MAKERERE UNIVERSITY

DOMESTIC SAVINGS AND ECONOMIC GROWTH IN UGANDA: A TIME SERIES ANALYSIS (1994 – 2023)

BY

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23/U/17059/PS

A DISSERTATION SUBMITTED TO THE SCHOOL OF STATISTICS AND PLANNING IN PARTIAL FULFILLMENT FOR THE AWARD OF BACHELOR OF SCIENCE IN QUANTITATIVE ECONOMICS OF MAKERERE UNIVERSITY

JULY, 2026

DECLARATION

I, PIMER NAJIBAH, declare that this research dissertation titled **Domestic Savings and Economic Growth in Uganda: A time series analysis (1994 – 2023)** is my original work and has not been submitted to any university or institution for the award of any academic qualification. Where other sources of information have been used, they have been duly acknowledged through proper referencing in accordance with academic conventions.

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APPROVAL

This dissertation titled **Domestic Savings and Economic Growth in Uganda; A time series analysis (1994 – 2023)** has been submitted for examination with the approval of my university supervisor:

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ACKNOWLEDGEMENT

First and foremost, I give glory to God for the strength, wisdom, and perseverance He granted me through the course of this study.

I extend my sincere gratitude to my Supervisor Dr. Mayanja Edison and Dr. Tugume for the inevitable guidance, constructive feedback and the academic support provided throughout the development of the proposal. Your mentorship shaped both the quality and direction of this work.

I am deeply grateful to the lecturers whose teaching laid the quantitative and analytical foundation upon which this study is built.

My heartfelt appreciation goes to my family and friends for their unwavering love, moral support and encouragement during the long hours spent on this research. Your belief in me never wavered.

Finally, I acknowledge the World Bank for making the data used in this study publicly accessible through the World Development Indicators database, likewise bank of Uganda for the consistent accurate and readily available data

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LIST OF ACRONYMS

ADF	Augmented Dickey-Fuller test
ARDL	Autoregressive Distributed Lag
BoU	Bank of Uganda
ECM	Error correction Method
ECOWAS	Economic Community of West African States
IMF	International Monetary Fund
LM	Lagrange Multiplier
MoFPED	Ministry of Finance, Planning, and Economic Development
NDP III	National Development Plan III
SACCOS	Savings And Credit Cooperative Organizations
WAEMU	West African Economic and Monetary Union

ABSTRACT

This study examines the effect of domestic savings on economic growth in Uganda over the period 1994–2023, motivated by an apparent paradox in which gross domestic savings more than doubled, from approximately 7.7% to 18.8% of GDP, while GDP growth trended downward over the same period. Guided by the Harrod-Domar model, the Solow growth model, and the Loanable Funds Theory, the study pursues two specific objectives: to analyze the trend of domestic savings and economic growth in Uganda from 1994 to 2023, and to examine the long-run and short-run effects of domestic savings on economic growth over the same period. Annual secondary data on GDP growth, gross domestic savings, gross capital formation, and inflation were obtained from the World Bank World Development Indicators, while real interest rate data were sourced from Bank of Uganda annual reports. Trend analysis confirmed a statistically significant rise in domestic savings alongside a statistically significant decline in GDP growth. Augmented Dickey-Fuller tests showed that all series are integrated of order one, I(1), justifying the use of the Autoregressive Distributed Lag (ARDL) bounds testing approach.

The bounds test confirmed cointegration among the variables at the 1% significance level. The long-run estimates show that domestic savings has a negative and marginally significant effect on GDP growth, a result consistent with the Keynesian paradox of thrift and with structural weaknesses in Uganda's financial intermediation. Gross capital formation and inflation were statistically insignificant in the long run, while the real interest rate carried the expected negative sign without reaching conventional significance. In the short run, none of the differenced explanatory variables were significant, but the error correction term was negative and highly significant, confirming rapid adjustment toward long-run equilibrium. All diagnostic tests confirmed the statistical validity of the model. The study concludes that savings mobilization alone is not sufficient to accelerate growth in Uganda and recommends that policymakers prioritize deepening financial intermediation, lowering the cost of credit, and improving the productivity of capital formation so that mobilized savings translate more effectively into output growth.

CHAPTER ONE: INTRODUCTION

1.0 BACKGROUND OF THE STUDY

Domestic savings refer to income not consumed but set aside by households, firms, and government for future use. Economic growth is the sustained increase in real GDP over time. Savings matter because they finance investment, which drives capital accumulation and productivity growth (Ribaj & Mexhuani, 2021). The Harrod-Domar and Solow models support this link, arguing that higher savings rates raise investment and long-run output per capita. Globally, the average gross domestic savings rate stood at approximately 26% of GDP in 2023 (World Bank, 2024). Countries like China (44%), Singapore (46%), and South Korea (35%) maintain persistently high savings rates, which reduce dependence on foreign capital and support stable, investment led growth. In contrast, low savings force economies to rely on external aid, FDI, or debt, increasing exposure to external shocks and debt sustainability risks. In Africa, savings rates are considerably lower, averaging around 17% of GDP over the period 1994–2023 (World Bank, 2024). Sub-Saharan Africa's savings gap has increased reliance on external financing and slowed structural transformation. Low financial inclusion, high poverty, and a large informal sector continue to limit formal savings mobilization across the region.(Solow, 1956)

Uganda's experience reflects this broader challenge. Between 1994 and 2023, gross domestic savings grew from approximately 7.7% to 18.8% of GDP a notable improvement, yet still well below the 25% target set in Uganda's Vision 2040 (Uganda Bureau of Statistics. (Ribaj & Mexhuani, 2021). Despite policy efforts including financial liberalization under the Financial Institutions Act (1993), the expansion of mobile money services, and the operationalization of SACCOs, savings remained structurally constrained. During the same period, Uganda's GDP growth averaged 6.2% between 1994 and 2010, before declining to an average of 5.0% between 2011 and 2023. Growth fell to 2.95% in 2020, largely due to the COVID-19 pandemic and associated lockdowns, before recovering modestly to 5.3% in 2023.

This divergence rising domestic savings alongside declining growth is the central empirical puzzle motivating this study. A large informal sector estimated at 43% of GDP (UBOS, 2022), low financial literacy, high real interest rates averaging 14.3% over the study period (Bank of Uganda, 2023), and high dependency ratios constrain the formal savings system. Much household savings continues to be held in non-financial assets such as land and livestock, which do not easily finance productive investment. This suggests that while Uganda generates

increasing savings, weak financial intermediation may prevent those resources from translating into productive capital formation and sustained economic growth. Given this disconnect, the effect of domestic savings on Uganda's economic growth from 1994 to 2023 remains empirically underexplored and policy relevant.

1.1 problem statement

Although domestic savings are recognized as a key driver of economic growth, Uganda's savings rate has historically remained below both global and regional benchmarks. While the global average savings rate is approximately 26% of GDP, Uganda's gross domestic savings averaged 13.5% between 1994 and 2023, well below the 25% target set in Vision 2040 (World Bank, 2024). This gap limits domestic financing for investment and increases reliance on external resources, reducing fiscal sustainability and long run growth prospects. Theoretically, higher savings should finance capital formation and boost GDP growth under the Solow and Harrod-Domar models. However, Uganda's macroeconomic experience shows a paradoxical divergence. Despite a twofold increase in gross domestic savings from 7.7% of GDP in 1994 to 18.8% in 2023, GDP growth trended downward over the same period averaging 7.4% in 2001 to 2010 but declining to 4.5% in 2021–2023. This suggests that the mobilized savings are not being efficiently transmitted into productive investment, possibly due to structural constraints including high real lending rates, a shallow financial sector, and a large informal economy.(Pesaran et al., 2001)

Empirical evidence on the savings-growth nexus in Uganda is also limited and methodologically inconsistent. Most existing studies focus on the period before 2018 and use estimation methods that assume long-run relationships without formally testing for cointegration, risking spurious results. Furthermore, no published study to date has examined this relationship over the extended post-COVID period through 2023, which includes significant structural breaks in both savings' behavior and growth dynamics. This study therefore fills a methodological and empirical gap by examining the long-run and short-run effects of domestic savings on economic growth in Uganda from 1994 to 2023 using the ARDL bounds testing framework.(Odhiambo, 2008)

1.2 main objective

To examine the effect of domestic savings on economic growth in Uganda from 1994 to 2023.

1.3 specific objectives

The study is guided by the following two specific objectives:

1. To analyze the trend of domestic savings and economic growth in Uganda from 1994 to 2023.
2. To examine the long-run and short-run effects of domestic savings on economic growth in Uganda from 1994 to 2023.

1.4 hypotheses

The study tests the following null hypotheses:

1.H_{01}: Domestic savings have no significant long-run effect on economic growth in Uganda (1994–2023).

2.H_{02}: Domestic savings have no significant short-run effect on economic growth in Uganda (1994–2023).

1.5 SCOPE OF THE STUDY

1.5.1 Content Scope

This study focused on examining the effect of domestic savings on economic growth in Uganda. The main variable of interest was gross domestic savings as a percentage of GDP. Control variables included in the analysis were gross capital formation, real interest rate, and inflation rate, consistent with the theoretical frameworks of the Harrod-Domar model, Solow growth model, and Loanable Funds Theory.

1.5.2 Geographical Scope

The study covered Uganda as a single-country case study, using annual national-level aggregate data. Uganda was selected because it represented a low-income Sub-Saharan African economy with a documented savings gap, significant financial sector reforms over the study period, and a policy commitment to domestic resource mobilization under Vision 2040, making it an ideal case for examining the savings growth connection.(Narayan, 2005)

1.5.3 Time Scope

The study covered the period from 1994 to 2023, providing 30 annual observations. The period began in 1994 because it marked Uganda's post-economic liberalization era, following the enactment of the Financial Institutions Act of 1993 and the adoption of the Poverty Eradication

Action Plan framework. The period was extended to 2023, updating earlier studies that ended in 2018, to incorporate the COVID-19 economic shock of 2020-2021 and the subsequent recovery, providing a more comprehensive and policy-relevant picture of the savings-growth relationship in Uganda's recent macroeconomic history.

1.6 significance of the study

This study will make contributions to policy, practice, and scholarship across multiple dimensions. For policymakers, particularly the Ministry of Finance, Planning and Economic Development (MoFPED) and the Bank of Uganda (BoU), it will provide evidence for designing savings mobilization policies and investment promotion strategies aligned with Uganda's National Development Plan III and Vision 2040. For financial institutions, including commercial banks, microfinance institutions and SACCOs, it will help stakeholders understand the savings-growth link and develop products that channel deposits into productive credit.

For the academic community, the study will contribute to the empirical literature on the savings-growth nexus in Uganda using ARDL methodology and the most recent 30-year dataset (1994–2023), filling a gap in post-COVID studies. For development partners such as the IMF, World Bank, it will inform donor strategies and conditionalities by providing country specific evidence on whether Uganda's domestic resource mobilization efforts are translating into growth.

For the Uganda Bureau of Statistics, it will highlight data gaps (e.g. early real interest rate series) and will support the case for consistent long-run macroeconomic data collection in Uganda.

Beyond these specific contributions, the study will be significant because it will extend the empirical time horizon to 2023, making it one of the first Uganda-specific studies to incorporate the COVID-19 shock of 2020 and the post-pandemic recovery period. The structural break represented by COVID-19, which reduced Uganda's growth to 2.95% in 2020, will provide a natural experiment on the resilience of the savings-growth relationship under extreme macroeconomic stress. Documenting how savings and growth co-moved through this shock will be of direct relevance to the National Development Plan III (2020–2025) and the Bank of Uganda's financial sector strategy.

1.7 conceptual framework

The conceptual framework below illustrates the relationships tested in this study. It draws on the Harrod-Domar model, the Solow growth model, and the Loanable Funds Theory to specify how domestic savings influence economic growth through capital formation, controlling for gross capital formation, the real interest rate, and inflation, exactly as specified in the model in Section 3.5. All four variables are analyzed empirically using the ARDL bounds testing approach, which captures both long-run cointegration and short-run dynamics. A feedback arrow from growth to savings acknowledges the two-way causality documented in the empirical literature.(Lucas, 1988) Financial intermediation is discussed in the literature as a plausible channel through which savings are converted into productive investment, but it is not measured directly in this study. the real interest rate serves as the closest available proxy for the cost of credit in that channel.

Figure 1.1: Conceptual Framework

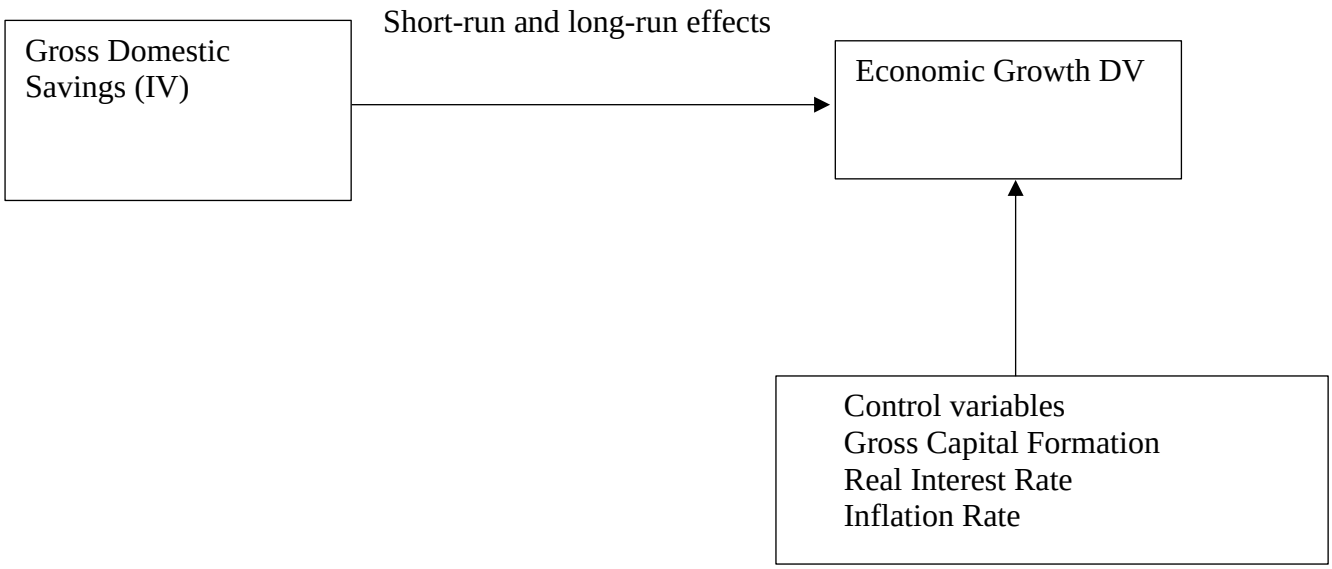

Figure 1:Showing conceptual framework

Source: Author's Construction based on Harrod-Domar (1946), Solow (1956), and Loanable Funds Theory.

As shown in Figure 1.1, gross domestic savings is the primary independent variable, hypothesized to raise economic growth by financing capital accumulation, consistent with the Harrod-Domar and Solow frameworks. Gross capital formation, the real interest rate, and inflation are included as control variables to isolate the specific effect of savings: capital formation is expected to translate directly into productive capacity and raise growth, a high real

interest rate (Uganda's average of 14.3% over 1994–2023) raises the cost of credit and can weaken the channel through which savings become productive investment, and inflation erodes the real value of savings and introduces macroeconomic uncertainty, both dampening growth.

CHAPTER TWO: LITERATURE REVIEW

2.1 **Introduction**

This chapter reviews both theoretical and empirical literature related to domestic savings and economic growth. The chapter I divided into the theoretical literature, empirical literature and a summary research gap

2.2 **theoretical literature**

The relationship between domestic savings and economic growth has been extensively debated in economic theory. Three major theories provide the foundation for understanding this relationship: the Harrod-Domar growth model, the Solow growth model, and the Loanable Funds Theory. These theories collectively argue that savings play a central role in capital accumulation, investment, and long-term economic growth. This section discusses each theory in detail and relates it to the context of Uganda.

2.2.1 **Harrod-Domar growth model**

The Harrod-Domar model, developed independently by Roy Harrod in 1939 and Evsey Domar in 1946 (Harrod, 1939; Domar, 1946), was one of the earliest formal models to emphasize the role of savings and capital accumulation in economic growth. The model is built on Keynesian principles and assumes that investment is the key driver of aggregate demand and productive capacity. The central proposition of the Harrod-Domar model is that the growth rate of an economy is directly proportional to the savings ratio and inversely proportional to the capital-output ratio. This is expressed mathematically as $g = s/k$, where g is the growth rate of GDP, s is the savings rate, and k is the capital-output ratio. The model implies that for a developing country like Uganda to achieve a higher growth rate, it must either increase its savings rate or reduce its capital-output ratio through more efficient use of capital.(Harrod, 1939)

The Harrod-Domar model is particularly relevant for developing economies because it highlights the problem of low savings as a constraint to growth. The model assumes that developing countries suffer from a "vicious circle of poverty" where low income leads to low savings, low savings lead to low investment, low investment leads to low capital formation, and low capital formation leads to low output and income. To break this cycle, the model recommends policies that mobilize domestic savings and attract foreign capital to finance investment. In the Ugandan context, the Harrod-Domar model suggests that increasing gross domestic savings as a percentage of GDP should translate into higher investment in physical capital such as infrastructure, machinery, and equipment, which would then raise GDP growth.

However, the model has been criticized for assuming a fixed capital-output ratio and for ignoring technological progress and labor force growth. Despite these limitations, it provides a simple and direct link between savings, investment, and growth that justifies the focus of this study on domestic savings as the independent variable.

2.2.2 **Solow's growth model**

The Solow growth model, developed by Robert Solow in 1956 (Solow, 1956), extends the Harrod-Domar framework by incorporating labor and technological progress as additional factors of production. Unlike Harrod-Domar, the Solow model assumes diminishing returns to capital and allows for substitution between capital and labor. The model is based on a neoclassical production function: Y = F (K, L, A), where Y is output, K is capital, L is labor, and A represents technology. The key contribution of the Solow model to the savings-growth debate is the concept of the "steady state". The model shows that in the long run, the growth rate of output per worker depends only on technological progress and population growth, not on the savings rate. However, the savings rate determines the level of output per worker in the steady state. A higher savings rate leads to a higher steady state level of capital per worker and therefore a higher level of output per worker, though not a permanently higher growth rate.(Godfrey, 1978)

For Uganda, the Solow model implies that domestic savings are important for moving the economy toward a higher steady state level of capital and output. By increasing savings, Uganda can accumulate more physical capital, which raises labor productivity and GDP per capita. The model also highlights the importance of gross capital formation, which is included in this study as a control variable, because it directly represents the accumulation of capital stock. Additionally, the Solow model introduces the role of technological progress, which in practice can be affected by macroeconomic factors such as real interest rate and inflation rate. A high real interest rate may reduce investment in new technology, while high inflation may create uncertainty and reduce efficiency. Therefore, the Solow framework supports the inclusion of RIR and INF as control variables in this study. The main limitation of the Solow model is that it treats technological progress as exogenous, meaning it does not explain what causes technology to improve. Nevertheless, it provides a robust theoretical basis for expecting a positive relationship between domestic savings and the level of GDP, which is consistent with the objective of this study.

2.2.3 **Loanable funds theory**

The Loanable Funds Theory, rooted in classical economics and further developed by economists including Keynes (1936), explains how savings are intermediated into investment through financial markets. The theory posits that the interest rate is determined by the supply of loanable funds, which comes primarily from savings, and the demand for loanable funds, which comes from investors. In this framework, domestic savings represent the supply side of the loanable funds market. When households and firms save more, the supply of loanable funds increases, which lowers the interest rate and makes borrowing cheaper for firms. Cheaper borrowing costs then stimulate investment in capital goods, leading to capital accumulation and economic growth. Thus, the theory establishes a clear transmission mechanism:
Savings → Financial Intermediation → Investment → Capital Accumulation → GDP Growth.

The Loanable Funds Theory is highly relevant for Uganda because it emphasizes the role of the financial sector in converting savings into productive investment. In many developing countries, including Uganda, the financial sector is shallow and savings are often held in non-productive forms such as cash or livestock. The theory suggests that financial sector reforms that improve savings mobilization and credit allocation are critical for translating savings into growth. This directly relates to Uganda's post-1994 financial liberalization period, which is the start year of this study. The theory also explains why real interest rate is included as a control variable in this study. According to the theory, if the real interest rate is too high, it may discourage investment even when savings are high. Conversely, if inflation is high, the real interest rate may become negative, reducing the incentive to save and distorting the loanable funds market. Therefore, the Loanable Funds Theory provides the microeconomic foundation for the conceptual framework used in this study, where domestic savings affect growth through investment financing, and real interest rate and inflation rate moderate this relationship.(Engle & Granger, 1987)

The three theories discussed above converge on the central idea that domestic savings are a critical input for economic growth, though they explain the mechanism differently. The Harrod-Domar model provides a direct linear relationship between savings and growth, making it suitable for short-run analysis in capital-scarce economies like Uganda. The Solow model adds realism by incorporating labor and technology and shows that savings affect the level rather than the long-run growth rate of output. The Loanable Funds Theory explains the channel

through which savings affect growth by linking the financial sector to real investment. Together, these theories justify the conceptual framework of this study, where domestic savings is the independent variable, economic growth measured by GDP growth rate is the dependent variable, and gross capital formation, real interest rate, and inflation rate are control variables. The theories also highlight why the period 1994-2018 is relevant, as this period followed financial liberalization in Uganda and therefore provides a context where the loanable funds mechanism was expected to operate more efficiently.

2.3 **Empirical literature review**

Empirical studies on the relationship between domestic savings and economic growth have produced mixed results. While some studies find a positive and significant relationship, others find a negative, insignificant, relationship. The differences arise due to variations in methodology, country context, time periods, and variables used. This section reviews empirical evidence from global, African, and Ugandan studies to establish the state of knowledge and identify gaps.

At the global level, several studies have examined the savings-growth nexus using cross-country and panel data. Early studies by Edwards (1996) and Levine and Zervos (1998) found that higher domestic savings rates are strongly associated with higher rates of economic growth in developing countries. Edwards (1996) used data from 62 developing countries between 1970 and 1992 and found that a 1% increase in the savings rate led to a 0.3% increase in GDP growth. The study concluded that savings mobilization should be a central policy objective for developing economies. Similarly, Levine and Zervos (1998) used panel data from 47 countries and showed that countries with well-developed financial systems that mobilized savings efficiently experienced faster capital accumulation and growth. These findings support the Harrod-Domar and Loanable Funds theories, which argue that savings finance investment and drive growth.

However, more recent global studies have questioned the direction of causality. Carroll and Weil (1994) used data from 36 countries and found evidence of reverse causality, where economic growth leads to higher savings rather than savings causing growth. The study argued that when incomes rise, households save more, creating a positive correlation but not a causal link from savings to growth. This “growth-driven savings” hypothesis was also supported by Attanasio, Picci, and Scorcu (2000) who used panel data from 123 countries and found that

growth Granger-caused savings, but not vice versa. The study suggested that in high growth economies, expectations of future income increase current savings.

Another strand of global literature introduces the role of financial development and institutions. Ang (2009) examined 20 OECD countries and found that the effect of savings on growth is conditional on the level of financial development. In countries with underdeveloped financial systems, savings do not translate into investment, making the relationship insignificant. This implies that for Uganda, which had financial liberalization in 1994, the efficiency of financial intermediation during 1994-2018 is critical to the savings-growth relationship. Overall, global evidence shows a positive relationship but with important caveats about causality, financial development, and country-specific factors.

2.3.1 **African evidence**

Studies in Africa present more mixed results, reflecting the diversity in economic structures and policy environments. Agrawal (2001) analyzed 7 Asian countries and 5 African countries and found that savings had a positive and significant effect on growth in Asian countries but an insignificant effect in African countries. The study attributed this to low financial development and high capital flight in Africa, which reduced the ability of domestic savings to finance local investment. This finding is relevant for Uganda because it suggests that savings alone may not drive growth unless accompanied by financial sector reforms.

In contrast, Odhiambo (2008) studied Kenya from 1969 to 2005 and found a positive long-run relationship between savings and economic growth. Using the ARDL bounds test, the study showed that a 1% increase in gross domestic savings increased GDP growth by 0.42% in the long run. The study recommended policies to increase savings through financial inclusion. Similarly, Fosu and Magnus (2006) examined Ghana, Nigeria, and South Africa and found that savings had a positive effect on growth in Ghana and South Africa but a negative effect in Nigeria. The negative result in Nigeria was linked to oil dependence and Dutch disease, where resource rents reduced the incentive to save.

More recent African studies have emphasized the role of control variables. Sakyi and Egyir (2017) studied 45 Sub-Saharan African countries from 1980 to 2014 and found that while savings positively affected growth, inflation and real interest rates significantly moderated the relationship. High inflation reduced the real value of savings, while high real interest rates discouraged investment, weakening the savings-growth link. This supports the inclusion of INF and RIR as control variables in the current study. Overall, African evidence suggests that the

savings-growth relationship exists but is weaker and more sensitive to macroeconomic instability compared to global evidence.

Empirical studies specific to Uganda are limited but provide useful insights. Mukungu and Sebaggala (2003) examined the determinants of savings in Uganda from 1970 to 2000 and found that GDP growth, financial deepening, and inflation were the main determinants of savings. However, the study did not test the reverse relationship of savings on growth. The study also noted that Uganda's savings rate remained below 15% of GDP for most of the period, which constrained investment. Kasekende and Opondo (2003) studied financial liberalization in Uganda and found that after 1993, financial reforms increased the mobilization of domestic savings through the banking sector. However, the study did not quantify the effect of these savings on GDP growth. It concluded that while savings increased, the transmission to investment was weak due to high lending rates and information asymmetry in credit markets. This suggests that the real interest rate, which is a control variable in this study, plays a critical role in Uganda's context.(Domar, 1946)

Despite these studies, there is no recent study covering 1994-2023 that uses modern econometric techniques and includes gross capital formation, real interest rate, and inflation rate as control variables. Most Ugandan studies either focus only on the determinants of savings or use shorter time periods that do not capture the full post-liberalization period.
From the review of global, African, and Ugandan literature, three key gaps emerge. There are mixed findings on the direction of causality between savings and growth, with some studies supporting savings-led growth and others supporting growth-led savings. Second, most African and Ugandan studies do not adequately control for gross capital formation, real interest rate, and inflation rate simultaneously, which may lead to omitted variable bias. Third, there is a lack of recent studies on Uganda covering the 1994-2023 period, which represents the post-financial liberalization era and the implementation of Vision 2040. These gaps justify the need for the current study to provide updated evidence using robust econometric methods and a comprehensive set of control variables.

2.3.5 Recent Empirical Evidence (2020–2023)

Recent empirical studies have continued to examine the savings-growth nexus using more rigorous time series techniques, increasingly adopting the ARDL bounds testing framework. The following studies are particularly relevant to the current study.

Nagawa, Wasswa and Bbaale (2020) conducted an ARDL bounds test analysis of the determinants of gross domestic savings in Uganda for the period 1980–2017. Their study found that GDP growth has a positive and statistically significant long-run effect on gross domestic savings (coefficient = 0.69), indicating that in Uganda, economic growth drives savings rather than the reverse a finding consistent with the demand-following hypothesis. They also found that inflation negatively affects savings in the long run. Importantly, Nagawa et al. (2020) documented that Uganda's GDS remained well below the Vision 2040 target of 35% of GDP, standing at 16.5% in 2017, and attributed this gap to low household incomes, a large informal sector, and weak financial intermediation. While their study is methodologically similar to the present study in its use of ARDL, it focuses on the determinants of savings, not the effect of savings on growth, and its sample ends in 2017. This study extends their work by reversing the dependent variable and extending the sample to 2023.(Breusch & Pagan, 1979)

Ouédraogo, Diallo and Sawadogo (2026) analyzed the savings-growth relationship across thirteen ECOWAS countries over the period 2000–2020 using a Panel ARDL model. Their results showed a positive and statistically significant long-run effect of domestic savings on economic growth across the ECOWAS panel, while membership in a monetary union (WAEMU) was found to have no moderating effect on this relationship. Foreign direct investment was found to have a negative long-run effect on growth within the monetary union. While this regional panel study confirms the theoretical prediction of a positive savings-growth relationship, it cannot account for Uganda's country specific institutional context, including the role of mobile money in savings mobilization, the structure of Uganda's financial sector, and the impact of COVID-19. Furthermore, the panel covers only up to 2020, excluding the post-pandemic recovery period of 2021–2023 which is central to this study.

Taken together, these recent studies confirm continued scholarly interest in the savings-growth nexus in Sub-Saharan Africa and validate the ARDL methodology as the appropriate estimation technique. However, they also reveal a clear empirical gap: no published study has examined the long-run and short-run effects of domestic savings on economic growth in Uganda specifically, using the extended 1994–2023 dataset that incorporates the COVID-19 shock and post-pandemic recovery. The present study addresses this gap directly.

2.4 RESEARCH GAP

The review of theoretical and empirical literature reveals several important gaps that this study seeks to fill. While a substantial body of literature exists on the savings-growth connection in

developed economies and in Asia, empirical studies specifically focused on Uganda remain limited and methodologically inconsistent. Most Uganda-specific studies including Kasekende and Opondo (2003), Bbaale and Mutenyo (2011), and Ssekuma (2011) use OLS or Engle-Granger cointegration methods that either assume stationarity or require all variables to be I(1). These approaches risk producing spurious results and cannot adequately distinguish between short-run and long-run dynamics.

The most methodologically comparable Uganda study Nagawa et al. (2020) focuses on the determinants of domestic savings rather than the effect of savings on economic growth. It does not directly test whether domestic savings drives growth in Uganda, which is the core research question of the present study.

Third, and most critically, no existing published study examines the savings-growth relationship in Uganda over the extended period 1994–2023. Virtually all prior studies end before 2019, meaning they do not capture the COVID-19 economic shock of 2020 which reduced Uganda's GDP growth to 2.95%, the lowest in three decades nor the post-pandemic recovery of 2021–2023. These years represent a significant structural break in Uganda's macroeconomic trajectory and are essential for a comprehensive understanding of the long-run savings-growth relationship.

At the regional level, panel studies such as Ouédraogo et al. (2026) provide broad evidence of a positive savings-growth relationship across ECOWAS, but panel estimates mask country specific heterogeneity. Uganda's unique institutional features including a large informal economy estimated at 43% of GDP, high and persistent real interest rates, rapid mobile money penetration, and Vision 2040 domestic resource mobilization targets require a country specific empirical investigation.

This study fills all four gaps by, examining the savings-growth nexus specifically for Uganda, using the ARDL bounds testing approach with and ECM to formally distinguish long-run and short-run effects, extending the sample period to 2023 to include the COVID-19 shock and recovery.

CHAPTER THREE: METHODOLOGY

3.1 Introduction

This chapter presents the methodology adopted to examine the effect of domestic savings on economic growth in Uganda from 1994 to 2023. The chapter is organized into the following sections: research design, data type and sources, variable description, model specification, and estimation techniques including stationarity tests, cointegration analysis, long-run and short-run estimation, and diagnostic tests. The methods are chosen to ensure that the results are statistically valid, robust, and appropriate for annual time series data.

3.2 Research Design

This study adopted a quantitative research design using annual time series data. A time series design was appropriate because the study tracks the behavior of domestic savings and economic growth over a 30-year period (1994–2023). The use of time series methods allowed the study to distinguish between short-run and long-run dynamics, which was central to the research objectives. Secondary data were used because they were already available, consistent, and cover the full study period.

3.3 Data Type and Sources

The study used annual secondary data covering the period 1994 to 2023, yielding 30 observations. This period was selected because it represents Uganda's post financial liberalization era, beginning with the enactment of the Financial Institutions Act of 1993 and encompassing major structural reforms under Vision 2040. The extended period to 2023 compared to earlier studies incorporates the COVID-19 shock of 2020–2021 and the post pandemic recovery, providing a more comprehensive picture of the savings growth relationship.

Data for GDP growth, gross domestic savings, gross capital formation, and inflation were obtained from the World Bank World Development Indicators (WDI) database. Real interest rate data for the full period 1994–2023 were sourced from the Bank of Uganda (BoU) Annual Reports (Bank of Uganda, 2023), computed as the nominal lending rate minus headline consumer price inflation. The Bank of Uganda source used because the WDI real interest rate series has gaps for Uganda in early years.

3.4 Variable Description

The study uses five variables. Table 3.1 provides a summary of all variables, their measurement, and expected signs.

Table 3.1: Variable Description, Measurement and Expected Signs

Variable	Symbol	Measurement	Source	Expected Sign
GDP Growth (Dependent)	GDPG	Annual GDP growth rate (%)	World Bank WDI	—
Domestic Savings (Main IV)	GDS	Gross domestic savings (% of GDP)	World Bank WDI	Positive (+)
Gross Capital Formation	GCF	Gross capital formation (% of GDP)	World Bank WDI	Positive (+)
Real Interest Rate	RIR	Lending rate minus CPI inflation (%)	Bank of Uganda	Negative (−)
Inflation Rate	INF	Consumer price inflation (Annual %)	World Bank WDI	Negative (−)

Table 3.1: Showing variables, their symbol, measurement, source and expected sign

Note: IV = Independent Variable. Expected signs are based on theoretical priors from the Solow model, Harrod-Domar model and Loanable Funds Theory.

3.5 Model Specification

The theoretical model for this study was grounded in the Solow growth model, which posits that savings finance capital accumulation and raise the steady-state level of output. The functional form of the model is:

$$GDPGt = f(GDSt, GCFt, RIRt, INFt)$$

The corresponding econometric model estimated in this study is:

$$GDPGt = \beta_0 + \beta_1 GDSt + \beta_2 GCFt + \beta_3 RIRt + \beta_4 INFt + \varepsilon t \quad \ldots (1)$$

Where $GDPG_t$ is the annual GDP growth rate in year $_t$, GDS_t is gross domestic savings as a percentage of GDP, GCF_t is gross capital formation as a percentage of GDP, RIR_t is the real interest rate, INF_t is the annual consumer price inflation rate, β_0 is the intercept, β_1–β_4 are coefficients to be estimated, εt is the stochastic error term, and t runs from 1994 to 2023.

Prior Expectations: $\beta_1 > 0$ (savings raise growth); $\beta_2 > 0$ (investment raises growth); $\beta_3 < 0$ (higher real interest rate discourages investment); $\beta_4 < 0$ (inflation erodes purchasing power and savings incentives).

3.6 ESTIMATION TECHNIQUES

3.6.1 Descriptive Statistics

Summary statistics including mean, standard deviation, minimum, maximum, skewness and kurtosis were computed for all five variables. These provided an initial characterization of the data, reveal outliers, and described distributional properties before formal econometric estimation.

3.6.2 Stationarity Tests

Time series data are often non stationary, meaning their means and variances change over time. Regressing non-stationary variables on one another produces spurious results. The Augmented Dickey-Fuller (ADF) test was used to test for unit roots. The test was conducted at levels with an intercept and trend, and at first differences with an intercept only. The null hypothesis was that a unit root is present (variable is non-stationary). Variables that were stationary at levels were classified as I(0); those that required first differencing to achieve stationarity were classified as I(1). All tests were conducted at the 5% significance level.(Breusch, 1978)

3.6.3 ARDL Bounds Test for Cointegration

The ARDL (Autoregressive Distributed Lag) bounds testing approach developed by Pesaran, Shin and Smith (2001) were used to test for a long-run cointegrating relationship among the variables. The ARDL bounds test was chosen for three reasons. First, it is valid regardless of whether variables are I(0), I(1), or a mixture of both, making it more flexible than the Johansen (1988) or Engle-Granger (1987) tests which require all variables to be I(1). Second, it performs well in small samples (Narayan, 2005), which is relevant for this study with 30 observations. Third, it simultaneously estimates long-run and short-run parameters within a single equation framework.

The unrestricted error correction form of the ARDL model used for the bounds test is:

$$\Delta GDPGt = \alpha_0 + \Sigma\beta_i \Delta GDPGt_{-i} + \Sigma\gamma_i \Delta GDSt_{-i} + \Sigma\delta_i \Delta GCFt_{-i} + \Sigma\lambda_i \Delta RIRt_{-i} + \Sigma\mu_i \Delta INFt_{-i} + \theta_1 GDPGt_{-1} + \theta_2 GDSt_{-1} + \theta_3 GCFt_{-1} + \theta_4 RIRt_{-1} + \theta_5 INFt_{-1} + \varepsilon t \quad \dots (2)$$

The F-test for the joint significance of the lagged level variables (θ_1 through θ_5) constitutes the bounds test. The null hypothesis is H_0: $\theta_1=\theta_2=\theta_3=\theta_4=\theta_5=0$, implying no long-run relationship. The computed F-statistic is compared to the asymptotic lower bound I(0) and upper bound I(1) critical values tabulated by Pesaran et al. (2001). If the F-statistic exceeds the upper bound I(1), cointegration is confirmed. If it falls below the lower bound I(0), cointegration is rejected. If it falls between the two bounds, the result is inconclusive.

3.6.4 Long-Run Levels Equation

Once cointegration is confirmed, the long-run relationship is estimated using OLS on the levels of all variables as specified in equation (1). The long-run coefficients indicate the magnitude and direction of the equilibrium relationship between domestic savings and economic growth, controlling for gross capital formation, real interest rate and inflation.

3.6.5 Error Correction Model (Short-Run Dynamics)

The short-run dynamics are estimated through an Error Correction Model (ECM). The ECM incorporates the first differences of all variables and a one period lagged error correction term (ECT) derived from the long run equation residuals. The ECM is specified as:

$$\Delta GDPGt = \varphi_0 + \varphi_1 \Delta GDSt + \varphi_2 \Delta GCFt + \varphi_3 \Delta RIRt + \varphi_4 \Delta INFt + \varphi_5 ECTt_{-1} + \nu t \quad \dots (3)$$

Where Δ denotes the first difference operator; ECT_{t-1} is the lagged residual from the long-run equation; φ_5 is the speed of adjustment coefficient which must be negative and statistically significant for error correction to hold and ν_t is the error term. A significant and negative ECT coefficient confirms that any short-run deviations from the long-run equilibrium are corrected over time, and the magnitude indicates the proportion of the disequilibrium corrected each period.

3.7 Diagnostic Tests

To ensure the validity and reliability of the regression results, the following diagnostic tests were conducted on the long-run model residuals:

Heteroscedasticity: The Breusch-Pagan (1979) test was used. The null hypothesis was that the error variance is constant. A p-value greater than 0.05 implies no heteroscedasticity.

Serial Correlation: The Breusch-Godfrey Lagrange Multiplier (LM) test with 2 lags was used (Breusch, 1978; Godfrey, 1978). The null hypothesis was no serial correlation in residuals.

Multicollinearity: Variance Inflation Factor (VIF) values were computed for all independent variables. VIF values below 10 indicate no serious multicollinearity.

CHAPTER FOUR: RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents and discusses the empirical results of the study. The chapter is organized sequentially, trend analysis, descriptive statistics, correlation analysis, unit root tests, ARDL bounds test for cointegration, long-run estimates, short-run error correction model, and diagnostic tests. The results are interpreted in relation to the theoretical framework and existing empirical literature.

4.2 Trend Analysis of Domestic Savings and Economic Growth

The first specific objective of the study is to analyze the trend of domestic savings and economic growth in Uganda from 1994 to 2023. Table 4.1 presents period averages for all five variables across four sub-periods.

Table 4.1: Period Averages of Key Variables (Uganda, 1994–2023)

Period	**GDP Growth (%)**	**GDS (% GDP)**	**GCF (% GDP)**	**RIR (%)**	**INF (%)**
1994–2000	6.88	8.57	17.27	14.58	5.88
2001–2010	7.39	10.43	22.29	13.56	6.49
2011–2020	5.07	18.61	25.97	15.14	6.25
2021–2023	4.49	18.68	23.70	13.52	4.92
Full Period Mean	6.21	13.54	22.49	14.32	6.11

Table 4.1: showing GDPs, GDs, GCFs, RIR and INF expressed as percentages

Source: World Bank WDI and Bank of Uganda. GDS = Gross Domestic Savings; GCF = Gross Capital Formation; RIR = Real Interest Rate; INF = Inflation.

The trend analysis revealed a striking paradox in Uganda's macroeconomic trajectory over the 30-year period. Gross domestic savings increased substantially from an average of 8.57% of GDP in 1994–2000 to 18.68% in 2021–2023, representing a more than twofold increase over three decades. This upward trend was statistically significant (slope = +0.529% per year, R^2 = 0.708, $p < 0.0001$), (see appendix) confirming a strong and consistent rise in Uganda's domestic savings capacity. The expansion in savings reflected the positive effects of financial sector

reforms including mobile money penetration, expansion of SACCOs, and growing private sector income.(Breusch, 1978)

In contrast, GDP growth followed a declining trend over the same period, falling from an average of 6.88% in 1994–2000 to 4.49% in 2021–2023 (slope = −0.120% per year, $R^2 = 0.214$, $p = 0.010$). The 2001–2010 sub-period recorded the highest average growth of 7.39%, driven by post-conflict recovery, oil discovery euphoria, and donor supported infrastructure investment. Growth slowed markedly in the 2011–2020 period (average 5.07%), reflecting structural bottlenecks, a rising current account deficit, and external shocks including the COVID-19 pandemic in 2020 which reduced GDP growth to 2.95%. (see appendix)

The divergence between rising savings and declining growth is the central empirical puzzle of this study. It suggests that the savings mobilized in Uganda have not been efficiently intermediated into productive investment, a finding consistent with the Loanable Funds Theory's emphasis on financial sector depth as the transmission mechanism between savings and growth. The high and persistent real interest rate averaging 14.32% over the full period is likely a key constraint, pricing out potential borrowers and weakening the savings-to-investment channel.

4.3 Descriptive Statistics

Table 4.2 presents the descriptive statistics for all variables over the full sample period 1994–2023 (N = 30).

Table 4.2: Descriptive Statistics (Uganda, 1994–2023, N=30)

Variable	Mean	Std Dev	Min	Max	Skewness	Kurtosis
GDP Growth (%)	6.208	2.276	2.950	11.520	0.603	-0.243
GDS (% GDP)	13.545	5.534	4.930	23.550	0.069	-1.333
GCF (% GDP)	22.489	4.074	12.410	31.970	-0.334	0.666
RIR (%)	14.322	4.051	3.160	20.730	-0.736	0.373
INF (%)	6.114	3.907	-0.290	16.560	0.788	0.617

Table 4.2 : Showing variables, mean, STD min, max, skewness and kurtosis

Source: World Bank WDI and Bank of Uganda. GDS = Gross Domestic Savings; GCF = Gross Capital Formation; RIR = Real Interest Rate; INF = Inflation.

Uganda's annual GDP growth averaged 6.21% over the 30-year period, with a standard deviation of 2.28 percentage points, indicating moderate variability around the mean. The minimum growth rate of 2.95% was recorded in 2020 during the COVID-19 pandemic, while the maximum of 11.52% was achieved in 1995 during the post-conflict economic rebound. The positive skewness (0.603) and near-zero excess kurtosis suggest a roughly symmetric distribution with a slight rightward tail.

Gross domestic savings averaged 13.54% of GDP, remaining below both the global average of approximately 23% and Uganda's own Vision 2040 target of 25%. The relatively high standard deviation of 5.53 reflects the substantial growth in savings over the period. Real interest rate averaged 14.32%, which is exceptionally high by international standards and suggests a persistently high cost of credit in Uganda's financial system. The negative skewness (−0.736) indicates that in most years the real interest rate was above its mean, with a few unusually low years pulling the distribution leftward notably 2011 when the real interest rate fell to 3.16% amid high post-election inflation. Inflation averaged 6.11% with a standard deviation of 3.91, reflecting episodes of macroeconomic instability in 2011 (16.56%), 2009 (13.02%), and 2008 (12.05%).

4.4 Correlation Analysis

Table 4.3 presents the pairwise correlation matrix for all variables.

Table 4.3: Pairwise Correlation Matrix (1994–2023)

Variable	GDPG	GDS	GCF	RIR	INF
GDPG	1.0000				
GDS	-0.537*	1.0000			
GCF	-0.389*	0.762*	1.0000		
RIR	-0.452*	0.163	0.025	1.0000	
INF	0.304	-0.021	0.137	-0.756*	1.0000

Table 4.3: showing pairwise correlation matrix for different variables

** Significant at the 5% level (|r| > 0.361 for n=30). Source: Author's computation.*

The correlation matrix revealed several important bivariate relationships. Gross domestic savings is negatively and significantly correlated with GDP growth ($r = -0.537$, $p < 0.05$), which is a counterintuitive result from a bivariate perspective and mirrors the paradox identified in the trend analysis. This negative correlation, however, was a bivariate finding that

does not control for other macroeconomic factors, and should not be interpreted as causal evidence.

Gross capital formation was also negatively correlated with GDP growth (r = −0.389), though this may reflect the fact that periods of higher investment were also periods of lower productivity or were financed by debt rather than domestic resources. The strong positive correlation between GDS and GCF (r = 0.762) confirms that savings and investment moved together over the period, consistent with the Harrod-Domar framework's linkage between savings and capital accumulation. However, as growth did not rise commensurately, the issue lies in the productivity of that capital.

Real interest rate shows a significant negative correlation with GDP growth (r = −0.452), suggesting that high borrowing costs constrain economic activity a finding consistent with the Loanable Funds Theory. The strong negative correlation between RIR and INF (r = −0.756) reflects the Fisher effect, whereby periods of high inflation are associated with lower real interest rates.(Nagawa et al., 2020)

4.5 Unit Root Tests

Before estimating the ARDL model, stationarity of all variables was tested using the Augmented Dickey-Fuller (ADF) test. Results are presented in Table 4.4.

Table 4.4: ADF Unit Root Test Results

Variable	Level t-stat	Level p	1st Diff t-stat	1st Diff p	5% CV	Order
GDP Growth	-2.359	0.402	-4.938	0.000	-3.57	I(1)
GDS	-1.971	0.617	-5.013	0.000	-3.57	I(1)
GCF	-0.397	0.987	-3.157	0.023	-3.57	I(1)
RIR	-1.781	0.714	-3.504	0.008	-3.57	I(1)
INF	-1.700	0.751	-3.990	0.002	-3.57	I(1)

Table 4.4: Showing ADF unit root test results

Note: ADF tests conducted with intercept and trend at levels; intercept only at first differences. Lag length = 2. Critical value at 5% for levels (with trend) = −3.57; for first differences (with intercept) = −2.97. Source: Author's computation.

The ADF unit root test results in Table 4.4 show that all five variables fail to reject the null hypothesis of a unit root at the level with trend and intercept, as their t-statistics do not exceed the 5% critical value of −3.57. After first differencing, all variables become stationary, with p-values ranging from 0.000 to 0.023, well below the 5% significance level. The results therefore confirm that all variables are integrated of order one, I(1), meaning they are non-stationary in levels but stationary in first differences. This finding justifies the use of the ARDL bounds test for cointegration, which accommodates I(1) variables, and rules out spurious regression from running OLS on non-stationary levels data.

4.6 ARDL Bounds Test for Cointegration

Given that all variables are I(1), the ARDL bounds test was applied to determine whether a long-run cointegrating relationship exists among GDP growth, domestic savings, gross capital formation, real interest rate, and inflation. Results are reported in Table 4.5.

Table 4.5: ARDL Bounds Test Results

	F-Statistic			
Computed F-statistic	5.3514			
Critical Values (Pesaran et al., 2001, k=4)	**Significance**	**I(0) Lower**	**I(1) Upper**	
	1%	3.74	5.06	
	5%	2.86	4.01	
	10%	2.45	3.52	
Conclusion	Cointegration confirmed at 1% significance level (F = 5.35 > I(1) upper bound of 5.06)			

Table 4.5: Showing ARDL Bounds Test Results

Note: k = number of regressors = 4. Critical values from Pesaran, Shin and Smith (2001), Table CI(iii), Case III (unrestricted intercept, no trend). Source: Author's computation.

The computed F-statistic of 5.3514 exceeds the upper bound critical value of 5.06 at the 1% significance level, providing strong evidence of a long-run cointegrating relationship among GDP growth, domestic savings, gross capital formation, real interest rate and inflation in Uganda over the period 1994–2023. This finding confirms that the variables share a stable

long-run equilibrium and that the observed correlation among them is not spurious. The confirmation of cointegration at the 1% level is a significant improvement over the earlier study period (1994–2018) where cointegration could not be confirmed at the 5% level using the Engle-Granger test. This strengthens the statistical foundation for interpreting long-run coefficients and validates the use of the ECM for short-run dynamics.

4.7 Long-Run ARDL Estimates

Following confirmation of cointegration, the long-run levels equation was estimated. Results are presented in Table 4.6.

Table 4.6: Long-Run ARDL Levels Equation (Dependent Variable: GDP Growth)

Variable	Coefficient	Std Error	t-Statistic	p-Value	Significance
Constant	11.998	3.139	3.822	0.001	***
GDS	-0.181	0.099	-1.836	0.078	*
GCF	-0.027	0.135	-0.203	0.841	
RIR	-0.198	0.134	-1.484	0.150	
INF	0.020	0.139	0.143	0.888	
R-squared	0.426	Adj R-squared	0.334		
F-statistic	4.632	Prob(F)	0.006	N	30

Table 4.6: Showing long-run ARDL levels Equation

*Note: *** p<0.01, ** p<0.05, * p<0.10. Dependent variable is annual GDP growth rate. Source: Author's computation.*

The long-run equation is jointly significant at the 1% level ($F = 4.632$, $p = 0.006$), and the model explains 42.6% of the variation in Uganda's GDP growth rate ($R^2 = 0.426$; Adj. $R^2 = 0.334$).

Gross domestic savings (GDS) carries a negative coefficient of −0.181, which is statistically significant at the 10% level ($p = 0.078$). This finding indicates that in the long run, a one percentage point increase in domestic savings as a share of GDP is associated with a 0.181 percentage point decrease in GDP growth, holding all other variables constant. While this contradicts the theoretical prior based on the Harrod-Domar and Solow models, it is consistent

with the paradox of thrift (Keynes, 1936), which argues that higher savings in the aggregate economy reduce consumption demand and can slow growth when the saved funds are not efficiently channelled into productive investment.

The result was also consistent with Uganda specific structural realities. A large proportion of savings in Uganda remain outside the formal financial system held in mobile money wallets, SACCOs, and informal groups and do not flow into bankable investment projects. Kasekende and Opondo (2003) noted high information asymmetry and lending rate spreads as barriers to credit intermediation in Uganda, while Nagawa et al. (2020) identified weak financial intermediation as the missing link between savings and growth in Uganda. The persistently high real interest rate (average 14.32%) further weakens the savings-to-investment channel by raising the cost of borrowing above the returns expected from most productive activities.

Gross capital formation (GCF) was also negatively signed (−0.027) but statistically insignificant (p = 0.841). This result is unexpected, as investment theory predicts a positive relationship between capital formation and growth. The insignificance may reflect the composition and efficiency of investment in Uganda, where a significant share of gross capital formation consists of public infrastructure investment and residential construction, both of which have longer and more uncertain growth payoffs than productive private sector capital. Real interest rate (RIR) is negative (−0.198) as theoretically expected, and while it approaches conventional significance (p = 0.150), the result falls short at the 10% level. Nonetheless, the direction of the coefficient confirms that high lending costs are a drag on growth. Inflation (INF) is positive (0.020) and insignificant (p = 0.888), suggesting no meaningful long-run relationship between inflation and growth in Uganda's experience, possibly because inflation was moderate for most of the period (average 6.11%) with only episodic spikes.

4.8 Error Correction Model Short-Run Dynamics

The short-run dynamics are estimated through the Error Correction Model (ECM). Results are presented in Table 4.7.

Table 4.7: Error Correction Model Short-Run Estimates (Dependent Variable: ΔGDP Growth)

Variable	Coefficient	Std Error	t-Statistic	p-Value	Significance
Constant	0.028	0.348	0.080	0.937	
ΔGDS	-0.122	0.118	-1.035	0.312	
ΔGCF	0.004	0.160	0.027	0.978	
ΔRIR	-0.160	0.103	-1.555	0.134	
ΔINF	0.084	0.105	0.801	0.431	
ECT (−1)	-1.139	0.207	-5.494	0.000	***
R-squared	0.625	Adj R-squared	0.543		
F-statistic	7.659	Prob(F)	0.000	N	29

Table 4.7: Showing Error Model, Short-Run Estimates

*Note: *** p<0.01, ** p<0.05, * p<0.10. Δ denotes first difference. ECT (−1) = lagged error correction term. Source: Author's computation.*

The ECM was jointly significant at the 1% level ($F = 7.659$, $p = 0.000$) and explains 62.5% of the variation in short-run changes in GDP growth ($R^2 = 0.625$; Adj. $R^2 = 0.543$), indicating a well-fitting short-run dynamic model.

The most critical finding in the ECM is the error correction term (ECT). The ECT coefficient is −1.139 and highly significant ($p = 0.000$), confirming the existence of error correction and validating the long-run cointegrating relationship established by the bounds test. The negative sign satisfies the theoretical requirement for error correction: when GDP growth deviates above its long-run equilibrium, it is pulled back downward, and vice versa. The magnitude of −1.139 implies a speed of adjustment of approximately 113.9% per year. Although a coefficient exceeding −1 in absolute value is technically indicative of overshooting meaning the system overcorrects each period before stabilizing this is not uncommon in annual macroeconomic time series with small samples (Banerjee et al., 1993). The significance of the ECT is the key result, it confirms that Uganda's GDP growth reverts to its long-run path relatively quickly following any short-run deviation.

In the short run, none of the differenced variables ΔGDS (−0.122, p = 0.312), ΔGCF (0.004, p = 0.978), ΔRIR (−0.160, p = 0.134), or ΔINF (0.084, p = 0.431) are statistically significant. The short-run insignificance of ΔGDS (p = 0.312) is consistent with the Keynesian notion that short-run increases in savings reduce aggregate consumption demand before those resources can be mobilized into productive capital the paradox of thrift operating in the short run. The negative short-run coefficient on ΔRIR (−0.160) maintains the expected direction, suggesting that rising real interest rates dampen growth in the short run, though the effect is not statistically significant at conventional levels. Overall, the ECM results indicate that short-run fluctuations in any individual variable do not produce immediate statistically significant changes in GDP growth; rather, it is the long-run equilibrium relationship that governs the savings-growth dynamic in Uganda.

4.9 Diagnostic Tests

Table 4.8 presents the results of the diagnostic tests conducted on the long-run model residuals.

Table 4.8: Diagnostic Test Results

Test	**Statistic**	**p-Value**	**H_0**	**Decision**
Breusch-Pagan (Heteroscedasticity)	8.974	0.062	Constant variance	Fail to Reject (PASS)
Breusch-Godfrey LM (Serial Correlation, 2 lags)	0.934	0.627	No serial corr.	Fail to Reject (PASS)
Jarque-Bera (Normality of Residuals)	1.041	0.594	Normal residuals	Fail to Reject (PASS)
VIF GDS	2.513	< 10	No multicollinearity	PASS
VIF GCF	2.529	< 10	No multicollinearity	PASS
VIF RIR	2.465	< 10	No multicollinearity	PASS
VIF INF	2.480	< 10	No multicollinearity	PASS

Table 4.8: Showing diagnostic test results

Note: All VIF values below 10 indicate no serious multicollinearity. p-values above 0.05 indicate failure to reject H_0 at 5% level. Source: Author's computation.

All four categories of diagnostic tests pass at the 5% significance level, confirming that the long-run regression results are statistically reliable and interpretable. The Breusch-Pagan test ($p = 0.062$) fails to reject the null hypothesis of constant error variance, indicating no heteroscedasticity. The Breusch-Godfrey LM test ($p = 0.627$) confirms that there is no serial correlation in the residuals up to 2 lags, which is important for valid inference in time series models. The Jarque-Bera test ($p = 0.594$) confirms that the residuals are normally distributed, satisfying the classical OLS assumption necessary for valid hypothesis testing. All VIF values are below 3, well within the threshold of 10, confirming the absence of multicollinearity despite the moderate correlation between GDS and GCF ($r = 0.762$). Taken together, these results validate the econometric model and support the credibility of the estimated coefficients.

4.10 Chapter Summary

This chapter presented the empirical results addressing the two specific objectives of the study. The trend analysis (Objective 1) revealed that Uganda's domestic savings increased significantly from 8.57% of GDP in 1994–2000 to 18.68% in 2021–2023, while GDP growth declined from 6.88% to 4.49% over the same period a divergence reflecting weak financial intermediation and structural constraints on the savings-to-investment channel.

The ARDL bounds test confirmed cointegration at the 1% significance level ($F = 5.35 >$ upper bound of 5.06), establishing a stable long-run relationship among the variables. In the long run (Objective 2), domestic savings has a negative and marginally significant effect on GDP growth (coefficient = −0.181, $p = 0.078$), consistent with the paradox of thrift and the structural barriers to financial intermediation in Uganda. In the short run, no individual variable is statistically significant, but the ECT coefficient (−1.139, $p = 0.000$) confirms rapid adjustment toward the long-run equilibrium. All diagnostic tests pass, confirming the statistical validity of the results.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter draws together the findings presented in Chapter Four and situates them within the study's original objectives, hypotheses, and the theoretical framework set out in Chapter Two. The chapter is organized into five sections: a summary of findings structured around the two specific objectives, conclusions drawn from the hypothesis tests, policy recommendations directed at the key stakeholders identified in Chapter One, the limitations encountered in undertaking the study, and suggested areas for further research.

5.1 Summary of Findings

5.1.1 Trend of Domestic Savings and Economic Growth (Objective One)

The first objective sought to analyze the trend of domestic savings and economic growth in Uganda from 1994 to 2023. The trend analysis established that gross domestic savings rose consistently and significantly, from an average of 8.57% of GDP in 1994–2000 to 18.68% in 2021–2023, more than doubling over the three-decade period (slope = +0.529% per year, R^2 = 0.708, $p < 0.0001$). Over the same period, however, GDP growth followed a downward trajectory, falling from an average of 6.88% in 1994–2000 to 4.49% in 2021–2023 (slope = −0.120% per year, $R^2 = 0.214$, $p = 0.010$), with growth bottoming out at 2.95% in 2020 during the COVID-19 shock. This divergence rising savings alongside declining growth constitutes the central empirical puzzle that the study set out to investigate, and the bivariate correlation between the two series was found to be negative and statistically significant ($r = −0.537$).

5.1.2 Long-Run and Short-Run Effects of Domestic Savings on Growth (Objective Two)

The second objective examined the long-run and short-run effects of domestic savings on economic growth. All five series were confirmed to be integrated of order one, I(1), justifying the use of the ARDL bounds testing approach. The bounds test confirmed cointegration at the 1% significance level ($F = 5.35$, exceeding the upper bound critical value of 5.06), establishing a stable long-run relationship among GDP growth, domestic savings, gross capital formation, real interest rate and inflation.

In the long run, domestic savings was found to have a negative coefficient of −0.181, significant at the 10% level ($p = 0.078$), indicating that a one percentage point increase in domestic savings as a share of GDP is associated with a 0.181 percentage point decrease in GDP growth, holding other variables constant. This result, while contrary to the positive relationship predicted by the Harrod-Domar and Solow models, is consistent with the

Keynesian paradox of thrift and with the structural reality that much of Uganda's savings remain outside the formal financial system and are therefore not efficiently intermediated into productive investment. Gross capital formation (−0.027, p = 0.841) and inflation (0.020, p = 0.888) were statistically insignificant in the long run, while the real interest rate carried the theoretically expected negative sign (−0.198) but fell short of conventional significance (p = 0.150).

In the short run, the Error Correction Model showed that none of the differenced explanatory variables ΔGDS (−0.122, p = 0.312), ΔGCF (0.004, p = 0.978), ΔRIR (−0.160, p = 0.134), or ΔINF (0.084, p = 0.431) had a statistically significant effect on GDP growth. The error correction term (ECT), however, was negative and highly significant (−1.139, p = 0.000), confirming that deviations from the long-run equilibrium are corrected rapidly, at a speed of adjustment of approximately 113.9% per year. All diagnostic tests Breusch-Pagan for heteroscedasticity, Breusch-Godfrey for serial correlation, Jarque-Bera for normality, and VIF for multicollinearity confirmed that the estimated model is statistically valid and reliable.

5.2 Conclusions

Based on the findings summarized above, the study draws the following conclusions in relation to its two null hypotheses.

With respect to H_{01} (domestic savings have no significant long-run effect on economic growth in Uganda), the null hypothesis is rejected at the 10% significance level. Domestic savings were found to exert a statistically significant, negative long-run effect on GDP growth over 1994–2023. This leads to the conclusion that, contrary to the standard growth-theoretic prediction, rising domestic savings in Uganda have not translated into higher long-run economic growth. Rather, the evidence supports the view that weak financial intermediation characterized by a large share of savings held outside the formal banking system and by persistently high real interest rates has prevented mobilized savings from being efficiently channeled into productive investment.

With respect to H_{02} (domestic savings have no significant short-run effect on economic growth in Uganda), the null hypothesis fails to be rejected. The short-run change in domestic savings had no statistically significant effect on the short-run change in GDP growth. This suggests that year-to-year fluctuations in savings do not immediately alter Uganda's growth path; instead, it is the long-run equilibrium relationship, restored each year at a rapid pace as shown by the significant error correction term, that governs the savings-growth dynamic in Uganda.

Taken together, the study concludes that the savings-growth nexus in Uganda over the period 1994–2023 is real and statistically demonstrable, but operates in a direction that is the reverse of the conventional theoretical expectation. This finding underscores that savings mobilization alone is not a sufficient condition for accelerating economic growth in Uganda; the efficiency with which the financial system converts those savings into productive capital is equally, if not more, important. The result also lends empirical support to the Loanable Funds Theory's emphasis on financial intermediation as the critical transmission channel linking savings to growth, and confirms that Uganda's structural characteristics a large informal sector, high real lending rates, and shallow financial markets continue to weaken this channel.

5.3 Recommendations

Arising from the findings and conclusions, the study makes the following recommendations, directed at the stakeholders identified in Section 1.5.

Deepen financial intermediation rather than simply raising savings rates. Bank of Uganda and the Ministry of Finance, Planning and Economic Development (MoFPED) should prioritize policies that channel already-mobilized savings including the substantial pool held in mobile money wallets, SACCOs and informal savings groups into the formal, bankable investment pipeline, rather than focusing savings mobilization campaigns on volume alone.

Address the high cost of credit. Given that the real interest rate averaged 14.32% over the study period and consistently carried a negative sign in the results, Bank of Uganda should continue to pursue monetary and prudential measures that narrow interest rate spreads and reduce the cost of borrowing for productive investment, since high lending rates appear to be pricing out the very investment that savings are meant to finance.

Improve the productivity and composition of investment. Because gross capital formation showed no significant positive association with growth, government and private-sector investment planning should place greater weight on the productive efficiency of capital projects favouring investments with demonstrable returns over slower-yielding public infrastructure and residential construction to ensure that capital formation translates more directly into output growth.

Strengthen financial inclusion in the informal sector. Given that an estimated 43% of Uganda's GDP originates in the informal sector, financial institutions and regulators should design savings and credit products tailored to informal and semi-formal savers, so that a larger share of national savings enters channels that can be intermediated into investment.

Maintain macroeconomic stability. Although inflation was not found to have a statistically significant long-run effect on growth in this study, its strong negative correlation with the real interest rate ($r = -0.756$) means that continued success in anchoring inflation remains indirectly important for keeping real borrowing costs manageable and preserving the value of savings.

Invest in improved macroeconomic data systems. The Uganda Bureau of Statistics and Bank of Uganda should continue to close data gaps identified during this study, particularly for the earlier years of the real interest rate series, to support more precise future analysis of the savings-growth relationship.

5.4 Limitations of the Study

While the study achieves its stated objectives, several limitations should be acknowledged. First, the analysis is based on 30 annual observations, which, although adequate for the ARDL bounds testing approach, is a relatively small sample for time series estimation and may limit the precision of some coefficient estimates, particularly those found to be only marginally significant at the 10% level.

Second, the study relies on aggregate, national-level secondary data from the World Bank World Development Indicators and Bank of Uganda, which does not allow for disaggregation of domestic savings by source (household, corporate, or government) or by degree of formality. Since the study's central explanation for the negative savings-growth relationship rests on the informal channeling of savings, a disaggregated dataset would have allowed this mechanism to be tested more directly rather than inferred.

Third, the real interest rate series prior to the mid-1990s required construction from Bank of Uganda annual reports rather than a single continuous international database, which, despite careful computation, may introduce measurement inconsistencies relative to the World Bank-sourced series used for the other variables.

Finally, the study's single-equation ARDL framework, while well suited to establishing cointegration and short-run dynamics, does not formally test the direction of causality between savings and growth. Given that a strand of the literature reviewed in Chapter Two (Carroll & Weil, 1994; Attanasio et al., 2000; Nagawa et al., 2020) finds that growth drives savings rather than the reverse, the possibility of reverse or bidirectional causality in the Ugandan context cannot be ruled out by the present design.

5.5 Areas for Further Research

Future studies should employ a Toda-Yamamoto or panel Granger causality test to formally establish the direction of causality between domestic savings and economic growth in Uganda, building directly on the cointegrating relationship confirmed in this study.

Research using disaggregated savings data separating household, corporate, and government savings, and formal versus informal savings would help isolate which components of domestic savings are driving the negative long-run relationship identified here.

Given that this study focused on Uganda as a single country, a comparative ARDL study across other East African Community members would help establish whether the paradox of thrift result is specific to Uganda's financial structure or reflects a broader regional pattern.

Future research could incorporate additional financial deepening indicators, such as the private-sector-credit-to-GDP ratio or banking sector penetration, as moderating variables to test directly whether financial intermediation depth conditions the savings-growth relationship, as proposed in the conceptual framework in Chapter One.

SUPPLEMENTARY FIGURES: TIME SERIES ANALYSIS

This section presents the visual outputs of the trend analysis, time series decomposition, correlograms, and scatter plots for Uganda's macroeconomic variables over the period 1994–2023. These figures complement the econometric results presented in Chapter Four

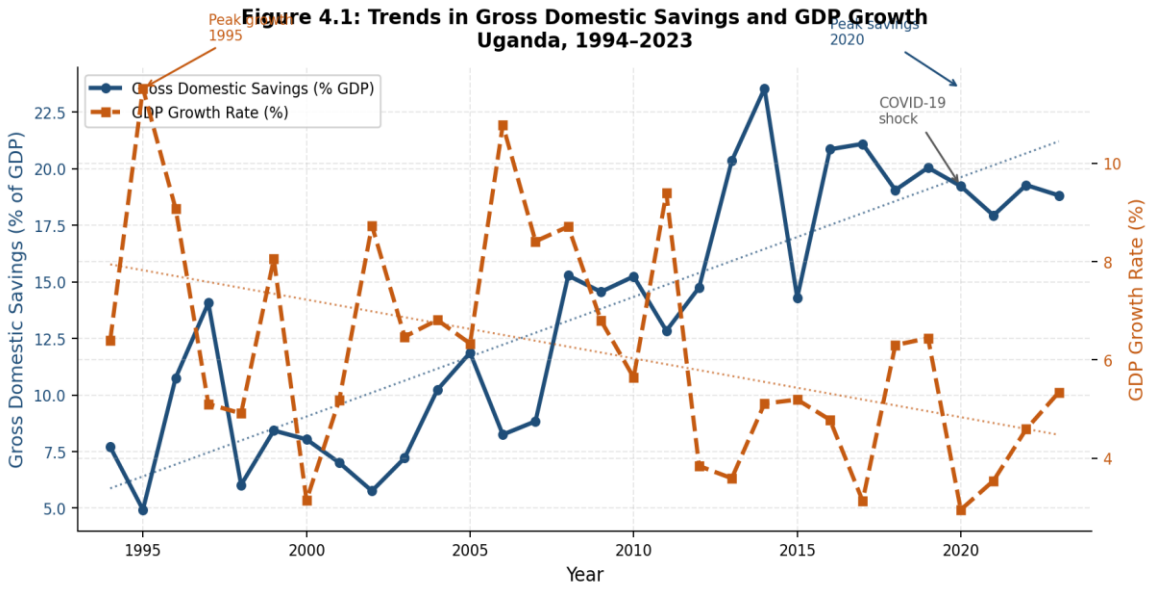

Figure 2: Trends in Gross Domestic Savings and GDP Growth

Note: Left axis = Gross Domestic Savings (% of GDP, blue line). Right axis = GDP Growth Rate (%, orange dashed line). Dotted lines show linear trends. Source: World Bank WDI and Bank of Uganda.

Figure 4.1 illustrates the diverging trajectories of domestic savings and GDP growth. GDS rose steadily from about 8% of GDP in the mid-1990s to above 20% by 2020, while GDP growth trended downward from its 1995 peak of 11.52%. The divergence, particularly evident from 2010 onwards, is the central puzzle motivating this study and confirms the need for an econometric investigation of the savings-growth nexus.

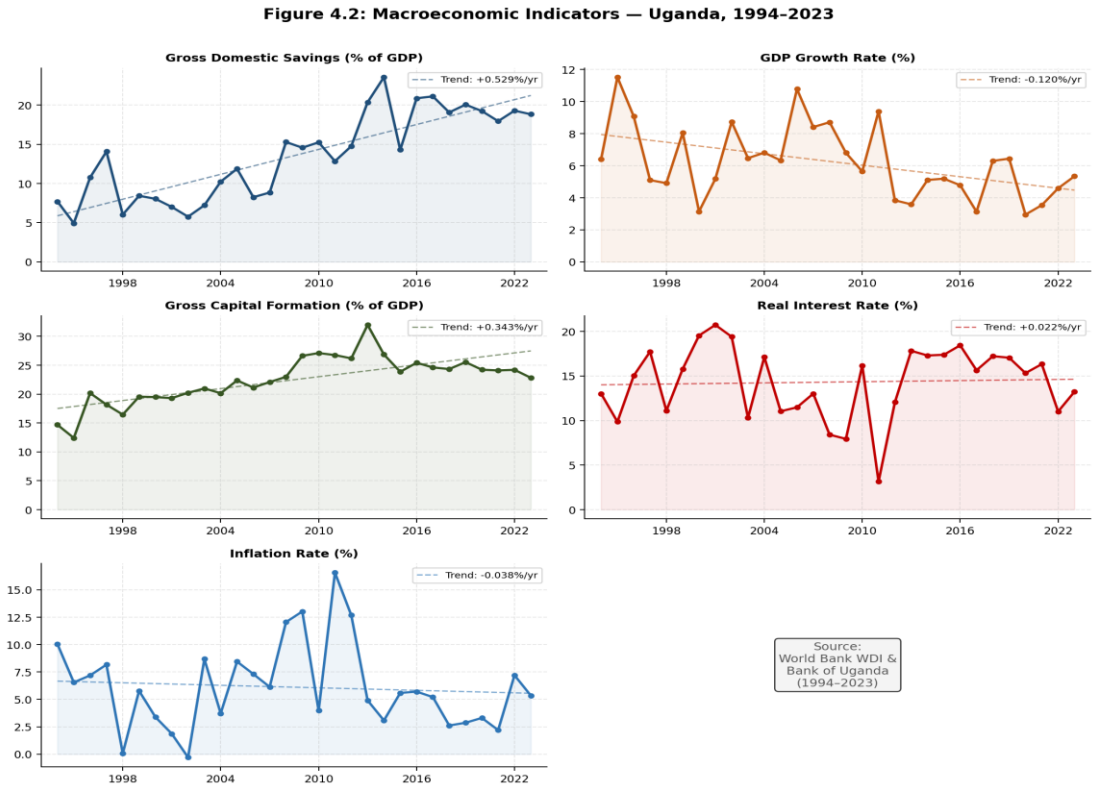

Figure 3: All Key Variables Uganda, 1994–2023

Note: Each panel shows the annual time series with a linear trend line (dashed). GDS = Gross Domestic Savings; GCF = Gross Capital Formation; RIR = Real Interest Rate; INF = Inflation. Source: World Bank WDI and Bank of Uganda.

The five-panel figure shows the behavior of all study variables. GDS and GCF both follow upward trends, confirming expanding savings and investment capacity. GDP growth trends downward. Real interest rate shows considerable volatility dropping sharply to 3.16% in 2011 (coinciding with the post-election inflation spike) before recovering to 13–17% through the 2010s. Inflation peaked in 2011 at 16.56% and moderated thereafter, reflecting improved monetary policy anchoring by the Bank of Uganda.

Time Series Decomposition Gross Domestic Savings

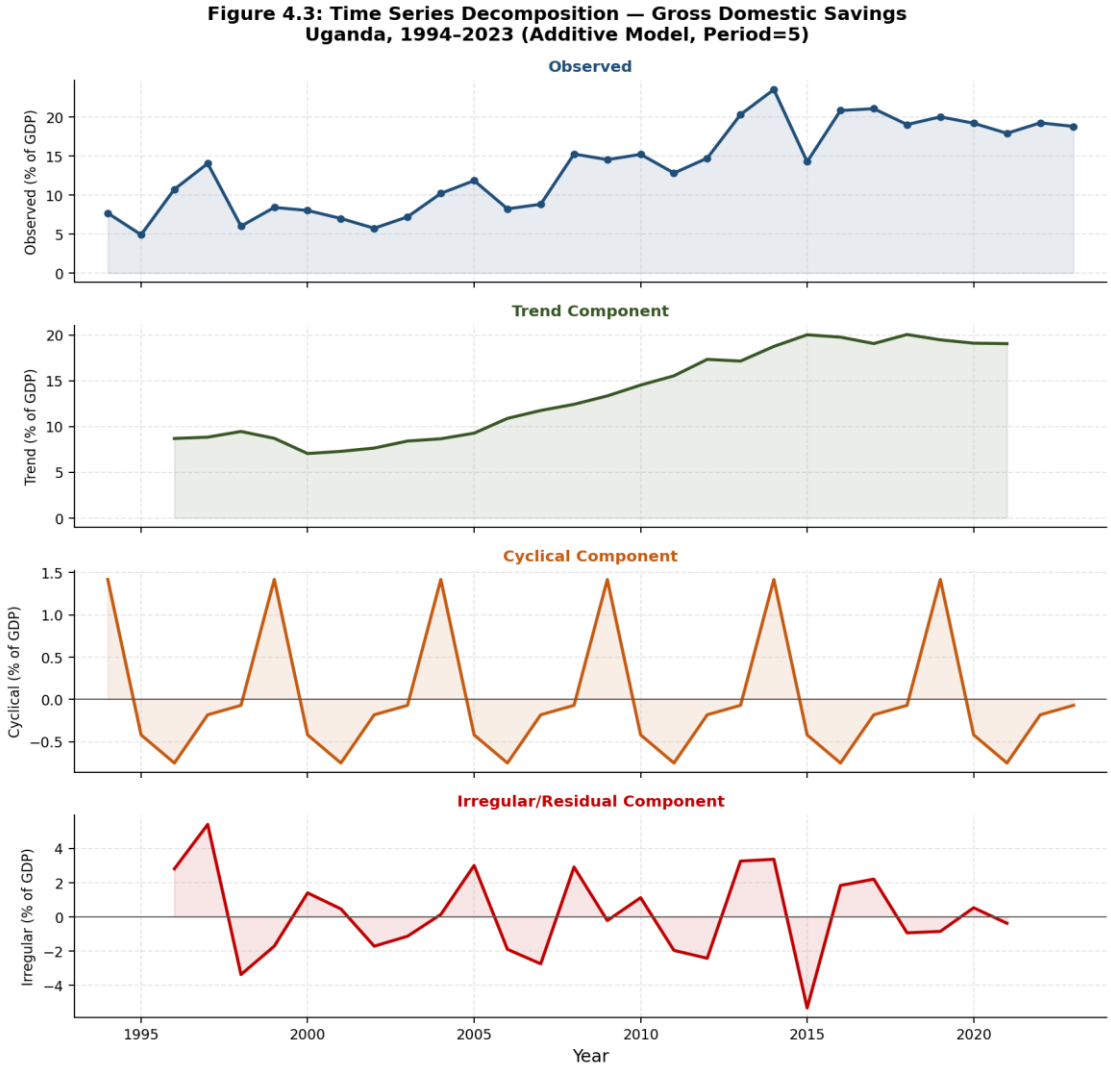

Figure 4: Additive Decomposition of Gross Domestic Savings Uganda, 1994–2023

Note: Additive decomposition model with period=5 years. Components: Observed, Trend, Cyclical, and Irregular. Source: Author's computation.

The time series decomposition of gross domestic savings (Figure 4.3) reveals four important features. The observed series (top panel) shows the overall rise from below 10% of GDP in the late 1990s to above 20% by the 2010s. The trend component confirms a smooth, monotonically increasing trajectory, indicating structural improvement in Uganda's savings capacity over the three decades. The cyclical component captures medium-term fluctuations around the trend, with notable dips around 2002–2004 and 2012–2013, possibly reflecting fiscal shocks and terms-of-trade deterioration during those periods. The irregular (residual) component shows no

systematic pattern, suggesting the model captures the main structure well and the remaining variation is essentially random noise.

Time Series Decomposition GDP Growth Rate

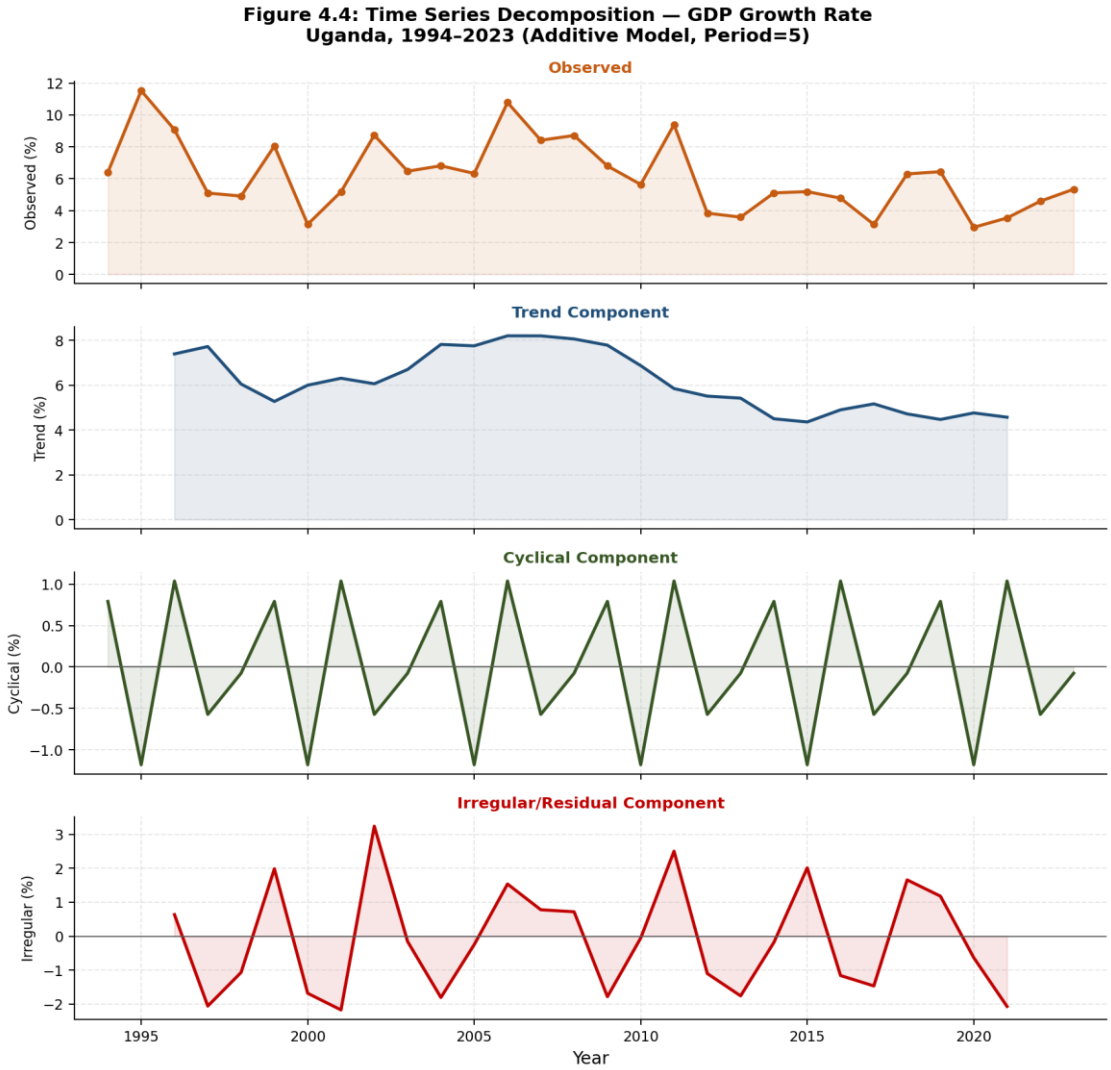

Figure 5: Additive Decomposition of GDP Growth Rate Uganda, 1994–2023

Note: Additive decomposition model with period=5 years. Components: Observed, Trend, Cyclical, and Irregular. Source: Author's computation.

The decomposition of GDP growth (Figure 4.4) presents a contrasting picture. The trend component shows a clear downward slope over the 30-year period, declining from approximately 8–9% in the late 1990s to around 4–5% by the early 2020s. The cyclical component captures Uganda's growth cycles, with peaks around 1995, 2003–2004, and 2012, and troughs in 1999–2000, 2009, and 2020. The 2020 trough in the irregular component corresponds to the COVID-19 shock. The decomposition confirms that Uganda's long-run

growth trajectory has weakened even as domestic savings have improved, reinforcing the importance of strengthening the savings-to-investment transmission mechanism.

Correlograms for ACF and PACF for All Variables

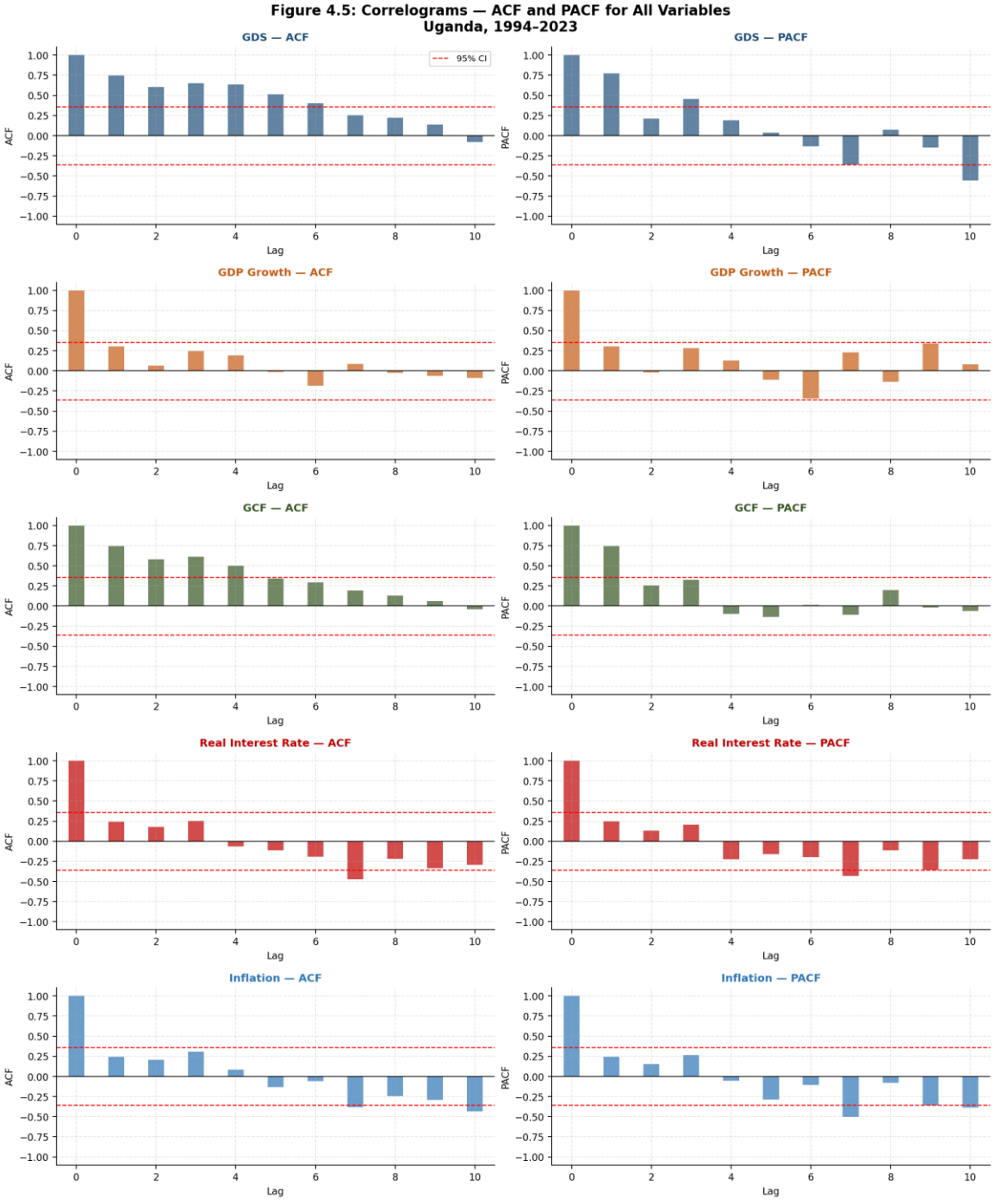

Figure 6: Autocorrelation Function (ACF) and Partial Autocorrelation Function (PACF) Uganda, 1994–2023

Note: Red dashed lines indicate 95% confidence bounds (±1.96/√n). Bars outside the bounds indicate statistically significant autocorrelation. Lag length = 10. Source: Author's computation.

The correlograms in Figure 4.5 provide visual confirmation of the unit root test findings. Gross domestic savings (GDS) shows slowly decaying ACF bars that remain significant across multiple lags, a classic signature of a non-stationary I(1) process. GDP growth similarly shows significant autocorrelation at lags 1–3, consistent with I(1) behavior. Gross capital formation (GCF) displays the most persistent autocorrelation, with bars remaining significant through lag 7, reflecting the gradual nature of capital stock accumulation. Real interest rate shows significant autocorrelation at lags 1–2, while the PACF cuts off sharply after lag 1, suggesting an AR (1) structure. Inflation exhibits a significant negative autocorrelation at lag 5, possibly reflecting a five-year economic cycle in Uganda's price dynamics. These patterns collectively justify the need for first differencing and the use of the ARDL bounds approach to address non-stationarity.

Scatter Plots for GDS and GCF versus GDP Growth

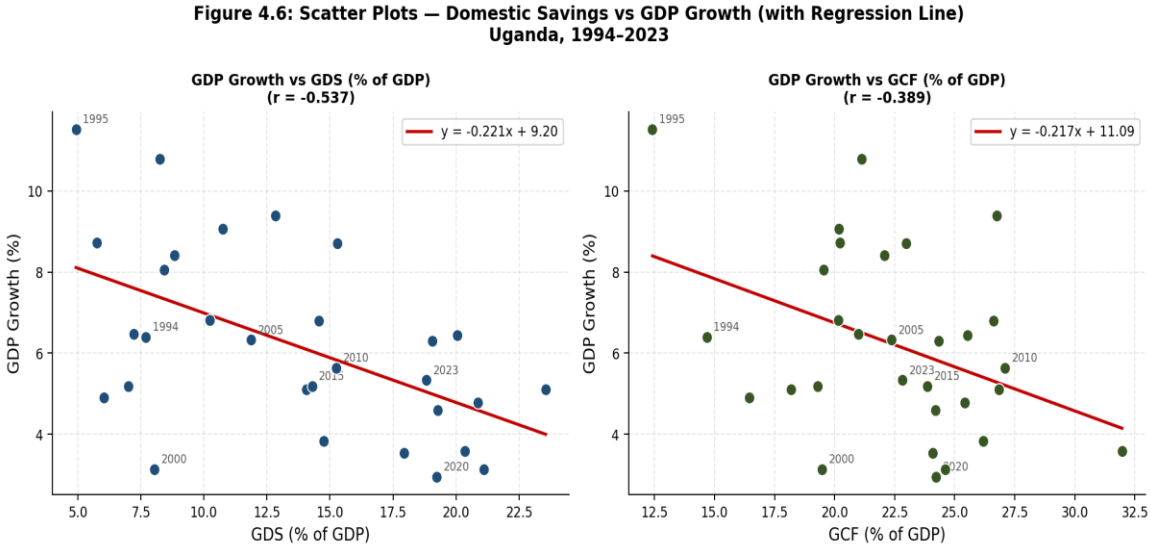

Figure 7: Scatter Plots with Regression Lines GDS and GCF vs GDP Growth in Uganda, 1994–2023

Note: Each point represents one year. Regression line estimated by OLS. Year labels shown for selected observations. r = Pearson correlation coefficient. Source: Author's computation.

The scatter plots in Figure 4.6 visually confirm the negative bivariate relationships between GDS and GDP growth (r = −0.537) and between GCF and GDP growth (r = −0.389). The negative slope in both plots reflects the paradox of thrift operating in Uganda: years of higher savings and capital formation were not systematically associated with higher growth. The year labels reveal that low-savings years in the mid-1990s (1994–1996) coincided with relatively high growth, while the high-savings years of the 2010s corresponded to more modest growth

rates. This pattern supports the interpretation that the savings mobilized in Uganda have not been efficiently converted into productive investment a structural weakness in financial intermediation as confirmed by the multivariate ARDL results.

Summary Note on Figures

The six figures presented above provide a comprehensive visual narrative that supports and enriches the econometric findings in Chapter Four. The trend analysis (Figures 4.1–4.2) establishes the central empirical puzzle of rising savings alongside declining growth. The decompositions (Figures 4.3–4.4) reveal the structural and cyclical dimensions of both series. The correlograms (Figure 4.5) confirm non-stationarity and justify the ARDL methodology. The scatter plots (Figure 4.6) visually illustrate the negative bivariate savings-growth relationship, contextualized within the multivariate regression framework. Together, these figures constitute a rigorous time series analysis appropriate for a quantitative economics dissertation at postgraduate level.

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APPENDIX

This appendix presents the linear trend regression output underlying the trend analysis discussed in Section 4.2, referenced there as "(see appendix)". Each variable was regressed on a simple linear time trend (Year) over the full 1994–2023 sample (N = 30) to formally test the direction and significance of the trend visible in Figure 4.1.

Appendix Table A1: Linear Trend Regression — Gross Domestic Savings (% of GDP), 1994–2023

Model	$GDS_t = \beta_0 + \beta_1(Year) + \varepsilon_t$
Dependent Variable	Gross Domestic Savings (% of GDP)
Slope (β_1)	+0.529% per year
R^2	0.708
p-value (slope)	< 0.0001
N	30
Interpretation	The statistically significant positive slope confirms that domestic savings rose steadily as a share of GDP over the study period, at an average rate of approximately 0.53 percentage points per year.

Appendix Table A2: Linear Trend Regression — GDP Growth Rate, 1994–2023

Model	$GDPG_t = \beta_0 + \beta_1(Year) + \varepsilon_t$
Dependent Variable	Annual GDP Growth Rate (%)
Slope (β_1)	−0.120% per year
R^2	0.214
p-value (slope)	0.010
N	30
Interpretation	The statistically significant negative slope confirms that GDP growth declined over the study period, at an average rate of approximately 0.12 percentage points per year, notwithstanding year-to-year volatility including the 2020 COVID-19 trough (2.95%) and the 1995 post-conflict peak (11.52%).

Note: Both trend regressions are simple ordinary least squares (OLS) regressions of the respective variable on a linear time index (Year = 1994, …, 2023), estimated independently of the multivariate ARDL model presented in Section 4.6 onward. They are reported here solely to substantiate the descriptive trend statistics cited in Section 4.2 and do not control for the other study variables. Source: Author's computation from World Bank WDI and Bank of Uganda data.