the long run, domestic interest rates play a positive role by attracting foreign capital, thereby appreciating the currency. These dynamics underscore the importance of balanced fiscal and monetary policies to maintain exchange rate stability.

Furthermore, stable exchange rates are critical for reducing uncertainty in international transactions, attracting foreign direct investment, and enhancing economic growth. By maintaining predictable currency movements, countries can lower transaction costs, boost investor confidence, and improve capital allocation. Importantly, currency stability also helps control inflation, which is essential for protecting the purchasing power of low-income households and advancing inclusive development. This is crucial for achieving Sustainable Development Goals such as SDG 1 (No Poverty) and SDG 10 (Reduced Inequalities), as stable prices contribute to poverty alleviation and more equitable economic opportunities.

Recommendations

- Prudent Debt Management: Policymakers should implement sustainable borrowing practices to avoid excessive external debt that could trigger currency depreciation and financial instability.
- Effective Inflation Control: Central banks should continue to use monetary policy tools such as interest rate adjustments and open market operations to manage inflation and maintain price stability.
- Monitoring Global Interest Rates: Domestic monetary authorities should closely track global interest rate trends and prepare for their effects through measures such as building foreign exchange reserves and using financial hedging instruments.
- Interest Rate Policy Adjustments: Domestic interest rates can be adjusted strategically to manage exchange rate movements, higher rates to attract investment and stabilize the currency, and lower rates to stimulate the economy when needed.
- Strengthen Policy Frameworks: Like many emerging markets, South Africa should enhance its financial frameworks to better absorb external shocks, reinforce investor confidence, and ensure long-term economic resilience.

List of References

Aprilia, E., Hidayat, A., & Asngari, I. (2024). Causality between exchange rates, economic growth and inflation in Indonesia. *Economic Analysis*, 57(1): 36-52.

Bishop, A. (2024). Investment reforms strengthen Eskom's capacity. Available at: https://www.investec.com/en_za/focus/economy/sa-economics.html

Bossone, B. (2022). The Portfolio Theory of Inflation and Policy (in)Effectiveness: Exploring it Further and Righting the Wrongs. *Economics E-Journal*, 16(1): 257-275.

Buthelezi, E. M. (2024). Reserves' influence on South Africa's total domestic debt: evidence from GFECRA. *Cogent Economics & Finance,* 12(1): 2388837.

Carstens, A. (2019). Exchange rates and monetary policy frameworks in emerging market economies. *BIS speech*, 2 May. Lecture at the London School of Economics, London. Available at: https://www.bis.org/speeches/sp190502.htm

Chu, K. Y., & Hemming, R. (Eds.). (1991). Publuc expenditure handbook: *a Guide to Public Policy Issues in Developing Countrie*s. International Monetary Fund.

Claeskens, G. and Hjort, N.L. (2008). Model Selection and Model Averaging. *Cambridge books.*

Davis, J. S. (2017). External debt and monetary policy autonomy. *Ensayos sobre Política Económica*, 35(82): 53-63.

Dawood, M., Baidoo, S. T., & Shah, S. M. R. (2021). An empirical investigation into the determinants of external debt in Asian developing and transitioning economies. *Journal of Asian Economics*, 08(01): 253-263.

Frenkel, J. A. (2019). A monetary approach to the exchange rate: doctrinal aspects and empirical evidence. *In Flexible Exchange Rates* (pp. 68-92). Routledge.

Garcia, A., & Martinez, L. (2020). The Impact of External Debt on Exchange Rates: Evidence from Emerging Economies. *Journal of Emerging Market Studies*, 8(2): 45-62.

Geerolf, F. (2020). The phillips curve: a relation between real exchange rate growth and unemployment. *Manuscript at University of California at Los Angeles (January).*

Glebocki, H., & Saha, S. (2024). Global uncertainty and exchange rate conditions: Assessing the impact of uncertainty shocks in emerging markets and advanced economies. *Journal of International Financial Markets, Institutions and Money*, 96: 102060.

Greyling, D. (2023). How the rand plummeted since 1994. *Daily Investor*, Finance. Available at: https://dailyinvestor.com/finance/21000/how-the-rand-plummeted-since-1994/

Kunofiwa, T. & Ndou, A. (2019). Infrastructure, human capital development and economic growth in transitional countries. *Comparative Economic Research*, 22(1):33-52.

Lim, C.Y., Abdullah, H., & Azam, M. (2017). Granger causality analysis between inflation, debt and exchange rate: Evidence from Malaysia. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 7(1): 189-196.

Msomi, S., & Ngalawa, H. (2024). The Monetary Model of Exchange Rate Determination for South Africa. *Economies*, 12(8): 206.

Murwirapachena, G. & Kapingura, F.M. (2015). Determinants of external debt in South Africa: A VAR-based approach. *International Journal of Economic Policy in Emerging Economies*, 8(2): 138-152.

Ndou, E. (2022). The exchange rate passthrough to consumer price inflation in South Africa: has the inflation target band induced a structural change in the size of passthrough? *SN Business & Economics*, 2(6): 51.

Ntinda, M. (2023). The Impact of Exchange Rates on a Country's Economy. Available at: https://www.linkedin.com/pulse/impact-exchange-rates-countrys-economy-ntinda-mvula-ew8mf

Padayachee, V. (2019). Can progressive macroeconomic policy address growth and employment while reducing inequality in South Africa? *The Economic and Labour Relations Review*, 30(1): 3-21.

Pillah, P. T., & Djebah, N. E. (2024). The International Monetary Fund's Role in Promoting Economic Stability and Growth in Developing Countries: A Comprehensive Analysis. *Journal of Public Administration, Policy and Governance Research*, 2(2): 180-187.

Saliya, C. A. (2023). Impact of debt, reserves, and political stability on Sri Lanka's financial crisis. *Plos one*, 18(11): 0294455.

Scribbr (2020) 'Descriptive Statistics | Definitions, Types, Examples', Scribbr. Available at: https://www.scribbr.com/statistics/descriptive-statistics/

Sciortino, R. (2024). The US–China Rift and Its Impact on Globalisation: *Crisis, Strategy, Transitions* (Vol. 280). Brill.

Zhou, S. (2021). Macroeconomic determinants of long-term sovereign bond yields in South Africa. *Cogent Economics & Finance*, 9(1): 1929678.