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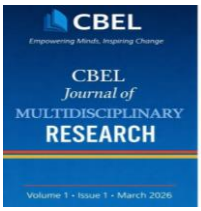

Macroeconomic Determinants of Savings in Developing Countries: An Empirical Investigation in Tanzania (1990-2025).

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Abstract
This study examines the macroeconomic determinants of gross savings in Tanzania using annual time-series observations assembled for 1990-2025 from the Bank of Tanzania, International Monetary Fund, and World Bank. The analysis combines ordinary least squares (OLS), augmented Dickey-Fuller tests, Johansen cointegration, and a vector error-correction model (VECM). All series are integrated of order one, and the Johansen trace test supports one cointegrating relationship. In the short-run VECM, none of the differenced regressors is significant at the 5% level; the error-correction coefficient is negative and marginally significant at 10% ($b = -0.381$, $p = .068$). The OLS model is jointly significant, $F(6, 28) = 23.72$, $p < .001$, with an adjusted R^2 of .800. Financial deepening is the only positive determinant significant at 5% ($b = 0.329$, $p = .016$), while the interest-rate coefficient is negative and marginal at 10% ($b = -0.534$, $p = .074$). Severe multicollinearity and a significant Ramsey RESET test, however, indicate that individual coefficients should be interpreted as exploratory rather than causal. The findings support carefully designed financial-intermediation reforms, alongside improved model specification and data documentation.

INTRODUCTION

Domestic saving is central to investment financing and macroeconomic resilience, particularly in economies where access to stable external finance is limited. Higher saving can enlarge the pool of resources available for capital formation, although saving alone is not a sufficient condition for productive investment. Cross-country evidence shows that income growth, fiscal conditions, financial development, demographic structure, and macroeconomic uncertainty can all shape saving behavior, but their effects vary across institutional settings (Elbadawi & Mwega, 2000; Loayza et al., 2000; Nagawa et al., 2020).

Tanzania provides an important case because the country has experienced substantial structural change, financial-sector reform, and periods of macroeconomic volatility. Existing Tanzanian studies reach mixed conclusions. Epaphra (2014) reports positive effects of disposable income and real GDP growth and a negative effect of inflation on national saving. Odhiambo (2008) emphasizes the dynamic connections among interest-

rate reform, financial depth, and saving, while Were and Joseph (2022) find that per capita income, public saving, and financial deepening are important long-run correlates of domestic saving. These differences suggest that results are sensitive to the saving measure, sample period, covariates, and econometric specification.

The descriptive series used in the present study displays a pronounced fall in the mid-1990s followed by a generally rising, though uneven, trajectory (Figure 1). The later increase does not remove the policy question: which macroeconomic variables are systematically associated with gross saving once time-series properties and long-run relationships are considered?.

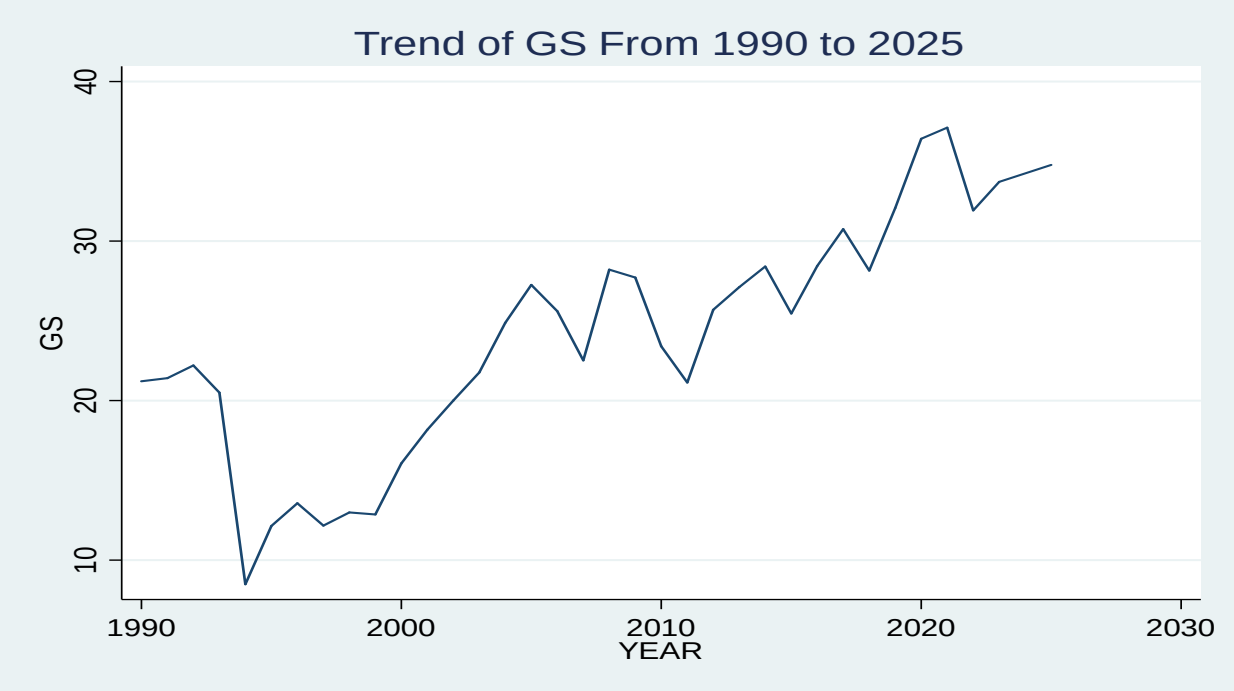

Figure 1: The Trend of Gross Savings in Tanzania, 1990-2025.

Source: World Development Indicators Data

This study therefore investigates the macroeconomic determinants of gross savings in Tanzania using an annual database assembled for 1990-2025. It makes three contributions. First, it extends the period examined in earlier Tanzania-focused research. Second, it considers income, gross fixed capital formation, financial deepening, interest rates, inflation, and the exchange rate within a common framework. Third, it reports both long-run and short-run estimates together with specification diagnostics. The study asks: which variables are associated with gross savings in the long run and short run, and how robust are those associations to the diagnostic evidence?

The analysis is deliberately associational. The small effective sample, strong collinearity among regressors, and evidence of functional-form misspecification do not support a causal interpretation. This qualification is important because policy recommendations based only on coefficient signs or a high R2 would overstate what the data can establish.

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LITERATURE REVIEW AND THEORETICAL FRAMEWORK

Theoretical perspectives

The life-cycle and permanent-income perspectives explain saving as part of consumption smoothing. Individuals and households base consumption not only on current income but also on expected lifetime resources; saving consequently responds to predictable income profiles and uncertainty (Friedman, 1957; Modigliani, 1970). At the aggregate level, this reasoning suggests that income and income growth may increase saving capacity, whereas uncertainty may either encourage precautionary saving or reduce the real return to saving. Mody et al. (2012), for example, show that labor-income uncertainty can raise precautionary saving, while other forms of risk may have ambiguous effects.

The Keynesian saving function links saving directly to disposable income: income not consumed is saved, and the marginal propensity to save rises with additional income (Keynes, 1936). This perspective motivates the inclusion of GDP. Gross fixed capital formation is included because saving and investment are connected through the national accounts, although the direction of association is empirically contestable and should not be treated as automatic causality.

Financial-liberalization theory emphasizes real interest rates and financial depth. McKinnon (1973) and Shaw (1973) argue that financial repression can discourage financial saving by reducing real returns and limiting intermediation. Yet liberalization does not necessarily increase saving. Bandiera et al. (2000) find that the effect of financial reform varies across countries, implying that institutional quality, access, and the allocation of credit matter alongside headline interest rates. Financial deepening may expand saving instruments and access, but it may also relax liquidity constraints and increase consumption.

Empirical evidence

Comparative research confirms substantial heterogeneity. Loayza et al. (2000) show that private saving is shaped by income, growth, fiscal policy, and demographic conditions across countries. Agrawal et al. (2010) identify long-run relationships among saving and macroeconomic variables in India, while Özcan et al. (2003) report inertia and policy-sensitive determinants of private saving in Turkey. For Uganda, Nagawa et al. (2020) find positive long-run effects of GDP growth, foreign direct investment, and broad money, but an insignificant deposit-interest-rate effect.

Evidence from Tanzania is similarly mixed. Odhiambo (2008) identifies dynamic links among interest-rate reform, financial depth, and saving. Epaphra (2014), using 1970-2010 data, finds positive effects of disposable income, real GDP growth, population growth, and life expectancy, together with a negative effect of inflation. More recently, Were and Joseph (2022) use an autoregressive distributed lag approach for 1990-2020 and identify per capita income, public saving, financial deepening, and terms of trade as important long-run correlates.

Two implications follow. First, coefficient signs cannot be assumed from theory because income, inflation, interest rates, and financial deepening operate through competing mechanisms. Second, model choice matters: studies use different saving concepts, transformations, lag structures, and cointegration procedures. The present analysis responds by reporting the supplied OLS and VECM results transparently and by making the diagnostic limitations part of the substantive interpretation rather than treating them as a procedural afterthought.

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DATA AND METHODOLOGY

Data and variables

Annual observations were assembled from the Bank of Tanzania Statistical Bulletin, the International Monetary Fund's International Financial Statistics, and the World Bank's World Development Indicators (Bank of Tanzania, 2026; International Monetary Fund, 2026; World Bank, 2026). The stated study window is 1990-2025. The complete-case descriptive and OLS samples contain 35 observations, while differencing and the two-lag VECM reduce the effective sample to 32 observations (1992-2023). This difference should be understood as an effective-sample adjustment rather than evidence that every estimator uses an identical set of years.

Gross savings (GS) is the dependent variable. The regressors are gross domestic product (GDP), gross fixed capital formation (GFCF), financial deepening (FinDEP), the interest rate (INTR), inflation (INF), and the exchange-rate index (EXCH). The supplied OLS output uses the natural logarithm of gross savings as the dependent variable; GFCF, FinDEP, INTR, INF, and EXCH also enter in logarithms, whereas GDP is reported in levels. Consequently, coefficients on logged regressors are interpreted as elasticities, while the GDP coefficient is not directly comparable in magnitude.

The estimation model is specified as follows:

$$LogGS_t = \beta + \delta_1 GDP + \delta_2 LogFinDEP_t + \delta_3 LogGFCF_t + \delta_4 LogINTR_T + \delta_5 LogINF_t + \delta_6 LogEXCH_t + \varphi_t \quad (1)$$

where,

GS = Gross saving;

GDP = Gross Domestic Product;

FinDEP = Financial Development (ratio of M2 to GDP);

GFCF = Gross Fixed capital Formation

INTR = Interest Rate;

INF = Inflation Rate

EXCH = Exchange Rate .

Moreover, $\delta_1, \delta_2, \delta_3, \delta_4, \delta_5$ and δ_6 are the parameters that measure by how much a change in the exogenous variables affect the independent variable, while φ_t =Stochastic error term.

Description of Variables

The variables were selected on theoretical and empirical grounds. Comparative evidence links saving to income, capital formation, financial development, interest rates, inflation, and exchange-rate conditions, although the direction and magnitude of these relationships vary across countries and specifications (Agrawal et al., 2010; Loayza et al., 2000; Mody et al., 2012; Nagawa et al., 2020; Özcan et al., 2003). Tanzanian evidence likewise identifies income, inflation, financial depth, interest-rate reform, public saving, and the terms of trade as relevant correlates (Epaphra, 2014; Odhiambo, 2008; Were & Joseph, 2022).

Gross savings (GS). Saving is the portion of income not used for current consumption (Keynes, 1936). At the aggregate level, gross saving is linked through the national accounts to resources available for investment, although measured saving and investment need not move one-for-one in an open economy.

Gross domestic product (GDP). GDP measures the value of production generated within an economy during a given period and serves here as an indicator of aggregate income. Higher income may increase saving capacity, but the empirical relationship depends on consumption responses and structural conditions (Agrawal et al., 2010; Loayza et al., 2000).

Financial deepening (FinDEP). Financial deepening captures the scale and reach of financial intermediation, commonly measured by a monetary or credit aggregate relative to GDP. Greater depth may widen access to saving instruments, but easier credit can also relax liquidity constraints; therefore, its net association with saving is an empirical question (Bandiera et al., 2000; McKinnon, 1973; Shaw, 1973).

Interest rate (INTR). The interest rate influences both the return to saving and the cost of borrowing. A higher real return may encourage substitution toward future consumption, while income effects and credit-market conditions can offset that response. Cross-country and Tanzanian evidence consequently reports mixed effects (Nagawa et al., 2020; Odhiambo, 2008).

Exchange rate (EXCH). Exchange-rate movements can affect saving through import prices, export income, inflation expectations, and the domestic-currency value of foreign assets and liabilities. Because these channels can work in opposing directions, the expected coefficient is not imposed a priori.

Inflation rate (INF). Inflation can reduce the real value of financial balances and increase macroeconomic uncertainty. It may therefore discourage financial saving or induce precautionary saving, depending on household expectations, available instruments, and policy credibility (Epaphra, 2014; Mody et al., 2012).

Estimation Techniques

This study employed an econometric technique using Ordinary Least Squares (OLS). The technique facilitated the study in achieving the relationship among variables. From the parameter estimates, one can ascertain the magnitude of change in the regression resulting from a unit change in any of the regressors, holding other conditions constant. This estimation technique was chosen because it is consistent with the basic assumptions of the Classical Linear Regression Model (CLRM), which requires linearity in parameters. Importantly, the technique is used because the estimators satisfy the BLUE (Best Linear Unbiased Estimators) properties of OLS; that is, the estimators are linear, unbiased, and efficient (possessing the minimum variance among the class of linear and unbiased estimators), as noted in Gujarati and Porter (2009). The analysis was complemented by descriptive analysis, including tests for normality, model specification, heteroscedasticity, and autocorrelation.

Time Series Properties

Ordinary least squares estimation with time-series data requires attention to stationarity because persistent nonstationary series can produce spurious regression results. Each variable was therefore tested for a unit root using the augmented Dickey–Fuller procedure (Dickey & Fuller, 1981).

Co-integration Analysis

In econometric terms, two or more series of variables that are integrated of order one, I(1), are cointegrated if their linear combination is stationary. Cointegration analysis attempts to determine whether there is a long-run association between dependent and independent variables. This procedure is important for the following reasons: to establish the credibility of estimating an ECM or VECM, which captures long-run information lost by differencing the variables; and to ascertain the speed of adjustment.

Estimation of Vector Error Correction Model

When the determinants of cointegrating relationship are determined, the next step is the estimation of Gross saving using Vector Error Correction Model (VECM). The VECM is specified as follows:

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$$LogGS_t = \beta + \delta_1 \sum_{i=0}^{k} \Delta GDP_{t-i} + \delta_2 \sum_{i=0}^{k} \Delta LogGFCF_{t-i} + \delta_3 \sum_{i=0}^{k} Log\Delta\, FinDEP_{t-i} + \delta_4 \sum_{i=1}^{k} Log\Delta\, INTR_{t-i} + \delta_5 \sum_{i=1}^{k} \Delta\, LogINF_{t-i} + \delta_6 \sum_{i=1}^{k} \Delta\, LogEXCH_{t-i} + \delta_7 \varphi_{t-1} + \omega_t \quad (2)$$

Equation (2) presents the VECM for Gross saving function with all determinants

On the equation, Δ indicates the first difference operator, $\varphi_{t-1}$is the error correction term (lagged one period) of long run model, ω_t is a white noise error term.

The dynamics affecting gross savings are captured by the differenced variables and one period lagged error term (φ_{t-1}) captures long run dynamics. The coefficient of φ_{t-1} estimated in equation (2) should have a negative sign not more than one basically the coefficient of φ_{t-1} provides information on the speed of adjustment to long run solution that enters to influence short run movement in gross saving. As long as equation (2) is correctly specified, $\alpha_5$carries negative sign less than unity.

RESULTS

Time Series Properties of the Data

Exploratory Data Analysis

Before estimating the model for the investigation of macroeconomic determinants on gross savings in Tanzania, descriptive analysis of the data was carried out for variables in level to establish normality properties.

Table 1: Descriptive of Variables used in the Analysis, 1990-2025 (n=35)

Statistic	GS	GDP	GFCF	FinDEP	INTR	INF	EXCH
Mean	23.84	1.09e+10	1.10e+10	9.64	19.69	11.09	117.60
Variance	54.70	1.06e+20	1.02e+20	18.80	40.42	90.83	841.75
Maximum	37.11	3.24e+10	3.59e+10	17.52	37.81	37.90	165.58
Minimum	8.48	1.04e+09	2.23e+09	2.13	14.14	3.29	78.25
SD	7.39	1.03e+10	1.01e+10	4.34	6.36	9.53	29.01
Skewness	-0.21	0.767	1.046	-0.25	1.42	1.46	0.39
Kurtosis	2.33	2.286	2.782	1.92	3.98	4.15	1.53

Note. GS = gross savings; GDP = gross domestic product; GFCF = gross fixed capital formation; FinDEP = financial deepening; INTR = interest rate; INF = inflation; EXCH = exchange-rate index. SD = standard deviation. Scientific notation is retained from the supplied output.

The ADF results in Table 2 indicate that none of the seven series is stationary in levels at the 5% threshold. After first differencing, every test statistic is more negative than its corresponding critical value. All variables are therefore treated as integrated of order one, I(1). This corrects the earlier narrative claim that GFCF and inflation were stationary in levels; the reported statistics do not support that claim.

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Table 2: Unit Root Test Results for Level and Differenced Variables Based on Augmented Dickey Fuller Approach.

Variable	Level ADF	5% critical	First-difference ADF	5% critical	Order
GS	-1.013	-2.978	-5.825	-2.980	I(1)
GDP	2.504	-2.978	-4.033	-2.980	I(1)
GFCF	4.563	-2.978	-3.952	-3.572	I(1)
FinDEP	0.148	-2.978	-3.663	-2.980	I(1)
INTR	-1.128	-2.978	-3.315	-2.980	I(1)
INF	-2.775	-2.978	-5.568	-2.980	I(1)
EXCH	-0.877	-2.978	-4.132	-2.980	I(1)

Note: GS=Gross savings; GDP=Gross Domestic Product; GFCF = Gross Fixed Capital Formation; FinDEP=Financial Deepening; INTR=Interest Rate; INF = Inflation Rate and EXCH = Exchange Rate

Cointegration and VECM estimates

The Johansen trace test (Johansen, 1988) rejects the null of no cointegration because the rank-zero trace statistic (136.433) exceeds the 5% critical value (124.24). At rank one, the trace statistic (76.701) falls below the critical value (94.15). The selected cointegration rank is therefore one, not four. This distinction materially changes the interpretation of the VECM.

Table 3: Johansen Test for Cointegration

Rank	Parameters	Log likelihood	Eigenvalue	Trace statistic	5% critical
0	56	-1750.5708	-	136.4329	124.24
1†	69	-1720.7048	0.84536	76.7010	94.15
2	80	-1702.0991	0.68741	39.4897	68.52
3	89	-1688.2816	0.57836	11.8547	47.21
4	96	-1683.6556	0.25108	2.6026	29.68
5	101	-1682.3825	0.07648	0.0564	15.41
6	104	-1682.3543	0.00176	0.0000	3.76
7	105	-1682.3543	0.00000	-	-

Note. Trend specification: constant; effective observations = 32; lag order = 2. † Selected rank: the rank-one null is not rejected at 5%.

Table 4 reports the short-run gross-saving equation. The error-correction coefficient is negative (-0.381), as required for convergence, but its p value (.068) provides only marginal evidence at 10%. The estimate implies that approximately 38% of a disequilibrium is corrected within one annual period, conditional on the model. None of the lagged first-difference regressors is statistically significant at 5%. The short-run results therefore do not support strong claims that GDP, GFCF, financial deepening, interest rates, inflation, or the exchange rate individually drive annual changes in gross saving.

Table 4: Vector Error Correction Model

Term	b	SE	z	p	95% CI LL	95% CI UL
ECT(t-1)	-0.3815	0.2093	-1.82	.068	-0.7918	0.0288
Delta GS(t-1)	0.1913	0.2496	0.77	.443	-0.2978	0.6804
Delta GDP(t-1)	3.90e-10	6.16e-10	0.63	.527	-8.18e-10	1.60e-09
Delta GFCF(t-1)	3.49e-10	9.72e-10	0.36	.720	-1.56e-09	2.25e-09
Delta FinDEP(t-1)	0.3185	0.6516	0.49	.625	-0.9586	1.5956
Delta INTR(t-1)	-0.1723	0.3290	-0.52	.600	-0.8172	0.4725
Delta INF(t-1)	-0.1239	0.1628	-0.76	.447	-0.4430	0.1953
Delta EXCH(t-1)	-0.1451	0.1160	-1.25	.211	-0.3724	0.0822
Constant	-1.7090	0.9788	-1.75	.081	-3.6274	0.2094

Note. Sample = 1992-2023; N = 32; log likelihood = -1721.023; AIC = 111.8764; HQIC = 112.9241; SBIC = 115.0369. ECT = error-correction term; Delta denotes first difference. Values are transcribed and relabeled from the supplied output.

In the normalized cointegrating vector (Table 5), GDP, GFCF, and financial deepening have coefficients statistically different from zero, whereas interest rate, inflation, and exchange rate do not. Because the vector is normalized on gross savings, coefficient signs must be interpreted in relation to the normalization convention; the table establishes membership in the long-run relation but does not, by itself, identify a causal effect.

Table 5: Normalized Cointegrating Vector

Variable	b	SE	z	p	95% CI LL	95% CI UL
GS (normalized)	1.0000	-	-	-	-	-
GDP	2.12e-09	2.85e-10	7.43	< .001	1.56e-09	2.68e-09
GFCF	-2.12e-09	2.86e-10	-7.39	< .001	-2.68e-09	-1.56e-09
FinDEP	-1.9426	0.3261	-5.96	< .001	-2.5818	-1.3035
INTR	0.0005	0.2188	0.00	.998	-0.4282	0.4293
INF	-0.0052	0.1397	-0.04	.970	-0.2790	0.2685
EXCH	0.0377	0.0338	1.11	.266	-0.0287	0.1040
Constant	-11.9826	-	-	-	-	-

Note. The vector is normalized on GS. The FinDEP standard error is reported as 0.3261 because that value is consistent with z = -5.96 and the reported confidence interval; the source table displayed a typographical overlap.

Static OLS results and diagnostics

The OLS model is jointly significant, $F(6, 28) = 23.72$, $p < .001$, and explains 83.6% of the sample variation in logged gross savings (adjusted $R2 = .800$). However, the individual estimates differ sharply from the original

prose. Financial deepening is positive and significant at 5% (b = 0.329, p = .016). In the log-log specification, a 1% increase in the financial-deepening indicator is associated with an estimated 0.329% increase in gross savings, holding the other regressors constant. The interest-rate elasticity is negative and marginally significant at 10% (b = -0.534, p = .074). GDP, GFCF, inflation, and the exchange rate are not statistically significant at 5%; the exchange-rate p value (.102) also exceeds 10%.

Table 6: OLS Estimates for Logged Gross Savings, 1990-2025

Predictor	b	SE	t	p	95% CI LL	95% CI UL
GDP	7.38e-12	1.41e-11	0.52	.604	-2.14e-11	3.62e-11
ln(GFCF)	0.0833	0.2254	0.37	.714	-0.3784	0.5451
ln(FinDEP)	0.3286	0.1287	2.55	.016	0.0650	0.5922
ln(INTR)	-0.5340	0.2877	-1.86	.074	-1.1234	0.0554
ln(INF)	-0.0734	0.0918	-0.80	.430	-0.2615	0.1146
ln(EXCH)	0.6822	0.4033	1.69	.102	-0.1439	1.5082
Constant	-1.0643	5.7129	-0.19	.854	-12.7667	10.6380

Note. N = 35; F(6, 28) = 23.72; p < .001; R2 = .8356; adjusted R2 = .8004; root MSE = .15965. GDP is retained in levels as shown in the supplied output; all other named predictors are logged.

The correlation matrix and VIF results show that the OLS coefficients are unstable. GDP correlates .9824 with GFCF, while several other absolute correlations exceed .80. The mean VIF is 20.43; GFCF (59.35), GDP (27.94), and EXCH (12.78) exceed the conventional threshold of 10. These diagnostics make it difficult to isolate independent effects, even when the overall model fit is high.

Table 7: Correlation Matrix

Variable	GS	GFCF	FinDEP	INTR	INF	EXCH	GDP
GS	1.0000						
GFCF	0.8306	1.0000					
FinDEP	0.8452	0.8085	1.0000				
INTR	-0.7084	-0.4804	-0.6057	1.0000			
INF	-0.5932	-0.5215	-0.3586	0.8136	1.0000		
EXCH	-0.8128	-0.7494	-0.8431	0.8060	0.6790	1.0000	
GDP	0.8470	0.9824	0.8447	-0.5470	-0.5542	-0.8093	1.0000

Note. Lower-triangular Pearson correlations. The FinDEP-GS entry is corrected to 0.8452 from the visually split value in the source table.

Table 8: Variance Inflation Factors

Predictor	VIF	Tolerance (1/VIF)
ln(GFCF)	59.35	0.016849
GDP	27.94	0.035792
ln(EXCH)	12.78	0.078255
ln(INTR)	8.69	0.115122
ln(FinDEP)	7.60	0.131627
ln(INF)	6.22	0.160759
Mean	20.43	-

Note. VIF = variance inflation factor. Values above 10 indicate severe multicollinearity.

The Breusch-Godfrey test does not reject the null of no first-order serial correlation, chi-square(1) = 0.152, p = .696. The Ramsey RESET test tells a different story: F(3, 25) = 4.45, p = .0123, so the null that the model has no omitted nonlinear combinations of the fitted values is rejected. The result is evidence of specification error, which may reflect omitted variables, an inappropriate functional form, or both. It contradicts the earlier claim that the RESET p value exceeded .05.

Table 9: Breusch-Godfrey LM Test for Autocorrelation

Lag	chi-square	df	p	Decision
1	0.152	1	.6964	Do not reject H0

Note. H0: no serial correlation.

Table 10: Ramsey RESET Specification Test

Test	F	df	p	Decision
Ramsey RESET	4.45	3, 25	.0123	Reject H0

Note. H0: the model has no omitted nonlinear combinations of the fitted values. The result indicates misspecification.

DISCUSSION OF RESULTS

The strongest recurring result is the role of financial deepening. It is significant in the static OLS model and appears in the long-run cointegrating vector, although it is not significant in the short-run VECM. This pattern is consistent with the idea that financial development operates gradually by widening access to saving instruments and improving intermediation. It also broadly aligns with recent Tanzanian evidence reported by Were and Joseph (2022). Nevertheless, the estimate should not be read as a causal policy multiplier because financial deepening may respond to income, institutional change, and saving itself.

The results do not support the manuscript's earlier claims that GDP, GFCF, and the exchange rate are individually significant in the OLS regression. Their p values are .604, .714, and .102, respectively. Interest rates show a negative coefficient with only marginal 10% evidence, while inflation is clearly insignificant. These

findings illustrate why coefficient signs must be separated from statistical evidence. They also accord with the wider literature's mixed findings: financial liberalization can increase saving opportunities, but its effect depends on access, institutional conditions, and whether credit expansion relaxes household liquidity constraints (Bandiera et al., 2000; McKinnon, 1973; Shaw, 1973).

The long-run and short-run estimates are not contradictory. The trace test supports one stable long-run combination, while the short-run equation shows no individually significant differenced regressor at 5%. The negative error-correction coefficient suggests convergence, but p = .068 means the speed estimate is imprecise. The data therefore provide tentative evidence of long-run co-movement rather than a strong account of year-to-year adjustment.

Three diagnostic limitations materially constrain inference. First, the sample is small: 35 complete cases for OLS and 32 effective observations for the VECM. Second, multicollinearity is severe, especially between GDP and GFCF. Third, the Ramsey RESET test (Ramsey, 1969) rejects the stated functional form. A high R2 cannot compensate for these weaknesses. A parsimonious model, explicit measurement codes, structural-break tests, and alternative estimators such as ARDL should be considered in future work. Replication would also be strengthened by documenting the missing-data treatment that produces 35 complete observations within the stated 1990-2025 window.

CONCLUSION AND POLICY IMPLICATIONS

This study examined macroeconomic correlates of gross savings in Tanzania using annual observations assembled for 1990-2025. All series are I(1), and the Johansen test supports one cointegrating relationship. The VECM provides marginal evidence of error correction but no significant short-run effect for the differenced regressors at 5%. In the OLS model, financial deepening is the only predictor significant at 5%; the interest-rate coefficient is negative and marginal at 10%.

The policy implication is narrower than a simple growth-and-saving prescription. Strengthening financial intermediation may support saving by expanding access, trust, and appropriate saving products, especially for households and small firms. Such measures should be paired with macroeconomic stability and consumer protection. The present estimates do not justify claims that higher GDP, fixed capital formation, or exchange-rate changes will automatically raise gross savings.

The diagnostic evidence also calls for caution. Severe multicollinearity and functional-form misspecification mean that the reported coefficients are exploratory associations. Before policy decisions are based on their magnitudes, the model should be re-estimated with a more parsimonious specification, transparent indicator codes, documented missing-data treatment, and robustness checks for structural breaks and alternative lag structures.

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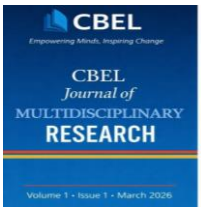

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