



## Journal of Economics and Financial Analysis

Type: Double Blind Peer Reviewed Scientific Journal

Printed ISSN: 2521-6627 | Online ISSN: 2521-6619

Publisher: Tripal Publishing House | DOI:10.1991/jefa.v9i1.a77

Received: 29.02.2024 | Accepted: 11.02.2025 | Published: 29.08.2025

Journal homepage: [ojs.tripaledu.com/jefa](https://ojs.tripaledu.com/jefa)



## Public Spending- Private Investment Nexus in South Africa

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### Abstract

*This paper empirically investigates the association between different components of government spending and private investment in South Africa. Using autoregressive distributed lags (ARDL) analysis, we examine data spanning from 2005q2 and 2022q1. Our results reveal distinct impacts of various government spending components on private investment. Specifically, we find that education spending has a significant effect in the long run but lacks significant short-term impact. Moreover, expenditures on housing and environmental protection stimulate investment, indicating a crowding-in effect. Conversely, health spending shows a negative long-term effect on investment, although its short-term impact is not significant. Notably, military expenditure is found to detrimentally affect private investment in South Africa. Our findings suggest the potential for reallocating resources among different spending categories without necessarily undermining investment. Furthermore, they underscore the potential for enhancing investment and fostering growth in South Africa by channelling more resources toward education, environmental protection, and housing.*

**Keywords:** *Crowd-in; Crowd-out; Investment; Military; Education; Government Spending.*

**JEL Classification:** *E31, E39.*

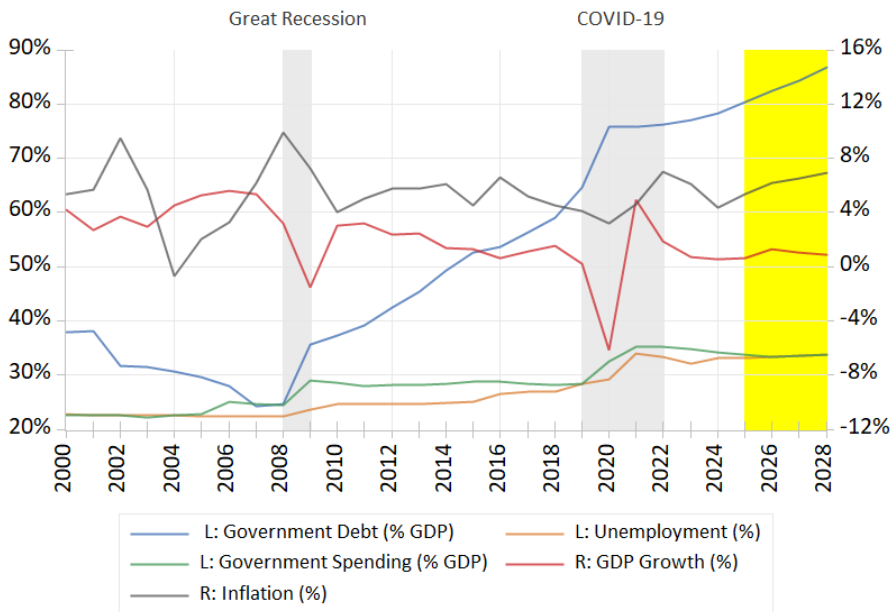
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## 1. Introduction

Following the 2007–09 global financial crisis and the COVID-19 pandemic, South Africa has witnessed unprecedented fiscal activity, resulting in rising public debt and persistent budget deficits. In 2024, government spending surged to 35% of GDP, up from 28% in 2018 (see Figure 1, green line), while gross government debt rose from 59% to 78% of GDP (blue line). Projections by the IMF suggest a further increase in debt levels, potentially reaching 87% of GDP by 2028 (yellow shaded). These dynamics have revived long-standing concerns about the sustainability of fiscal policy and its implications for private investment and growth.



**Figure 1.** South African Government Spending

Despite the rise in government expenditure, private investment has remained stagnant or declined in certain periods, partly due to structural constraints such as persistent electricity shortages, policy uncertainty ahead of national elections, and higher borrowing costs. Beyond these cyclical and structural challenges, a critical policy debate concerns whether expanding government size itself crowds out private-sector investment or, conversely, stimulates it by enhancing aggregate demand and providing complementary infrastructure.

Economic theory offers competing perspectives on this question. Keynesian perspectives suggest that public expenditure, particularly on infrastructure and human capital, stimulates demand and raises the marginal productivity of private capital, thereby crowding in investment. Conversely, the neoclassical view emphasizes resource competition: when government spending is financed through borrowing or taxation, it increases interest rates and reduces available funds for private agents, crowding out investment. The Ricardian equivalence theorem provides a third perspective, positing neutrality in the long run as rational agents anticipate higher future taxation (Barro, 1981). Empirical evidence suggests that the effects of public expenditure are not uniform but depend critically on its composition, financing method, and the institutional environment (Afonso & Alegre, 2011; Kim & Nguyen, 2020).

Recent studies underscore these nuances. For instance, Espinoza et al. (2024), using firm-level data from 49 countries, show that public investment can crowd in private investment, but the effect depends on firm characteristics such as leverage, liquidity constraints, and efficiency. Similarly, Jalles et al. (2024) find that in emerging and developing economies, public investment shocks tend to raise growth and crowd in private activity, particularly when fiscal space is available. In contrast, Kim and Nguyen (2020) demonstrate that exogenous increases in U.S. federal spending reduced corporate investment, hiring, and R&D, highlighting crowding out through labor-market competition. These heterogeneous findings suggest that context matters deeply.

South Africa offers a distinctive and underexplored case. The country combines a high social transfer burden—nearly half of the population receives social grants—with persistent structural bottlenecks such as energy rationing, policy uncertainty, and weak infrastructure delivery. Recent evidence shows that the impact of fiscal policy depends on financial conditions: Nuru (2023) finds that output multipliers of spending shocks are higher under tight credit conditions, with public investment shocks more effective than public consumption shocks. Yet, to date, little is known about how different components of government spending affect private investment specifically in South Africa. Most domestic studies (Odhiambo, 2015; Buthelezi, 2023) focus on aggregate spending and growth rather than disaggregated effects on investment, leaving an important empirical and policy gap.

International research highlights why disaggregation matters. Xu and Yan (2014) distinguish between public investment in “public goods,” which crowds in private investment, and investment in commercial activities, which crowds out. Maluleke et al. (2023), focusing on Botswana, find that infrastructure-related

investment tends to crowd out private investment, whereas non-infrastructure spending can generate short-term crowding in. Similarly, Bouakez et al. (2017) show that the multiplier effects of public investment depend on time-to-build delays, which can amplify crowding-in effects in liquidity traps. Collectively, these findings suggest that the composition of spending—education, health, military, social transfers, housing, and environmental protection—matters far more than aggregate totals.

Against this backdrop, this paper examines the impact of disaggregated government spending on private investment in South Africa from 2005Q2 to 2022Q2, employing an Autoregressive Distributed Lag (ARDL) framework. By distinguishing between categories such as education, health, military, housing, environmental protection, and social security, we provide new evidence on whether particular spending lines stimulate or deter private capital formation. To our knowledge, this is the first systematic attempt to apply disaggregated fiscal accounts to the question of crowding in versus crowding out in South Africa.

This contribution is threefold. First, by focusing on private investment rather than growth, we avoid the definitional overlap that arises when government spending is included in GDP (Hansson & Henrekson, 1994). This allows us to directly assess how fiscal activity influences private-sector capital formation. Second, by disaggregating spending, we reveal asymmetries that aggregate studies obscure. For example, we find that education, housing, and environmental protection expenditures exhibit a crowding-in effect, while military and social security spending exert a crowding-out effect. Third, our results have direct policy relevance for South Africa's fiscal consolidation agenda. They suggest that reallocation—rather than mere retrenchment—of spending could enhance private investment without undermining social objectives.

The rest of the paper is structured as follows. Section 2 reviews the theoretical and empirical literature on government spending and private investment, situating South Africa within this debate. Section 3 describes the data and methodology. Section 4 presents and discusses the results, while Section 5 concludes with policy implications.

## **2. Literature Review**

### **2.1 Theoretical Perspectives**

The debate on the relationship between government spending and private investment is rooted in three major strands of economic theory: the Keynesian, neoclassical, and Ricardian perspectives. Each provides different predictions about whether public expenditure stimulates or inhibits private capital formation.

From a Keynesian standpoint, public expenditure is viewed as complementary to private activity. In the presence of idle resources, increased government spending boosts aggregate demand, raises output, and enhances the marginal productivity of private capital. This “crowding-in” hypothesis implies that strategic government expenditure, particularly on infrastructure, education, and public goods, reduces production costs and creates profitable opportunities for private firms to invest (Barro, 1990; Bouakez et al., 2017). In this view, public spending acts as a catalyst that lowers risk perceptions and stabilizes expectations, thereby encouraging firms to undertake investment projects that might otherwise be postponed during periods of uncertainty (Barbosa et al., 2016).

In contrast, the neoclassical framework posits a crowding-out mechanism. When government spending is financed by debt or higher taxation, it competes with private agents for scarce resources. Debt issuance raises interest rates, increasing the cost of borrowing, while higher taxation reduces disposable income and savings. As a result, the availability of loanable funds to private investors contracts, reducing private investment (Traum & Yang, 2015). This resource competition is particularly acute in economies with limited fiscal space or shallow financial markets, where public borrowing can easily displace private borrowers. The neoclassical perspective is reinforced by studies showing that deficits reduce public savings, thereby requiring either higher foreign capital inflows or reduced private investment to equilibrate the economy.

A third perspective is offered by the Ricardian Equivalence theorem (Barro, 1981), which asserts that government spending has a neutral long-run effect on private investment. The logic is that rational agents anticipate higher future taxation associated with government borrowing. Anticipating this burden, households increase their savings, offsetting the government’s fiscal expansion. In this framework, neither crowding-in nor crowding-out occurs, as forward-looking agents neutralize the stimulatory effects of public spending.

Beyond these classical theories, more recent approaches emphasize the importance of composition, financing structure, and institutional context. Theoretical refinements stress that not all forms of public spending have the same implications. Productive expenditures, such as investment in infrastructure, education, and environmental protection, may raise the marginal productivity of private inputs and induce crowding in (Lin, 1994; Benos & Zotou, 2014). By contrast, unproductive spending, such as excessive military outlays or recurrent transfers, may divert resources from productive uses, raising uncertainty and crowding out private investment (Rehman et al., 2023). The Adaptive Market Hypothesis further suggests that the effects of government spending evolve with

economic conditions, credit availability, and investor expectations, implying that crowding-in or crowding-out effects may not be stable across regimes.

Overall, theory provides no universal prediction. Instead, it highlights that the effect of government spending on private investment is contingent upon financing methods, economic context, and spending composition. These theoretical distinctions provide a framework for evaluating empirical evidence across different countries, sectors, and fiscal regimes.

## **2.2. Empirical Literature on Government Spending and Investment**

Empirical evidence on the relationship between government spending and private investment remains inconclusive, with studies producing results consistent with both the crowding-out and crowding-in hypotheses. Several studies find evidence consistent with the crowding-out view. Pieroni (2009), Afonso and Sousa (2011), and Yovo (2017) report that higher public spending reduces private investment, particularly when financed through fiscal deficits. Bahal et al. (2018) report comparable evidence for India, documenting that public investment displaced private activity over the long period from 1950 to 2012. Funashima and Ohtsuka (2019) add that spatial spillovers exacerbate crowding-out effects in Japan, especially when fiscal expansion interacts with regional investment decisions. Evidence from advanced economies reinforces this view, with Kennedy (2021) and Lorusso and Pieroni (2017) highlighting persistent crowding-out dynamics when deficits are high or fiscal multipliers are weak. Kim and Nguyen (2020) also provide firm-level evidence from the United States showing that federal spending shocks reduce corporate investment, hiring, and innovation, particularly among financially constrained firms.

Other studies, however, lend support to the crowding-in hypothesis. Atabaev et al. (2018) show that government spending stimulates private investment in the short run, suggesting complementarities between public and private capital in Kyrgyzstan. Kuştepelı (2005) finds that public investment in infrastructure consistently crowds in private capital over the period 1963–2003 in Turkey. Similarly, Argimón et al. (2007) report that in 14 industrialized countries public investment played a complementary role, while Atukeren (2006) documents that in 25 developing economies public expenditure enhanced private capital formation. Evidence from Nigeria also supports this perspective, with Raifu (2022) showing that government spending crowds in private investment in the long run. Jalles et al. (2024), using a broad panel of emerging and developing economies, further demonstrate that public investment shocks have particularly strong effects in recessions, crowding in private investment and consumption when fiscal space is available.

A growing body of research has emphasized that these conflicting results can often be explained by the composition of spending. Xu and Yan (2014) show that investment in public goods such as infrastructure has a complementary effect on private investment, whereas expenditure on commercial activities by state-owned enterprises crowds it out in China. Maluleke et al. (2023) find that infrastructure spending reduces private investment in the long run in Botswana, while non-infrastructure expenditure exerts a short-term crowding-in effect. These findings reinforce earlier work by Afonso and Alegre (2011) and Afonso and Jalles (2015), which highlight that disaggregated spending categories exert heterogeneous effects, some stimulating and others discouraging private investment. Espinoza et al. (2024) extend this analysis to the firm level, showing that public investment crowds in private capital for firms with low leverage and high efficiency but not for those financially constrained or inefficiently managed.

Turning to South Africa, the empirical evidence is still limited. Odhiambo (2015) and Buthelezi (2023) examine the impact of public spending on growth, but not explicitly on private investment, while Nuru (2023) shows that credit conditions strongly mediate fiscal multipliers. His findings suggest that public investment has larger effects under tight credit regimes compared to periods of financial ease. Yet, despite these contributions, no study has systematically examined the impact of disaggregated government spending categories on private investment in South Africa. Given the country's fiscal consolidation pressures, stagnant investment trends, and the urgent need to foster growth, such an inquiry is both timely and policy-relevant.

### **3. Data & Methodology**

#### **3.1. Data**

This study investigates the impact of government spending on private investment in South Africa using quarterly data from 2005Q2 to 2022Q2. Data on government expenditure disaggregated by function were obtained from the International Financial Statistics (IFS), while private gross fixed capital formation and real GDP were sourced from the South African Reserve Bank (SARB). Since disaggregated government expenditure data are only available at annual frequency, we transformed the series into quarterly data using standard temporal disaggregation techniques. Similar approaches have been adopted in macroeconomic time-series research where data availability is limited (Chan, 1993; Lahari et al., 2011).

All variables were seasonally adjusted and converted into real terms using the GDP deflator. Private investment (PI) is expressed as the natural logarithm of

real gross fixed capital formation by the private sector. Government spending components are disaggregated into categories such as education, health, military, housing, social protection, and environmental protection. The sample period was selected to capture post-liberalization dynamics while excluding distortions from apartheid-era fiscal structures.

### 3.2. Econometric Specification

Private investment dynamics are modeled within the Autoregressive Distributed Lag (ARDL) framework, which allows for distinguishing between short-run and long-run effects of government spending. The general ARDL(p, q) representation is specified as:

$$PI_t = \alpha_0 + \alpha_1 t + \sum_{i=1}^p \beta_i PI_{t-i} + \sum_{j=1}^k \sum_{l=0}^{q_j} \gamma_{jl} X_{j,t-l} + \varepsilon_t$$

where  $PI_t$  denotes private investment,  $X_j$  represents disaggregated categories of government spending (e.g., education, health, military, housing, environmental protection),  $\varepsilon_t$  is the error term, and  $t$  is a deterministic trend.

The ARDL framework is particularly suitable for this study for three reasons. First, unlike traditional cointegration methods (Engle & Granger, 1987; Johansen, 1991), the ARDL bounds approach (Pesaran et al., 2001) does not require all variables to be integrated of the same order, provided none is I(2). This feature minimizes pre-testing biases and is especially relevant for small samples typical of macroeconomic time series (Pata & Samour, 2022; Hu et al., 2024). Second, it accommodates both stationary and non-stationary regressors, ensuring flexibility in dealing with mixed integration orders. Third, it allows direct estimation of both short-run and long-run elasticities within a unified model.

Unit root tests performed by Augmented Dickey-Fuller (ADF) analysis confirm suitability of our series for ARDL framework. To establish whether a long-run relationship exists between government spending and private investment, we employ the ARDL bounds test for cointegration. The null hypothesis of no long-run relationship is tested against the alternative of cointegration, with critical values provided by Pesaran et al. (2001). Rejection of the null confirms the presence of a stable long-run equilibrium.

The ARDL(p, q) presented above yields both long-run and short-run dynamics as:

$$PI_t = \alpha_0 + \sum_{j=1}^k \theta_j x_{j,t} + u_t$$

where  $\theta_j$  are the long-run coefficients. This model generates the error correction term (ECT) as:

$$ECT_{t-1} = PI_{t-1} - \alpha_0 - \sum_{j=1}^k \theta_j x_{j,t-1}$$

When ARDL(p, q) establishes valid cointegration, it is reparameterized into an Error Correction Model (ECM) as:

$$\Delta PI_t = \phi_0 + \sum_{i=1}^{p-1} \theta_i \Delta PI_{t-i} + \sum_{j=1}^k \sum_{l=0}^{q_j-1} \lambda_{jl} \Delta X_{j,t-l} + \psi ECT_{t-1} + \mu_t$$

where  $ECT_{t-1}$  is the lagged error-correction term derived from the long-run equation, and  $\psi$  captures the speed of adjustment back to equilibrium. Theoretically, a valid error-correction model requires that  $\psi$  be negative and statistically significant, with values between  $-1$  and  $0$ . A coefficient in this range indicates that deviations from the long-run equilibrium are gradually corrected, with the absolute value reflecting the adjustment speed. If  $\psi$  is positive, it suggests serial correlation in the residuals, while values smaller than  $-1$  imply explosive dynamics and model instability, which should be tested using CUSUM and CUSUMSQ (Sovbetov, 2018).

To ensure the robustness and reliability of the ARDL estimates, a comprehensive set of diagnostic tests is employed. Serial correlation is assessed using the Breusch–Godfrey LM test, while the Breusch–Pagan–Godfrey test evaluates heteroskedasticity. The Jarque–Bera test is applied to examine residual normality, and the Ramsey RESET test detects potential functional misspecification or omitted variables. Furthermore, the stability of estimated parameters over time is verified through the CUSUM and CUSUMSQ tests (Brown et al., 1975). Only when these diagnostics confirm adequacy can the model be considered suitable for inference.

**Table 1.** Series and Descriptive Statistics

Variable	Series	Mean	Min	Max	Std.Dev	Skew.	Kurtosis
PI	Private Investment, % of GDP	18.42	15.21	21.09	1.47	-0.36	2.11
RECR	Recreation, culture & religion, % of	2.14	1.76	2.63	0.22	0.51	2.48

	total spend						
STRANS	Social transfers, % of total spend	16.97	15.1	18.82	0.98	0.27	2.35
HEALTH	Health expenditure, % of total spend	12.53	10.78	14.12	0.91	-0.41	2.52
EDU	Education expenditure, % of total spend	19.87	18.21	22.36	1.05	0.32	2.19
HOUSING	Housing expenditure, % of total spend	6.12	5.31	7.01	0.48	0.21	2.01
ENV	Environmental protection, % of total spend	3.42	2.91	4.05	0.33	-0.19	2.47
MILITARY	Defence expenditure, % of total spend	11.25	9.68	12.93	0.89	-0.44	2.71
ECON	Economic affairs, % of total spend	7.61	6.83	8.4	0.46	0.17	2.05

#### 4. Results

Initially, we determine lag length of our ARDL model using the Akaike Information Criterion (AIC), which is preferred for small samples and dynamic models. The optimal lag structure is obtained as ARDL(2,1,1,0,1,1,0,1,0), ensuring sufficient dynamics without over-parameterisation.

To validate the robustness of the ARDL estimates, several diagnostic tests are performed and summary results are given in Table 2. The Breusch–Godfrey LM test confirmed the absence of serial correlation, while the Breusch–Pagan–Godfrey test indicated no heteroskedasticity in the residuals. The Jarque–Bera test suggested that the residuals were normally distributed. The Ramsey RESET test did not detect functional form misspecification. Finally, stability of the coefficients was assessed using CUSUM and CUSUMSQ tests (Brown et al., 1975), both of which remained within critical bounds, confirming model stability (Figure 2).

**Table 2.** Diagnostic and Stability Tests

Test	Statistic	p-value	Interpretation
Breusch–Godfrey LM	1.72	0.19	No serial correlation
Breusch–Pagan–Godfrey	2.03	0.16	No heteroskedasticity
Jarque–Bera	1.65	0.44	Normal residuals
Ramsey RESET	2.11	0.14	No misspecification

CUSUM	0.22	> 0.10	Parameters stable
CUSUMSQ	0.23	> 0.10	Parameters stable

Then, we carry ARDL bount test for cointegration between private investment and disaggregated components of government spending. Table 3 reports where calculated F-statistic of 3.856 exceeds the Pesaran et al. (2001) upper critical bounds at the 1%, 5%, and 10% levels, confirming the presence of a stable long-run relationship among the variables. This suggests that private investment and government spending components move together over the long horizon. Our finding is consistent with Ho (2001), Laopodis (2001), and Ghali (1999), who similarly document long-run co-movements between fiscal variables and investment.

**Table 3.** ARDL Bound Test

F-Statistic	Significance	I(0) Bound	I(1) Bound
3.856***	1%	2.62	3.77
	5%	2.11	3.15
	10%	1.85	2.85

**Note:** \*\*\*, \*\*, \* denote significance at the 1%, 5%, and 10% levels. Critical values are taken from Pesaran et al. (2001) at Table CI(ii) Case II: restricted intercept with no trend for 8 regressors.

The short- and long-run ARDL estimates reported in Table 4 provide nuanced evidence on how different components of government spending affect private investment in South Africa. The error correction term (ECT<sub>t-1</sub>) is correctly signed, negative, and significant (−0.975), indicating that nearly 97% of any disequilibrium between government spending components and private investment is corrected within a single quarter. This relatively fast adjustment speed is consistent with other ARDL studies in emerging markets (e.g., Latif et al., 2015) and underlines the validity of the estimated long-run relationships.

Military results consistently indicate a strong crowding-out effect. In both the short run (−0.774, p<0.01) and the long run (−0.793, p<0.01), military spending significantly reduces private investment. The magnitude of the coefficients is among the largest across spending categories, underscoring how military outlays divert scarce fiscal resources from productive sectors, increase macroeconomic uncertainty, and potentially raise interest rates in a deficit-constrained economy. This aligns with findings by Rehman et al. (2023), Elish et al. (2023), and Dunne and Tian (2015), who document that military expenditure displaces private capital formation in developing economies.

The short-run coefficient for health spending is negative (−0.194) but statistically insignificant, while the long-run coefficient turns positive (0.466) though it remains insignificant. This pattern suggests that, although health spending could in principle enhance productivity and eventually support private capital formation, in the South African context the evidence is too weak to confirm such an effect. The insignificant results imply that health outlays may be absorbed largely by recurrent expenditures, such as wages and administration, rather than investments that yield measurable spillovers to private investment. These findings align with Afonso and Jalles (2015), who observed that in many emerging economies health spending does not exhibit a statistically discernible impact on private capital accumulation.

**Table 4.** Error Correction Model (Short-run ARDL Model)

Variable	Short-Run	Variable	Long-Run
$\Delta PI_{t-1}$	0.381*** (0.017)	$PI_{t-1}$	-0.126* (0.065)
$\Delta RCR$	-1.192*** (0.345)	$RCR$	0.079 (0.082)
$\Delta STRANS$	-0.280** (0.131)	$STRANS$	0.006 (0.068)
$\Delta HEALTH$	-0.194 (0.382)	$HEALTH$	-0.466 (0.424)
$\Delta EDU$	0.051 (0.293)	$EDU$	0.241*** (0.037)
$\Delta HOUSING$	0.332* (0.188)	$HOUSING$	0.181*** (0.049)
$\Delta ENV$	0.276* (0.102)	$ENV$	0.912*** (0.434)
$\Delta MILITARY$	-0.774*** (0.222)	$MILITARY$	-0.793*** (0.077)
$\Delta ECON$	-0.055 (0.487)	$ECON$	-0.032 (0.487)
$ECT_{t-1}$	-0.975*** (0.340)	Intercept	9.351*** (0.340)

**Note:** The \*\*\*, \*\*, and \* implies significance levels at 1%, 5%, and 10% respectively. Robust standard errors are given in parantheses.

Education expenditure emerges as a significant driver of private investment in the long run (0.241,  $p < 0.01$ ), while the short-run effect is insignificant. This finding accords with human-capital theory (Lin, 1994) and the meta-study by Nijkamp and Poot (2004), which show that education stimulates private

investment over time by raising the marginal productivity of capital and enhancing innovation capacity. The delayed effect is intuitive, as returns to human-capital investment accrue gradually.

Both housing and environmental protection expenditure categories exert robust crowding-in effects. Housing spending is positive in both horizons (short run: 0.332,  $p < 0.1$ ; long run: 0.181,  $p < 0.01$ ), suggesting that public support for housing development reduces barriers for private construction and real estate investment. Similarly, environmental protection expenditure has significant investment-inducing effects (short run: 0.276,  $p < 0.1$ ; long run: 0.912,  $p < 0.01$ ), consistent with global evidence that green policies stimulate complementary private investments (Bouakez et al., 2017; Jalles et al., 2024). Notably, the long-run coefficient is nearly one, implying strong complementarity between public environmental spending and private capital formation, potentially reflecting alignment with global sustainability goals.

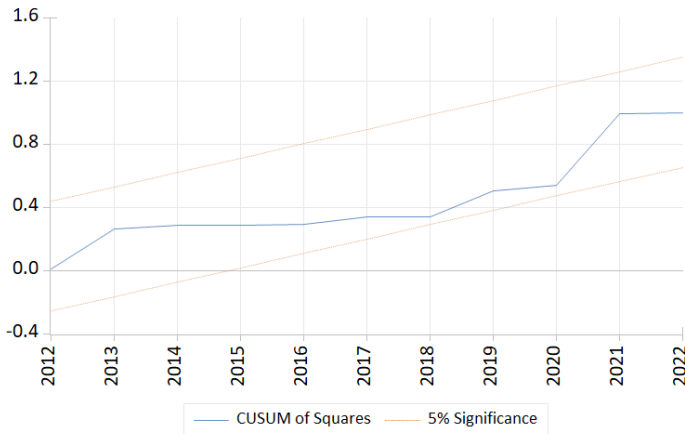
Recreation, culture, and religion (RCR) and social transfers expenditures show adverse short-run effects (RCR:  $-1.192$ ,  $p < 0.01$ ; social transfers:  $-0.280$ ,  $p < 0.05$ ) but insignificant long-run effects. This suggests that redistributive expenditures may temporarily depress investment by diverting resources from productive sectors, but their effects dissipate over the longer horizon. These results echo Afonso and Alegre (2011) and Afonso and Jalles (2015), who found that social transfers reduce investment incentives, particularly in economies with high dependency ratios.

Spending on economic affairs is insignificant in both the short and long run, implying that government allocations to this category are either too limited in scale or inefficiently implemented to influence private investment. This contrasts with some cross-country studies (e.g., Argimón et al., 2007) but may reflect South Africa's structural challenges, such as persistent policy uncertainty and infrastructure bottlenecks, which dilute the effectiveness of such spending.

The results paint a clear picture of heterogeneity. Productive categories such as education, housing, and environmental protection crowd in investment, while military, health, recreation, and social transfers crowd it out. The significance of the ECT term and model stability diagnostics reinforce the robustness of these findings. Importantly, the analysis supports the notion that fiscal consolidation in South Africa should be selective: trimming unproductive spending categories could create fiscal space for reallocations toward investment-enhancing sectors without undermining private capital accumulation.

Additionally, model stability is evaluated using the CUSUM test, which traces the cumulative sum of recursive residuals over time. As shown in Figure 2, the CUSUM statistic (blue line) remains within the 5% significance boundaries (red

dotted lines), indicating parameter constancy throughout the sample period. This confirms that the estimated ARDL model is stable and the results are not spurious.



**Figure 2.** Cumulative Sum (CUSUM) Test

## 5. Discussion

This paper set out to investigate the effects of disaggregated government spending on private investment in South Africa between 2005Q2 and 2022Q2. Using the ARDL bounds testing framework, complemented by short- and long-run error correction estimates, we provided new evidence on how specific categories of government expenditure influence private capital formation. Unlike most prior studies that examine aggregate government spending, our approach focused on functional disaggregation, thereby allowing for sharper insights into which components of fiscal policy stimulate or inhibit investment.

The findings reveal strong heterogeneity across spending categories. Education, housing, and environmental protection consistently exhibit investment-enhancing effects, supporting the crowding-in hypothesis. These categories expand human capital, reduce barriers to private construction activity, and align with green transition objectives that are increasingly central to global and domestic investment strategies. By contrast, military expenditure exerts a robust crowding-out effect in both the short and long run, highlighting the trade-off between defense spending and productive capital formation in a fiscally constrained economy. Similarly, social transfers and recreation, culture, and religion exert negative short-run effects on investment, though their influence dissipates over the longer horizon. Health spending, while theoretically

productivity-enhancing, yields insignificant effects in the short run and fails to demonstrate a sustained positive relationship with investment, suggesting inefficiencies in allocation and absorption. Spending on economic affairs is found to be neutral, with no significant impact detected.

Taken together, these results underscore that fiscal policy in South Africa has not been uniformly conducive to private investment. Instead, only certain expenditure categories create complementarities with private capital formation, while others either crowd out investment or remain neutral. Importantly, the error correction term is strongly negative and significant, indicating rapid adjustment toward long-run equilibrium. Stability diagnostics confirm the robustness of the model, reinforcing confidence in the validity of the results.

From a policy perspective, the findings point toward the need for selective fiscal consolidation and strategic reallocation. Curtailing unproductive spending components—such as excessive military outlays and inefficient social transfers—could create fiscal space for scaling up investment-enhancing expenditures, particularly education, housing, and environmental protection. Doing so would not only foster private investment but also strengthen South Africa’s long-term growth prospects by improving human capital, addressing structural bottlenecks in housing, and advancing the sustainability agenda. At the same time, enhancing the efficiency of health spending remains critical if such outlays are to generate productivity spillovers and attract complementary private investment.

Overall, the study contributes to the literature by demonstrating that the composition of government spending matters as much as its scale in shaping private investment outcomes. By adopting a disaggregated approach, we show that crowding-in and crowding-out effects coexist within the same fiscal system, with their net effect depending on how resources are allocated across functions. For South Africa, where fiscal space is tightening and investment remains subdued, the results provide actionable insights: promoting investment requires not just controlling the size of government spending, but reallocating it toward functions that complement private capital formation.

Future research could extend this analysis by examining sector-specific private investment responses to public spending, exploring the role of governance and institutional quality in mediating these effects, and testing for nonlinearities across different phases of the business cycle. Such extensions would further enrich our understanding of how fiscal policy design can support private investment and long-term economic development in South Africa and comparable emerging markets.

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