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Impact of Government Expenditure on Domestic Investment in Tanzania: Evidence from Autoregressive Distributed Lag

Yakoub Mbarak Faki[1]
[1]Department of Health Systems Management, School of Public Administration and Management, Mzumbe University. Email: yakoub.faki@mzumbe.ac.tz

Abstract

This study investigates the linear and non-linear effects of government expenditure on domestic investment in Tanzania using time-series data from 1990 to 2022. The analysis employs the Autoregressive Distributed Lag (ARDL) and Bound test approach. The findings confirm the existence of a stable long-run cointegration relationship among the variables under both linear and non-linear specifications. The long-run linear results indicate that government expenditure and domestic savings significantly promote domestic investment, while subsidies, inflation, and money supply negatively affect investment in the long-run. Importantly, the non-linear quadratic model reveals an inverted U-shaped relationship between government expenditure and domestic investment. In short run, however, subsidies, inflation and money supply show positive effects on domestic investment. Based on these findings, the study recommends that the Government of Tanzania enhance the efficiency pf public expenditure by prioritizing productive infrastructure investment, reforming inefficient subsidy systems, maintaining monetary stability to control inflation, and strengthening policies that encourages domestic savings mobilization through coordinated fiscal and monetary measures.

Key words*: Government expenditure, Domestic investment, non-linear effects, Time Series, ARDL, Tanzania*

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1. Introduction

The study highlights domestic investment as a cornerstone of economic growth, with gross fixed capital formation serving as its key measure (Kong et al., 2020; Machobani, 2024). Globally, nations like the United States have shown consistent increases in domestic private investment, while others, such as Vietnam, have experienced fluctuations due to various economic conditions (Bakari & Benzid, 2021; Nguyen & Trinh, 2018; An, 2024). In Sub-Saharan Africa, domestic investment trends reveal inconsistencies, often marked by low contributions to GDP in nations like Ethiopia, despite economic growth (Islam, 2015; Bosede et al., 2020; Adegboye et al., 2020).

Government spending has played a crucial role in stabilizing investment levels, particularly through infrastructure development and public services (Fintan & Furahisha,2017; Gitonga et al., 2022; Vagliasindi & Gorgulu, 2021). However, recurrent expenditures often outweigh development spending, raising concerns about the efficiency of resource allocation (URT, 2014; Burisch et al., 2023).
In Tanzania domestic investment sector has historically faced challenges, remaining small before the 1990s, while Gross Fixed Capital Formation (GFCF) as measure of domestic investment has shown periods of growth, such as peaks of 18.69% in 2005 and 16.04% in 2006, it has also experienced fluctuations, with notable contractions during the 1990s and the 2009 global financial crisis (Odass, 2023; Were & Joseph, 2022). Recent recovery trends, including growth rates of 7.81% in 2021 and 9.59% in 2022, reflect a dynamic yet inconsistent investment environment shaped by economic conditions (WDI, 2024; Bank of Tanzania, 2024; Mpfubhusa et al., 2026).

Government expenditure has been instrumental in stabilizing investment levels, increasing steadily from $3.8 billion in 2009/10 to $15.4 billion in 2022/23 (BoT, 2024; Mwamkonko, 2023; URT, 2024).
Efforts to improve the investment climate, such as the establishment of the Tanzania Investment Centre (TIC) following the 1986 Economic Recovery Programme, have facilitated investor support and streamlined processes (Nathasya, 2024). Yet, barriers to stable domestic investment persist, necessitating strategic policy interventions to address these fluctuations and foster economic stability (Jehovaness Aikae, 2014; Robert et al., 2024; Challoumis, 2024).

Although government expenditure and domestic investment have been studied by earlier researchers, it is unclear whether government spending boosts or lowers domestic investment (Blanchard, 2019; Dong et al., 2023). There seems to be some ambiguity in the results of the many econometric models being employed, some studies contend that government expenditure has a positive impact on domestic investment, such as (Figueiró, 2020; Kinyanjui *et al*., 2022; Carvelli, 2023). and Others contend that government expenditure has a negative impact on domestic investment like (Oyedepo & Okor, 2024); Babatola *et al*., 2022; Mwakalila, 2020), due to the inconclusive nature of the findings.

Additionally, numerous studies have been conducted on other nations, such as Kenya (Kinyanjui *et al*., 2022), Tanzania (Mwakalila, 2020) and Sub-Saharan Africa (Babatola *et al*., 2022). However, there are few some studies that specifically examine Tanzina's situation regarding the impact of government expenditure and domestic borrowing on credit to the private sector in Tanzania by (Laurent, 2025 Mwakalila, 2020), also (Odass, 2023) observed only one side that is performance of domestic investment in Tanzania and (Ruturagara & A, 2016) observed government spending and economic growth. Even in

Tanzania there are few studies that mentioned above but researcher never seen the studies that examine the influence of government expenditure on domestic investment in Tanzania (Ndanshau, 2023). The study was examined the linear and non-linear effects of government expenditure on domestic investment, identifying thresholds and tipping points where government spending either diminishes or amplifies investment. This insight is crucial for optimizing the level and composition of government expenditure, ensured efficient and effective spending strategies that was promoted domestic investment (Wenjuan & Zhao, 2023); Ragab & Salah, 2025). The hypothesis of the study is there is no linear impact of government expenditure on domestic investment; there is no non-linear effect of government expenditure on domestic investment in Tanzania and there is no main growth enhancing transmission channel for government expenditure on domestic investment in Tanzania.

2. Literature review

Keynesian economic theory, developed by Keynes's (1936), emphasizes the critical role of aggregate demand in determining economic output and inflation. It argues that government spending is essential for stabilizing the economy, particularly during recessions or periods of low private sector activity and high unemployment. By increasing spending through social welfare programs, infrastructure projects, and direct purchases, governments can stimulate economic activity and address insufficient aggregate demand. This theory underscores the importance of fiscal policy interventions in driving economic recovery and promoting private sector investment during economic downturns. It provides a foundational perspective for analyzing the impact of government expenditure on domestic investment.

Moreover, numerous studies have been conducted between government expenditure and domestic and other controlled variables using different econometric techniques. Carvelli, (2023), conducted the elements of government spending have an impact on the long-term dynamics of private investments as well? In OECD countries. The study used panel data from 1993 to 2019 on 30 OECD countries and employed an ECM version. The findings indicated that the long-term dynamics of private investment are positively impacted by the allocation of public funds to health and general public services.

Daniel Eka Bonokeling et *al.,* (2023), examined how government spending, exports, imports, and investment affected Indonesia's economic growth. Annual data was used between 1960 and 2018.An analysis of the data was conducted using the Error Correction Model (ECM). According to the study's findings, Indonesia's economic growth is favourably and considerably impacted by imports, exports, government spending, and investment all at the same time. Furthermore, Oyedepo & Okor, (2024), examined evidence on the factors influencing domestic investment in Nigeria from 1991 to 2021. This study used the ARDL model. The findings show that domestic savings have a favourable impact on investment in Nigeria, whereas government spending, inflation, and trade openness have a negative impact. In the long term, trade openness has a considerable but negative impact on domestic investment in Nigeria.

Kinyanjui *et al*., (2022), examined how government spending affected Kenya's infrastructure and the rise of domestic private investment. An explanatory design was used in the research. The outcome demonstrated that government investment in infrastructure has a long-term favorable impact on domestic sector investment. Through accelerator effects, public infrastructure spending indirectly encourages private investment. Mwakalila, (2020), examined how Tanzanian private sector credit was affected by

domestic borrowing and government spending by raising lending rates. The study employed the auto regressive distributed lag (ARDL) model using time series data from 2004 to 2018. The outcome demonstrates how domestic borrowing and government spending raise lending rates over time, which has a detrimental impact on private sector credit.

3. Method

Theoreticall framework

To achieve this objective, the study was employed theoretical model is based on the neoclassical investment theory popularized by (Hall & Jorgensin, 1967), which later adapted for use in developing nations. Many studies have applied this model to examine the impact of government expenditure on domestic investment such as (Eregha, 2012). The theoretical framework is presented in relation to total investment, of which foreign investment is a subset. The whole investment (It) is then shown in its most basic form as real foreign investment (If,t) plus real domestic investment (Id,t),

$$I_t = Id_{,t} + I_{f,t} \quad \text{.....1}$$

Subsequently, (Bakari & Benzid, 2021) made additional modifications to the investing model. As a dependent variable, they developed a model for domestic investment. The independent variables they used in this model are the Corruption Perceptions Index (CORR), Democracy Index (DEMO), Degree of Freedom to Invest (DFI), Human Development Index (IDH), Foreign Direct Investment Net Inflows (FDI, % of GDP), Final Consumption Expenditure (FC, % of GDP), and GDP Growth (Y, Annual %) (Rizqa & Wibowo, 2024).

The following is how the basic model is expressed:

$$DI = f\ (CORR, DEMO, DFI, IDH, FDI, FC, Y) \quad \text{……..2}$$

Therefore, the neoclassical investment theory model will be expanded in this study to include additional control variables like the money supply, interest rate, and saving rate. The dependent variable is domestic investment, and the independent variable is government spending, which is expressed as a percentage of an economy's GDP (Odass, 2023); (Magdalena & Suhatman, 2020).

Model specification

Therefore, this study adopted and modified the econometric model used by (Odass, 2023) which are:

$$DI_t = \beta_o + \beta_1 MS + \beta_2 IR + \beta_3 SR + \beta_4 EXP + \mu_t \quad \text{……....3}$$

where SR is the saving rate, IR is the interest rate, EXP is government spending, μt is the error term, and DI is domestic investment and extended as follows:

$$lnDI_t = \beta_o + \beta_1\ lnGEXR_t + \beta_2\ lnSB_t + \beta_3\ lnINF_t + \beta_4\ lnMS_t + \beta_5\ lnIR_t + \beta_6\ lnSR_t + \varepsilon_t \quad \text{……4}$$

Model for symmetric to examine non-linear effects of government expenditure on domestic investment in Tanzania, where **$GEXR^2$** represent non-linear government expenditure measured as percentage of GDP.

$$lnDI_t = \beta_o + \beta_1 lnGEXR_t + \beta_2 lnGEXR^2_t + \beta_3 lnSB_t + \beta_4 lnINF_t + \beta_5 lnMS_t + \beta_6 lnIR_t + \beta_7 lnSR_t + \varepsilon_t \quad \text{……..5}$$

Table 1: Summary of the variables, data source and measurement

Variables	Symbols	Measurement	Sources of data	Previous authors	Expected sign
Domestic investment	DI	Gross fixed capital formation (constant 2015 US$)	WDI- World Bank	(Ben Yedder *et al*., 2023)	
Government expenditure	GEXR	Share of percentage of national income (share of %GDP)	WDI- World Bank	(Odass, 2023)	Positive
Money supply	MS	Narrow money (M1) or Broad money	WDI- World Bank	(Odass, 2023)	Negative
Interest rate	IR	Nominal interest rate	WDI- World Bank	(Odass, 2023)	Negative
Saving rate	SR	Total domestic saving	WDI- World Bank	(Odass, 2023)	Positive
Subsidies	SB	Percent of expense	WDI- World	(Marzouk & Oukhallou, 2017)	Positive
Inflation	INF	CPI	BOT	(Dao, 2017)	Negative

Source: Author's compilation, 2024

Empirical methodology

The study examines impact of government expenditure on domestic investment in Tanzania. It involves several steps to find out the impact between government and domestic investment in Tanzania as follows:

Unite root test

The unit root was tested using the augmented Dick-Fuller (ADF) test, which was recommended by (Dickey & Fuller, 1981) used to check for consistency. The ADF test established the sequence of integration for each series in this investigation. If it is found that all of the variables are integrated in the same order, the Johansen cointegration approach is used to assess the cointegration among the variables(Johansen, 2009; Perron & Campbell, 1993; Johansen, 2016).

In order to characterize the trend properties of the available data, it is crucial to properly establish the null and alternative hypotheses when testing for unit roots (Herranz, 2017; Bierens, 1993). The three variations of the Dickey-Fuller test are designed to take into consideration the role of the constant term and the trend: -

$$\Delta Yt = \alpha_0 + \gamma Y_{t-1} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 6$$

Bonds test for Co-integration

If series of varying orders are merged once. A common technique for analysing the cointegration connection between variables is the bound testing strategy, sometimes referred to as the Autoregressive Distributed Lag approach, since it combines the stationarity of level I (0) and first difference I (1)(Allen et al., 2021; Alimi, 2014). Since this method eliminates the issues related to nonstationary time series data, it is especially helpful when the variables are integrated at different orders, such as I (0) and I (1), or when the order of integration is uncertain(Philips, 2018).

Null hypothesis and alternate hypothesis will be tested for co-integration.

- Null hypothesis: H0 =There is no co integration between variables, and
- Alternative hypothesis: H1 =There is co-integration between variables.

Autoregressive Distributed lag (ARDL) model

ARDL model used in this study to examine the stability between government expenditure and domestic investment. ARDL cointegration technique is preferable when dealing with variables that are integrated of different order, I (0), I (1) or combination of the both and, robust when there is a single long run relationship between the underlying variables in a small sample size (Ilu, 2025; Byanjankar, 2020; Emeka & Kelvin, 2016). The long run relationship of the underlying variables is detected through the F-statistic (Wald test). In this approach, long run relationship of the series is said to be established when the F-statistic exceeds the critical value band (Emeka & Kelvin, 2016). An Autoregressive Distributed lag (ARDL) model written as:

$$\Delta \ln DI_t = \beta_{01} + \beta_{11}\ln DI_{t-1} + \beta_{21}\ln GEXR_{t-1} + \beta_{31}\ln SB_{t-1} + \beta_{41}\ln INF_{t-1} + \beta_{51}\ln MS_{t-1} + \beta_{61}\ln IR_{t-1} + \beta_{71}\ln SR_{t-1} + \sum_{i=1}^{p}\beta_{1i}\Delta(\ln DI_{1t-1}) + \sum_{i=0}^{q}\beta_{2i}\Delta(\ln GEXR_{1t-1}) + \sum_{i=0}^{q}\beta_{3i}\Delta(\ln SB_{1t-1}) + \sum_{i=0}^{q}\beta_{4i}\Delta(\ln INF_{1t-1}) + \sum_{i=0}^{q}\beta_{5i}\Delta(\ln MS_{1t-1}) + \sum_{i=0}^{q}\beta_{6i}\Delta(\ln IR_{1t-1}) + \sum_{i=0}^{q}\beta_{7i}\Delta(\ln SR_{1t-1}) + \lambda_1 ECT_{1t-1} + \varepsilon_{1t} \quad \ldots\ldots 7$$

However non-linear effect of government expenditure on domestic investment and autoregressive distributed lag (ARDL) model in quadratic term as:

$$\Delta \ln DI_t = \beta_{01} + \beta_{11}\ln DI_{t-1} + \beta_{21}\ln GEXR_{t-1} + \beta_{31}\ln GEXR_{t-1}^2 + \beta_{41}\ln SB_{t-1} + \beta_{51}\ln INF_{t-1} + \beta_{61}\ln MS_{t-1} + \beta_{71}\ln IR_{t-1} + \beta_{81}\ln SR_{t-1} + \sum_{i=1}^{p}\beta_{1i}\Delta(\ln DI_{1t-1}) + \sum_{i=1}^{q}\beta_{2i}\Delta(\ln GEXR_{1t-1}) + \sum_{i=1}^{q}\beta_{3i}\Delta(\ln GEXR_{1t-1}^2) + \sum_{i=1}^{q}\beta_{4i}\Delta(\ln SB_{1t-1}) + \sum_{i=1}^{q}\beta_{5i}\Delta(\ln INF_{1t-1}) + \sum_{i=1}^{q}\beta_{6i}\Delta(\ln MS_{1t-1}) + \sum_{i=1}^{q}\beta_{7i}\Delta(\ln IR_{1t-1}) + \sum_{i=1}^{q}\beta_{8i}\Delta(\ln SR_{1t-1}) + \lambda_1 ECT_{1t-1} + \varepsilon_{1t} \quad \ldots\ldots 8$$

4. Results, Analysis and Discussions

Summary statistics and correlation results

The descriptive statistics indicate that Domestic Investment (DI) shows considerable variability with a mean of 9.36 billion USD and no significant departure from normality. Government Expenditure (GEXR) and Subsidies (SB) exhibit moderate variation and are near-normal in distribution. Inflation (INF) and Interest Rate (IR) display noticeable right-skewness and significant deviation from normality, while Money Supply (MS) and Savings Rate (SR) show substantial variability and heavier tails, with the latter also deviating significantly from normality.

Table 2: Descriptive statistics results

	Mean	Max	min	Std. Dev.	Skew	kurtosis	Jarque-Bera	probabi	N
DI	9.364e+09	2.700e+10	2.100e+09	7.759e+09	.798	2.286	4.208	0.093	33
GEXR	100.258	114.441	74.061	10.722	-.963	3.049	5.108	0.061	33
SB	62.339	76.889	49.23	8.142	.167	1.921	1.755	0.118	33
INF	11.586	35.827	3.29	9.457	1.272	3.393	9.105	0.016	33
MS	1.476e+10	5.600e+10	1.200e+08	1.669e+10	.995	2.74	5.533	0.061	33
IR	20.029	37.805	14.14	6.548	1.287	3.541	9.514	0.014	33
SR	8.364e+09	2.800e+10	1.700e+09	7.823e+09	1.249	3.449	8.851	0.017	33

Source: Author's computation, 2024

The correlation analysis reveals that Domestic Investment (DI) is strongly positively associated with the Savings Rate (0.966) and Money Supply (0.940), indicating that higher savings and increased money supply support domestic investments. In contrast, DI is negatively correlated with Subsidies (-0.844), Inflation Rate (-0.642), and Interest Rate (-0.694), suggesting that higher subsidies, inflation, and interest rates hinder investment. These relationships highlight the interconnectedness of economic variables and their influence on domestic investment dynamics.

Table 3: Correlation matrix results

Variables	lnDI	lnGEXR	lnSB	lnINF	lnMS	lnIR	lnSR
lnDI	1.000						
lnGEXR	0.635	1.000					
lnSB	-0.844	-0.749	1.000				
lnINF	-0.642	-0.592	0.562	1.000			
lnMS	0.940	-0.229	0.310	0.323	1.000		
lnIR	-0.694	0.154	-0.140	0.177	0.011	1.000	
lnSR	0.966	0.453	-0.775	-0.616	-0.251	0.136	1.000

Source: Author's computation, 2024

Results of Unit Root Test

The results indicate that Domestic Investment (DI) is stationary at level (I(0)), while all other variables Government Expenditure (GEXR), Subsidies (SB), Inflation (INF), Money Supply (MS), Interest Rate (IR), and Savings Rate (SR) are non-stationary at level but become stationary after first differencing (I(1)). This justifies the use of the Autoregressive Distributed Lag (ARDL) model, which accommodates a mix of I (0) and I (1) variables and is suitable for examining both short- and long-term relationships.

Table 4: Unit root test results

	Augmented Dickey fuller test						
At level at				First difference			
Variables	Test statistic ADF at level	Critical Value at 5%	P-Value	Test statistic ADF at *I* (1)	Critical Value at 5%	P-Value	Order of integration
lnDI	-3.515	-3.576	0.0378	------	--------	---------	I (0)
lnGEXR	-2.450	-3.576	0.3534	-4.350	-1.703	0.0001	I (1)
lnSB	-0.153	-3.576	0.9923	-4.450	-1.703	0.0001	I (1)
lnINF	-1.977	-3.576	0.6140	-4.646	-1.703	0.0000	I (1)
lnMS	-2.556	-3.576	0.3005	-4.919	-1.703	0.0000	I (1)
lnIR	-2.089	-3.576	0.5521	-4.008	-1.703	0.0002	I (1)
lnSR	-2.970	-3.576	0.1406	-4.833	-1.703	0.0000	I (1)

Source: Author's computation, 2024

Bounds test approach to cointegration

The ARDL Bounds test yields an F-statistic of 13.054, which exceeds the upper bound critical values at all conventional significance levels, indicating a rejection of the null hypothesis. This confirms the existence of a long-run relationship among the variables.

Table Error! No text of specified style in document.**5: Linear impact**

Test statistics	Value	K	
F-statistics	13.054	6	
Significance level		Lower bound I (0)	Upper bound I (1)
10%		2.120	3.230
5%		2.450	3.610
2.5%		2.750	3.990
1%		3.150	4.430

Source: Author's computation, 2024

The ARDL bounds test, accounting for the nonlinear effect of government expenditure on domestic investment in Tanzania, produced an F-statistic of 4.114. As this exceeds the critical values, the null hypothesis of no long-run relationship is rejected, confirming a long-run equilibrium relationship that captures both linear and nonlinear effects of government expenditure on domestic investment.

Table 6: Non-linear impact

Test statistics	Value	K	
F-statistics	4.114	7	
Significance level		Lower bound I (0)	Upper bound I (1)
10%		2.03	3.13
5%		2.32	3.50
2.5%		2.60	3.84
1%		2.96	4.26

Source: Author's computation, 2024

Diagnostic Test Results of Linear impact of government expenditure on domestic investment

The diagnostic test results indicate that the linear ARDL model is statistically reliable. The Breusch–Pagan–Godfrey test (p = 0.3822) shows no evidence of heteroskedasticity, implying that the error variance is constant. The Jarque–Bera test (p = 0.7271) confirms that the residuals are normally distributed. The Ramsey RESET test (p = 0.9061) indicates no model specification errors, suggesting that the model is correctly specified and does not omit important variables or include incorrect functional forms. These results confirm that the model satisfies the key diagnostic assumptions and provides reliable estimates of the relationship between government expenditure and domestic investment.

Table 7: Diagnostic Test Results

Diagnostic Result	Test Name	P-Value
Heteroskedasticity	Breusch-Pagan-Godfrey	0.3822
Normality	Jarque-Bera	0.7271
Model Specification	Ramsey RESET	0.9061

Source: Author's Computation,2024

Long-run estimation results: Linear impact of government expenditure on domestic investment

The result show that regression analysis reveals that investigates the long run estimation linear impact of government expenditure on domestic investment, revealing important insights. The coefficient for the government expenditure (ln GEXR) is 3.064 a probability value of 0.000 indicate that the government expenditure is a highly significant predictor of domestic investment as dependent variable. In the long

run, government expenditure has a significant positive impact on domestic investment, with a 1% increase in expenditure leading to a 3.064% rise in investment.

Subsidies (lnSB) significantly reduce domestic investment, with a 1% increase in subsidies leading to a 1.958% decrease, the negative subsidy coefficient in long-run does not mean that subsidies are always harmful; it shows that in Tanzania (1990–2022), higher subsidies were associated with lower domestic investment. This means that due to inefficient allocation, crowding out of private investment, resource misallocation, and reduced government resources for productive investments such as infrastructure. Therefore, the impact of subsidies depends on their efficiency, targeting, and contribution to economic productivity.

Inflation (lnINF) and money supply (lnMS) also negatively impact investment, with coefficients of -0.144 and -0.368, respectively. Indicates that higher inflation increases production costs and creates economics uncertainty, discouraging investment on other hand a negative effect of money supply to domestic investment implies that excessive growth in money supply may increase inflationary pressures and macroeconomic instability, discouraging domestic investment.
This outcome is consistency with study of (Carvelli, 2023 in OECD countries, Nyoman *et al.*, 2021 in Indonesia, Kinyanjui *et al*., 2022 in Kenya) and in consistency study of (Reinamah *et al*., 2022 in Indonesia, Oyedepo & Okor, 2024).

Subsidies (lnSB) significantly reduce domestic investment, with a 1% increase in subsidies leading to a 1.958% decrease. Inflation (lnINF) and money supply (lnMS) also negatively impact investment, with coefficients of -0.144 and -0.368, respectively. The interest rate (lnIR) has no significant effect. In contrast, the savings rate (lnSR) strongly boosts investment, with a 1% increase in the savings rate leading to a 1.123% rise in domestic investment.

Table 8: Linear impact of government expenditure on domestic investment

Variables	Coef.	Std.Err	t- stat	p-value	[95%Conf.	Interval]
lnGEXR	3.064	0.448	6.840	0.000	2.096	4.031
lnSB	-1.958	0.526	-3.730	0.003	-3.094	-0.823
lnINF	-0.144	0.051	-2.830	0.014	-0.254	-0.034
lnMS	-0.368	0.100	-3.680	0.003	-0.585	-0.152
lnIR	0.043	0.164	0.260	0.799	-0.312	0.397
lnSR	1.123	0.108	10.450	0.000	0.891	1.356
_cons	-0.021	1.694	-0.010	0.990	-3.681	3.639
R-squared	0.9475					
Adj R-squared	0.8789					
Durbin-Watson stat	2.6618					

Source: Author's compilation, 2024

Short run estimation: Linear impact of government expenditure on domestic investment

The short-run dynamics of the model reveal several significant relationships with domestic investment. The coefficient for the lagged domestic investment is -0.3028, which is statistically significant with a probability value of 0.011. This indicates that past levels of domestic investment have a significant negative effect on current domestic investment, suggesting a lagged adjustment process.

For subsidies, the coefficients for both the first difference and the lagged difference are positive and statistically significant, with values of 0.8014 and 0.7702, respectively. The probability values for these

coefficients are 0.008 and 0.004, demonstrating that increases in subsidies lead to a significant increase in domestic investment in the short run. In the short run, subsidies increase domestic investment because they reduce production costs, improve business incentives, and provide financial support that encourages firms to expand investment activities.

Inflation also shows a positive effect, with coefficients of 0.0956 for the first difference and 0.0637 for the lagged difference. Both coefficients are statistically significant, with probability values of 0.010 and 0.036, respectively. The positive short-run effect of inflation suggests that moderate price increases may reflect higher economic activity and demand, encouraging firms to increase production and investment.

The money supply, similarly, has positive coefficients of 0.1158 and 0.0734 for the first and lagged differences. Both coefficients are statistically significant with probability value 0.007 and 0.043 respectively, indicating that increases in the money supply are associated with higher domestic investment. The positive effect of money supply indicates that increased liquidity and availability of credit in the economy support businesses by providing more funds for investment. In contrast, the interest rate does not show a significant impact on domestic investment, with a coefficient of 0.1462 and a probability value of 0.207. This suggests that changes in interest rates do not significantly affect domestic investment in the short run.

In comparing the findings of this study with previous research, notable similarities and differences emerge. (Carvelli, 2023) demonstrates that reallocating public resources positively impacts private investment in OECD countries, particularly in areas like health, which mirrors the positive effect of subsidies on domestic investment observed in Tanzania. Similarly, (Daniel Eka Bonokeling et al., 2023) found that government expenditure boosts economic growth in Indonesia, aligning with this study's findings that subsidies significantly drive domestic investment in Tanzania.

However, a divergence is noted in Oyedepo & Okor, (2024) research, which identified a negative relationship between government expenditure and domestic investment in Nigeria. This contrasts with the positive effect observed in Tanzania, highlighting the importance of the specific composition of government spending. Additionally, (Nguyen, 2022) found that government spending can reduce economic growth after a lag, akin to the negative effect of past domestic investment on current levels observed in this study. Finally, (Mwakalila, 2020) highlighted the negative effect of government borrowing on private sector credit in Tanzania through higher lending rates, contrasting with the insignificant impact of interest rates on domestic investment found in this research, where factors such as inflation and money supply appear more influential.

Table 9: Linear impact of government expenditure on domestic investment

Variable	Coefficient	Std. Error	t-Statistic	p-Value	[95% Conf. Interval]
D.lndi (LD)	-0.3028	0.1022	-2.96	0.011	[-0.5236, -0.0820]
D.lnsb (D1)	0.8014	0.2547	3.15	0.008	[0.2511, 1.3516]
D.lnsb (LD)	0.7702	0.2239	3.44	0.004	[0.2866, 1.2539]
D.lninf (D1)	0.0956	0.0316	3.02	0.010	[0.0273, 0.1640]
D.lninf (LD)	0.0637	0.0272	2.34	0.036	[0.0049, 0.1225]
D.lnms (D1)	0.1158	0.0365	3.18	0.007	[0.0371, 0.1946]
D.lnms (LD)	0.0734	0.0327	2.24	0.043	[0.0027, 0.1441]

Variable	Coefficient	Std. Error	t-Statistic	p-Value	[95% Conf. Interval]
D.lnir (D1)	0.1462	0.1100	1.33	0.207	[-0.0914, 0.3837]
D.lnsr (D1)	-0.0705	0.0509	-1.39	0.189	[-0.1804, 0.0394]
D.lnsr (LD)	-0.1096	0.0437	-2.51	0.026	[-0.2040, -0.0153]
_cons	-0.0206	1.6941	-0.01	0.990	[-3.6806, 3.6393]

Source: Author's compilation, 2024

Diagnostic Test Results of Non-linear effect of government expenditure on domestic investment

The diagnostic test results indicate that the non-linear ARDL model is statistically reliable. The Breusch–Pagan–Godfrey test (p = 0.8766) shows no evidence of heteroskedasticity, indicating that the residual variance is constant. The Jarque–Bera test (p = 0.0798) suggests that the residuals are approximately normally distributed, as the p-value is above the 5% significance level. The Ramsey RESET test (p = 0.8689) indicates no model specification errors, implying that the model is correctly specified. Overall, these results confirm that the non-linear model satisfies the key diagnostic assumptions and provides reliable estimates of the relationship between government expenditure and domestic investment.

Table 10: Diagnostic Test Results

Diagnostic Result	Test Name	P-Value
Heteroskedasticity	Breusch-Pagan-Godfrey	0.8766
Normality	Jarque-Bera	0.07984
Model Specification	Ramsey RESET	0.8689

Source: Author's compilation, 2024

Long-run estimation: Non-linear effect of government expenditure on domestic investment in Tanzania

The nonlinear analysis of the relationship between government expenditure and domestic investment in Tanzania reveals a complex dynamic. The coefficient for the of government expenditure (ln GEXR) is 59.330, which is statistically significant at the 1% level. This indicates that in the long run, an increase in government expenditure positively affects domestic investment, suggesting that higher government spending is associated with increased investment in the economy.

However, the inclusion of the squared term of government expenditure (ln $(GEXR)^2$) introduces a nonlinear dimension to the analysis. The coefficient for this term is -6.274, also statistically significant, suggesting that while initial increases in government expenditure have a positive effect on domestic investment, this effect diminishes as expenditure continues to rise. This finding points to the presence of diminishing returns; beyond a certain point, further increases in government spending may actually start to reduce domestic investment. This result is consistency with (Mwakalila, 2020, Azreen *et al.*, 2022, Parasan & Manoppo, 2022).

Other variables in the model provide additional context. The coefficient of the subsidies is negative and statistically significant of probability value of 0.004, suggesting that the subsidies adversely affect domestic investment. Inflation and interest rate coefficients are not statistically significant, indicating that these factors do not have a strong influence on domestic investment within the period analysed. The money supply has a negative and significant impact on domestic investment (p-value = 0.020), while the savings rate positively influences domestic investment, as indicated by its highly significant coefficient (p-value = 0.000).

Table 11: Non-linear impact of government expenditure on domestic investment

Variables	Coef.	Std.Err	t- stat	p-value	[95%Conf.	Interval]
lnGEXR	59.330	18.653	3.180	0.010	17.769	100.891
ln (GEXR)^2	-6.274	2.066	-3.040	0.013	-10.878	-1.671
lnSB	-1.550	0.416	-3.730	0.004	-2.477	-0.623
lnINF	0.036	0.047	0.770	0.460	-0.068	0.140
lnMS	-0.184	0.067	-2.760	0.020	-0.334	-0.035
lnIR	0.055	0.147	0.370	0.718	-0.274	0.384
lnSR	0.993	0.077	12.870	0.000	0.821	1.165
_cons	-103.53	58.28	-1.780	0.106	-233.392	26.331
R-squared	0.9318			Adj R-squared	0.7953	
Durbin-Watson st	2.421448					

Source: Author's compilation, 2024

Short-run estimation: Non-linear effect of government expenditure on domestic investment

The short-run analysis reveals that the lagged difference of domestic investment has a significant negative impact on current investment, with a coefficient of -0.800 and a probability value of 0.025. However, neither the first difference nor lagged values of government expenditure and its squared term show significant effects, indicating no short-term influence on domestic investment. Subsidies and money supply demonstrate marginal significance, suggesting potential but inconclusive short-run impacts, while changes in the savings rate show no significant effect. These findings align with Kinyanjui et al. (2022) on the role of subsidies in Kenya but contrast with Oyedepo & Okor (2024), who found a negative relationship between government expenditure and investment in Nigeria. The negative lagged effect of investment on current investment mirrors Nguyen (2022) in Vietnam, while the insignificance of government expenditure and its squared term highlights the critical role of fiscal efficiency and macroeconomic context, as noted by Nyoman et al. (2021).

Table 12: Non-linear impact of government expenditure on domestic investment

Variable	Coefficient	Std. Error	t-Statistic	p-Value	[95% Conf. Interval]
D.lndi_L1	-0.8	0.305	-2.62	0.025	-1.479 to -0.121
lngexr_D1	-22.482	17.31	-1.3	0.223	-61.052 to 16.087
lngexr_LD	-27.809	23.31	-1.19	0.26	-79.747 to 24.130
ln(gexr)^2_D1	2.415	1.864	1.3	0.224	-1.739 to 6.569
ln(gexr)^2_LD	3.018	2.526	1.2	0.26	-2.609 to 8.646
lnsb_D1	1.062	0.554	1.92	0.084	-0.171 to 2.296
lnsb_LD	0.918	0.458	2.01	0.073	-0.102 to 1.938
lnms_D1	0.124	0.064	1.93	0.082	-0.019 to 0.268
lnms_LD	0.065	0.047	1.37	0.199	-0.041 to 0.171
lnir_D1	0.07	0.172	0.41	0.69	-0.312 to 0.453
lnsr_D1	-0.282	0.263	-1.08	0.308	-0.867 to 0.303
lnsr_LD	-0.333	0.282	-1.18	0.265	-0.961 to 0.295
_cons	-103.531	58.282	-1.78	0.106	-233.392 to 26.331

Source: Author's compilation, 2024

The quadratic specification indicates an inverted U-shaped relationship between government expenditure and domestic investment. The turning point was calculated using the formula $-\beta_1/2\beta_2$, resulting in a threshold value of ln(GEXR) = 4.73, equivalent to approximately 113.3% of GDP. Since Tanzania's government expenditure remained below this level during the study period, the economy had not yet reached the point where government spending negatively affects domestic investment. Instead, the result

suggests diminishing returns to government expenditure, where additional spending continues to support investment but with declining marginal effects.

Although theory predicts that higher interest rates reduce domestic investment, the interest rate was statistically insignificant in both the linear and non-linear models. This may suggest that during the study period, investment decisions in Tanzania were influenced more by government expenditure, savings, inflation, and money supply than by changes in lending rates. Although the models achieved high explanatory power (R^2 = 0.93–0.95) using 33 annual observations, the ARDL approach is well suited for small samples and the diagnostic tests confirmed that the models are correctly specified and statistically reliable. Therefore, the findings are considered robust, although future studies using larger datasets could further validate the results.

5. Conclusion and Recommendation

In conclusion, this study examined the impact of government expenditure on domestic investment in Tanzania using data from 1990 to 2022. The findings reveal that government expenditure has a significant positive impact on domestic investment, though this effect is moderated by factors such as savings rates, subsidies, inflation, and money supply. The relationship is non-linear, with initial spending increases stimulating investment but excessive expenditure leading to diminishing returns. The opposite effects between the short run and long run can be explained by the different adjustment periods in the economy. In the short run, increases in subsidies, inflation, and money supply may stimulate domestic investment by providing immediate financial support, increasing liquidity, and encouraging business expansion. However, in the long run, continuous reliance on subsidies, excessive inflation, and rapid monetary expansion may create economic inefficiencies, increase uncertainty, and reduce productivity. Therefore, while these factors may provide temporary support for investment, their long-term effects depend on the quality of policy implementation, macroeconomic stability, and whether they contribute to sustainable economic growth. Regarding the study hypotheses, the findings reject the first null hypothesis, confirming that government expenditure has a significant linear effect on domestic investment in Tanzania. The second null hypothesis is also rejected, as the results reveal a significant non-linear (inverted U-shaped) relationship between government expenditure and domestic investment. Policy recommendations include enhancing government spending efficiency, reforming subsidies, managing inflation and money supply, promoting savings, avoiding excessive expenditure, adopting long-term budgeting, and implementing an integrated policy framework that aligns fiscal and monetary strategies to sustain and improve domestic investment in Tanzania.

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