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Navigating the economic tightrope: Exploring governance, public debt, and their influence on South Africa's capital formation

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Abstract: This paper explores the interconnected dynamics between governance, public debt, and domestic investment (also known as gross fixed capital formation (GFCF) in South Africa). It also highlights domestic investment as a key driver of economic growth, noting a consistent decline in investment since the country's democratic transition in 1994. Moreover, this downward trend is exacerbated by excessive public debt, poor governance, and increased economic risks, discouraging domestic and foreign investments. The analysis incorporates two theoretical perspectives: endogenous growth theory, which stresses the significance of local capital investment and innovation, and institutional governance theory, which focuses on the role of governance in promoting economic development. The study reveals that poor governance, rising debt, and high economic risks have impeded GFCF and economic stability. By utilizing quantitative data from 1995 to 2023, the research concludes that reducing public debt, improving governance, and minimizing economic risk are critical to revitalizing domestic investment in South Africa. These findings suggest that policy reforms centered on good governance, effective debt management, and economic stabilization can stimulate investment, promote growth, and address the country's economic challenges. This study offers insights into how governance and fiscal policies shape investment and capital formation in a developing nation, providing valuable guidance for policymakers and stakeholders working towards sustainable economic growth in South Africa.

Keywords: capital formation; economic growth; good governance; public debt; South Africa

1. Introduction

Domestic investment, also known as gross fixed capital formation (GFCF), represents the net increase in fixed assets utilised to produce goods and services and is pivotal in bolstering a country or region's economy (Turnovsky, 2015). Additionally, local investments fuel economic growth and generate job opportunities, improve infrastructure, attract more businesses, elevate the overall standard of living for residents, and foster innovation (Maisonnave et al., 2019). More specifically, political risks and uncertainties compel potential investors to strategically manage their investments (Leopold and Wafo, 1998).

Since the inception of South Africa's transition to democracy in 1994, the rate of investment (GFCF) has consistently declined, with South Africa's GFCF contribution to gross domestic product (GDP) standing at a modest 13% in 2023. This figure pales in comparison to China's remarkable 42% GFCF contribution to GDP during the same period (Quantec, 2024). As outlined in the National Development Plan (NDP) targets, achieving a GFCF of approximately 30% of GDP by 2030 is crucial for sustaining long-term growth. However, South Africa falls short, managing only to attain a range between 12% and 16%, significantly below the international benchmark (Republic of South Africa, 2016).

Moreover, the South African economy grapples with a multitude of challenges, which encompass sluggish economic growth, a decline in the level of governance, insufficient levels of investment, escalating poverty rates, soaring unemployment figures, and electrical capacity issues leading to rotational load shedding (Thakoor and Coronel, 2020). The current financial year reflects a mere 0.6% economic growth, an alarming unemployment rate of 32.1% and a debt-to-GDP ratio exceeding 73% as of September 2023 (CEIC Data, 2024; StatsSA, 2024). Despite these glaring issues, the government has struggled to address these concerns effectively. Among these challenges, the low economic growth rate is particularly worrisome, with no discernible solutions forthcoming from the government for this or any other predicament.

Examining the sovereign government debt ratings provided by agencies such as Standard and Poor's (BB-), Moody's Investors Service (Ba2), and Fitch Ratings (BB-), South Africa's overall rating is deemed speculative, falling just below investment grade or what is commonly referred to as "junk status" (World Government Bonds, 2024). Moreover, understanding the impact of credit ratings on economic dynamics is pivotal for navigating the complexities of modern financial systems and formulating policies aimed at sustainability and growth (Elkhoury, 2008). According to Meyer and Mothibi (2021), poor credit ratings, indicating sub-investment or "junk" status, tend to elevate public borrowing costs, with lower ratings correlating with higher interest payments on public debt. Governments with weaker credit ratings may encounter obstacles in implementing fiscal policies and managing budget deficits (Utzig, 2010). More specifically, credit ratings serve the function of assessing the creditworthiness of entities and guiding investment and lending decisions (Utzig, 2010). Consequently, elevated economic risks are poised to negatively impact local and foreign investments (Hassan, 2023).

In finance, multiple factors wield significant influence over investment levels and appeal. Investors must recognise and evaluate these factors to make informed decisions, balancing risks to optimise returns (Shevchenko, 2016). Just as individual and corporate financial ventures depend on investments, a nation relies heavily on capital inflows to enhance its developmental trajectory. This encompasses the distribution of investments across economic sectors and the pace of economic expansion (Tvaronavičius and Tvaronavičiene, 2008). As Molocwa et al. (2018) emphasised, private investments underpin economic growth and contribute to the potential scale of national income. However, numerous variables impact investments within a national economy, including economic uncertainties, governance, and public debt.

Economic risk is also critical to economic investments (Spyromitros and Panagiotidis, 2022). For example, heightened economic risk often results in decreased investment levels as investors shy away from uncertain markets and are wary of fluctuating exchange rates, political instability, and shifts in government policies (Qi et al., 2022). Hence, effectively managing economic risk is essential to attract investments and foster economic expansion (Harmon et al., 2015).

Good governance also plays a crucial role in enhancing investment attractiveness. According to Njuguna and Nnadozie (2022), nations characterised by good governance tend to attract more investments due to the provision of a consistent and

secure business climate. Additionally, key components such as accountability, transparency, and adherence to the rule of law are integral (Njuguna and Nnadozie, 2022). Dela Rama (2012) noted that corruption and inadequate governance practices can deter investments by creating an unpredictable and volatile environment. Accordingly, corruption exacerbates issues by misusing public funds, resulting in heightened public debt levels and diminished investment prospects (Cooray et al., 2017). Therefore, fostering a culture of good governance is paramount in attracting investments and fostering economic progress.

The extent of public debt can also influence investments within an economy (Jalles and Medas, 2022), as elevated levels of public debt can potentially decrease overall investments by heightening the risk of a fiscal crisis (Zenghelis et al., 2020). Public debt accumulation may stem from various factors, including increased government spending, reduced tax revenue, and various fiscal adjustments (Buthelezi and Nyatanga, 2023). Moreover, public debt may trigger what is known as the crowding-out effect, wherein government borrowing reduces the availability of funds for private investments. Thus, effective public debt management stimulates investments while fostering economic growth (Sánchez-Juárez and García-Almada, 2016).

In summary, the importance of domestic investment cannot be overstated as a means of bolstering economic growth and prosperity, as it generates employment opportunities, enhances infrastructure, fosters innovation, attracts businesses, and elevates living standards. However, in today's economic uncertainties, investment decisions are fraught with apprehension due to political risks and uncertainties. Currently, South Africa's investment landscape reflects a trend of declining GFCF rates, falling far below international benchmarks. Moreover, the country's sovereign credit ratings, hovering around speculative or "junk" status, have further compounded economic risks, impacting local and foreign investments. Thus, effective governance, characterised by accountability and transparency, is vital for cultivating an environment conducive to investment. At the same time, public debt management also plays a pivotal role in sustaining economic growth by mitigating the risk of fiscal crises and avoiding crowding-out effects on private investments.

This study aims to analyse the problems experienced in South Africa regarding the insufficient levels of investment and the impacts of rising government debt and declining governance within a low-growth environment. South Africa is recognised as a proxy for developing economies.

2. Literature review

The study aims to determine the correlations between domestic capital investment, government debt, good governance, and economic risk factors. The research has a theoretical foundation in the endogenous growth theory and the institutional governance theory. Firstly, the endogenous growth theory is applicable, as this theory argues that economic activities such as growth are primarily driven by internal factors (Soyer et al., 2020). The theory further emphasises local capital investment, human capital development, innovation, and knowledge spillovers in driving growth (Acs and Sanders, 2021; Baycan et al., 2017). Related to these factors

and with collaboration, good governance can enhance relevant factors by providing an enabling environment for local businesses to prosper (Helling et al., 2005). In addition, excessive public debt could have a negative impact on economic activities, as necessary resources could be allocated away from productive investments (Panizza and Presbitero, 2013). By linking this theory to current South African conditions, this theory allows researchers to better understand how governance and economic policies shape incentives for innovation, investment in human capital, and, ultimately, capital formation (Fedderke and Simkins, 2012).

Secondly, the institutional theory of governance also relates to this study. This theory, first formulated by Meyer and Rowan (1977) and followed by DiMaggio (1988), posited that good governance via quality public institutions is critical for economic success. These economic successes include economic growth and capital formation. According to Lindsey et al. (2021), good governance, including accountability, transparency, quality regulations, and policies, is required to create an enabling environment to attract investment. Linking this to South Africa, enhancing governance could enhance investor confidence and increase capital investments (Agyemang et al., 2019). Therefore, reforms in South Africa are required to strengthen institutions weakened by the period of state capture since 2009 (Jonas, 2019).

The next section of the literature review assesses empirical studies related to this research topic. Firstly, the relationship between domestic investment and good governance is assessed, followed by domestic investment versus public debt, and, lastly, domestic investment and its relationship with economic conditions.

2.1. Relationship between domestic investment and governance

Governance is related to a country's management and regulatory framework, which, in turn, influences economic decision-making processes (Aiyede, 2023). In addition, governance also means the decision-making process and prioritisation of policies that will most impact achieving the developmental goals (De Guimarães et al., 2020). Following the general concept of governance, the more specific concept to be assessed is "Good Governance". The World Bank was the first globally recognised institution to coin the concept of good governance in its 1992 report entitled "Governance and Development" (Frey, 2008). This document defines good governance as how power is used to regulate a country's economic and social resources for development. According to Onichakwe (2016), good governance refers to the processes and structures that guide political and socio-economic relationships, ensuring accountability, effectiveness, transparency, inclusiveness, responsiveness, and the rule of law while using government resources efficiently. In addition, good governance aims to fight corruption and respond proactively to all communities' needs (Brillantes and Fernandez, 2010).

The relationship between governance and domestic capital investment (GFCF) is complex, with governance significantly impacting domestic investment decisions and overall economic growth (Shahid and Abbas, 2019). In short, good governance is integral to economic development, fostering a conducive business environment, ensuring efficient resource allocation, and attracting investments (Azam and Emirullah, 2014; Dellepiane-Avellaneda, 2010). Conversely, weak governance can

impede economic growth, deter investments, and result in inefficient resource allocation (Fagbemi and Kotey, 2022).

The relationship between good governance and GFCF is also reciprocal, as good governance facilitates investment attraction predicated on political stability, transparent regulations, and effective legal systems (Ayuba, 2014; Cieślik and Goczek, 2018). Political instability, corruption, and a lack of rule of law can deter potential investors and, thus, hinder infrastructure development, economic growth, and innovation, exacerbating socio-economic challenges (Ogbuabor et al., 2020; Owusu et al., 2020).

Meyer (2023) analysed the correlations between risk ratings, governance, economic performance, and investment using a comparative analysis between Poland and South Africa. The study adopted a quantitative research approach using data from 1994 to 2021. The analysis entailed a descriptive and econometric analysis for both countries. The findings revealed significant differences between the two countries. Poland performed more efficiently than South Africa, which performed at approximately 43% of that of Poland in 2021 and only 73% over the study period. Moreover, long-run relationships were estimated, with the formulated risk rating index as the dependent variable. In the case of Poland, the level of government debt had the highest impact on the dependent variable, while in the South African case, the level of GDP growth had the highest impact. The results suggest that management with good governance, economic performance, and the level of investment significantly impact countries' sovereign risk rating indexes. Thus, policymakers need to ensure high levels of management, good governance, and government debt management. In addition, policy certainty must be ensured to attract investment by facilitating stable risk ratings.

In a study by Iheonu (2019), the impact of governance on domestic investment in 16 African countries from 2002 to 2015 was assessed using the World Bank's Worldwide Governance Indicators. The results indicated that all the governance indicators positively and significantly impacted domestic investment, except for "government effectiveness", which had insignificant results. Additionally, economic growth was essential in explaining domestic investment in Africa.

In conclusion, the nexus between GFCF and good governance is pivotal. Good governance fosters an investment-friendly climate, promotes innovation, and drives economic progress, highlighting the importance of creating an enabling environment to attract investments (Meyer, 2014).

2.2. Relationship between domestic investment and public debt

Gross fixed capital formation (GFCF) represents the total investment in physical assets such as buildings, machinery, and critical infrastructure. At the same time, public debt refers to government borrowing to finance projects or expenses (Kanu and Ozurumba, 2014), with the understanding that public debt levels can impact fixed capital investment by altering borrowing costs. For instance, high debt levels may lead to higher interest rates to attract investors to government bonds (Ncanywa and Masoga, 2018). Moreover, higher borrowing costs can discourage private investments in fixed-capital projects, as businesses may find it more costly to finance their ventures. Additionally, the crowding-out effect may occur when government borrowing from

domestic financial markets reduces the funds available for private investment (Fayed, 2013). This reduction in financial resources for private firms can decrease private investments in fixed capital, thereby impeding productivity and long-term economic growth.

When examining the relationship between public debt and gross fixed capital formation, it is crucial to consider resource allocation. For example, public debt can positively impact gross fixed capital formation by enhancing infrastructure quality, attracting private investments, and fostering economic growth (Otieno, 2024). However, careful consideration is necessary to prevent the inefficient use of resources and excessive borrowing, which could diminish investment returns. Moreover, misallocating funds and excessive public debt can exacerbate the debt burden and significantly jeopardise the long-term sustainability of capital formation (Pan et al., 2017).

Furthermore, Ndou and Gumata (2023) investigated whether increased government debt levels impact investments and the economy. The results indicated that increasing government debt has a negative impact on investment and economic growth. Kocha et al. (2021) analysed the effect of public debt on capital formation in Sub-Saharan Africa (SSA) from 2000 to 2008. This study revealed that rising debt and increases in interest repayments have a limited impact on domestic investment in the short run but have a significant adverse effect in the long run. The study recommended that all efforts be made to increase the government revenue base, effective public expenditure, and a focus on public debt management.

Kamau (2021) investigated the relationship between public debt and gross capital formation in Kenya. The study methodology used time series data from 1980 to 2019 in a quantitative analysis. The findings indicated that increasing public debt negatively impacts gross fixed capital formation. It also showed that high government debt levels place a long-term burden on a country's capital formation, growth, and development. Hence, policymakers must facilitate sustainable debt levels to support economic macroeconomic fundamentals, including capital formation.

Also, Saungweme and Odhiambo (2021) investigated the impact of government debt on economic growth in South Africa from 1970 to 2017. Using the ARDL model, the results indicated that rising and high public debt levels significantly negatively impact economic growth in both the long and short run. The study recommends that if the government implement sustainable financial management, it could attract investment, thereby leading to growth.

In conclusion, the relationship between public debt and gross fixed capital formation is complex and influenced by various factors. Accordingly, public debt levels play a crucial role in fixed capital investments by affecting borrowing costs and the crowding-out effect, highlighting its impact on economic development and growth (Ncanywa and Masoga, 2018).

2.3. Relationship between domestic investment and economic risk

Understanding the interplay between economic risks and gross fixed capital formation (GFCF) is crucial for grasping the dynamics of stability and economic growth (Meyer and Sanusi, 2019). More specifically, GFCF, representing fixed assets

such as buildings, machinery, and infrastructure, significantly drives economic development. Therefore, it is essential to recognise that a country's economic risk level can profoundly influence GFCF outcomes (Oluwaleye et al., 2022). Economic risk denotes the potential for adverse effects on financial performance stemming from external factors impacting the overall economy, which include interest rates, inflation, and exchange rates (Aisen and Veiga, 2013). It is, therefore, noteworthy that multiple factors impact GFCF, such as the macroeconomic environment (economic vitality, interest and inflation rates, and government policies), as well as technological advancements (productivity growth, innovation, and incentivising business investment in infrastructure) (Meyer and Sanusi, 2019).

Analysing the relationship between gross fixed capital formation (GFCF) and economic risks can also aid in understanding investment behaviour and its impact on economic conditions. Moreover, a positive correlation may indicate increased investment during periods of lower economic risk, while lower investment might occur during periods of higher economic risk (Abiad et al., 2016). In developing nations, economic risks can significantly affect GFCF, mainly due to factors such as currency fluctuations, political instability, and volatile regulatory changes, which can also deter investments in infrastructure and long-term strategies, leading to a decrease in overall GFCF levels (Oluwaleye et al., 2022).

The government's proactive involvement in sustaining gross fixed capital formation (GFCF) amidst economic risks is crucial, necessitating the provision of incentives for long-term capital investments, facilitating access to financing options, and implementing risk-sharing mechanisms for high-risk projects. Additionally, through partnerships between the public and private sectors and targeted interventions, the government can bolster investor confidence while mitigating the impact of economic uncertainties (Mazzucato et al., 2020). Examining the interplay between economic risk and GFCF further underscores the importance of prudent decision-making and risk management in fostering a resilient and sustainable economic landscape. Thus, businesses, policymakers, and investors must carefully assess the dynamics and relationship between long-term economic prosperity through fixed investments and economic risks to optimise opportunities and navigate challenges effectively (Laplane and Mazzucato, 2020).

In conclusion, understanding the relationship between economic risks and gross fixed capital formation (GFCF) is crucial for comprehending stability and economic growth. Moreover, GFCF significantly drives economic development and is profoundly influenced by a country's level of economic risk. Analysing this relationship aids in garnering a better understanding of investment behaviour and its impact on economic conditions, further emphasising the need for proactive government involvement and prudent decision-making to sustain GFCF amidst economic risks and foster a resilient economic landscape.

3. Methodology

The study adopted a quantitative approach grounded in the functionalist theoretical paradigm, utilising secondary data. Focusing on South Africa as a representative case for other developing nations grappling with similar developmental

obstacles, the research investigates the influence of various risk factors on domestic investment. Key predictive variables encompass government debt levels, such as a composite good governance index formulated from the World Bank Governance Indicators and an economic risk index obtained from the PRS Group. Moreover, the hypotheses postulate that reduced government debt, improved good governance standards, and favourable economic risk conditions could bolster domestic investment. **Table 1** below describes all the variables and their respective sources.

Table 1. Summary of variables.

Variable and description	Variable abbreviation in log format	Unit	Source
Gross fixed capital formation (GFCF) includes all fixed investments, leading to higher outputs and productivity. This includes machinery and equipment and the construction of hard infrastructure (e.g., roads, public facilities, and residential, commercial and industrial buildings) (World Bank, 2024).	LGFCF	R millions at constant values.	Quantec (2024)
Government debt includes domestic and foreign liabilities such as loans (World Bank, 2024).	LGOVDEBT	R millions at constant values.	Quantec (2024)
Combined good governance index. The author created this combined index by producing a composite index from the following variables: effective governance, corruption control, and quality of regulations.	LCGGI	Index from −2.5 to +2.5 with 0.0 as the midpoint.	WBGI (2024)
Composite economic risk index: This composite index consists of GDP per capita, GDP growth, the inflation rate, budget balance as a percentage of GDP, and the current account as a percentage of GDP (PRS Group, 2024).	LECONRISK	The index is between 0 and 100, with higher values related to the improved economic risk environment.	PRS Group, ICRG Data, 2024.

Source: Author's compilation.

The quantitative research methodology used secondary data from the sources listed in **Table 2**; the analysis period ranged from 1995 to 2023. The analysis included descriptive assessments of trends within the data and a regression analysis using an ARDL (autoregressive distributed lag) model for the econometric analysis. This model included long- and short-run analyses of the relationships between the variables included in the study. Moreover, a Granger causality analysis was also estimated to test the impact direction and confirm the econometric model's stability. It should also be noted that the ARDL method was selected due to various reasons, which include the following: The model combines the strengths of both the distributed and autoregressive lag models and is widely utilised in econometric analysis for examining and elucidating time series data (Wang et al., 2016). This makes it particularly suitable for this study, given that all the included variables exhibited I (0) or I (1) regarding stationarity. Additionally, the ARDL examination for long-term associations does not impose constraints on the integration order of the variables. This implies that variables with diverse levels of integration, whether non-integrated or fractionally cointegrated, can be incorporated. Furthermore, the ARDL method is suitable for small samples (Stoian and Iorgulescu, 2020). Besides this, the ARDL method offers an advantage

over alternative cointegration techniques by facilitating the assessment of short-run relationships by including an error correction term (Rehman et al., 2021). This term specifies the speed of adjustment following an initial deviation from equilibrium and is integrated into the ARDL framework. Finally, the ARDL technique aids in mitigating endogeneity issues (Musah, 2022).

The equation can be represented as follows Equation (1):

$$\Delta LGFCF_t = \partial_0 + \sum_{i=1}^{n} \partial 1_i \Delta LGFCF_{t-i} + \sum_{i=0}^{n} \partial 2_i \Delta LGOVDEBT_{t-i} + \sum_{i=0}^{n} \partial 3_i \Delta LCGGI_{t-i}$$
$$+ \sum_{i=0}^{n} \partial 4_i \Delta LECONRISK_{t-i} + a_1 LGFCF_{t-1} + a_2 LGOVDEBT_{t-1} + a_3 LCGGI_{t-1}$$
$$+ a_4 LECONRISK_{t-1} + \mu_{1t}$$

(1)

where:

$LGFCF_t$ denotes the dependent variable domestic investment (gross fixed capital formation)

$\alpha_2 LGOVDEBT_t$ refers to the first independent variable total government debt

$\alpha_2 LCGGI_t$ represents the second independent variable composite good governance index

$\alpha_3 LECONRISK_t$ designates the third independent variable economic risk index

∂_0, $\sum_{i=1}^{n} \partial$, and $1_i \Delta$ represent the coefficients of the short-run relationships and a_1 to $a4$ the long-run relationships

μ_{1t} denotes the white noise error term and the error term at time t

Upon confirmation of cointegration among the variables, the error correction model is represented as follows, as suggested by Pesaran et al. (2001):

$$LGFCF_t = \partial_0 + \sum_{i=1}^{n} \partial 1_i \Delta LGFCF_{t-i} + \sum_{i=0}^{n} \partial 2_i \Delta LGOVDEBT_{t-i} + \sum_{i=0}^{n} \partial 3_i \Delta LCGGI_{t-i} + \sum_{i=0}^{n} \partial 4_i \Delta LECONRISK_{t-i}$$
$$+ \lambda ECT + \mu_{1t}$$

(2)

ECM_{t-1} is the one-period lagged error correction term with a coefficient λ that measures the speed of adjustment of the model towards equilibrium. All other variables and parameters are as defined in Equation (1). The best model for the estimation based on the model selection criteria (Akaike information model) was 1,0,1,0. The econometric process included the following: a descriptive statistical analysis with a trend analysis; unit root tests to assess the stationarity of all variables; and the ARDL model followed by an error correction estimation, a Granger causality analysis, and a model stability confirmation.

4. Results and discussion

4.1. Descriptive results

Table 2, in conjunction with **Figure 1**, summarises the descriptive data and trends per variable. The four variables have been discussed individually and in the same order as listed in the table and Figures. Firstly, regarding domestic investment (GFCF), the mean value over the research period from 1995 to 2023 was R 596 billion

per year. The maximum investment value of R 796 billion was achieved in 2015, with a minimum value of R 316 billion. Domestic investment increased from 1995 to a peak in 2010 (Soccer World Cup in SA) but has stagnated and declined to real values far lower than in 2015. Secondly, total government debt has increased steadily since mid-2008 after a subdued start from 1995. Unfortunately, the rapid increase in government debt has continued to 2023. Additionally, total government debt at constant prices has increased from R 1058 billion in 2008 to R 3114 billion in 2023, relating to an increase of 194%. Thirdly, an assessment of the combined good governance index indicates a steady decline in good governance from 1995 to 2023. This index ranges between −2.5 and +2.5, and in 1995, the value was 0.78; in 2023, it declined to −0.21. This indicates a below-average level of governance in South Africa. Lastly, the assessment of the economic risk index has been provided by the PRS Group. This index ranges between 0 and 50. The risk index generally declined over the study period from a value of 36.5 out of 50 in 1995 to a low point of 25.5 in 2020, after which it improved to a value of 31 in 2023.

Table 2. Descriptive statistics.

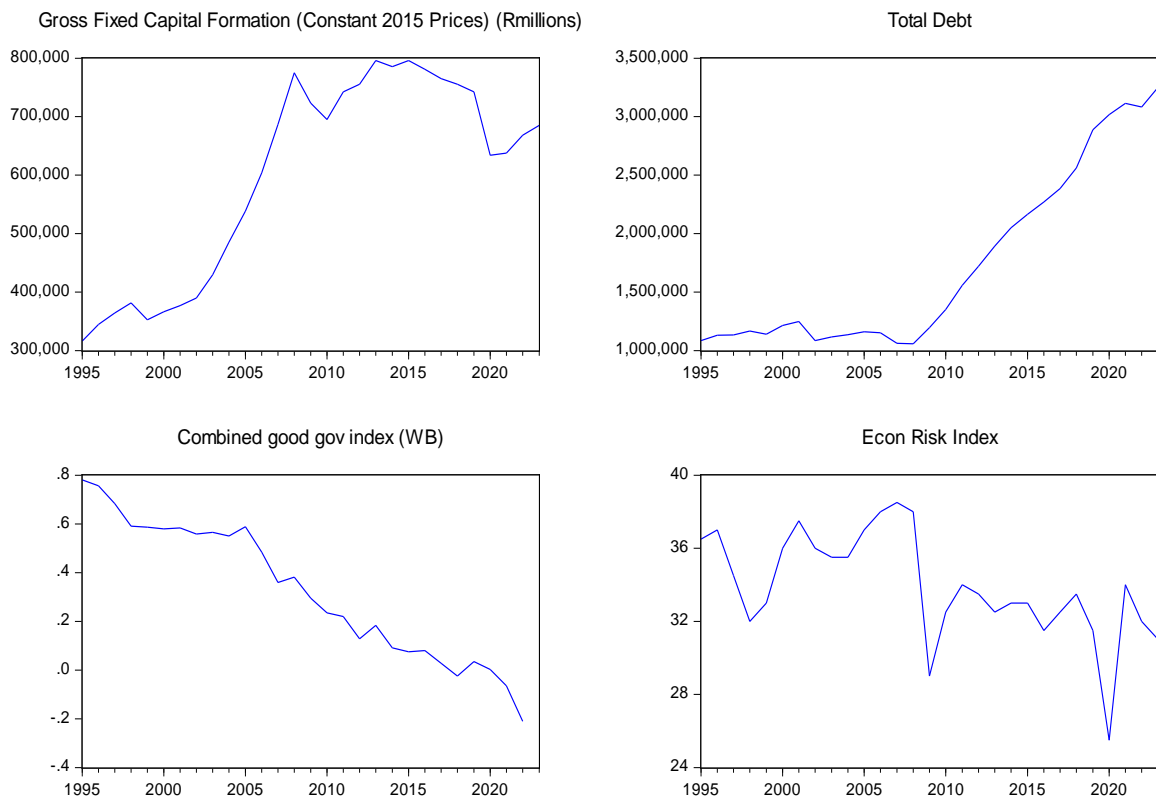| Statistic	Domestic Investment (R Millions)	Total Government Debt (R Millions)	Combined Good Governance Index (between −2.5 to +2.5)	Economic Risk Index (0 to 50)
Mean	596,028	1,683,393	0.325	34.04
Maximum (year in brackets	796,139 (2015)	3,114,000 (2023)	0.780 (1995)	38.50 (2007)
Minimum (year in brackets)	316,035 (1995)	1,057,540 (2008)	−0.210 (2023)	25.50 (2020)

Figure 1. Trend analysis of the four variables.
Sources: Quantec (2024); World Bank (2024); PRS (2024).

4.2. Unit root testing results and breakpoint test

Table 3 presents the results of the unit root tests for each variable under different conditions. These conditions include the presence of a trend and intercept, the absence of a trend and intercept, and the first difference without a trend and intercept. All the variables were integrated in a mixed order at I (0) or I (1). Additionally, both the ADF (augmented Dickey-Fuller) test and the PP (Phillips-Perron) test confirmed that all the variables were integrated at level I (1) and level I (0). The mixed levels in stationarity of variables allowed for using an ARDL model.

Table 3. The unit root tests.

Variable (Test type in brackets)	Level I (O)		First Difference I (1)		Test Results
	t-statistic	*p*-value	*t*-statistic	*p*-value	
(ADF) LGFCF	−1.535	0.4910	−3.2101	0.0252*	I (1)
(PP) LGFCF	−1.872	0.3301	−3.2101	0.0252*	I (1)
(ADF) LGOVDEBT	0.3591	0.9772	−3.187	0.0319*	I (1)
(PP) LGOVDEBT	0.6737	0.9892	−3.187	0.03198	I (1)
(ADF) LCGGI	2.6451	0.9908	−3.3591	0.0218*	I (1)
(PP) LCGGI	3.0312	0.9896	−3.3512	0.0222*	I (1)
(ADF) LECONRISK	−3.2615	0.0269	−5.7690	0.0001*	I (0)
(PP) LECONRISK	−3.1910	0,0312	−19.0301	0.0001*	I (0)

Note: *denotes a p-value at a 5% level of significance. Source: E-Views 12.

Regarding the unit root breakpoint test, all the variables were tested to determine any breaks in the data set. This was deemed necessary because the data set included two COVID-19 years. These tests showed no significant breakpoints concerning the COVID-19 years in any of the four variables used.

4.3. ARDL bounds test

Table 4. Results of f-bounds test for cointegration.

Total Debt as the dependent variable			
Significance Level	**Critical Values**		**F-statistic**
	Lower Bound I (0)	Upper Bound I (1)	
10%	3.47	4.45	
5%	4.01	5.07	10.426
2.5%	4.52	5.62	
1%	5.17	6.36	

Source: EViews 12, own compilation.

The next step in the process was the bound test, which is a pre-test for long-run relationships between variables before the ARDL regression estimation is completed. This test determines whether the variables in a time series model are cointegrating in the long run, using F and t-statistics to evaluate the significance of the lagged levels of the variables (Reda and Nourhan, 2020). **Table 4** presents the critical values and the F-bounds test. The findings reject the null hypothesis that no long-run relationship

exists between domestic investment (GFCF) and the other independent variables. The computed F-statistic (10.426) signifies that it is higher than both the lower I (0) (4.01) and the upper I (1) (5.07) bounds values at the 5% significance level, which confirms the result that there is a long-run cointegration relationship between domestic investment and the other variables.

4.4. ARDL long-run estimates

The F-Bounds test confirmed a long-run cointegration of the variables included in the ARDL, while the regression model was estimated with domestic investment as the dependent variable. The results are displayed in **Table 5**. The long-run ARDL model was appraised based on the Schwarz information criterion (SIC) using four lags and the best cast ARDL model: ARDL (3,4,1,2).

Table 5. ARDL long-run estimates: Domestic investment (LGFCF) as the dependent variable (best case model: lag (3,4,1,2)).

Variable	Coefficient	Std. error	t−statistic	Prob
LGOVDEBT	−1.2478	0.2271	−5.4930	0.0003
LCGGI	0.3345	0.1278	2.6170	0.0435
LECONRISK	0.5349	0.3213	1.6648	0.1012

Source: EViews 12.

The results indicate that government debt has a negative relationship with domestic investment. However, in contrast, the combined good governance index and the econ risk index have positive relationships with domestic investment. Government debt also has the highest impact and coefficient on domestic investment. Additionally, by assessing the results in **Table 5**, it can be seen that domestic investment could increase by 1.25% if government debt decreases. In South Africa, government debt has reached unsustainably high levels of more than 70% of the GDP. The government cannot afford higher debt levels (Ncanywa and Masoga, 2018). From a theoretical point of view, the relationship between domestic investment and government debt is affected by several factors, such as the efficiency of government spending and the broader macroeconomic environment. Moreover, increasing and relatively high government debt levels can lead to the "crowding out" of private-sector investment (Akanbi, 2020). Policymakers must balance these effects to ensure that government borrowing is appropriately utilized and supports long-term economic growth without stifling private-sector investment (Stiglitz, 1998).

Secondly, the relationship between the combined good governance index and domestic investment was positive, meaning improved good governance could lead to increased domestic investment with a coefficient of 0.33, which is significant. Across most economies, good governance practices lead to political and economic stability, a main condition for investment (Raza et al., 2021). As such, countries with quality institutions and policies that are well implemented attract investment as a result of high levels of confidence in the process (Daude and Stein, 2007). Good governance also means sustainable financial management with investments in infrastructure for economic development (Al-Saadi and Khudari, 2024). Besides this, good governance

also leads to the effective use of limited public resources to reduce the cost of doing business and any domestic risks (Handoyo, 2017).

Lastly, the relationship between economic risk factors included in the index and domestic investment has also been examined. The results indicate a positive and significant relationship. If economic risk conditions, such as GDP per capita, GDP growth, the inflation rate, budget balance as a percentage of GDP, and the current account as a percentage of GDP improve by 1%, domestic investment appreciates by 0.53%. Therefore, economic risk conditions are crucial in shaping the domestic investment environment. According to Collier and Pattillo (2000), economic risk conditions significantly impact domestic investment, influencing investment activities' costs and potential returns. Low economic-risk conditions, which include low and stable inflation, interest rates, and policy certainty, encourage businesses to invest in local economies. In conclusion, economic risk factors must be managed through sound policy formulations and good governance, leading to investor confidence and investment.

The long-run equation:

$$LGFCF = -1.248\_LGOVDEBT + 0.335\_LCGGI + 0.535\_LECONRISK \qquad (3)$$

4.5. ARDL short-run estimates

The short-run estimation results are depicted in **Table 6**. The coefficient of the ECM (error correction model) was negative and significant. This result confirms the long-run relationships between all the variables. The short-run results further reveal that the main findings remain coherent with what is attained in the long run, which is that government debt (at current levels) in South Africa has a negative impact on domestic investment. The diverse variables were assessed, including different lags per variable. Domestic investment significantly impacted itself in the 1st and 2nd lags, with coefficients ranging between 0.36 and 0.35. Additionally, government debt negatively and significantly impacted the short-run domestic investment at the 1st lag with a coefficient of −0.46. Good governance also had a significant positive impact with a coefficient of 0.14, while the economic risk index significantly impacted domestic investment with coefficients between 0.39 and 0.52.

Table 6. ARDL short-run estimates (domestic investment as dependent variable).

Variable	Coefficient	Std. error	t-statistic	Prob
LGFCF (−1)	0.364308	0.076099	4.787311	0.0007*
LGOVDEBT (−1)	−0.454581	0.093622	−4.855488	0.0007*
LCGGI (−1)	0.012704	0.031693	0.400849	0.6970
LECONRISK (−1)	0.194874	0.269622	0.722767	0.4864
D (LGFCF (−1))	0.206715	0.151544	1.364062	0.2025
D (LGFCF (−2))	0.350854	0.161357	2.174395	0.0488**
D (LGOVDEBT)	−0.131708	0.155124	−0.849048	0.4157
D (LGOVDEBT (−1))	0.135315	0.124908	1.083310	0.3041
D (LGOVDEBT (−2))	0.060479	0.111434	0.542731	0.5992

Table 6. (*Continued*).

Variable	Coefficient	Std. error	t-statistic	Prob
D (LGOVDEBT (−3))	0.365885	0.121444	3.012779	0.0131**
D(LCGGI)	0.136453	0.049986	2.729810	0.0212**
D(LECONRISK)	0.516180	0.085203	6.058249	0.0001*
D (LECONRISK (−1))	0.391703	0.143753	2.724829	0.0214**
ECM_{t-1}	−0.3641	0.0494	−7.3732	0.0002*
R^2 = 0.9217				

Note: *denotes a *p*-value at the 1% significance level; **denotes a *p*-value at the 5% significance level.
Source: EViews 12.

4.6. Diagnostic testing

The diagnostic test was utilised to ascertain the efficiency and reliability of the model; the ARDL diagnostics test is shown in **Table 7**. The hypothesis can be outlined as follows:

Table 7. Diagnostics tests.

Test statistic	F-statistics and *p*-value	Decision
Breusch-Godfrey serial correlation LM test	F statistic = 0.1363; and *p*-value = 0.8740	Do not reject H_0: No serial correlation
Normality	Jarque-Bera = 1.6851; and *p*-value = 0.4305	Do not reject H_0: Data normally distributed
Heteroscedasticity test	F statistic = 2.6412; and *p*-value = 0.0740	Do not reject H_0: No heteroscedasticity

Source: EViews 12.

H_0: Errors are normally distributed with no serial correlations and no indication of heteroscedasticity.

H_1: Errors are not normally distributed but are serially correlated and are presented with heteroscedasticity.

As indicated in **Table 8**, it is confirmed that the *p*-value was above 0.05 for all the variables utilised, meaning we accepted the null hypothesis, indicating that the data were normally distributed, no serial correlations were found, and there was no heteroscedasticity.
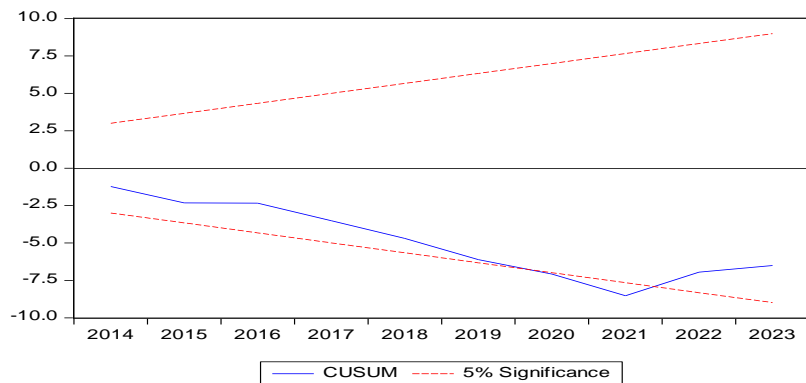

Figure 2. Plot of the cumulative sum of recursive residuals.
Source: EViews 12.

Figure 2 illustrates the plot of the cumulative sum of recursive residuals, which is a sum test for parameter stability. If the coefficients change after a specific period, the plot of the recursive CUSUM process will drift away from the projected value of 0, indicating that the model is stable.

4.7. Granger causality test

Table 8 illustrates the pairwise Granger causality tests for the selected variables in the study. A bi-directional causality was estimated between GFCF and government debt, meaning that both variables cause changes or shocks in the other variable. More GFCF could increase government debt, while more debt could increase investment. Additionally, the direction of causality can vary depending on factors such as economic conditions and monetary and fiscal policies. Furthermore, a bi-directional relationship appears possible when high and rising government debt "crowds out" private investment. However, well-managed debt could lead to increased economic activity. This, in turn, could then result in higher investment in the long run. Eventually, this investment increase can support the government's debt situation (Yusuf and Mohd, 2021; Vuluka, 2020).

Table 8. Pairwise granger causality test.

Null Hypothesis	Obs	Prob	Result
LGOVDEBT does not Granger cause LGFCF LGFCF does not Granger cause LGOVDEBT	28	0.0923** 0.0224*	Bi-directional
LCGGI does not Granger cause LGFCF LGFCF does not Granger cause LCGGI	28	0.0567** 0.8685	Unidirectional CGGI → GFCF
LECONRISK does not Granger cause LGFCF LGFCF does not Granger cause LECONRISK	28	0.3842 0.0988**	Unidirectional GFCF → ECONRISK
LCGGI does not Granger cause LGOVDEBT LGOVDEBT does not Granger cause LCGGI	28	0.0141* 0.6458	Unidirectional CGGI → GOVDEBT
LECONRISK does not Granger cause LGOVDEBT LGOVDEBT does not Granger cause LECONRISK	28	0.4398 0.0039*	Unidirectional GOVDEBT → ECONRISK
LECONRISK does not Granger cause LCGGI LCGGI does not Granger cause LECONRISK	28	0.9335 0.0005*	Unidirectional CGGI → ECONRISK

Source: EViews 12. Note: *denotes a *p*-value at a 5% significance level; **denotes a *p*-value at a 10% significance level.

Also, research indicates that good governance, which includes openness, transparency, corruption prevention, and political stability, attracts domestic investment (Nizam and Hassan, 2018). This relationship was also detected in our study, thereby confirming previous research.

Regarding the causality between domestic investment and economic risk, previous studies indicated that increased levels of economic risk lead to reduced domestic investment (You and Solomon, 2015). This study found that domestic investment causes changes in economic risk.

Moreover, this study ascertained that good governance causes changes in government debt. Good governance can positively impact management's more effective use of public resources and ensure debt sustainability. Biondi (2023) stated

that governments with open and transparent financial and budget processes and oversight institutions will have effective control over debt. It should also be noted that in some cases, high and increasing government debt levels can harm governance. The relationship could, therefore, also be bi-directional.

High government debt levels are often associated with higher economic risks, particularly in developing economies with weaker institutions. Conversely, the relationship between debt and economic risks may be less pronounced in advanced economies with strong governance and fiscal frameworks (Laplane and Mazzucato, 2020). Following these findings, this study also determined that government debt causes economic risk conditions to deteriorate.

Additionally, the relationship between good governance and economic risk levels is significant, with good governance typically reducing economic risks, while poor governance can exacerbate them (Sharma, 2007). It was determined that the causality between the two is mainly one-directional, where improvements in governance help mitigate economic risks. However, there are feedback loops where high economic risks can also undermine governance structures. Similar findings were confirmed during this study.

5. Conclusion and recommendations

This study aimed to examine the correlation between public debt, governance, and domestic capital investment in South Africa. By utilising the endogenous growth theory and institutional theory of governance, the research aimed to understand how government debt and governance influence investment decisions and economic growth. An ARDL econometric model was applied to secondary data from 1995 to 2023 to assess both short-term and long-term dynamics. The key findings revealed that high public debt negatively affects domestic investment by displacing private capital, while good governance fosters a positive environment for investment, enhancing GFCF. Economic risk factors also play a crucial role in determining investment levels, with improved economic conditions boosting domestic investments.

The research is limited by its focus on South Africa, potentially restricting the applicability of the findings to other developing nations. Furthermore, although the ARDL model captures both short- and long-term dynamics, the analysis could benefit from including additional variables related to fiscal policies and external shocks, such as global financial crises. Hence, future studies should explore cross-country comparisons to better understand the interactions between debt, governance, and investment in different regions.

This study contributes to the existing literature by offering empirical evidence regarding the importance of governance and public debt management in fostering economic growth. Furthermore, its implications extend to policymakers seeking diverse strategies to stimulate investment in developing economies facing high debt levels and governance challenges. The following policy recommendations are listed based on the research:

1) Public Debt Management: The South African government must prioritise sustainable debt levels by enhancing fiscal discipline, reducing unnecessary expenditures, and focusing on long-term investments to stimulate growth.

2) Promote Good Governance Practices: Institutional reforms should improve transparency, accountability, and regulatory frameworks that are critical to attracting domestic and foreign investments.

3) Mitigate Economic Risks: Policies should be developed that can stabilise inflation, manage exchange rate volatility, and ensure a balanced budget, which are all essential for fostering an investment-friendly environment.

4) Encourage Public-Private Partnerships: Collaborations between the government and private sector in infrastructure development can alleviate the crowding-out effect and stimulate domestic investment.

In conclusion, effective governance and prudent public debt management are critical drivers of domestic investment and economic growth in South Africa. Thus, addressing governance shortcomings and economic risks is crucial to unlocking the country's collective economic potential. Policymakers should also prioritise reforms that enhance institutional quality and foster a stable, investment-conducive environment.

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