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Domestic savings in sub-Saharan Africa

The case of Ghana

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Abstract: One essential condition of economic progress in any society is an ample supply of savings, which depends on the growth of real capital. Economists agree that higher investment rates will lead to higher growth. Thus, domestic savings is considered an important determinant of growth in developing countries. However, Ghana has one of the poorest savings performances in the world. There are many reasons for the low savings rates in Ghana. In view of Ghana's aspiration to wean herself 'Beyond Aid', this study aims to provide an understanding of the long-run relationship between variables considered to be important determinant savings in Ghana. We employ time series analyses using data from 1980–2020 to capture the effects of the major policy changes in the financial sector of the history of the country, which are also likely to have implications for private savings. While the empirical analyses provide no compelling evidence of a long-run relationship between private savings and the variables considered, estimates from the short-run analysis suggest that per capita income and money supply have a significant positive relationship with domestic savings. This finding is particularly instructive because it suggests that policy makers must think critically about the kinds of policies and reforms required to boost domestic resource mobilization in the long term.

Key words: domestic savings, financial reforms, time series, Ghana, developing countries

JEL classification: E21, E44, E52

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1   Introduction

In the neoclassical economic growth theories, savings is regarded as the main source of capital accumulation and, therefore, an important driver of long-term growth. Predictions from the Harrod-Domar growth model, for instance, encourage developing countries to increase their savings and investments to spur economic growth. However, most countries in sub-Saharan Africa (hereafter SSA), including Ghana, have struggled over the years to mobilize sufficient domestic resources to promote and sustain growth of their economies. According to Elbadawi and Mwega (2000), private savings in the sub-region declined consistently from the 1970s to the 1990s, from 11 per cent of disposable income to about nine per cent. Based on data from the World Development Indicators (WDI) database, for SSA, between 2000 and 2020, the savings ratio (i.e. savings as a percentage of gross domestic product [GDP]) declined significantly from 30 per cent to about 20 per cent, although there have been fluctuations in between the period. In Ghana, the story is not any different.

The low levels of savings in Ghana necessitated the heavy reliance on foreign aid and other external sources of finance for economic development in the past. However, the renewed call and resolution towards the 'Ghana Beyond Aid' agenda has revived interests in domestic resource mobilization for economic growth and development. In line with this agenda, the Bank of Ghana embarked on an agenda to ensure a resilient financial system required to facilitate economic growth by 'cleaning up' the banking sector between mid-2017 and the end of 2018. The clean-up appeared to have paid off as the total deposits recorded in 2019, according to Bank of Ghana (2020), grew by 22 per cent in 2019 compared with 12 per cent recorded in 2017. A combination of various macroeconomic financial sector policies as well as population policies may offer an interesting perspective on the relationship between savings and economic growth in Ghana (Gatsi and Appiah 2020). For example, the Financial Sector Adjustment Program (FINSAP I and FINSAP II) implemented between 1988 and 1990 (1990/1991), the Highly Indebted Poor Country (HIPC) initiative between 2001 and 2006, and the population policy drive geared towards reducing family size during the same period are all noteworthy. The implementation of these policies directly or indirectly affects savings and economic growth in the long run.

The fundamental theoretical underpinnings for understanding savings behaviour is based on Keynes (2018). Keynes argues that there is a positive relationship between consumption and savings, and both of them are correlated with disposable income. Thus, increases in an individual's disposable income leads to increases in consumption. However, according to Keynes (2018), the increase in consumption is less than the increase in disposable income. This suggests that the excess disposable income is used as savings, thereby suggesting a positive relationship between disposable income and savings.

The existing empirical literature on domestic savings suggests a broad range of factors as potential determinants of savings. These include income-related variables (GDP per capita), economic growth rates, and interest rates (Verma and Wilson 2005; Freytag and Voll 2013). Macroeconomic variables often consist of fiscal policy measures such as taxation and government expenditures and monetary policy variables such as the regulation of interest rates, money supply, and inflation. Other important determinants of domestic savings are macroeconomic volatilities and external shocks, especially terms of trade (Chowdhury 2015), financial liberalization (Keho 2011), and the quality and efficiency of the institutional environment within which a country operates (Feng and Yu 2020; Kebede et al. 2021).

External shocks are particularly significant for countries such as Ghana that depend on the production and export of primary commodities, for which changes in international prices affect export receipts. In most cases, the terms of trade fluctuations result in macroeconomic uncertainty (Adler and Magud 2013), and the heavy reliance on primary commodities increases the country's vulnerability to external shocks. This ultimately complicates macroeconomic management, particularly on the fiscal side (Adler and Magud 2013; Céspedes and Velasco 2014). Given the less developed and inefficient domestic credit and capital markets in developing countries, including Ghana, economic agents are often subjected to tight constraints, especially when commodity prices plummet. The adverse shocks ultimately compel them to reduce their savings by a much larger proportion than they would have otherwise had to. Using data on developing countries including Ghana, Chowdhury (2015) established a significant and positive effect of terms of trade on savings.

A growing body of literature documents the role of institutions, legal environments, and regulations on domestic resource mobilization in developing country contexts (e.g., Appiah et al. 2020; Ntow-Gyamfi et al. 2019; Aluko and Ibrahim 2020; Kebede et al. 2021). These studies have described the extent to which the monetary and regulatory environment reposes confidence in the financial system. Gani and Rasul (2020), Troilo et al. (2019), and Haselmann and Wachtel (2010) have all emphasized that the strength of legal systems, regulatory quality, and the rule of law have a significant influence on the financial sector and are associated with deeper financial markets in developing countries. Regulatory quality and good governance promote the development of the private sector and reduce the cost of doing business in an economy (Feng and Yu 2020; Sanga and Aziakpono 2022). Weak law enforcement of credit contracts reduces bank credit and increases the cost of intermediation due to prolonged and costly litigation to settle business disputes (Shen et al. 2009; Sanga and Aziakpono 2022). Closely linked to the issue of weak institutions is corruption. Empirical evidence has shown that corruption causes inefficiency, limits access to financial markets, and increases the economic costs and deters entrepreneurs from investing, leading to a negative effect on the development of the financial sector and hence savings (Khwaja and Mian 2011; Acemoglu and Robinson 2012; Sanga and Aziakpono 2022).

In addition, political stability and accountability in democratic regimes allows for financial intermediaries to operate efficiently and ultimately increases financial access and depth (Dutta and Meierrieks 2021). As noted by Ho et al. (2018) and Karikari et al. (2021), political instability and undemocratic regimes have been known to undermine confidence in the financial markets, inhibit bank credit to the private sector, and reduce the confidence of investors and entrepreneurs to increase their investments.

While the literature provides empirical evidence on the various factors that determine domestic savings, most of these studies have largely focused on a group of countries in various regions. However, conclusions drawn from such studies for individual country contexts may mask heterogeneity evident in individual country contexts. Moreover, the existing empirical research has focused more on the determinants of savings in the short run. Nevertheless, understanding the long-run relationship between these variables and savings is critical for effective long-term policy-making regarding the improvement of domestic savings mobilization. This study aims to fill this gap by determining, empirically, the primary long-term determinants of savings in Ghana, using data covering the period from 1980 to 2020. In addition, we aim to establish whether there is a long-term relationship between savings and the variables considered in Ghana's context. The sample period is chosen precisely to capture the effects of the various major policies that have been implemented over the period (see Section 2).

The rest of the paper is organized as follows. Section 2 describes the policy context, discussing the macroeconomic environment, as well as various monetary, fiscal, and financial policies that have shaped savings behaviour in Ghana over the period. In Section 3, we describe the data used and

the empirical estimations. Section 4 discusses the results from the descriptive analysis and the results from the empirical estimations. Section 5 concludes the paper.

2   The policy context

2.1   The macroeconomic environment

The political and macroeconomic instability that confounded the Ghanaian economy in the early 1980s had negative implications on the confidence of the population, which also affected the confidence in the banking and financial sector. The Economic Recovery Program (ERP) and the Structural Adjustment Program (SAP), which were geared towards macroeconomic stabilization and economic growth restoration, comprised a set of fiscal and monetary policies, as well as trade and payment policies. While Ghana was commended by the World Bank for the successful implementation of the policies, its impact on sustained economic growth was short lived (Aryeetey and Tarp 2000) as the economic performance produced mixed results. As discussed by Bekoe and Adom (2013), by the mid-1990s inflation was around 23.6 per cent, peaking at 59 per cent in 1995, while GDP growth averaged around four per cent over the period. Around the same period, domestic borrowing by the government had increased significantly, crowding out the private sector from the credit market. Additionally, monetization of foreign debt put further pressure on prices (Aryeetey et al. 2000), and by 1998, the country's debt stock was double the rates recorded in the early 1980s. By this time, the country's external debt was about 79 per cent of GDP, giving an indication of a looming debt crisis and burden on future generations (Bekoe and Adom 2013).

In a bid to achieve fiscal balance, the government was encouraged to reduce its expenditures. One major area that was targeted was cuts in public sector employment. During the early years of implementation of the program and in a bid to increase revenue, taxes were imposed on various consumables (e.g., beer, cigarettes, and gasoline) and new taxes were imposed on wealth, including property and non-commercial vehicles (Osei et al. 2020). While these policies may have yielded positive results by raising government revenue, it may have stifled domestic savings, as private savings declined from 12.6 per cent of GDP in 1981 to about 7.7 per cent of GDP by 1983.

By the early 2000s, the Growth and Poverty Reduction Strategies (I and II) were implemented to 'enable wealth creation for the benefit of all Ghanaians'. The adoption of these strategies appeared to have turned the economy around with an impressive growth outcome. Real GDP, for instance, grew by an average of 4.8 per cent from 2000 to 2008, which was attributed to the good performance of the country's commodity prices on the world market, as well as the prudent fiscal and monetary policies pursued around the same period. Other macroeconomic indicators such as inflation and interest rates witnessed significant declines. Between 2004 and 2008, the average annual cedi-dollar depreciation fell significantly from 49.8 per cent to about 0.9 per cent, and inflation rates also declined from about 33 per cent in 2001 to about 12.6 per cent in 2004 and then to 16.5 per cent in 2008. Similar declines were recorded for nominal interest rates, which were halved from 47 per cent in 2000 to about 25 per cent in 2008. High external debt continued to persist between 2000 and 2005 at about 79.2 per cent but recorded significant declines to about 28.9 per cent between 2006 and 2008. By 2008, perhaps due to the discovery of oil in commercial quantities, large inflows of foreign direct investments (FDIs) were recorded.

In the post-2010 era, the country experienced massive economic growth, partly due to the production of oil in commercial volumes. Growth increased from 4.8 per cent in 2009 to 7.9 per cent in 2010 and peaked at 14 per cent in 2011 before declining sharply between 2012 and 2016 due to the sustained power crises during this period. As a result, a 2.2 per cent growth rate was

recorded in 2015 before rising again to 8.1 per cent in 2017. However, growth began to decline again in 2018 to 6.2 per cent and further down in 2019 through to 2021 due to the effects of the COVID-19 pandemic. The significant negative effects of the power crises and the pandemic on economic activities are likely to affect savings due to effects on economic activities. Under a new administration, ambitious policies such as the 'Free Senior High School' policy financed by proceeds from oil production may have increased the disposable income of parents whose children were enrolled in the senior high school as private savings increased from 11.9 per cent in 2016 to 15.4 per cent and then to 18.6 per cent before declining to 13.6 per cent in 2018. The increased government expenditure through the 'Free Senior High School' and the associated increase in savings during this period may be consistent with the Ricardian Equivalence hypothesis, which states that economic agents envisage government spending as a future liability and therefore tend to save to pay for future tax increases. In addition, the core objective of monetary policy in Ghana is to ensure price stability, pursuing within the context of inflation targeting. The basic understanding is that a stable price environment has significant implications for domestic savings and sustained economic growth.

2.2 Monetary and financial sector reforms

Savings and the financial sector operations cannot be delineated. In fact, it would appear that growth within the finance and banking sector could partly be propelled by growth in savings, as this forms a significant component of the liability of the banking sector. Following independence, the financial market in Ghana underwent several reforms, culminating in the volatility in financial savings, particularly for the period post-dating 1970 (Aryeetey et al. 1996).

Using a measure of financial deepening (M2/GDP), Aryeetey et al. (1996) observed that the savings rate in Ghana declined significantly for the period 1977 to 1982. They added that this occurrence made Ghana lose its progressive status of being considered one of the deeply financialized countries in Africa. The low savings during the period was attributed to repressive government measures, which aimed at essentially exerting control over the banking space in Ghana. For instance, Brownbridge and Gockel (1996) report that the mandatory request of providing the government with all details of banks' customers invariably deterred formal savings and rather encouraged informal financial intermediation. Additionally, the freezing of all bank deposit accounts that exceeded GHS50,000, the sudden withdrawal of GHS50 notes, and the recall of bank loans for trading inventory financing featured prominently in eroding public confidence in holding deposit accounts with banks (Aryeetey and Gockel 1991). Not only was public confidence eroded because of government policies, but banks were also discouraged from actively mobilizing deposits because of unfavourable reserve requirements. In this regard, Leite (1982) recognized that banks occasionally refused to open new time and savings accounts for prospective clients (as cited in Brownbridge and Gockel 1996).

Between 1984 and the early 1990s, Aryeetey et al. (1996) reported a steady rise in savings, with occasional declines. This trending but slow progress in financial savings, according to Aryeetey et al. (1996), was elicited by the rising real incomes and economic reforms of the period (particularly the Economic Reform Program).

Specific banking regulations and policies were pursued in the early 1980s to reverse the negative impacts of various government programs and intervention policies that were implemented through the banking sector. For example, in rebuilding a resilient banking sector, a weekly auction in Treasury Bills was established in 1986. The central bank also made attempts to move away from direct control regimes where policies such as fixed interest rates and credit ceilings were used to direct sectors within which credit was to be provided (see Quartey and Afful-Mensah 2014). To reverse the undesirable effects of the previous repressive policies, the first Financial Sector

Adjustment Programs (FINSAP I) was implemented from 1988 to 1990 and was aimed at achieving specific objectives, including restructuring of distressed banks, mobilization of savings and efficiency in credit allocation, and development of the money and security markets (Gockel et al. 1997).

To complement FINSAP I, there were additional banking regulations that were amended to further fortify the banking sector. New requirements of minimum capital for all banks eliminated the discretionary powers of the central bank to increase the ratio for particular banks in the amended banking laws in 1989. The amendments also sought to improve the supervisory and regulatory framework for the banking sector by instituting limits to single borrowers. FINSAP II was an extension of FINSAP I and focused on strengthening the non-bank financial institutions as well as divesting state-owned banks between 1990 and 1991. Shortly after, in 1993, the Non-Bank Financial Institutions legislation was passed. Other legislations, including the Banking Law, the Bank of Ghana Law, the Bills and Cheques Bill, and the Payment Systems Bill were all laid before parliament for consideration to liberalize the financial sector between 2000 and 2001 (Quartey and Afful-Mensah 2014). Under the Financial Sector Strategic Plan, the Banking Bill and Payment Systems Bill were eventually passed in 2003. The broad aim of these new regulations was to ensure effective supervision by the regulator as well as modernize and improve the efficiency of the payment systems in the country. These regulations improved banking convenience and probably impacted financial savings positively. The roll-out of the FINSAP (in all its phases) undoubtedly helped restore some customer confidence in Ghana's financial market, hence contributing to the steady (howbeit marginal) increase in financial savings, as reported by Aryeetey et al. (1996). It is important to add that, whereas the liberalization of interest rate controls was intended to shore up savings mobilization, macroeconomic misalignment in high inflation rates eroded most of the nominal gains.

The concept of universal banking, which was introduced in 2003 by the Bank of Ghana, allowed banks to extend commercial, investment, and merchant banking services to customers. Hitherto, banks were required to have separate licences for such activities that restricted these services to their customers. To minimize the risks and opportunity costs associated with running a cash-based economy, the Real Time Gross Settlement System (RTGS) was launched. This new system facilitated high-value interbank payments and created an environment of safe, sound, secure, and timely payments within the financial sector (Quartey and Afful-Mensah 2014). To complement the RTGS, other payment systems, including a paper-based clearing system to facilitate 'low-value' transactions, were instituted in 2006 together with the National Switch (known as E-ZWICH), which was introduced in 2008. Aside from the advantages of being an efficient system and allowing for low-cost transactions in infrastructure-limited communities, the E-ZWICH, most importantly allowed for the interoperability of all automated teller machines (ATMs) for customers of different banks, according to Bank of Ghana (2007). The introduction of the E-ZWICH biometric card in 2009 made things even better. It enabled customers to make deposits and withdrawals, transfer money, and load and withdraw wages and salaries. The E-ZWICH was highly patronized because of the low infrastructure requirements for its operations. So far as subscribers had access to telecommunication networks, they could access the range of services on the unified platform. According to Bank of Ghana (2010), shortly after its introduction, the number of card holders had increased by 48.9 per cent.

The Foreign Exchange Act (Act 723), which replaced the Exchange Control Act, 1961, liberalized the foreign exchange regime. The new act eliminated restrictions on the issuance and transfer of securities and allowed for foreign exchange inflows to encourage FDIs. Another important feature of the new act was that it allowed foreign holdings of equities listed on the Ghana Stock Exchange. Non-residents were also allowed to invest in the money market for at least three years (Bank of

Ghana 2007). The liberalization of the foreign exchange regime had important implications for investment and savings.

The various financial reforms resulted in the creation of a financial market that consisted of the bonds, equity, foreign exchange, and derivative markets. The reforms, according to Ackah and Asiamah (2016), also led to the influx of foreign banks and investors with leading brands from Nigeria and South Africa pitching camp in Ghana's banking sector. Competition was increased among the banks, resulting in a situation where banks were forced to adopt best practices in the sector (Quartey and Afful-Mensah 2014). The liberalization of the banking sector through the implementation of the reforms increased the number of commercial banks from three in the early 1990s to about 17 by 2001. By the end of 2005, the number of banks increased to 21 banks, consisting of commercial, universal, merchant, and development banks (Owusu-Antwi and Southeastern 2011), with about 121 rural and community banks operating in the economy. Innovative products such as the *Akuafo Bond* were introduced to improve the savings habits of farmers in the country. The various reforms that were implemented resulted in a vibrant financial sector compared to other economies within the sub-region.[1]

Between mid-2017 and mid-2018, the Bank of Ghana embarked on what it termed the 'financial sector clean-up' to 'sanitise the banking sector and to protect the interest and confidence of depositors' (Bank of Ghana 2019). The clean-up was necessitated by the failed efforts of regulators geared towards remedying compliance lapses such as defiance of minimum required capital, risk-taking without the obligatory risk management, use of depositors' investments to fund private business ventures, and weak corporate governance systems. These lapses were uncovered by assessments into the operations of banks and other financial institutions in the financial sector. By the end of the exercise in mid-2018, the number of banks was reduced from 33 in 2016 to 23 banks. Through the clean-up exercise, 347 microfinance companies, 39 microcredit companies, and two non-bank institutions had their licences revoked due to various infractions on their operations. After the clean-up, Mante (2020) reported the negative impacts by way of job losses and loss of entrepreneurs' businesses and assets. This had a devastating effect on the confidence and trust in the financial sector. Especially microfinance and microcredit institutions that serve the informal sector began to record panic withdrawals, as noted by Affum (2020). Consequently, liquidity levels were affected, making it even more difficult to meet the credit needs of customers. Although data from the Bank of Ghana suggest that the financial sector posted a positive outlook based on the performance indicators one year after the financial sector clean-up, Affum (2020) argues that the clean-up has resulted in a situation where customers, particularly workers from the informal sector, have lost confidence in the financial sector.

3   Data and empirical estimation

3.1   Data and model specification

Similar to Athukorala and Sen (2004) and Ang and Sen (2011), the empirical specification in this paper is based on the life cycle model (hereafter LCM), which provides a framework in which we are able to link the intertemporal decisions about consumption and therefore savings and its implications for investments and capital accumulation for long-term economic growth. While the

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[1] The Bank of Ghana had to put an embargo on new entrants into the sector given the rise in the number of applications for new licences. By 2013, there were about 29 banks with both foreign and local ownership operating within the banking sector in Ghana.

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basic LCM suggests economic growth, population structure, and interest rates as the main determinants of savings, Athukorala and Sen (2004) challenge the core assumptions of the basic LCM in the contexts of developing countries where inflation directly impacts the value of accumulated wealth in the long run. Based on the peculiarity of the Ghanaian context, we also consider other important determinants of savings to include economic growth GDP per capita, the age structure of the country (i.e. dependency ratio), the real interest rate on bank deposits, terms of trade, remittances, and money supply.

Based on the theoretical model discussed above, the empirical specification modelling the determinants of savings in Ghana is represented by the equation below:

$$PSAV = F\,(GDPG, GDPL, GDPLSQ, INF, RIR, MON, DOMCRE, TOT, DEPRATIO, REM) \quad (1)$$

Private savings (PSAV) is defined as the difference between gross savings and public savings, where public savings refers to the difference between government final consumption from government revenue. Private savings is expressed as a percentage of GDP, similar to its components. PSAV is also influenced by growth of GDP (GDPG) and GDP per capita (GDPL). Including both GDPG and GDPL is important because it captures the capacity of individuals to save, as inferred from the absolute income hypothesis, which directly relates income levels with savings. Both variables give an indication of how the economy is doing and therefore a proxy of household welfare. It is necessary to distinguish between the effect of higher growth on the level of current domestic savings and the effect on the level of GDP per capita on savings. While GDP growth is indicative of how well the economy is faring, GDP per capita captures the capacity of individuals to save. Moreover, the square term of GDPL (GDPLSQ) is included in the analysis to capture the possible non-linear effect of national income on savings.

All things being equal, it is expected that at lower levels of income there is dissaving given that consumption expenditure is more than income, which depicts the reality in most Ghanaian households. Many households operate at near-subsistence income levels, which may strengthen the motive for consumption smoothing. As income increases, however, the proportion of saved income should increase given that the proportion of income consumed decreases. This description suggests the inclusion of a square term of the level of income that is represented by GDPSQ. In addition to per capita income and growth, the age structure of the economy influences the capacity of households to save. Households with larger numbers of dependents (individuals below the age of 15 years and those above 60 years) are less likely to save compared to households with fewer dependents. Inward remittances received by households have the potential to increase household savings. While evidence shows that a significant proportion of remittances received by households in Ghana is used for consumption, it may increase the capacity of receiving households to increase their savings. REM in this study is defined as total remittances expressed as a percentage of GDP. As indicated earlier, terms of trade (TOT) serves as a signal for macroeconomic uncertainty in Ghana, which has implications for fiscal policies and hence savings. The TOT variable is computed as the difference between the value of exports and imports and is expressed as a percentage.

Other important variables that are likely to affect savings are inflation, real interest rate, money supply, and domestic credit. Collectively, these variables can be described as financial sector variables. Inflation is measured in annual averages and is a good measure of the prevailing economic conditions within the economy, while the real interest rate is expressed as the nominal interest rate on deposits adjusted for inflation. Following Fisher's equation, the real interest rate (RIR) is constructed as the difference between the nominal interest rate and inflation. All things being equal, it is expected that an increase in RIR would lead to an increase in private savings. Domestic credit to the private sector (DOMCRE) expressed as a percentage of GDP refers to

financial resources provided to the private sector by financial institutions. The provision of such credit is important as it facilitates the capital formation process through its financing of production and economic activities. All things being equal, the higher the credit to the private sector, the higher the rate of savings. Broad money (MON) is a policy tool used by the central bank to control inflation in the economy. It serves as a proxy for the level of financial development in the economy and, therefore, the willingness of households to save. All things being equal, an increase in money supply is a good indication of access to financial assets and instruments, which increases an individual's willingness to save.

3.2   Empirical estimations

In most cases, economic analysis has relied on theoretical models to assume the existence of a long-run relationship between variables. Inherent in such assumptions are further assumptions that the variables in the model have constant means and variances that do not depend on time. Results from estimations that make such assumptions may lead to misleading inferences. To avoid relying on spurious regressions and inferences, recent econometric analysis using time series data has increasingly relied on cointegration, which has proven to be a robust way of detecting the presence of a steady-state equilibrium between variables. In determining the existence of a true long-run relationship between series that are non-stationary, the bounds test of cointegration by Pesaran and Shin (1999) and Pesaran et al. (2001) has usually been employed.

Generally, the presence of a unit root implies that a time series is non-stationary while the absence of it depicts stationarity. In such a series, the mean, variance, covariance, and autocorrelation functions change over time and may affect the long-run relationship between the variables. This violates the assumption of constant means and variances under the OLS estimations. As mentioned earlier, for any meaningful empirical analysis, the series would have to be purged often through the process of detrending, which most often is done by undertaking the differencing given that most series are described as following a difference stationary process. In this process, however, the variables lose the relevant information or long-run properties of the equilibrium relationship between the variables under consideration. Cointegration therefore is a way of retaining the relevant long-run information of the relationship between the considered variables that were lost on differencing. Pesaran and Shin (1999) and Pesaran et al. (2001) use the ARDL technique to determine the long-run relationship between series with different orders of integration. The reparametrized results give the short-run dynamics and the long-run relationship of the variables under consideration in the model.

In ensuring that all variables are stationary, we start off with the stationarity test by employing the Augmented Dicky Fuller (ADF) and Phillips-Perron (PP) (Phillips and Perron 1988) tests to ascertain the order of integration of all the variables. The results from the ADF and PP tests are shown in Table 3. At levels, the only variables that show stationarity are GDP growth, inflation, real interest rate, and terms of trade for both the ADF and PP tests. However, after first differencing, all the non-stationary variables become stationary[2] (see Table 1).

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[2] The dependency ratio was initially included in the model, but this became stationary only at the second difference. This was therefore eliminated from the model to allow for the estimation of the ARDL model in establishing whether or not there is a long-run relationship between the savings and the other variables in the model. The summary statistics for all variables used are shown in the appendix.

Table 1: Unit root test results

		ADF test		Phillips-Perron	
Variable	SBIC lag	t-statistic	Crit. value (5%)	t-statistic	Crit. value (5%)
SAV	1	-1.955	-2.966	-2.182	-2.964
GDPG	1	-4.604***	-2.966	-3.471**	-2.964
GDQSQ	1	0.446	-2.964	-0.108	-2.964
GDPLevel	1	0.592	-2.966	0.524	-2.966
INFLATION	1	-2.583	-2.966	-6.270***	-2.964
RIR	0	-5.237***	-2.969	-5.237***	-2.966
MON	1	-1.374	-2.966	-1.474	-2.964
TOT	1	-2.889**	-2.966	-3.527**	-2.964
DOMCRED	1	-1.534	-2.966	-1.498	-2.964
DEPRATIO	2	-0.217	-2.972	-1.302	-2.966
REMGDP	3	0.357	-2.972	-1.281	-2.964
EXT_DEBT	1	-4.914	-2.966	-1.569	-2.966

Note: *** p<0.01, ** p<0.05, * p<0.10.

Source: authors' computations from data.

Table 2: Unit root test results for the first difference

		ADF test		Phillips-Perron	
Variable	lag	t-statistic	Crit. value (5%)	t-statistic	Crit. value (5%)
DSAV	0	-6.917***	-2.966	-6.917***	-2.966
DGDQSQ	0	-7.437***	-2.966	-7.437***	-2.966
DGDPLevel	0	-6.607***	-2.966	-7.607***	-2.966
INFLATION	0	-13.659***	-2.966	-13.659***	-2.966
DMON	0	-6.511***	-2.966	-6.511***	-2.966
DDOMCRED	0	-7.071***	-2.966	-7.071***	-2.966
DDEPRATIO	0	-2.302	-2.969	-2.302	-2.969
DREMGDP	0	-8.446***	-2.966	-8.446***	-2.966
DEXT_DEBT	0	4.935***	-2.966	-4.935	-2.966

Note: *** p<0.01, ** p<0.05, * p<0.10.

Source: authors' computations from data.

3.3   Test for cointegration

This is a preferred technique because it offers the advantage of not requiring all the variables in the model to be integrated of order one or zero. In addition, the ARDL test can apply a number of lags to the variables separately, unlike the Johansen test that restricts all variables to a uniform number of lags (Khalil and Dombrecht 2011). In addition, the test has been seen to be efficient with small and finite sample sizes, as seen in the current paper. Ultimately, the ARDL model produces unbiased estimates of the long-run model (Harris and Sollis 2003).

The null hypothesis of the bounds test is no long-run relationship nor cointegration among the variables, while the alternative hypothesis is a long-run relationship among variables. Results from the bound test are shown in Table 2. The estimated F-statistic is 1.78. Compared to the lower- and upper-bound values of the Pesaran table of critical values, we accept the null hypothesis on no cointegration.

Table 3: Results of bound test (testing for existence of a level relationship among the variables in the ARDL model)

F-statistic	95% lower bound	95% upper bound	90% lower bound	90% upper bound
1.905	2.06	3.24	1.83	2.94
N = 35				

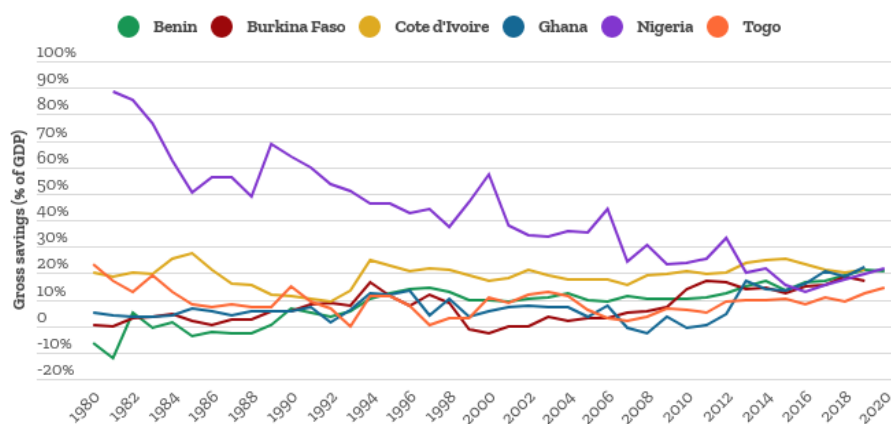Source: authors' computations.

Based on the results from the bounds test, we conclude that the error correction model would not be appropriate. We therefore implement the ARDL model without the error correction model and show the short-run dynamics of the model. The short-run results from the ARDL model are shown in Table 4.

4 Results

4.1 Descriptive analysis of savings in Ghana—trends

Ghana's domestic savings rate remains relatively low compared to other countries in the sub-region, averaging 7.4 per cent of GDP between 1980 and 2020 (see Figure 1). This rate is only slightly better than the domestic savings rate in Burkina Faso, which averages 7.2 per cent over the same period but lower than the domestic savings rate in Benin (8.5 per cent), Cote d'Ivoire (19.3 per cent), Nigeria (41.7 per cent), and Togo (9.1 per cent).

Figure 1: Gross domestic savings in selected West African countries

Source: authors' calculations based on data from WDI.

The empirical literature provides several reasons for the low savings rate in Ghana. Osei (2011), Issahaku (2011), Kwakwa (2013), and Larbi (2013) examined the determinants of savings in Ghana. Among other factors, these studies observed that Ghana's domestic savings rate is positively correlated with the level of per capita income. These studies argue that there is a positive relationship between economic wellbeing promotion and savings. They suggest that any policy directed towards the improvement of the welfare of households has the potential to generate increased domestic savings rates. Typically, these studies conclude that Ghana's low savings rate corresponds to low levels of income per capita. The results from these studies are consistent with the theory.

Figure 2: GDP per capita and domestic savings in Ghana (1981–2019)
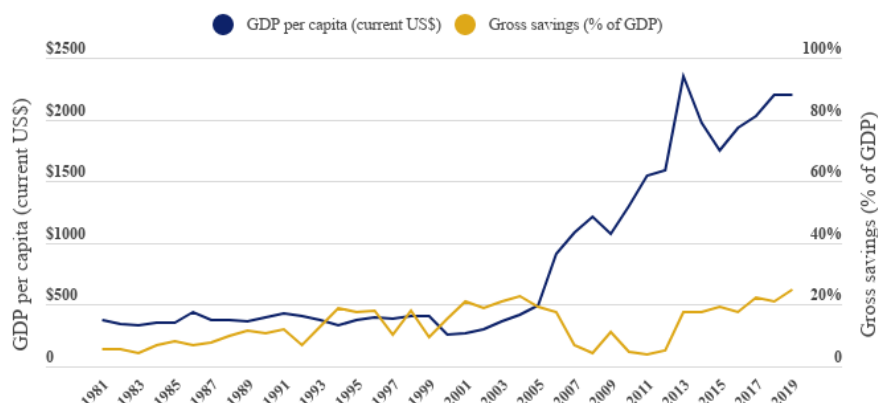
In Figure 2, we note that, even though per capita income has consistently increased over the period, savings have remained unresponsive, contrary to the tenets of the absolute income hypothesis, which predicts that the level of income positively influences saving (Wood 1995; Branson 2003). This may be indicative of the fact that the general incomes are already low, and with a high marginal propensity to consume, a small fraction will be dedicated to savings.

Figure 3: Trends in savings and GDP per capita growth (1981–2019)
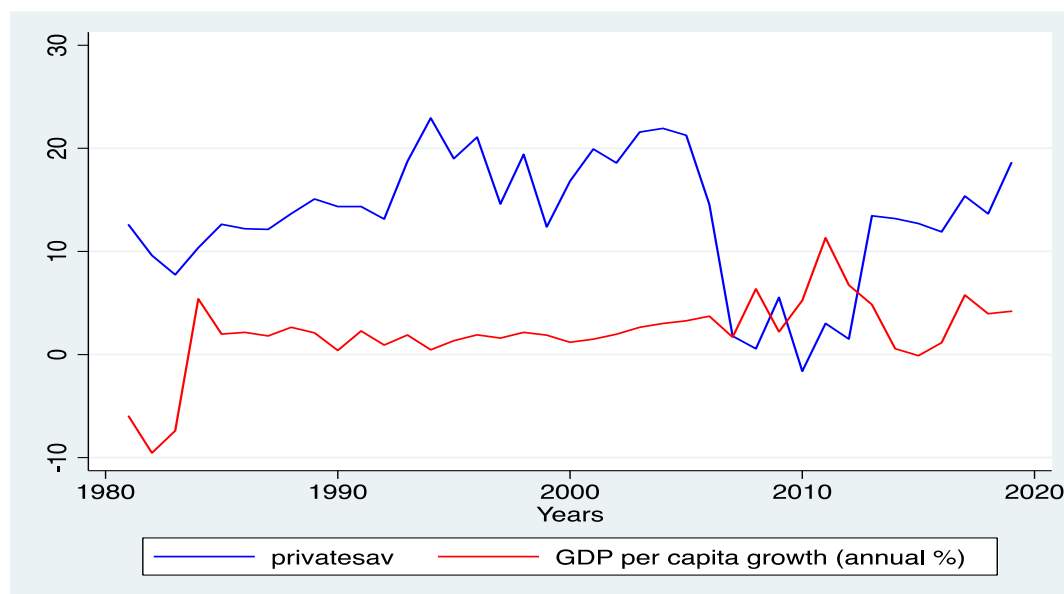
Figure 3 shows the trends in economic growth and private savings from 1980 to 2019. From the graph, an interesting patterning is observed. Private savings increase during economic downturns and reduce when the economy is doing better. For example, at the height of the economic crisis in 1981, both economic growth and private savings recorded significant declines. By the mid-1980s when the economy began to stabilize, private savings continued to increase significantly, peaking at 21 per cent between 2003 and 2005 and then declining sharply to 0.6 per cent in 2006. During this same period, economic growth picked up again between 2007 and 2011, during which time

private savings had recorded its lowest in the country at -1.6 per cent. Again between 2013 and 2019, economic growth declined steadily while savings continued to increase.

Figure 4: Trends in private savings and domestic credit to the private sector by banks (1981–2019)
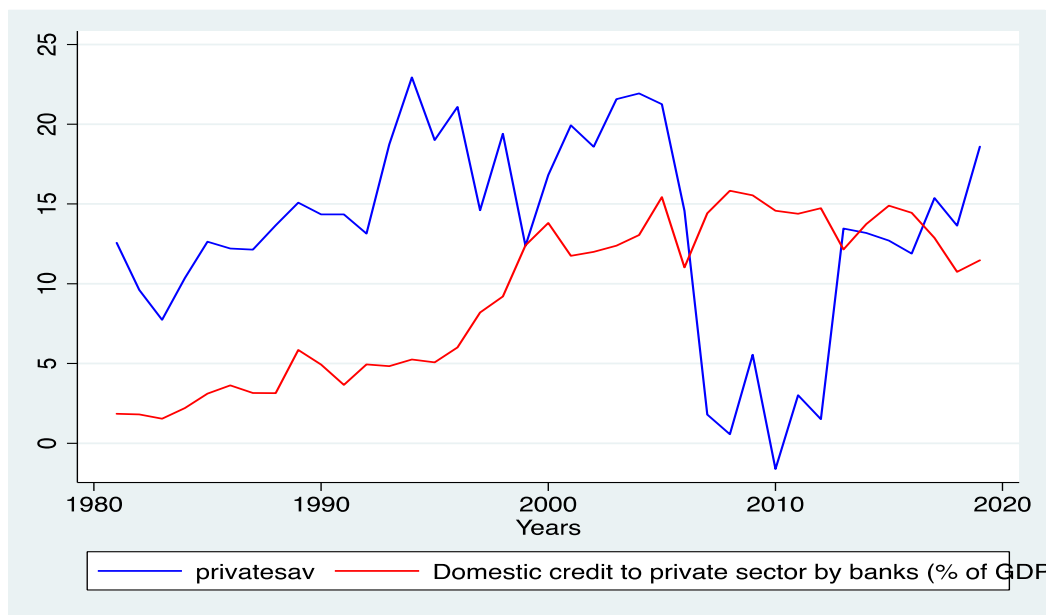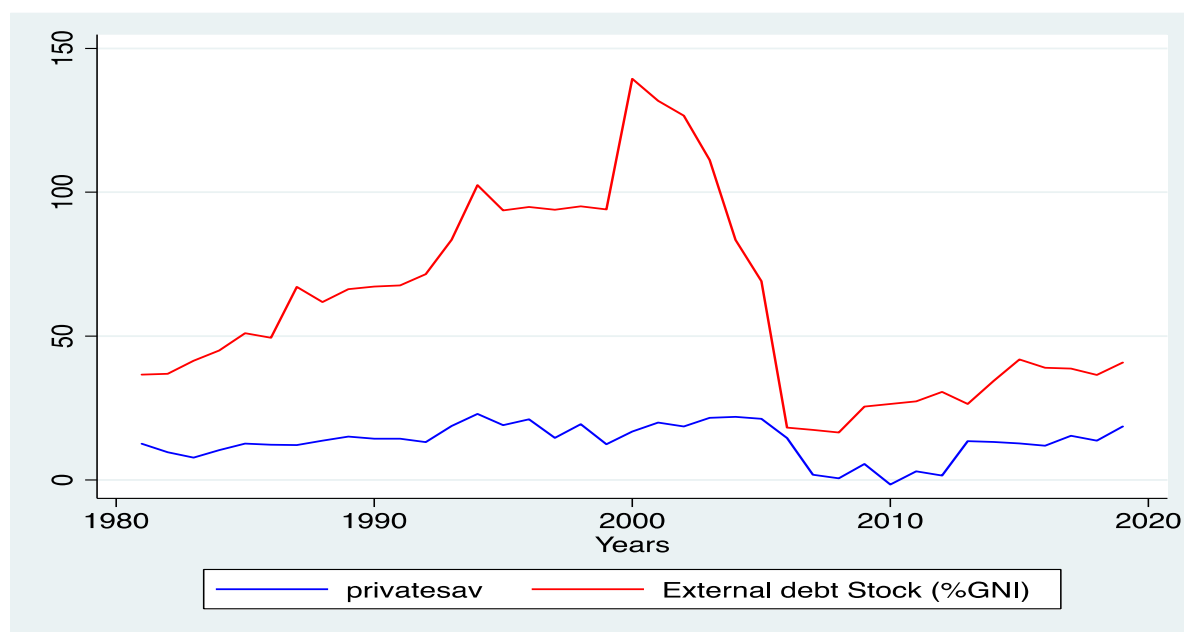

Source: authors' calculations based on data from WDI.

Figure 4 highlights the relationship between financial deepening (as measured by the ratio of direct credit to the private sector by banks to GDP) and private savings. Over a long period, between 1981 and 2006, the data suggest a positive relationship between savings and credit to the private sector. However, from 2007, private savings witnessed a significant decline, while domestic credit remained high. Savings remained below five per cent between 2007 and 2013 while domestic credit continued to increase over the same period. In 2014, however, the trend reversed with domestic credit declining while private savings continued to soar.

Figure 5 suggests a close relationship between external debt stock and savings. Rising debt stocks are associated with rising savings, although the rise in debt stocks is not proportionate to the rise in savings. However, in the period of sharp decline in external stocks, the fall in savings was not as sharp.

Figure 5: Trends in private savings and domestic credit to the private sector by banks (1981–2019)

Source: authors' calculations based on data from WDI.

4.2 Empirical estimation results from ARDL analysis

Given that the Pesaran et al. (2001) bounds test (see Table 3) discussed in the earlier section provides evidence from the F-tests, which show that there is no long-term relationship between private savings and the variables in the model considered, we show the short-run relationships in the model (see Table 5).

From Table 2, the first lag of money supply (financial deepening) significantly affects savings in the short run. The coefficient is significant at the five per cent level. This finding suggest that the past year's level of money supply significantly impacts current levels of savings. A one per cent increase in the previous period money supply increases current savings by about 1.33 per cent, all things being equal. This suggests that economic agents are basing their current savings behaviour on the previous year's money supply. Interestingly, however, current levels of money supply have a negative effect on savings, although this is not statistically significant. We also note that per capita GDP negatively affects savings. This finding is significant at the 10 per cent significance level. All things being equal, the results suggest that a one per cent increase in per capita income reduces savings by about five per cent. We note that the square term of per capita income is positive and significant at the 10 per cent significance level. Taking these two results together, the results are indicative of the non-linear relationship between per capita income and savings in the Ghanaian context. As indicated earlier, at lower levels of income, there is likely to be dissaving given that consumption expenditure is more than income, which is what pertains in most Ghanaian households. Given that most households survive on near-subsistence income levels, all income is used on consumption expenditure. Increases in income at some point will induce some level of savings, as no income will be spent on consumption. This suggests that, beyond some income threshold, the proportion of saved income increases given that the proportion of income consumed decreases. Particularly, an increase in per capita income by US$1,000 beyond a certain threshold results in a 0.15 per cent increase in savings. The Breush-Geofrey and Breush-Pagan tests indicate evidence of serial correlation but no evidence of heteroskedasticity.

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Table 4: Short-run coefficient estimates for the ARDL model

Variables	Coefficients	t-stats
SAV (L1)	0.305	1.01
GDPG	-0.483	-0.86
GDPG (L1)	-0.511	-1.34
GDPLSQ	1.45E-05	2.02*
GDPLSQ (L1)	2.78E-06	0.30
GDPL	-0.05	-1.84*
GDPL (L1)	0.003	0.08
INFLATION	-0.046	-0.47
INFLATION (L1)	-0.046	-1.08
RIR	0.078	0.85
MON	-0.488	-1.12
MON(L1)	1.332	3.02**
DOMCRE	-0.850	-1.51
DOMCRE (L1)	0.408	0.57
TOT	0.043	1.06
TOT (L1)	0.004	0.11
REM_GDP	0.788	1.37
REM_GDP (L1)	-0.139	-0.27
REM_GDP(L2)	0.096	0.13
REM_GDP (L3)	-0.660	-0.98
EXT_DEBT	-0.050	-0.57
EXT_DEBT(L1)	-0.07	-0.56
R-square	0.934	
Adjusted R-square	0.777	
Observations	35	
Diagnostics	Test value	P-value
Breush-Geofrey test for serial autocorrelation	11.108	0.0009
Breush-Pagan test for heteroskedasticity	0.30	0.58

Note: *** $p < 1\%$ significance, ** $p < 5\%$ significance, and * $p < 10\%$ significance.

Source: authors' computations.

5   Conclusions and policy implications

This study aimed to explore the determinants of savings in Ghana using data from 1980 to 2019 and to establish whether or not there is a long-run relationship between savings and the other variables such as inflation, interest rate, and GDP growth. Overall, the econometric analysis and the bounds test find no compelling evidence that supports a long-run relationship between private savings and the variable in the model. However, estimates from the short-run analysis suggest that per capita income, per capita squared, and money supply significantly increase savings.

Our findings from the short-run dynamics suggest that, in line with the prediction of the absolute income hypothesis, there appears to be a significant relationship between savings and per capita income, although this is negative in the current study context. With a significant effect on the square of per capita income, we conclude that this effect is non-linear. Also, we find that the money supply from the previous period significantly increases savings, suggesting that previous money supply has a lingering effect on savings in the Ghanaian economy.

From the trend analysis, we also note that economic downturns are associated with high savings, indicating the rational expectations of economic agents. The correlation analysis provides evidence to support the importance of monetary and fiscal policies in the savings behaviour of economic agents. We find significant positive correlations between deposit interest rates and broad money and a negative relationship between savings and inflation. Regarding fiscal policies, we note the external debt stock and budget deficits wield the strongest correlations with savings. While external debt stocks are positively associated with savings, budget deficits negatively correlate with savings.

Based on the findings, we make the following recommendations. First, given that savings become responsive to per capita income after a threshold, there is the need to continuously pursue policies to keep income levels of households high to trigger savings, as continuously rising income beyond a certain point would encourage savings so far as the basic needs of households are catered for. Policies that promote financial deepening should be pursued to improve savings in the country. Steps should be taken to ensure that the population is financially included to effectively increase savings. In view of the significant correlations between monetary and fiscal policies on savings, it is also recommended that sound monetary and fiscal policies be pursued to encourage savings and domestic savings mobilization. The absence of a long-run relationship suggests that the relationship between savings and the variables considered in the model are short lived. The finding on the effect of the previous year's money supply on current savings is indicative of the importance of previous policies on financial deepening on current savings behaviour. This should guide policy makers given that current policies pursued to promote financial deepening have a significant effect on subsequent savings behaviour.

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Appendix

Table A1 presents some summary statistics for the variables considered in the study. The average private savings recorded over the period was about 14 per cent of GDP, with the average GDP per capita of US$860 and growing at a rate of about three per cent. Although the money supply was about one-quarter of GDP, the inflation rate also hovered around 25 per cent, pushing the real interest rate below one per cent. The high dependency ratio is indicative of the burden on the working population and its implications on savings. Similarly, the high terms of trade recorded may have implications on the average standard of living and, therefore, savings.

Table A1: Summary statistics

Variable	Mean	Std.
Savings (% of GDP) (SAV)	13.6	6.46
GDP growth (%) (GDPG)	2.91	2.25
Square OF GDPL (GDPLSQ)	1,263,981	1,693,614
GDP per capita ($USD) (GDPL)	886.749	701.218
Inflation rate (%) (INF)	20..29	12.11
Real interest rate (%) (RIR)	-7.574	15.705
Money supply (% of GDP) (MON)	23.974	6.103
Domestic credit to private sector (% of GDP) (DOMCRE)	9.997	4.578
Terms of trade index (%) (TOT)	96.386	24.388
Remittances (% of GDP) (REM)	1.710	2.481
External debt stock (% of GNI) (EXT_DEBT)	63.383	34.866
Observations	35	

Source: authors' own computations.

Table A2: Lag length for study variables (1985–2019)

Var	Optimal lag	LL	LR	FPE	AIC	HQIC	SBIC
sav	1	-100.388		20.348*	5.851*	5.881*	5.939*
gdpgrowth	1	-73.202	8.447*	4.304*	4.297*	4.328*	4.386*
gdplevel	1	-231.732	93.453*	36998.2*	13.356*	13.3867*	13.445*
gdplsq	1	-517.445	67.361*	4.6e+11	29.6826	29.713*	29.771*
inflation	1	-131.557	9.180*	120.791*	7.631	7.662*	7.721*
rir	0	-126.319		284.319*	8.488*	8.502*	8.534*
money	1	-83.673	56.133*	7.829*	4.895*	4.926*	4.984*
domcredit	1	-65.158	72.691*	2.718*	3.838*	3.868*	3.926*

depratio	2	13.297	27.195*	0.0319*	-0.606*	-0.560*	-0.471*
rem_gdp	3	-61.740	5.359	3.756*	2.508	3.818	3.934*
tot	1	-154.117	15.106*	438.438*	8.921*	8.952*	9.010*
Ext_debt	1	-142.171	62.288	221.54	8.238	8.269	8.327*

Note: * indicates lag order selected by the criterion.

Source: authors' own computations.

The determination of the optimal lag length is a critical component of estimating the ARDL model. The study employs the Schwartz Bayesian Information Criterion (SBIC) for the selection of optimal lags for the variables in this study for the period 1985–2019. These are indicated in Table A2.

In Figure A1, we note a strong correlation (p-value=0.002) between savings and deposit interest rates. Inflation (p-value=0.78) and broad money (p-value=0.83)—even though the correlation coefficients are positive, suggesting a positive association between the variables—are not statistically significant.

Osei (2011) examined the relationship between inflation and domestic savings in Ghana and found that inflation has a negative effect on domestic savings in Ghana. The explanation offered is that inflation is indicative of a decline in the welfare of households as prices increase. Consequently, households increase their consumption expenditure and reduce savings. Larbi (2013), however, observed a positive relationship between inflation and domestic savings in Ghana. The author suggests that during periods of high and increasing prices, individuals would increase their savings to safeguard against future economic uncertainty. Intuitively, inflation captures the level of income uncertainty and macroeconomic volatility in the economy. Nwachukwu and Egwaikhide (2007) and Nurudeen et al. (2013) found similar results for Nigeria and West Africa, respectively. Therefore, inflation may lead to increases in precautionary savings or impede savings when the inflation is higher than the returns on savings, given that the net effect is not desirable. Figure A1 suggests that Ghana's domestic savings rate is inversely related to inflation.

Figure A1: Correlation between savings and selected monetary policy variables
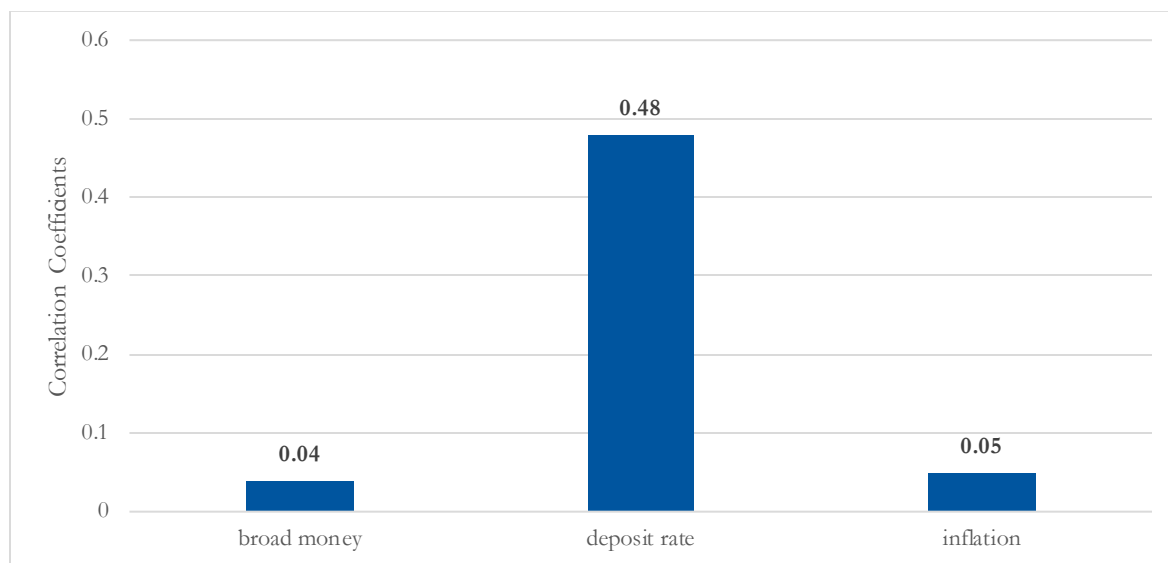
Source: authors' calculations based on data from WDI.

Figure A2 suggests that Ghana's domestic savings rate is positively correlated with its external debt accumulation and government spending and negatively correlated with taxes and budget deficit. However, the empirical evidence is mixed regarding the direction and magnitude of the impact of government actions on the economy.

Some studies have observed a positive relationship between the government budget deficit and savings (Ang and Sen 2011; Hondrayiannis 2006). Ang and Sen (2011) suggest that when the government runs a budget deficit, the private sector responds by saving more to offset any undesirable effect on future generations. In contrast, Ehikioya and Mohammed (2014) found that the government budget deficit exerts a detrimental effect on domestic savings in Nigeria. They argue that an increase in the budget deficit implies increased government expenditures over revenue. Consequently, public savings decreases. Since public savings constitute a share in domestic savings, a reduction in public savings will lead to a decline in domestic savings.

Figure A2: Correlation between savings and selected fiscal policy variables
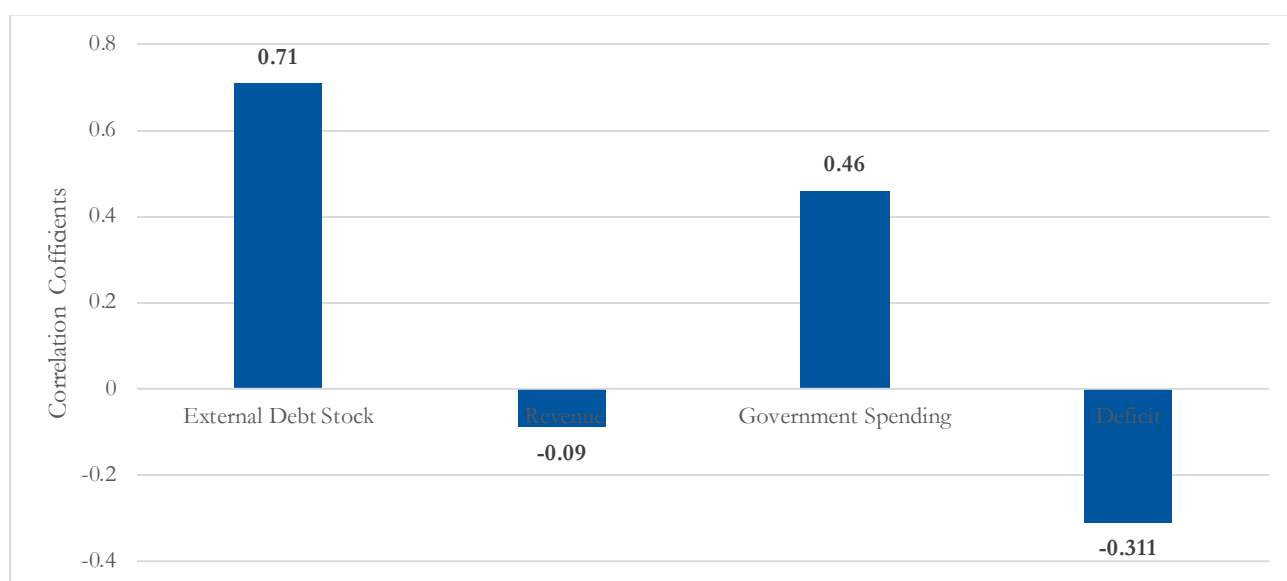
Source: authors' calculations based on data from WDI.

With regard to external debt, Uremadu (2007) and Nwachukwu and Egwaikhide (2007) found that external debt stock is positively correlated with domestic savings in Nigeria. They suggest that prudent management of government borrowing will have spill-over effects on the economy by increasing domestic savings to promote sustained economic growth. In contrast, other studies found that external debt negatively impacts domestic savings in Nigeria (Aliyu and Usman 2013; Chinaemerem and Anayochukwu 2013). They argue that external debt is a result of external borrowing, and accumulated debt acts as a future tax liability and derails domestic savings in the long run.

In the case of Ghana, the data show a strong correlation (p-value=0.000 for both) between savings and external debt and government spending. As suggested in the literature, increased government spending and debt stock is a signal for increased liability in the future; hence, households save to hedge against increased taxes in the future. The correlation between budget deficit and savings is negative and statistically significant (p-value=0.05), which is contrary to Ang and Sen (2011). While the correlation with government revenue is negative, this is not statistically significant (p-value=0.58).