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The role of inflation targeting policy in the McKinnon-Shaw financial liberalization hypothesis in Ghana: Evidence from linear and non-linear autoregressive distributed lag approaches

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Abstract

The capacity of inflation targeting (IT) policy to consolidate gains from financial liberalization in developing countries has been questioned, particularly after real interest rates have been driven to a negative territory following COVID-19's inflationary pressures. In this study, we examine the role of Bank of Ghana's IT policy in moderating the real interest rate-saving nexus analysed through the lens of the McKinnon-Shaw Hypothesis (MSH), which posits that maintaining real interest rates in a reasonable positive range would stimulate saving and investment rates in developing countries. We apply linear autoregressive distributed lag (ARDL) model to time series data spanning 1986–2023, augmented by non-linear ARDL analysis. Results show that IT policy strengthens the positive impact of real deposit interest rate on financial saving in the long run. The study, however, finds no stable long-run relationship between real interest rate and financial saving as there prevails only a short run nexus, suggesting that the MSH might be delayed than implied by theory. Further analysis reveals that the saving-real interest rate relationship is characterised by asymmetry in the short run, with saving responding more strongly to negative than positive levels of real deposit interest rate. The study's findings highlight the importance of maintaining strong commitment to low and stable inflation for successful financial liberalization. The findings again suggest that the central bank of Ghana should be mindful of the asymmetric effects of real interest rates when adjusting the policy rate in response to shocks.

Keywords: Asymmetric effects, financial liberalization; real deposit interest rate, domestic savings, McKinnon-Shaw Hypothesis, inflation targeting policy

1. Introduction

Low savings rates in Ghana pose a significant challenge to economic development, with the country's gross domestic savings share in the gross domestic product (GDP) averaging below 10 per cent during 1986–2023 (World Bank's collection of development indicators, 2024). This is despite the

indicated period being marked by the introduction and implementation of financial reforms, as part of structural adjustments and conditionalities imposed by the International Monetary Fund (IMF) and the World Bank. Some aspects of the structural adjustments were underpinned by the McKinnon–Shaw financial liberalization hypothesis (MSH) (Greenidge, McIntyre & Yun, 2016), alongside political, institutional and crisis-driven factors. The McKinnon–Shaw framework anticipates a positive impact on economic outcomes particularly savings, from financial liberalization policies including interest rate deregulation (see Osei-Assibey & Baah-Boateng, 2012). Therefore, the observation of low savings rates in Ghana, despite financial market liberalization policies, does challenge the theoretical basis of the MSH. The hypothesis is particularly facing criticism due to the country's recent economic situation, characterised by persistently high inflation and elevated borrowing costs, even within the context of Bank of Ghana's inflation-targeting framework.

A core tenet of the McKinnon–Shaw hypothesis (MSH) is the prediction that if interest rates were allowed to rise from the negative rates imposed by the authorities to a positive range that would prevail if they were liberalized, the savings and investment rates in developing countries would increase significantly, fuelling economic growth (see Andersen & Tarp, 2003; Osei-Assibey & Baah-Boateng, 2012). In view of this, the government of Ghana, like several other governments in Sub-Saharan Africa (SSA), notably Kenya, Mauritius, Nigeria, Senegal, and Tanzania, took steps to liberalise domestic financial markets by easing restrictions on interest rates and other financial instruments (Akinsola & Odhiambo, 2017). It was expected that these reforms would ensure the efficient functioning of the financial market to support savings mobilization, necessary to advance progress of global sustainable development goals (Biru et al., 2024) including but not limited to goal 1 (no poverty), goal 5 (gender equality and empowerment of women), and goal 10 (reduce inequality).

Critics, however, argue that the MSH could potentially face challenges in low-income countries due to variety of factors including low institutional quality, political corruption, and global shocks (see Tagem & Sama-Lang, 2024) or similar other factors like financial instability and monetary policy uncertainty. The fact that financial liberalization is proven to encourage increased global financial integration implies that it could heighten the complexity of risks injected into the financial system (Chow et al., 2007), leading to market failures, which can attenuate the positive effects of freeing-up domestic interest rates (see Stiglitz & Weiss, 1981). This view is what has become known as the Stiglitz–Weiss critique, which highlights how failures in the financial market can undermine the benefits of freeing-up interest rates without government's intervention to correct the market failures. In line with the Stiglitz–Weiss critique, this study argues that factors that create financial market distortions – including, for example, incredible monetary policy among several, alongside systemic risks and inadequate regulation – can undermine the benefits of financial liberalization in developing countries.

Chow et al. (2007) argue that credible monetary policy, anchored by a strong and consistent commitment to low and stable inflation, is crucial for developing countries to maximize the gains from financial liberalization policies. If monetary policy is incredible due to unexpectedly high inflation and low interest rates, it will complicate the risk landscape leading to a situation where financial institutions will exhibit rigidity in adjusting their interest rates to reflect changes in the policy rate. Therefore, a lack of commitment to maintaining low and stable inflation could hinder the gains from interest rate liberalization by distorting market signals. This argument has gained prominence in recent years especially in inflation targeting countries (including Ghana) that witnessed significant inflationary pressures following the COVID-19 shock. There are concerns particularly about perceived weak shock-absorbing capacity of inflation targeting in countries that are challenged by fiscal dominance, dollarization, and global risks (see Agénor & Da Silva, 2013) among other limiting factors. In an inflation targeting context, these factors can heighten monetary policy uncertainty with consequences for the interest rate-savings nexus. In such an instance, the response of savings to the real deposit interest rate may not be as quick, symmetric, and complete (see Jannsen, Potjagailo,

& Wolters, 2019) as implied by theory.

In Ghana, for instance, while the adoption of inflation targeting has coincided with a drop in the inflation rate from 25.49 per cent on average during 1986–2006 to 15 per cent during 2007–2023, actual inflation rates consistently breach the medium-term target of 8 per cent (see Abango et al., 2019). This shows that inflation remains a major adversary to maintaining a higher purchasing power on the interest agents earn on their savings. In recent times following COVID-induced fiscal shocks, the country has had to deal with troubling inflation developments with year-on-year inflation rate reaching a two-decade peak of over 50 per cent in November 2022 (Ghana Statistical Service [GSS], 2022). The unexpected hike in the inflation rate drove the real interest rate to a negative territory, raising questions about the shock-absorbing capacity of inflation targeting. In fact, the real deposit interest rate averaged about -2.70 per cent over the inflation targeting period between 2007 and 2023, which shows only marginal improvement compared to the average of -4.87 per cent during 1986–2001 and -3.06 per cent during 2002–2006.

The challenge with steering inflation to within the target band seems to have undermined the transmission of financial liberalization gains to economic outcomes, particularly savings. Indeed, the country's gross domestic savings share in the gross domestic product (GDP) averaged only 8.65 per cent over the period of financial reforms i.e., 1986–2023, while bank deposit to GDP averaged 11.46 per cent (World Bank's Development Indicators, 2024). Curiously, the savings rates reported for Ghana are significantly lower compared to the levels attained by some of her peers in SSA. In 2023, for instance, Ghana's gross domestic savings to GDP was reported at 9.88 per cent as gleaned from the World Bank's collection of development indicators, which is far lower compared to the 38.47 per cent reported for Angola and 19.71 per cent reported for Mauritius over the same comparative period. At this pace, Ghana may struggle to generate sufficient savings to meet the financing required to scale up productive investments (Ackah & Lambon-Quayefio, 2023; Keho, 2011).

Given recent advances in interest rate liberalization as a strategy for stimulating savings and investment rates in Ghana, the sluggish domestic savings levels raise questions about the empirical relevance of the MSH. Amid growing scepticism about the hypothesis, a wide range of studies have been conducted to test its validity in both developed and developing country contexts, although the findings have yielded no clear-cut picture. Nagawa et al. (2020), for instance, found no significant relationship between real deposit interest rate and savings in Uganda, confirming earlier work of Quartey (2005). This is despite Kwakwa (2013) uncovering a negative relationship between real interest rate and savings in Ghana, comparable to (Bandiera et al., 2000; Horioka & Yin, 2010; Loayza et al., 2000). In Tanzania, a recent study by Were and Joseph (2022) revealed a positive relationship between real interest rate and savings, which aligns with the findings of earlier works by (Ang, 2010; Iganiga, 2010; Nyanzi & Kaberuka, 2013).

Aside from the mixed empirical support for the MSH, the extant body of empirical literature has paid limited attention to the mechanisms through which the hypothesis operates, especially the moderating effect of inflation targeting policy. Limited emphasis has also been placed on the potential asymmetric effect of real interest rate on savings which can arise when there is uncertainty about monetary policy transmission. As a response, our study addresses the question: 'how does inflation targeting policy moderate the operation of the MSH?'. In addition to exploring the role of inflation targeting in the MSH, we test for the existence of an asymmetric non-linear relationship between real deposit interest rate and private financial saving. By addressing these critical issues, our study will inform monetary policy reforms that can strengthen the impact of interest rate liberalization on savings, critical to address the vulnerabilities arising from dependence on external financing. The rest of the paper is organised as follows: Section 2 evaluates previous studies and provides a theoretical framework upon which the empirical model is anchored, Section 3 describes the empirical model as well as the methodological approach, the regression results are discussed in Section 4 while in Section 5, a summary of the concluding remarks and policy guidelines is provided.

2. Literature review

2.1 Conceptual/theoretical considerations

Several studies provide empirical support for the relevant role of savings in influencing the growth trajectories of both developed and developing countries (see for example Antras, 2001; Cesaratto, 1999; Tang, 2010), consistent with the neoclassical growth theory. Therefore, low savings rates in low-income countries can have detrimental consequences for economic growth. As a result, addressing low savings rates in low-income countries continues to be a major policy concern, often analysed through the lens of the McKinnon-Shaw model, which predicts that keeping real interest rates within a reasonable positive territory will incentivize households to save more to support long-term investments. This viewpoint has, however, not received universal acceptance. Stiglitz and Weiss (1981), for example, note that market failures can alter the logic behind the MSH by amplifying the impact of a liquidity trap, where interest rates will be less responsive to the policy rate with consequences for savings mobilization. Moreover, the validity of the MSH partly rests on the substitution and income effects of real interest rate changes. On the one hand, a dominant substitution effect will imply that an increase in real interest rate would encourage saving as future consumption would be cheaper. On the other hand, a dominant income effect will make savers wealthier, which could result in “present bias” thereby, slowing saving levels. These relationships may, however, not be linear given that household consumption or savings decisions are influenced by a broader set of factors beyond just interest rates.

Informed by the Stiglitz-Weiss critique, this study attempts to resolve the ambiguity surrounding the MSH by shedding light on the mechanisms through which changes in real interest rates are transmitted to savings, focusing on the moderating effect of inflation targeting policy. Inflation targeting involves a forward-looking inflation-responsive rule-like monetary policy framework that allows short-term interest rates to be adjusted upward or downward, based on parameters such as output gap as well as the gap between actual and expected inflation (see Abango et al., 2019; Taguchi & Wanaslip, 2017). Evidence suggests that this approach to combatting inflation is effective in anchoring inflation expectations and steering inflation to stable low levels (see Mishkin and Schmidt-Hebbel, 2007) especially in developed countries, indicating that the policy can play a critical role in the realization of the MSH. The ability to reduce inflation to stable, low levels will increase the expected real return on savings thereby, motivating higher private financial savings. Agents with surplus funds will take advantage of the high purchasing power on savings to save in monetary form, which will consequently make funds available for investment leading to enhanced GDP growth in the long run.

The point must be made, however, that the interest elasticity of savings may not be as smooth and symmetric (see Janssen, Potjagailo, & Wolters, 2019) as predicted by theoretical economic models, especially when uncertainty arises from monetary policy transmission. Heightened uncertainty about monetary policy transmission can create situations where agents will postpone long-term decisions like savings, which can result in a non-linear interest rate-savings nexus. This will most likely be the case especially when savings decisions are simultaneously influenced by socio-political and -cultural factors as well as prevailing economic conditions. In low-income contexts, for example, where consumption choices are heavily influenced by subsistence considerations, the interest rate sensitivity of saving will be close to zero. Therefore, our theoretical model is underpinned by the nonlinear effect of real interest rate on domestic savings, with negative levels of real interest rate expected to decrease private saving by more than positive levels increase it.

2.2 Empirical review

Regarding empirical studies that have investigated the real interest rate-savings nexus, Nyanzi and Kaberuka (2013) found a positive relationship between real interest rate and financial saving in Uganda during 1980-2007. Utilizing Granger and Engel framework as well as structural change analysis,

the study revealed three transmission channels through which financial liberalization affects savings namely, money supply, exchange rate and deposit rate. The finding of Oinonena and Virén (2022) partly aligns with what is reported in Nyanzi and Kaberuka (2013), in relation to the real interest rate channel for the realization of the positive impact of financial liberalization on saving. Leveraging cross-country data for 34 OECD countries during 1970–2019, the study reports that household savings are very sensitive to real interest rates. Similarly, Were and Joseph (2022) determined that real deposit rate had a positive influence on domestic savings in Tanzania, by applying the autoregressive distributed lag model to annual time series data over the period 1990–2020. While these studies largely provide support for the MSH, less attention has been paid to its enablers or disablers, which limits policy relevance of the findings in terms of what feasible options can be explored to consolidate the gains from financial liberalization.

In Tanzania, Ndanshau and Kilindo (2012) found compelling empirical support for the MSH after investigating the responsiveness of financial savings to real interest rates. Applying ordinary least squares (OLS) and dynamic error correction model (ECM) to annual time series spanning the period 1967–2010, the authors established that both nominal and real interest rates exert statistically significant positive impacts on financial savings in both short-run and long-run, which has been confirmed by several robustness tests. This finding aligns with those of (Nyanzi & Kaberuka 2013; Oinonena & Virén, 2022; Were & Joseph, 2022), indicating feasibility of the MSH in some developing countries. That notwithstanding, there is limited understanding of the mechanisms through which the impacts of financial liberalization are transmitted to savings, which requires attention.

Contrary to the conventional view of the MSH, Kwakwa (2013) found that the real interest rate negatively impacted savings in Ghana during 1975–2008, based on Johansen cointegration technique and error correction model. This finding corroborates what was reported by Ang's 2010 study on the impact of financial deepening and liberalisation on savings mobilisation in Malaysia. The findings of Ang (2010) suggest that financial sector liberalisation and development of insurance markets had a negative influence on private savings. Similarly, a 2020 study by Dahunsi found that interest rates had a negative influence on domestic savings in Nigeria over the period of economic reforms since 1986. Loayza et al. (2000) further corroborates a negative relationship between real interest rate and savings using panel instrumental-variable techniques to analyse a large cross-country time-series dataset. The study specifically established that real interest rate had a negative impact on private savings rate. This could be understood within the context of the Stiglitz-Weiss critique which highlights the fact that the positive impacts of financial liberalization on savings could be impeded by financial market failures or similar other factors like fiscal risks, incredible monetary policy, among several.

Again, Balassa and Balassa (1993) provided inconclusive evidence on the effect of interest rate on savings across selected developing countries, with some time-series estimates for individual countries as well as a cross-section of countries revealing positive effect of real interest rate on savings rates. The estimates for some developing countries were, however, statistically insignificant, which the study attributed to errors in the measurement of nominal interest rates and inflation rates that might have distorted the real interest rate and hence, its relationship with savings. Bandiera et al. (2000) also found inconclusive results after testing the MSH for a group of countries including Chile, Ghana, Indonesia, Korea, Malaysia, Mexico, Turkey, and Zimbabwe. The study sophisticates the extant literature by constructing a financial liberalisation index based on eight different proxies: directed credit; reserve requirements; interest rates; prudential regulation; bank ownership; capital account liberalisation; and securities market deregulation, although the findings show mixed support for the MSH. While financial liberalisation has a significant positive impact on savings in Ghana and Turkey, the impact is negative in Korea and Mexico. These mixed findings are not surprising given differences in the economic structures and institutional frameworks across the countries under consideration.

Some studies have extended the discourse to examine the effect of specific financial reforms on savings rates. Granville and Mallick (2002), for instance, investigated the impact of pension reforms on

aggregate savings rates in the United Kingdom (UK) during 1978–2000 using the ARDL estimator. The study found that higher privately funded pensions in the UK caused marginal net increase in aggregate savings. Perhaps, pension reforms influenced market capitalisation by allocating long-term domestic savings into the capital market. However, the findings of the study should be treated with caution because of the relatively small sample size involved.

In Ghana, Asamoah (2008) used regression analysis and savings–investment models to examine the impact of financial sector reforms on savings, investment and GDP growth. The study found that financial liberalisation stimulates savings, investment and growth of GDP through increasing capital accumulation and ensuring efficient use of capital. However, the study’s use of static estimation approaches implies that the estimated models are liable to specification and endogeneity biases which can affect reliability of parameter estimates and lead to biased results. Meanwhile, Ackah and Lambon-Quayefio (2023) employed time series analyses, using data for the 1980–2020 period, to understand the implications of major policy changes in Ghana’s financial sector for private savings. The results provide no evidence of a long-run relationship between private savings and the variables considered. The study’s short-run analysis, however, suggests 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 that can ensure development of the financial markets necessary to boost domestic resource mobilization to finance investment over the long-term.

A review of the extant studies reveals mixed empirical support for the MSH, which points to ambiguity regarding the gains from financial liberalization across countries. This ambiguity could be explained by limiting factors such as financial market failures as suggested by Stiglitz and Weiss (1981) or similar other factors like volatile political regimes and unpredictable policy regimes (see Tagem & Sama-Lang, 2024). Empirical evaluations of the MSH in the context of the Stiglitz-Weiss critique, however, remain scarce, implying limited understanding of conditioning factors that influence financial liberalization success, from the perspective of financial savings adaptation to real deposit interest rate changes. Our study, therefore, aims to move beyond existing understanding by re-examining the factors moderating the real interest rate–savings nexus in Ghana, focusing on the role of inflation targeting policy. Consequently, the study was guided by the following three hypothesis:

1. **Hypothesis 1:** Domestic saving responds positively to the real deposit interest rate.
2. **Hypothesis 2:** Domestic saving responds positively to inflation targeting policy.
3. **Hypothesis 3:** Inflation targeting policy strengthens the impact of real deposit interest rate on domestic savings.

3. Materials and Methods

3.1 Research design/approach

This study employs correlational time series design, leveraging the potential of linear and non-linear autoregressive distributed lag (ARDL) models, to address the study objectives. Correlational time series design is commonly used to discover whether valid relationship(s) exist between or among variables being studied, establish cause and effect, or provide a more complete explanation of how variables are related (see Cohen et al., 2002; Valerie & Lois, 2012). The choice of correlational time series design is, therefore, appropriate for this study since its primary objective is to explore the potential drivers of domestic savings in Ghana, focusing on how inflation targeting policy moderates the impact of real interest rate on saving. Regarding the analytical approach, we start by conducting visual inspection of the time series to enable us to develop an appreciation of the patterns, trends, and outliers in the data set. This was followed by an evaluation of the unit root process of the time series based on the Augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) unit root tests, which were utilised to test the null hypothesis that unit root exists.

The unit root test results indicate that the time series are integrated of mixed orders, allowing us to deploy the autoregressive distributed lag (ARDL) estimator which has the property of admitting stationary and non-stationary variables. We first estimate a baseline autoregressive distributed lag (ARDL) model followed by non-linear ARDL (NARDL) model estimation, upon detecting evidence of level relationship based on the bounds cointegration test. The NARDL estimator was used to isolate long and short run asymmetric effects of real interest rate on private financial saving, since the effects of positive and negative real interest rates on saving can differ. The NARDL analysis also afforded us the opportunity to establish robustness and reliability of the parameter estimates.

3.2 Model specification

We provide a theoretical model for explaining the long-term impact of financial liberalization on savings through the real interest rate channel, generally referred to as the McKinnon-Shaw Hypothesis (MSH). We do so within the context of the Stiglitz-Weiss critique, arguing that the potential positive impacts of financial liberalization might be undermined by limiting factors, such as incredible or ineffective monetary policy. We, therefore, modify the conventional idea of the MSH to account for the role of inflation targeting policy in strengthening the interest rate-savings nexus. Our focus on inflation targeting policy is informed by the recent shift in monetary policy conduct from targeting of monetary aggregates to targeting of inflation by the central bank of Ghana, with the authorities aiming to steer inflation to stable low levels and ultimately, keep the purchasing power of savings high enough to motivate increased levels of private financial savings. In the model, we interact the proxy for inflation targeting policy with real deposit interest rate, to determine whether the policy is conducive for strengthening the real interest rate-savings relationship, while considering other potential determinants of savings following Bandiera et al. (2000) and Were and Joseph (2022). Thus, the functional form of the model is described as follows:

$$ds = f(rdr, it, I, K) \quad (1)$$

Where “ds” is a vector of domestic savings indicators including gross domestic savings to GDP (“gds”) and bank deposits to GDP (“dm”); “rdr” represents real deposit interest rate; (“it”) signifies inflation targeting policy dummy, which takes a value of 1 for the period 2007–2023 and 0 during 1986–2006; “I” is an interaction term for real deposit interest rate and the inflation targeting policy dummy; and “K” is a vector of other potential drivers of domestic savings comprising financial deepening as measured by broad money to GDP (“bm”); real GDP growth rate (“gdpgr”); fiscal deficit to GDP (“fd”); and current account balance to GDP (“cab”). Functionally, “K” is defined as follows:

$$K = f(bm, gdpgr, fd, cab) \quad (2)$$

Plugging (2) into (1), we formulate a base model to explain domestic savings dynamics in Ghana, making modifications where necessary. The base model is given by:

$$ds = f(rdr, it, I, bm, gdpgr, fd, cab) \quad (3)$$

The specific operational models to be estimated are specified as follows:

$$gds(t) = \alpha_0 + \alpha_1 rdr_t + \alpha_2 it_t + \alpha_3 I_t + \alpha_4 bm_t + \alpha_5 gdpgr_t + \alpha_6 fd_t + \alpha_7 cab_t + \mu_t \quad (4)$$

$$dm_t = \beta_0 + \beta_1 rdr_t + \beta_2 it_t + \beta_3 I_t + \beta_4 bm_t + \beta_5 gdpgr_t + \beta_6 fd_t + \varepsilon_t \quad (5)$$

Where α_i (for $i = 1, 2, \dots, 7$) and β_j (for $j = 1, 2, \dots, 6$) denote coefficients to be estimated; μ_t and ε_t represent the disturbance error terms which are assumed to be independently identically distributed (iid); and all other variables are defined as previous.

3.3 Data and proxy measures

This study leverages secondary data to examine the main effects of real interest rate and inflation targeting policy together with their interaction effect on domestic savings in Ghana. The dataset involves annual time series covering the period 1986–2023, which were sourced from WDI database and IMF’s International Financial Statistics (IFS). The key variables contained in the dataset are gross domestic savings to GDP ratio, bank deposits to GDP ratio, deposit interest rate, broad money supply to GDP ratio, real GDP growth, fiscal deficit to GDP ratio, and current account balance to GDP ratio. Specifically, data on gross domestic savings to GDP, bank deposits to GDP, deposit rate, inflation rate, and current account balance were sourced from WDI database (2024) while that of fiscal deficit was retrieved from the IFS. As the study sets out primarily to examine the sensitivity of savings to real interest rate, domestic savings enters as the dependent variable, proxied by gross domestic savings and bank deposits. The gross domestic savings variable is measured as GDP less final consumption expenditure expressed as a share of GDP, while bank deposits is an indicator for private financial savings as measured by total deposits held in deposit money banks including demand, saving, and time deposits, expressed as a share of GDP. Table 1 provides a descriptive summary of the data.

Regarding the explanatory variables, the real deposit rate variable enters as the focal independent variable. We measured real deposit rate as the difference between average annual nominal deposit interest rate and average annual inflation rate, which enters as a proxy for financial liberalization. The study expects that a higher positive real interest rate would motivate rising levels of domestic savings (see Sakyi et al., 2016; Were & Joseph, 2022). The study further sought to understand whether the effect of real deposit rate on “domestic savings” is moderated by inflation targeting policy, proxied by a dummy variable which takes 1 over the inflation targeting period spanning 2007–2023 and 0 during 1986–2006.

Table 1. Exploratory Data Analysis, Summary Statistics

Statistic	dm	gda	gdpg	bm	fsl	cab	rdr
Mean	11.46	8.65	5.19	24.99	-7.36	-5.38	-3.70
Median	8.94	7.17	4.82	25.58	-6.40	-5.05	-1.78
Maximum	23.84	20.66	14.05	34.11	1.70	1.40	17.43
Minimum	2.50	-2.96	0.51	13.51	-24.20	-12.49	-30.72
Std. Dev.	6.72	6.29	2.33	5.88	4.29	3.54	10.39
Skewness	0.36	0.296	1.52	-0.44	-1.51	-0.18	-0.86
Kurtosis	1.67	2.19	7.09	2.21	7.75	2.30	3.56
Jarque-Bera	3.33	1.59	41.00	2.199	50.03	0.97	5.202
Probability	0.190	0.451	0.000	0.333	0.000	0.62	0.074
Sum	401.0	328.7	197.1	949.5	-279.5	-204.6	-140.8
Sum Sq. Dev.	1537.5	1465.1	200.8	1280.4	681.5	464.95	3991.3
Observations	35	38	38	38	38	38	38

Notes: “dm”=bank deposit to GDP; “gds”=gross domestic savings to GDP; “gdpg”=gross domestic product (annual growth); “bm”=broad money supply to GDP; “fd”=fiscal deficit to GDP; “cab”=current account balance to GDP; “rdr”=real deposit rate.

Source: Computed using data from the World Development Indicators database (2024)

A set of control factors have been included as potential drivers of savings, including financial system depth which is proxied by broad money to GDP. We expect increased financial system depth to exert a positive impact on domestic savings in the long run (Were & Joseph, 2022). We also controlled for the effects of other factors such as real GDP growth, budget deficit, and current account balance. Real GDP growth is used as a proxy for real income growth. The study expects

that an increase in real income growth would have a positive impact on savings (see Were & Joseph, 2022).

Fiscal deficit to GDP is another control variable, which depicts a shortfall in government revenue relative to its expenditure, implying negative government savings. On the one hand, higher fiscal deficit can reduce the level of domestic savings through reducing national savings, especially when it results in higher interest rate payments. On the other hand, an increase in fiscal deficit may have a crowding out effect by absorbing credit that is needed to fund private investment, which could dampen growth and hence, domestic savings. Finally, we include current account deficit to GDP as a potential determinant of domestic savings. A higher deficit on the current account would reflect lower levels of domestic savings.

3.4 Estimation strategy

We start by examining the stationarity property of the data using parametric Augmented Dickey and Fuller (ADF) test and non-parametric Phillips-Perron (PP) test. For the real deposit rate, GDP growth rate, and fiscal deficit to GDP variables, we reject the null hypothesis of the existence of unit root, which is robust to whether ADF or PP unit root test. This suggests that the stated variables are robustly stationary at the 1 per cent level of significance, implying that they are integrated of order Zero, $I(0)$. There is, however, suspicion that gross domestic savings to GDP, bank deposits to GDP, broad money to GDP, and current account balance to GDP are non-stationary, as both tests detected the presence of unit root. Further checks reveal that all four variables are integrated of order One, $I(1)$, indicating that they are differenced series. Therefore, the evidence of mixed orders of integration is clear, which is what informed our choice of ARDL bounds approach to cointegration, a postestimation feature with high efficacy in dealing with the challenge of combining $I(0)$ and $I(1)$ series (see Pesaran et al. 2001; Kripfganz & Schneider, 2023).

The specific case of our study permits the use of the ARDL bounds approach to cointegration given that the set of dependent variables is $I(1)$ and at least one explanatory variable is $I(1)$. This suggests that the variables could potentially display level long run relationships. Besides, the ARDL is relatively easy to implement as the long and short run coefficients can be consistently estimated in a single step, and its asymptotic normality enables valid statistical inference (see Shin & Greenwood-Nimmo, 2014). Moreover, the ARDL captures dynamic effects by including lag of the dependent variable as a regressor, which improves efficiency of the parameter estimates (Sakyi et al., 2017).

After detecting mixed orders of integration of the time series, we tested the existence of a long-run stochastic trend between the included variables using a combination of linear and asymmetric non-linear ARDL cointegration techniques. The process involves re-parameterizing the specified ARDL models in a conditional error correction (EC) form, which disentangles the long run dynamics from that of the short run (Kripfganz & Schneider, 2023). The conditional EC models that were generated are specified as follows:

$$\begin{aligned} \Delta gds_t = & \lambda + \delta_r rdr_{t-1} + \delta_i it_{t-1} + \delta_j I_{t-1} + \delta_k K_{t-1} \\ & + \sum_{i=1}^k \phi_1 \Delta gds_{t-i} + \sum_{i=1}^k \phi_2 \Delta rdr_{t-i} + \sum_{i=1}^k \phi_3 \Delta it_{t-i} \\ & + \sum_{i=1}^k \phi_4 \Delta I_{t-i} + \sum_{i=1}^k \phi_5 \Delta K_{t-i} + V_t \end{aligned} \quad (6)$$

$$\begin{aligned} \Delta dm_t = & \varphi + \delta_p r dr_{t-1} + \delta_q i t_{t-1} + \delta_r I_{t-1} + \delta_s K_{t-1} \\ & + \sum_{i=1}^k \theta_1 \Delta dm_{t-i} + \sum_{i=1}^k \theta_2 \Delta r dr_{t-i} + \sum_{i=1}^k \theta_3 \Delta i t_{t-i} \\ & + \sum_{i=1}^k \theta_4 \Delta I_{t-i} + \sum_{i=1}^k \theta_5 \Delta K_{t-i} + \eta_t \end{aligned} \tag{7}$$

Consequently, we tested the hypothesis that no level relationship exists between the dependent and independent variables. The study demonstrates this by carrying out the F-statistic on the joint null hypothesis, which states that the coefficients of the lagged variables in the conditional EC models (i.e., equations 6 and 7) are statistically equivalent to zero i.e., no long run relationship exists.

$$[H_0 : \delta_r = \delta_i = \delta_l = \delta_k = 0 \quad \text{and} \quad H_1 : \delta_r \neq \delta_i \neq \delta_l \neq \delta_k \neq 0]$$

$$[H_0 : \delta_p = \delta_q = \delta_r = \delta_s = 0 \quad \text{and} \quad H_1 : \delta_p \neq \delta_q \neq \delta_r \neq \delta_s \neq 0]$$

Following Pesaran et al. (2001), the computed F-Statistic was compared with the two pairs of extreme points referred to as lower and upper bounds. The criterion is to reject (or accept) the null hypothesis if the F-statistic is greater (or less) than the upper bound value. In cases where the estimated F-statistic falls between the lower and upper bound, the result would be deemed to be inconclusive. For both equations 6 and 7, we found sufficient evidence to reject the null hypothesis of no level relationship i.e., the F-statistic exceeded the upper bound value at 5 per cent level of significance. This suggests that the variables are bound together in the long run.

Having corroborated the existence of cointegration, we proceeded to explore the long-run dynamics of domestic savings and the exogenous set of variables. The selected ARDL long run models are denoted as follows:

$$gds_t = \Pi_0 + \sum_{i=1}^k \lambda_i Y_{t-i} r dr_{t-1} + \sum_{i=1}^k h_i i t_t + \sum_{i=1}^s \Phi_i I_t + \sum_{i=1}^k \Gamma_i K_t + \tau_t \tag{8}$$

$$\tag{6}$$

$$dm_t = \chi_0 + \sum_{j=1}^s \Psi_j r dr_t + \sum_{j=1}^s B_j i t_t + \sum_{j=1}^s \Upsilon_j I_t + \sum_{j=1}^s T_j K_t + \xi_t \tag{9}$$

The parameters Π_0 and χ_0 are drift components; τ_t and ξ_t are disturbance error terms, which are assumed to be white noise; and all other variables are defined as previous.

By reparametrizing equations (8) and (9) in terms of the lagged levels and first difference, the conditional EC models associated with the specified ARDL models are represented as follows:

$$\Delta gds_t = \lambda_0 + \phi_0 gds_{t-1} + \sum_{i=1}^{p-1} \phi_i \Delta gds_{t-i} + \sum_{i=1}^k \sum_{j=1}^{q-1} \phi_{ij} \Delta X_{it-j} + \delta ect_{t-1} + u_t \tag{10}$$

$$\Delta dm_t = \varphi_0 + \alpha_0 dm_{t-1} + \sum_{i=1}^{p-1} \alpha_i \Delta dm_{t-i} + \sum_{i=1}^k \sum_{j=1}^{q-1} \beta_{ij} \Delta X_{it-j} + \pi ect_{t-1} + v_t \tag{11}$$

Where equations 8 to 11 are baseline ARDL long and short run specifications of the relationship between domestic savings and its drivers; X represents the set of explanatory variables; δ and π measure the quantitative relevance of the EC terms; ϕ_i , α_i , ϕ_{ij} and β_{ij} capture the short run dynamics of the models' adjustment to equilibrium following a shock; $\hat{\lambda}_0$ and φ_0 are drift components; while u_t and v_t are error terms which are white noise.

4. Results and Discussion

Here, the study reports the results and discusses the key findings in the following order: results of unit root tests, model diagnostic and stability tests, cointegration test, as well as long-run and short-run dynamics.

4.1 Unit root tests

Table 2. Results of ADF and PP Unit Root Tests

Variable	ADF				PP			
	Level		First Difference		Level		First Difference	
	Intercept	Intercept +T	Intercept	Intercept +T	Intercept	Intercept +T	Intercept	Intercept +T
dm	0.865	-2.121	-4.219***	-4.469***	1.865	-1.727	-4.235***	-5.817***
gds	-2.358	-2.614	-7.703***	-7.597***	-2.326	-2.624	-7.702***	-7.596***
gdpg	-6.404***	-6.165***	-11.083***	-10.857***	-6.322***	-6.116***	-30.719***	-32.416***
bm	-1.863	-2.290	-6.600***	-6.564***	-1.846	-2.300	-6.650***	-6.642***
fd	-4.518***	-4.629***	-5.867***	-5.776***	-4.292***	-4.441***	-19.651***	-23.428***
cab	-2.681*	-2.546	-5.998***	-6.113***	-2.727*	-2.592	-8.028***	-9.688***
rdf	-9.659***	-8.863***	-4.067***	-4.418***	-9.709***	-8.929***	-13.310***	-15.303***

Notes: (***)[**]* denote rejection of the null hypothesis of the presence of unit root at the 1 percent, 5 percent and 10 percent significance levels respectively. T denotes Trend. ADF=Augmented Dickey-Fuller; PP=Phillips-Perron

Source: Computed using data from the World Development Indicators database (2024)

4.2 Diagnostic tests for estimated models

Postestimation model diagnostic and stability test results, as reported in Table 3, largely show that all the ARDL and NARDL estimated coefficients are within the bounds of critical values. Specifically, the results suggest the absence of serially correlated residuals, while providing evidence of normally distributed errors, and the absence of systematic change in the spread of the residuals. In terms of functional form, the Ramsey Reset test results show that the two dynamic domestic savings models are correctly specified. Again, results of the residual stability tests, CUSUM and CUSUM of square (CUSUMQ), also show that the coefficients are stable within the boundary of critical points, corroborating the absence of structural shifts in the dependent variable (see Figures 1 and 2). Thus, models I, II and III are statistically adequate.

Table 3. Model Diagnostic and Stability Tests

Test Statistic	Dependent “gds”		Dependent “dm”
	ARDL	ARDL	NARDL
Serial Correlation χ^2 (1)	3.218 [0.168]	2.0313 [0.168]	0.255 [0.516]
Functional Form χ^2 (1)	0.0052 [0.2198]	1.640 [0.2198]	1.083 [0.316]
Normality χ^2 (1)	0.365 [0.184]	3.391 [0.184]	0.257 [0.880]
Heteroskedasticity χ^2 (1)	0.451 [0.264]	1.384 [0.264]	0.408 [0.551]
CUSUM	Stable	Stable	Stable
CUSUMSQ	Stable	Stable	Stable

Notes: Shown in parenthesis ‘[]’ are P-values. The CUSUM and CUSUMSQ tests indicate that the coefficients are stable within the boundary of critical points.

Source: Authors’ Estimation (2024)

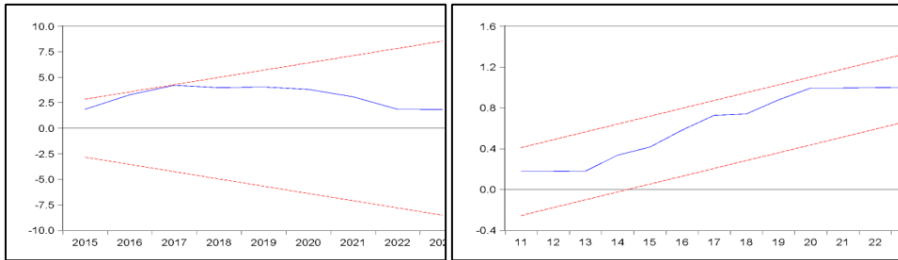


Figure 1. CSUSUM and CUSUMSQ tests for parameter stability (Model I)

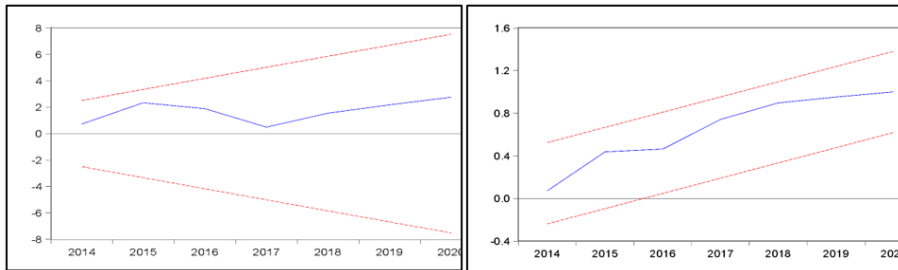


Figure 2. CSUSUM and CUSUMSQ tests for parameter stability (Model II)

Table 4. ARDL Bounds (Cointegration) Test Results

Model	Specification	F-Statistic	Critical Points	
			I(0)	I(1)
I	$gda = f(rdr, it, l, bm, gdp, fd, cab)$	4.823**	2.96	4.26
II	$dm = f(rdr, it, l, bm, gdp, fd)$	3.296**	2.27	3.28
III	$dm = f(prdr, nrdr, it, l, bm, gdp, fd)$	4.314**	2.597	3.907

Notes: *** and ** indicate rejection of the null hypothesis of no cointegration at 1% and 5% level of significance respectively. The null hypothesis is rejected (or accepted) if the F-Statistic falls above (or below) the upper bound (or lower bound). The test is deemed inconclusive if it lies between the two bounds.

Source: Author's Estimation (2024)

4.3 ARDL and NARDL Results

In this section, we present the long and short run results, starting with estimates of the error correction term, $ecm(-1)$. As reported in Tables 6 and 7, the $ecm(-1)$ coefficients are -0.678 , -0.685 , and -0.5996 for models I, II and III, respectively. The negative and statistically significant $ecm(-1)$ coefficients imply that convergence to long-run equilibrium is statistically feasible. The convergence process would take approximately 1.47 years (for model I), 1.46 years (for model II) and 1.67 years (for model III) to complete, with 67.8 per cent, 68.5 per cent and 59.96 per cent of the adjustment taking place each year, respectively. The evidence of long run equilibrium convergence reinforces the bounds test result that suggests that a cointegration relationship exists between the study variables. Therefore, it is plausible to disentangle long and short run dynamics within the ARDL framework, since the variables are integrated of mixed orders.

4.3.1 Effect of real deposit rate on domestic savings in Ghana

Hypothesis 1: Real deposit interest rate and domestic savings are positively related. Results in Tables 5, 6 and 7 show that the effect of real deposit rate on domestic savings depends on the proxy measure for savings. While the real deposit rate (rdr) has insignificant impact on gross domestic savings to GDP in both long and short run, it has significant positive short run impact on financial saving as measured by bank deposits to GDP. We find that a 1 per cent increase in the real deposit interest rate (rdr) will cause bank deposits (per cent of GDP) to increase by about 0.0250 percentage points in the short run. It appears agents react rationally to real interest rates in the short-term, saving more (less) when the real deposit rate increases (decreases). The relationship is, however, not stable over longer horizons, indicating that the MSH might be delayed than implied by theory. The evidence of no stable long run relationship between real interest rate and saving corroborates what is reported in Nagawa et al. (2020) and earlier work of Quartey (2005). This finding could be understood in the context of heightened vulnerability of Ghana's economy to the confluence of internal and external shocks including international commodity price fluctuations, high fiscal deficits, and domestic currency depreciation, that tend to raise inflationary pressures thereby, eroding the benefits of interest rate liberalization by reducing the purchasing power on savings.

Table 5. ARDL Estimated Long-run Effects

Variable	Dependent: "gds"		Dependent: "dm"	
	ARDL	ARDL	ARDL	NARDL
Independent	Coefficient [Std. Error]	Coefficient [Std. Error]	Coefficient [Std. Error]	Coefficient [Std. Error]
Rdr	0.113 [0.117]	0.0087 [0.0328]		
Prdr				0.030 [0.044]
Nrdr				0.0518 [0.0550]
It	9.046** [1.877]	15.158** [0.620]		13.346** [1.671]
I	0.835 [0.865]	0.524** [0.2361]		0.585* [0.244]
Gdpg	-2.480** [0.814]	-1.338*** [0.157]		-1.236*** [0.2406]
Bm	-0.252 [0.224]	0.337** [0.0453]		0.224 [0.131]
Cab	-1.797 [1.227]			
Fd	1.165 [0.755]	0.173** [0.0793]		0.137 [0.083]
C	26.374** [4.884]	6.816*** [1.283]		11.715** [5.347]

Notes: *** (** and * indicate statistically significant coefficients at the 1% (5%) and 10% level.

Source: Authors' Analysis (2024)

Non-linear ARDL (NARDL) analysis further reveals asymmetric, nonlinear effect of real interest rate on savings, with the result showing that private financial saving responds more strongly to negative real interest rate (nrdr) than positive real interest rate (prdr) of the same magnitude. In fact, the impact of nrdr on savings is positive and significant while that of prdr is negative and insignificant, indicating that negative levels of real interest rate increase saving more than positive levels reduce it. The positive impact of negative real interest rate on saving may be attributable to weak substitution effect, implying that individuals might be less incentivised to reduce their savings even when faced with negative returns. This finding indicates reversal of the theoretical implications of negative real deposit interest rate for saving in the short run, which might be informed by the lack of alternative financial instruments or other factors like behavioural bias, which may have forced people to save more despite being faced with low real return on saving. The income effect of low real interest rates may have also incentivised people to accumulate more savings in the present period, probably necessitated by the desire to compensate for the low returns on their savings or build larger buffers against rising costs.

We, however, find that financial deepening can be an important channel through which interest rate liberalization drives long run financial saving dynamics. Specifically, the linear ARDL estimate shows that a percentage increase in broad money to GDP (bm) would trigger an increase in bank deposits to GDP by about 0.337 percentage points (see Table 5). The NARDL estimate is, however, insignificant, although its sign is theoretically acceptable. Once the sign of the coefficient is the same for both models, the evidence suggests that broad money to GDP (an indicator of financial deepening) is a long-run determinant of financial savings, which confirms the work of Ackah and Lambon-Quayefio (2023). Meanwhile, when gross domestic savings is used as an indicator of saving, the long run impact of financial deepening is insignificant, which corroborates Kwakwa (2013). This indicates that while financial deepening can be a good strategy for stimulating financial savings, it may not be a potent tool for driving gross domestic savings. Again, the fact that financial deepening significantly drives financial savings in the long run while real deposit rate does not, implies that

removal of restrictions on financial instruments must be combined with broader liberalization efforts targeted at ensuring financial deepening.

4.3.2 Moderating effect of inflation targeting policy on the relation between real interest rate and domestic savings

Hypothesis 3: Inflation targeting policy moderates the effect of real interest rate on domestic savings

The coefficient of the interaction term for real interest rate and inflation targeting policy is statistically significant across both linear and non-linear ARDL specifications and across time horizons (see Tables 5 and 7). The coefficient of the interaction term is 0.524 under the ARDL model and 0.585 under the NARDL model, showing that inflation targeting policy strengthens the effect of real interest rate on private financial saving. Results further show that the direction of the interaction effect is largely consistent with the main effect of real interest rate on domestic savings, especially in the long run. This suggests that further improvement in inflation targeting policy might eventually amplify the positive short run impact of real interest rate on saving. Therefore, we find strong empirical support for the hypothesis that “inflation targeting policy moderates the effect of real deposit interest rate on domestic savings in the long run”. This is despite the challenge with keeping inflation within the medium-term target band of 8 ± 2 . Therefore, further commitment to maintaining low and stable inflation will be required to ensure that the regime of inflation control is credible enough to moderate the expected long run positive impact of real deposit interest rate on domestic savings.

Table 6. Short Run Determinants of Gross Domestic Savings

Variable	Dependent: "gds"	
	ARDL	
Independent	Coefficients	Standard Errors
D[gds(-1)]	-0.424**	-4.090
D[gds(-2)]	-0.237**	-1.911
D[gdp]	-0.739**	-3.680
D[gdp(-1)]	0.897**	4.172
D[rdr]	0.076*	0.085
D[bm]	-0.892**	0.316
D[bm(-1)]	-0.007	0.315
D[bm(-2)]	-0.524	0.367
D[cab]	0.081	0.215
D[cab(-1)]	0.297	0.270
D[cab(-2)]	0.920**	0.313
D[fd]	0.133	0.243
D[fd(-1)]	-0.423**	0.182
D[fd(-2)]	0.752***	0.205
D[it]	-17.409**	4.628
D[it(-1)]	-5.023	9.784
D[it(-2)]	-18.621**	6.785
D[l]	-0.253	0.194
D[l(-1)]	-0.190	0.406
D[l(-2)]	0.725	0.567
gds(-1)	-0.678**	-2.221
Number of Obs.	38	
R-squared	0.966	
Adjusted R-Squared	0.875	
F-statistic (probability)	10.574 (0.00023)	
Durbin-Watson Stat	2.521	

Notes: *** (***) and * indicate statistically significant coefficient at the 1% (5%) and 10% level.

Source: Authors' Analysis (2024)

Table 7. Short Run Determinants of Deposit Mobilization

Variable	Dependent "dm"	
	ARDL	NARDL
Independent	Coefficient [Std. Error]	Coefficient [Std. Error]
D[dm(-1)]	-0.694*** [0.218]	-0.631*** [0.170]
D[rdr]	0.0250** [0.00998]	
D[rdr(-1)]	0.0215** [0.0099]	
D[rdr ⁺]		-0.0181 [0.023]
D[rdr ⁻]		0.0483** [0.0132]
D[rdr ⁻ (-1)]		0.062** [0.0174]
D[it]	8.159** [1.214]	6.279** [0.793]
D[it(-1)]		8.002* [2.794]
D[l]	0.0271 [0.0688]	0.0380 [0.0594]
D[l(-1)]	-0.254** [0.0819]	-0.242** [0.0672]
D[gdpg]	-0.298** [0.0563]	-0.218** [0.0424]
D[gdpg(-1)]	0.272** [0.0724]	0.209** [0.0545]
D[bm]	-0.0346 [0.0375]	-0.0197 [0.0318]
D[fd]	-0.0060 [0.024]	-0.0086 [0.0210]
D[fd(-1)]	0.0537* [0.0276]	-0.045* [0.0236]
dm(-1)	-0.685** [0.111]	-0.5996** [0.0777]
Number of Obs.	35	35
R-squared	0.747	0.807
Adjusted R-Squared	0.626	0.714
F-statistic (probability)	193.045 [0.000]	224.639 [0.000]
Durbin-Watson Stat.	2.153	2.088

Notes: Indicated in parenthesis are standard errors. *** (** and * indicate statistically significant coefficient at the 1% (5 and 10% level.

Source: Authors' Analysis (2024)

4.3.3 Direct Impact of inflation targeting policy on domestic savings in Ghana

Hypothesis 2: Inflation targeting policy and domestic savings are positively related

Regarding the direct impact of inflation targeting policy (it) on bank deposits to GDP, the estimated long run and short run coefficients are positive and statistically significant at the 1 per cent level. Specifically, an effort to enhance inflation targeting policy would cause bank deposits to GDP to expand by about 13.35 to 15.16 percentage points in the long run (see Table 5) compared to 6.28 to 8.16 percentage points in the short run (see Table 7). Similarly, inflation targeting policy induces an increase in gross domestic savings to GDP by about 9.05 percentage points in the long run (see Table 5), while the short run impact is negative. Results reveal that the impact of inflation targeting policy on bank deposits to GDP is more profound than its impact on gross domestic savings to GDP. This indicates that agents will feel more comfortable saving in monetary form if they have high confidence that policy announcements will yield the desired outcomes.

The negative short run impact of inflation targeting policy on gross domestic savings can potentially be explained by agents' preference for financial saving rather than real investment. The preference for financial saving might have led to contraction in national income in the short-term thereby, reducing gross domestic savings. We, however, observe that over longer horizons, the theoretically expected relationship between inflation targeting policy and gross domestic savings is confirmed. This suggests that further commitment to strengthen the inflation targeting policy can create the conditions necessary to support efficient reallocation of accumulated short-term financial savings into productive investments in the long run, leading to a rise in national income and hence, gross savings.

Based on this finding, we are unable to reject the hypothesis that "*enhanced inflation targeting policy induces higher domestic savings in the long run*". The evidence of positive impact of inflation targeting policy on domestic savings could be explained by the relatively improved inflation rates recorded under explicit inflation targeting (2007–2023), which appears to be effective in anchoring inflation expectations leading to relative price stability. Perhaps, the associated increase in purchasing power on savings incentivized agents to accumulate more financial savings, which probably had a ripple effect on national income leading to enhanced gross domestic savings.

4.3.4 Other drivers of domestic savings

Other drivers of domestic savings have been determined including real GDP growth, which is found to exert a negative and significant impact on domestic savings. In fact, a percentage increase in real GDP growth induces a decline in gross domestic savings by about 2.48 percentage points and contraction in private financial savings by 1.24 to 1.34 percentage points (see Table 5). Thus, real GDP growth is a robust long-run determinant of domestic savings. However, its negative effect on savings contradicts the conventional view of Modigliani and Brumberg (1954) and empirical works by (Ackah and Lambon-Quayefio, 2023; Ang, 2010; Munozmoreno et al., 2014), that suggest that saving is an increasing function of real income growth. Perhaps, greater vulnerability of households to income shocks along with the inflationary effect of volatile macroeconomic conditions such as persistent local currency depreciation, may have resulted in "present bias" leading to declining savings levels. The study further reveals that positive current account balance (net income) is crucial for achieving enhanced levels of gross domestic savings in the long run. A percentage increase in the current account balance to GDP would induce a 0.85 percentage point increase in the gross domestic savings to GDP (see Table 6).

5. Conclusions and Policy Implications

This study investigates whether inflation targeting policy strengthens the impact of real deposit interest rate on domestic savings using data from Ghana spanning 1986–2023. Other factors, such as broad money to GDP (indicator of financial deepening), real GDP growth (indicator of real income growth), fiscal deficit to GDP, and current account balance to GDP (indicator of net income), are introduced as control variables. Alternating gross domestic savings to GDP and bank deposits to GDP (financial saving) as indicators of domestic savings, we specify two dynamic savings models. The linear ARDL estimator was used to explore the long- and short-run dynamics of domestic savings and the independent variables, augmented by the non-linear ARDL estimator.

The ARDL results show that inflation targeting policy induces higher domestic savings, which is consistent across different model specifications and time horizons. Again, inflation targeting policy significantly moderates the relation between real deposit interest rate and private financial saving (as measured by bank deposit to GDP). This finding implies that the potential positive impacts of financial liberalization can be sustained provided the right conditions exist to support efficient functioning of the financial system, which is an extension of the Stiglitz–Weiss critique. The study's results, however, reveal no long run stable relationship between financial saving and real deposit interest rate as there prevails only short run nexus, indicating that the MSH might be delayed than implied by theory. NARDL analysis further reveals that private financial saving responds more strongly to negative real interest than positive real interest rate of the same magnitude, revealing non-linear asymmetric effects in the short run. Specifically, negative real interest rate has a positive and significant impact on financial saving, while the impact of positive real interest rate is insignificant. This appears to suggest a reversal of the theoretical implications of negative real interest rate for saving over the period of financial liberalization. Regarding the control factors, real GDP growth has a robust negative and significant impact on the different indicators of domestic savings, which predicts a situation in which agents give up future consumption for present consumption. Again, enhanced financial system depth is associated with higher financial saving while positive net income drives expansion in gross domestic savings.

In summary, we establish that long run dynamics of domestic savings are mainly driven by factors such as inflation targeting policy, financial deepening, real GDP growth, and net income, rather than the real deposit interest rate. This finding has profound implications for financial reforms targeted at inducing higher savings rates in Ghana. Principally, financial reforms that are targeted at stimulating savings must be modelled in ways that accommodate broader liberalization efforts aimed at ensuring financial deepening, beyond the removal of administrative controls. Moreover, the choice of instrument for driving savings must depend on the broader strategy for domestic savings mobilization. If the strategy is to enhance financial savings mobilization, focus should be placed on reforms that can enhance monetary policy efficacy and financial system depth. However, if the strategy is to expand gross domestic savings, then focus should be placed on structural reform policies that can enhance the country's net income, including, for example, export-led growth policies and import substitution industrialization.

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