



# The Dynamic Effect of Financial Sector Development in Stimulating the Gross National Savings of Djibouti

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**Abstract:** Savings are important determinants of wealth. At the macroeconomic level, governments attach importance to saving money in order to make new investments, produce new capital goods, and sustain economic growth. However, due to the high level of internal and external debt in Djibouti, it is nearly impossible for the country to achieve domestic savings. Hereby, the major aim of this study is to examine the dynamic effect of financial sector development in stimulating the gross national saving of Djibouti from the period 1987 to 2021. The paper considered numerous indicators as measurements of the financial sector development including FDI inflows, domestic loans to the private sector, central bank assets to GDP, and money supply. To proceed with the analysis, Non-Linear Autoregressive Distributed Lag (NARDL) was performed and according to the model, the findings highlighted that the Djiboutian financial industry is still in its early development and has not yet made a substantial contribution to boosting the country's national savings. Nevertheless, the gross national saving of Djibouti was still positively prompted by significant components of the financial sector development, such as the positive shocks of FDI inflows and both the negative shocks of central bank assets and money supply. While both the positive and negative shocks of the credit offered to the private sector were uncovered to diminish the national savings in the long run. In conclusion, the current research will help governments and policymakers understand the best ways to use the financial sector to raise gross national savings. It will also present evidence of how to implement long-term initiatives that can lower public debt and encourage savings. Not to mention, the article provides information on the value of long-term investments.

**Keywords:** national savings; financial sector; money supply; central bank; NARDL; Djibouti.

## Introduction

Many theoretical models have long acknowledged that the saving rate is a major contributor to economic expansion. Countries may rely on internal resources (*national savings*), to finance the creation of physical capital for growth. More importantly, domestic savings can lessen a nation's reliance on foreign finance. Hence, the failure of any nation to accumulate sufficient savings; drives foreign borrowing, which has, in retrospect negative impacts on the equilibrium of payments and raises the cost of servicing these loans in the future, subsequently, these countries experience slow development in the productive capacity sector, since, this accumulated loans, ultimately causes economic regression via monetary burden channels.

Tony (2007) contends that nations that rely on external funding for investment are more susceptible to shocks from the outside world. To reduce sensitivity to changes in the global economy, domestic savings will thus continue to be prioritized as a source of investment funding. This has been validated by the Keynesians. For instance, the Harrod-Domar model, a traditional "*Keynesian model*" of productivity expansion, takes into account the saving rate as a major determinant of the growth rate in addition to the marginal product of capital and the depreciation rate (Harrod, 1939). In a similar vein, Swan-Solow (*neoclassical model*), the level of national saving also affects short-term economic development (Swan, 1956). These ideas contend that higher rates of saving would result

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in faster economic expansion. Yet, a diminishing trend in national savings is causing alarm in a number of countries and economies around the world (Cavallo & Pedemonte, 2016).

This alarming consecutive shrinking of saving rate can be addressed through macroeconomic factors or demographic spectrum, while the former could be perceived in lower-middle income countries, particularly Djibouti, the former is more trending in developed nations. From a demographic threshold, it is believed *Age* is the main trigger of the abovementioned low saving in advanced nations. For instance, Fukuda and Okumura, (2021) suggest that a rising problem for maintaining economic development in Japan is the country's rapidly aging and shrinking population. Which is both the decline in the labor force and the alteration in saving habits caused by the demographic transition lower potential growth. Indeed, savings are the primary source of money in financial markets, therefore a decline in savings might cause a reduction in the amount of money available overall. As a result, demographic change has a potential effect on economic growth in many regions, where aging and decreasing populations are expanding quickly. This is especially true to the degree that interregional capital flows are constrained.

Nevertheless, this is in the demographic threshold, on the other hand, the current paper focuses on the role of financial development in enhancing national savings. Because it is stated that foreign financing was relatively ineffectual in easing the credit restrictions that are typical in many developing nations, thus, there is a need to increase local savings. Likewise, it is asserted a significant reason can be attributed to the absence of suitable financial structures that are capable of effectively combining household resources to make them accessible to borrowers. Even yet, the research that has been done in this area thus far has not proven definitive. According to our hypothesis, the financial sector improves effectiveness in the context of immobilizing resources by directing them toward productive use. An advanced financial system is also generally defined by better-saving opportunities, including a variety of savings options that provide higher profit returns. The productive sectors will get these resources, which will encourage economic expansion. Few scholars, such as Ribaj and Mexhuani (2021) and Bui (2018) consider liquidity savings as a crucial preventive measure to guard against volatility. Yet in order to motivate people to save, it's critical that the funds can be accessed when necessary to deal with an unexpected monetary drop.

Despite the likelihood of greater savings among more affluent individuals in Djibouti, the scenario markedly contrasts for households with lower to moderate incomes. This demographic faces a distinct set of challenges, including the prevalence of high-cost financial services, impediments to savings, absence of insurance coverage, and limitations on credit access. These factors contribute to the perpetuation of poverty and the emergence of various socioeconomic challenges. Lower-income segments often encounter difficulties in securing access to financial services offered by conventional banks and savings institutions. Consequently, they often resort to alternative, but considerably more costly, financial service providers, such as check cashing outlets, payday lenders, and money transfer agencies. In their research, Jima and Makoni (2023) findings underscore a robust and enduring association between financial inclusion and economic growth, highlighting a compelling long-term connection. Moreover, the results suggest a reciprocal causation, signifying a mutually reinforcing relationship between these two pivotal variables. This phenomenon implies that there exists a symbiotic interplay between financial inclusion and economic growth. Indeed, the accessibility of financial services assumes paramount significance in the context of mobilizing financial capital, fostering investments, and, consequently, engendering value generation for nascent enterprises and small-scale businesses. These positive effects, in turn, reverberate throughout the socioeconomic landscape, contributing substantively to the overarching goal of economic development (Nanda & Kaur, 2016). But the posterior positive effect, relatively, depends on a well-advanced financial institution. Therefore, financial institutions must provide a good rate of return to attract money in order to mobilize individual savings.

The backbone of the Djiboutian economy, beyond its financial institutions, predominantly rests on its port services and strategic geographical location. Djibouti's economic viability is heavily intertwined with its port facilities, most notably the Port of Djibouti, which ranks among the busiest ports in the region. This port complex serves as a pivotal conduit for the import and export activities of landlocked nations in East Africa, notably Ethiopia. The government has made substantial investments in the expansion and modernization of its port infrastructure to facilitate the burgeoning trade demands. While tourism does contribute to the economy, its impact remains relatively modest in comparison.

However, it is an indisputable fact that Djibouti is grappling with a host of financial limitations, particularly when we consider the restricted scope of financial freedom in the Djiboutian financial system (the financial sector in Djibouti is characterized by a high level of concentration, with a few dominant banks controlling a significant portion of the market. This concentration can limit competition and hinder the development of a more diverse and competitive financial ecosystem) which is rather hindered by a lack of severely limited financial inclusion. Indeed, a considerable segment of Djibouti's population finds itself excluded from the formal financial sector. This exclusion is particularly pronounced in rural areas, where access to basic banking services is notably lacking. This deficiency hinders their ability to save, invest, and participate in the formal economy. Remarkably, this issue extends to urban areas, where individuals are also hesitant to engage in savings activities due to unattractive savings options or, in some cases, their complete absence.

The coexistence of Islamic and conventional banking systems adds to the complexity, causing confusion among those interested in using banking services for savings and financial transactions. Given the dominant religion in Djibouti, Islam, the population is wary of profit-oriented systems that involve interest rates. Moreover, Djibouti's banking sector is relatively small and underdeveloped compared to neighboring countries in the region. The limited number of banks and financial institutions restricts competition and innovation in the sector. Likewise, small and medium-sized enterprises (SMEs) and individuals often face hurdles in accessing credit. These obstacles stem from various factors, including a lack of collateral, limited credit history, and the caution of lenders. Additionally, the absence of financial literacy represents another potential obstacle to domestic savings engagement. Meanwhile, both insufficient regulatory frameworks and infrastructure challenges further compound the obstacles in Djibouti's financial landscape.

Despite this, the Djiboutian government continues to place a high priority on maintaining a sufficient and optimal level of savings. However, when the majority of the Djiboutian residents turn to the traditional method of saving, instead of financial sector usage, the likelihood of an equilibrium saving-investment mechanism fails to materialize. In accordance with this, the current research mainly focuses on the Republic of Djibouti. The country's mixed conventional banking and Islamic financial institutions provide us with stronger novelty, notwithstanding, this is the first paper that has been written at the national level. Therefore, we aim to provide salient information on the understanding of Djibouti's potential growth through cardinal national saving, particularly, through a rigorous empirical evaluation process that can be captured by the employment of several variables namely; broad money, domestic credit to the private sector, central bank role, and foreign direct inflows, which are all potential factors for Djiboutian financial sector development. Our research makes significant contributions to the existing body of literature in two distinct ways. Firstly, there is a notable absence of empirical studies in Djibouti that investigate the impact of the financial sector on saving growth. While the focus of this paper's case study is Djibouti, the conceptual framework we propose has the potential to yield benefits for governments in Africa and beyond. Therefore, our study represents a pioneering effort to shed light on this unexplored aspect of the local financial landscape. Secondly, we employ an approach by dissecting the factors influencing savings into categories of short-term and long-term determinants, thus providing a more comprehensive understanding of the dynamics underlying saving behavior. By doing so, a

nonlinear autoregressive distributed lag (NARDL) model will be used. In contrast to the traditional ARDL model, the NARDL allows for the simultaneous assessment of a single-equation error correction model and permits asymmetry with regard to both positive and negative changes in the explanatory variable(s).

The paper is organized as follows: section 2 briefly juxtaposes national saving with financial institutions development by referring to the available literature papers, with a particular contextualization on lower-middle income countries, considering Djibouti's current status, followed by a methodology section 3 including the adopted econometric models. Whereas sections 4 and 5 illustrate; the results and general discussion, and finally the conclusion is offered in the last section.

## Literature review

### *Juxtaposing financial development with domestic saving*

National saving is a mechanism that is integrated, mostly, into every government's framework. This mechanism can be interpreted from two dimensions, one from a private threshold that incorporates household and business entities, whereas the other threshold involves public activities such as tax (Quartey, 2008). Prominent studies have applied the current factor (National saving) in economics, albeit producing permanently contradictory findings. Some writers have relied on techniques that use a range of time series models to try and demonstrate a long-run link between the amount of savings and GDP growth (Sahoo & Dash, 2013).

Beginning with Quarte's study, the author used the Johansen co-integration test and Granger causality to analyze the effects of financial reform on savings and unemployment in Ghana from 1970 to 2001. According to the empirical findings, there is no proof that Ghana's financial sector expansion and savings are causally related. These findings, however, were at odds with those of (Adenutsi, 2010); the findings showed that, while the long-term economic performance was negatively impacted, the expansion of the financial sector had a favorable influence on the performance of commercial banks through the mobilization of savings. A Johansen co-integration test was also applied by (Odhiambo, 2008a) in Tanzania for the years 1968 to 2001, and it was found that the expansion of the finance market had a favorable impact on the amount of domestic savings. Nevertheless, a study that used a trivariate model (Odhiambo, 2008b) failed to discover the aforementioned relationship between financial sector upgrading and saving rate in the Kenya context.

Similarly, Ang (2011) examined the effect of Malaysia's financial system on savings from 1960 to 2007. According to empirical findings, financial development has a favorable influence on savings. On the other hand, it was revealed that the expansion of the insurance companies and the financial system's deregulation tend to lower Malaysia's level of savings. In Pakistan, Khan and Hye (2013) demonstrated that the growth of the financial industry has a detrimental impact on savings levels both in the long and short terms. (Mojekwu & Ogbulu, 2017) used a multivariate regression model to evaluate the factors that affected domestic savings in Nigeria between 1981 and 2015. The selected variables were the gross domestic product, inflation rate, interest rate on deposits, financing of budget deficits, financial advancement, and age dependency ratio. National Savings is the dependent variable. The co-integration test demonstrated that the variables have an ideal connection over the long term. Regression analysis findings show that only financial sector development significantly affects domestic savings in Nigeria; other factors have little bearing on national savings over the time period under study.

In a similar vein, Simleit et al. (2011) studied the factors influencing household savings in South Africa and illustrated that interest rates, economic cycle upturns, and wealth contribute to the country's declining savings rates. It's worth noting that one of the key

components of economic expansion is saving. In four West African nations, Abasimi and Martin (2018) looked into the factors that influence national saving. The World Bank database's yearly data for the years 1997 through 2016 was used by the author. According to the long-term findings, gross savings are statistically and substantially influenced positively by gross domestic income, individual capita income, and real interest rates, On the other hand, the age ratio statistically has a negative influence on gross savings.

Ironically, these countries are failing under the umbrella of lower-middle-income countries or emerging countries, which puts a higher impediment to their already vulnerable status of providing a salient saving framework with less worrying about the internalities embodied in their economic structure. According to (Kapingura & Alagidede, 2016), although bolstering Africa's fragile financial institutions is important, serious consideration should also be given to ways that the financial sector might raise the amount of savings. Hence, the authors contend that boosting the provision of savings facilities should be prioritized together with enhancing general monetary stability, adequate regulation and monitoring of local banks, and the regulatory environment for microfinance companies.

Although saving could be a key factor for economic thriving, however with the current aging population and birth rate in decline, especially in developing countries, the ad-hoc effect of national saving in contributing toward economic activities, starts materializing as infective, particularly as we witness many retired people withdrawing the considerable reserved amount. Let's regard this, from a similar threshold (Age) but with financial sector inclusion. For instance, according to the life-cycle model, an individual's savings habits change throughout the course of their life. Consumers are believed to have a set number of periods in which they will live and are motivated to smooth their spending route. Moreover, it is believed that because young people have limited assets at their disposal, they would choose to borrow money in order to extend their spending over a longer period of time.

According to the life-cycle model, an individual's savings habits change throughout the course of their lives. Consumers are believed to have a set number of periods in which they will live and are motivated to smooth their spending route. Moreover, it is believed that because young people have limited assets at their disposal, they would choose to borrow money in order to extend their spending over a longer period of time. Theoretically, they are in a precarious position since they lack any financial assets and cannot take on debt, making it impossible for them to fund the amount of consumption they seek while they are still young. In a more formal way, saving happens when a person is working and spending happens. Such a model, undoubtedly, depends on a lot of presumptions. It must be possible to save and dissave in a financial intermediation system to the extent that it is difficult to imagine saving in non-monetary forms. In order to create institutions that provide more effective financial intermediation, the financial sector must be reformatted as a key component of the process of financial liberalization. The degree to which people are willing to put off consuming into the future and therefore their tendency to save is determined by the intertemporal elasticity of substitution in consumption. This in turn will depend on the actual rate of interest, which will both decide how willing people are to accumulate savings in the financial sector and impact their spending choice based on whether it is above or below the person's interest.

### ***Financial incentives and their impact on sectoral growth and savings rates***

According to Ünvan and Yakubu (2020), banks rely significantly on the inflow of depositor funds as a pivotal source of financial resources. Grounded in the Keynesian theory of money demand, a multifaceted framework emerges, postulating the existence of three primary motives underlying the rationale for holding money: namely, the transactional, precautionary, and investment motives. In alignment with this theoretical construct, financial institutions extend a tripartite spectrum of deposit categories, encompassing demand deposits, savings deposits, and time deposits, strategically designed to cater to

these intricate and divergent motivations. The demand deposit, often referred to as the current account, is tailored to the discerning needs of individuals and businesses whose imperative is the seamless facilitation of day-to-day financial transactions. This category chiefly serves those seeking immediate access to monetary resources for household expenses and entrepreneurs engaged in the ongoing operations of their enterprises. In tandem, the savings account emerges as the second facet of this financial tapestry, diligently addressing the requirements of individuals who seek to accumulate financial reserves for unforeseen contingencies, thus embodying the precautionary motive, while concurrently nurturing their aspirations for investment. This account type accommodates a delicate balance between the security of preserving liquidity and the potential for wealth appreciation. Concluding this financial tableau is the time deposit, a distinct offering furnished by banks to their clientele seeking avenues for investment-driven objectives. Typically attracting individuals with surplus funds, this deposit option provides an outlet for optimizing returns on idle financial resources, marking the culmination of the banking sector's endeavor to align its services with the multifaceted motivations of depositors.

A vital task for all financial organizations is deposit mobilization. However, the efficient mobilization of deposits depends on a thorough comprehension of the crucial factors controlling this procedure. Therefore, the specific criteria that control bank deposits at the level of each particular bank are a crucial question. Keeping in line with this; the impact of particular macroeconomic and financial factors on saving behavior in different African countries has been the subject of several academic research. For instance, Imoisi et al. (2018) used cointegration and ordinary least squares (OLS) techniques to determine that national income and deposit interest rates emerged as the main determinants impacting domestic savings in the Nigerian economy from 1982 to 2016. This analysis covered the period from 1982 to 2016. Similar to this, Otiwu et al. (2018) used the Vector Error Correction Method (VECM) to prove that income levels and financial inclusion were the main factors influencing savings in Nigeria between 1981 and 2015. Additionally, Mojekwu and Ogbulu (2017) employed a multiple regression technique in their investigation into the factors impacting national savings. Their findings confirmed that financial deepening played a significant role in promoting aggregate savings in Nigeria over the period from 1981 to 2015. Furthermore, the influence of macroeconomic determinants on deposit mobilization in Ghana from 1980 to 2010 was examined by Ngula (2012) using the ordinary least squares (OLS) method. The study's findings indicate that while interest rate has little bearing on banks' ability to mobilize deposits, money supply, exchange rate, and inflation have a substantial impact. Additionally, Boadi et al. (2015) demonstrated that interest rate liberalization and gross domestic product are important elements in luring commercial banks deposits using the OLS approach.

In a comparative research endeavor, Mushtaq and Siddiqui (2017) conducted an extensive examination of the influence of interest rates on bank deposits within both Islamic and non-Islamic countries. Notably, the ARDL outcomes revealed a distinctive contrast: in Islamic economies, interest rates displayed no discernible impact on bank deposits, while in non-Islamic nations, a clear and positive relationship emerged between interest rates and bank deposit levels. Shifting the focus to Morocco, Ferrouhi (2017) delved into the determinants of bank deposits by considering both bank-specific and macroeconomic factors. Utilizing the OLS analysis technique on panel data spanning from 2003 to 2014, the research findings unveiled variables such as bank size, bank funding, interest rates on deposits, and unemployment collectively elucidate deposit behavior within the Moroccan context. Meanwhile, Raza et al. (2017) directed their attention to Pakistan, where they meticulously scrutinized the impact of interest rates on savings and bank deposits, relying on annual data encompassing banks and other financial institutions over the period from 2002 to 2016. The outcomes derived from the OLS regression analysis distinctly suggested a noteworthy and positively significant effect of interest rates on bank deposits within the Pakistani financial landscape.

Mashamba et al. (2014) conducted an examination of the correlation between interest rates and bank deposits in Zimbabwe during the timeframe spanning from 1980 to 2006.

Their research revealed compelling insights: deposit interest rates and the economic activity level, as measured by GDP, exhibited a significantly positive influence on bank deposits. Conversely, the study uncovered that inflation rates and interest rate margins had a detrimental impact on deposit mobilization. In a parallel study, Tatliyer (2017) employed both Ordinary Least Squares (OLS) and the Vector Error-Correction Model to delve into the factors shaping private savings during the period from 1988 to 2010. Tatliyer's research established that lower levels of social security and inflation rates positively correlated with increased private savings. However, the relaxation of credit constraints appeared to exert an inverse effect on savings. Additionally, the study highlighted the favorable terms of trade and a positive current account balance served to boost levels of private savings. Furthermore, Özen et al. (2018) discerned a direct and discernible impact of interest rates on the behavior of depositors within the context of Turkey.

Morgan and Long's (2020) extensive analysis in Laos unveiled key findings: financial literacy notably and positively influenced financial inclusion and savings. Moreover, the impact of financial literacy on diverse aspects of financial inclusion varied. Those with higher financial literacy scores were more inclined to participate in formal and informal savings, a trend persisting when adjusting for income and education. Additionally, individuals with greater financial literacy tended to amass larger savings, whether through formal or informal channels, compared to those with lower literacy scores. In other words, the results suggest that individuals with greater wealth and educational attainment are inclined to participate in both formal and informal savings practices, whereas individuals with a primary education background are more predisposed to engage solely in informal savings methods. Moreover, it was noted that younger individuals in the age bracket of 18 to 30 were less likely to utilize formal savings mechanisms, but their propensity for informal savings was not diminished. Lastly, the study highlighted individuals residing in rural areas exhibited a higher likelihood of opting for informal savings options, potentially influenced by limited financial infrastructure and reduced accessibility to formal financial services.

Beyond the scope of savings, financial activities geared towards bolstering the economy hold considerable significance. Financial institutions wield the potential to be stalwart pillars of national economic sustainability. In this context, Saeed et al. (2018) identified innovation and bank investment as pivotal determinants of economic growth, along with factors such as lending capacity and interest margins. In a related study, Salami (2018) examined the impact of interest rates on economic growth in Swaziland, *discovering a noteworthy and negative relationship between deposit interest rates and Gross Domestic Product (GDP)*. Additionally, research by Tahir (2008) and Mushtaq (2016) explored the unidirectional causal link between economic development and progress in the financial industry in Pakistan, spanning both short and long-term periods. Liu and Zhang (2018) highlighted the positive and significant influence of profitability, loans, and advances on economic growth while indicating that deposits and assets of banks do not significantly impact Malaysia's economic growth. Meanwhile, Hou and Cheng (2017) established a favorable correlation between banking activity and economic performance. Lastly, Tahir et al. (2015) unveiled a short-term causal relationship between bank lending and economic development.

Hou and Cheng (2017) delved into an investigation concerning the short and long-term consequences of banks' performance metrics on economic growth. Their research underscored that the impact of these metrics is contingent upon the growth trajectories of both banks and the nation's income over time. The study strongly advocated for economies to actively engage in diverse financial activities as a means to substantiate and ensure a sustainable process of economic growth. On a related note, Liu and Zhang (2018) embarked on an exploration of the endogenous growth dynamics within an economy's financial system. Their study, based on panel data encompassing 29 provinces of China, unveiled theoretical insights suggesting the existence of an optimal financial structure

capable of accommodating various demands throughout the economic development journey.

Alam et al. (2021) research findings suggest that variables related to banking exhibit cointegration with economic growth. Furthermore, the study's in-depth analysis reveals a notable and meaningful correlation between economic growth and both interest margin and return on assets. However, lending capacity and investment activities do not display a statistically significant association with economic growth. Karjaluo et al. (2021) extensive investigation scrutinized the influence of financial sector development on domestic investment across chosen nations within the Economic Community of West African States (ECOWAS) during the period spanning 1985 to 2017. The research outcomes revealed several key findings: firstly, the impact of financial sector development on domestic investment was contingent upon the specific measure of financial sector development employed. Secondly, while domestic credit extended to the private sector exhibited a positive relationship with domestic investment, it lacked statistical significance. In contrast, the banking intermediation efficiency and the broader money supply demonstrated a noteworthy and negative influence on domestic investment. Thirdly, discernible variations in the effects of financial sector development on domestic investment were observed across the diverse ECOWAS countries, highlighting cross-country disparities. Lastly, the study indicated a Granger-causal relationship, whereby domestic credit to the private sector emerged as a causal factor affecting domestic investment in the ECOWAS region.

## **Methodology**

### ***Data description***

The purpose of the study is to determine how the growth of the financial sector has influenced Djibouti's gross national savings. Djibouti faces several challenges that contribute to its classification as a lower-income or economically disadvantaged country. Primarily due to limited natural resources, a small domestic market, and a history of political instability. Its economy heavily relies on services, particularly as a trade and logistics hub, but faces issues such as income inequality, unemployment, and a significant debt burden. Consequently, investigating the Gross National Savings (GNS) of Djibouti is important because it provides insights into the country's economic development, investment capacity, and resilience to economic crises. A higher GNS indicates greater potential for economic growth, increased investment in vital sectors, and a better ability to withstand economic shocks.

Moreover, the under-researched issue is the asymmetrical long-run and short-run effects of several independent variables, including FDI inflows, domestic loans to the private sector, central bank assets to GDP, and money supply on the gross national savings (Gozgor, 2014; Kaur et al., 2013; Rapih, 2021). The current paper's model investigated the asymmetric reaction of the financial sector components to the gross national savings of Djibouti. Hereby, the appropriate model we employed is the Non-Linear Autoregressive Distributed Lag (NARDL). The model is used in economics and econometrics to analyze and understand the complex relationships between variables in a dataset. It's important because it allows researchers to capture nonlinear dynamics and interactions among variables, which traditional linear models may not adequately represent. NARDL helps in making more accurate economic forecasts, policy evaluations, and decision-making by providing a more realistic representation of the data (Chen et al., 2020; Qamruzzaman & Jianguo, 2020). Consequently, the model will be beneficial in this study to analyze the relationships between variables, especially in cases of nonlinearity. It helps to capture both short- and long-term effects, tests for cointegration, and handles policy analysis and forecasting. It's valuable for understanding complex economic phenomena and accounting for structural changes in data. Finally, the model is particularly useful for nonstationary time series data and feedback mechanisms in economic systems.



The study takes yearly data from 1987 through 2021 into account. Additionally, the numerical data for all the variables included in this analysis were extracted from various widely recognized international sources, namely World Development Indicators, Global Financial Indicators, and the African Development Bank Group.

**Table 1. An overview of the variables**

Variables	Definition	Source
GN	Gross national savings (% of GDP)	African Development Bank Group
FDI	Foreign direct investment, net inflows (% of GDP)	World Development Indicators
DC	Domestic credit to the private sector (% of GDP)	
CB	Central bank assets to GDP (%)	Global Financial Indicators
M	Broad money (% of GDP)	

Source: own processing

### **Model specification**

The nexus between the variables was investigated in this study using the nonlinear autoregressive distribution approach. A functional equation that depicts the relationship between gross national saving, FDI inflows, central bank assets, domestic credit to the private sector, and money supply is shown below in agreement with Balsalobre-Lorente et al. (2021) and Shin et al. (2014).

$$GN = f(FDI, CB, DC, M) \quad (1)$$

Equation (1) may be expressed more consistently as follows:

$$GN_t = \beta_0 + \beta_1 FDI_t + \beta_2 CB_t + \beta_3 DC_t + \beta_4 M_t + \varepsilon_t \quad (2)$$

In equation 2, we observe the independent variables that consist of FDI inflows (FDI), central bank assets (CB), domestic credit to the private sector (DC), and money supply (M). The coefficients of the model are  $\beta_0$  to  $\beta_4$ , and the time span is shown by the factor  $t$ . Next, the following formula was used in this study to test the relationship between the variables using the ARDL (Autoregressive Distributed Lag) approach, which was initially established by Pesaran et al. (2001).

$$\begin{aligned} \Delta GN_t = & \alpha_0 + \sum_{i=t}^p \alpha_1 \Delta GN_{t-1} + \sum_{i=t}^p \alpha_2 \Delta FDI_{t-1} + \sum_{i=t}^p \alpha_3 \Delta CB_{t-1} + \sum_{i=t}^p \alpha_4 \Delta DC_{t-1} \\ & + \sum_{i=t}^p \alpha_5 \Delta M_{t-1} + \lambda_1 GN_{t-1} + \lambda_2 FDI_{t-1} + \lambda_3 CB_{t-1} + \lambda_4 DC_{t-1} + \lambda_5 M_t \end{aligned} \quad (3)$$

Also, in accordance with Majeed et al. (2020), the research exclusively examines the variable of interest in terms of positive and negative shock to the dependent variable. To put it another way, we create positive and negative variation in FDI inflows, central bank assets, domestic credit to the private sector, and money supply to assess the asymmetric influence on gross national saving. The following equations is an explanation of these variations.

$$POS(FDI_t) = FDI^+_q = \sum_{q=1}^q \Delta FDI^+_q = \sum_{q=1}^q \max(FDI^+_q, 0) \quad (4)$$

$$NEG(FDI_t) = FDI^-_q = \sum_{q=1}^q \Delta FDI^-_q = \sum_{q=1}^q \min(FDI^-_q, 0) \quad (5)$$

$$POS(CB_t) = CB^+_q = \sum_{q=1}^q \Delta CB^+_q = \sum_{q=1}^q \max(CB^+_q, 0) \quad (6)$$

$$NEG(CB_t) = CB^-_q = \sum_{q=1}^q \Delta CB^-_q = \sum_{q=1}^q \min(CB^-_q, 0) \quad (7)$$

$$POS(DC_t) = DC^+_q = \sum_{q=1}^q \Delta DC^+_q = \sum_{q=1}^q \max(DC^+_q, 0) \quad (8)$$

$$NEG(DC_t) = DC^-_q = \sum_{q=1}^q \Delta DC^-_q = \sum_{q=1}^q \min(DC^-_q, 0) \quad (9)$$

$$POS(M_t) = M^+_q = \sum_{q=1}^q \Delta M^+_q = \sum_{q=1}^q \max(M^+_q, 0) \quad (10)$$

$$NEG(M_t) = M^-_q = \sum_{q=1}^q \Delta M^-_q = \sum_{q=1}^q \min(M^-_q, 0) \quad (11)$$

In equations (4, 5, 6, 7, 8, 9, 10, and 11) variables are decomposed into a positive shocks (FDI+ q; CB+ q; DC+ q; M+ q), and negative shocks (FDI- q; CB- q; DC- q ; M- q), This allows for the creation of an asymmetric method, which may be shown as follows:

$$\begin{aligned} \Delta GN_t = & \alpha_0 + \sum_{i=t}^p \alpha_1 \Delta GN_{t-a} + \sum_{i=t}^p \alpha_2 \Delta FDI^+_{t-1} + \sum_{i=t}^p \alpha_3 \Delta FDI^-_{t-1} + \sum_{i=t}^p \alpha_4 \quad (12) \\ & \Delta CB^+_{t-1} + \sum_{i=t}^p \alpha_5 \Delta CB^-_{t-1} + \sum_{i=t}^p \alpha_6 \Delta DC^+_{t-1} + \sum_{i=t}^p \alpha_7 \Delta DC^-_{t-1} + \sum_{i=t}^p \alpha_8 \Delta M^+_{t-1} \\ & \sum_{i=t}^p \alpha_9 \Delta M^-_{t-1} + \lambda_1 GN_{t-1} + \lambda_2 FDI^+_{t-1} + \lambda_3 FDI^-_{t-1} + \lambda_4 CB^+_{t-1} + \lambda_5 CB^-_{t-1} + \lambda_6 \\ & DC^+_{t-1} + \lambda_7 DC^-_{t-1} + \lambda_8 M^+_{t-1} + \lambda_9 M^-_{t-1} + ECM_{t-1} + \varepsilon_t \end{aligned}$$

Equation (12) explains the examination of the error correction models.

#### Unit root test

To ensure the stability and reliability of the data the study performed stationarity tests that consist of the Augmented Dickey-Fuller test (ADF) and the Phillips-Perron test (PP). Starting with the augmented Dickey-Fuller test, it assumes that  $u$  is a white noise error term. However, if  $u$  is autocorrelated we would need a drift version of the test which allows for higher-order lags. Accordingly, the test is augmented using  $p$  lags of the original series (Dickey & Fuller, 1979). Furthermore, the Phillips-Perron test corrects for any serial correlation and heteroskedasticity in the errors by some direct modification to the test statistics (Phillips & Perron, 1988). Below the equations for both tests are presented.

$$\Delta y_t = \psi y_{t-1} + \mu + \alpha t + \sum_{i=1}^p \beta \Delta y_{t-i} + u_t \quad (13)$$

$$\Delta y_t = \psi y_{t-1} + \mu^* + \delta t + u_t, \quad u_t \sim I(0), ARMA(p, q) \quad (14)$$

As per equation (13)  $p$  is used to augment the past autoregressive lags of the difference term. While  $\mu$  and  $\alpha t$  denotes the time trend parameter and also the intercept. In equation (14)  $\psi y$  consist of the initial term of the data while the term  $u_t$  implies the stationarity at level  $I(0)$ . Additionally,  $\mu^*$  expresses the intercept while  $\delta t$  denotes the time trend.

#### BDS test

When determining the linearity and nonlinearity of a model, the Brock-Dechert-Scheinkman-LeBaron test (BDS test) is empirically very reliable (Broock et al., 1996). The null hypothesis of the BDS test is that data are either equally distributed in a nonlinear manner or are conditionally independent (Galadima & Aminu, 2020). Thus, if the data are nonlinear, we apply NARDL to investigate the relationship between the variables.

$$BDS_{\epsilon,b} = \frac{\sqrt{N}[C_{\epsilon,b} - (C_{\epsilon,b})^B]}{\sqrt{V_{\epsilon,b}}} \quad (15)$$

Where  $[C_{\epsilon,b} - (C_{\epsilon,b})^B]$  an asymptotic normal distribution with zero is the mean;  $V_{\epsilon,b}$  is a variance; and  $b$  is the number of consecutive points which is used in the set or embedding dimension.

#### *Granger causality test*

Additionally, it was intended to record how the different variables related to one another causally. The Granger causality test, recommended by (Granger, 1969), was performed to ascertain whether there is a causal link between the variables. Below a more comprehensive explanation of the model is provided:

$$X_t = \sum_{l=1}^p (a_{11,1}X_{t-1} + a_{12,1}Y_{t-1}) + \mu_t \quad (16)$$

$$Y_t = \sum_{l=1}^p (a_{21,1}X_{t-1} + a_{22,1}Y_{t-1}) + \epsilon_t \quad (17)$$

As presented in equation (16) and (17) is the model order,  $a_{ij,1}(i, j = 1, 2)$  are the coefficients of the model, and  $\mu_t$  and  $\epsilon_t$  denotes the residuals. Ordinary least squares can be used to estimate the coefficients, and F tests can identify the Causality relationship between X and Y.

## **Findings**

A detailed overview and evaluation of the empirical findings are provided in this section. The results of the descriptive statistics for the chosen variables from 1987 to 2021 are shown in Table 2. A number of measurements are used in the calculation of descriptive statistics. All of the variables' numerical measurements for the descriptive data exhibited reasonable distribution with a zero mean and constant variance. For instance, the results of the Jarque-Bera test demonstrate that the GN, FDI, CB, DC, and M variances are normally distributed. The mean value of GN is 10.836, and its lowest and maximum values are -0.0112% and 23.915%, respectively. For each of the variables under examination, the values of skewness (near 0) and kurtosis (near 3) are used to further validate the obtained statistics.

**Table 2. Summary statistics**

	<b>GN</b>	<b>FDI</b>	<b>CB</b>	<b>DC</b>	<b>M</b>
Mean	10.836	4.7149	1.3330	31.512	71.803
Median	9.0055	3.1332	1.3044	28.855	72.170
Maximum	23.915	23.038	2.7797	54.848	93.526
Minimum	-0.0112	-0.0317	0.2639	20.075	53.700
Std. Dev.	7.1235	5.9185	0.8429	11.130	9.7430
Skewness	0.4819	1.8040	0.1091	0.6656	0.0184
Kurtosis	1.7523	3.2392	1.7310	2.0599	2.4996
Jarque-Bera	3.6252	31.583	2.4179	3.8735	0.3671
Probability	0.1632	0.0000	0.2984	0.1441	0.8323
Observations	35	35	35	35	35

Source: own processing

After the statistical analysis, a pair-wise correlation is computed in Table 3 to examine the connection and real link among the factors. The empirical findings show that all the variables are significantly related to one another, but the specific link is not especially strong enough to create a multicollinearity issue because the correlation between each

explanatory factor (FDI, CB, and M) is less than 0.90. (Shin et al., 2014). Additionally, according to Gujarati (2022), any regression assessment requires an association between all regressors; however, this association cannot be greater than the predefined threshold of 0.90. Greater values indicate the prevalence of a serious multicollinearity problem. Consequently, the study estimated the VIF test in order to dismiss the presence of multicollinearity, hence, in Table 3, the values of VIF and adherence for all the explanatory factors are less than 5 and more than 0.10. This clearly ascertains that the data is free from the multicollinearity problem. Moreover, the established relationship between the explanatory and reliant variables shows that all other variables including FDI inflows, central bank assets, and money supply are positively related to gross national saving, with the exception of domestic credit to the private sector, which showed a weak negative relationship.

**Table 3. Correlation matrix**

	GN	FDI	CB	DC	M
GN	1.0000	0.3572	0.2087	-0.1544	0.4325
FDI	0.3572	1.0000	0.3033	-0.5531	0.3028
CB	0.2087	0.3033	1.0000	-0.6404	-0.1206
DC	-0.1544	-0.5531	-0.6404	1.0000	0.0358
M	0.4325	0.3028	-0.1206	0.0358	1.0000
VIF		1.70	1.73	2.28	1.19

Source: own processing

As illustrated by the ADF and PP stationarity tests, Table 4 depicts the absence of unit root in all the variables. According to the results, except for a few variables that exhibit a blended stationary situation, the factors under investigation are stationary at the first difference. For instance, CB, DC, and M exhibit stationary properties at first difference whereas GN, and FDI reveal stationarity at both the level and first order. Moreover, these estimates show that neither of the variables is stationary or integrated at the second difference. The blended order of integration at I(1)/I(0) but not at I(2) supports the route toward examining long-run and short-run connections using a bound testing approach (Pesaran et al., 2001).

**Table 4. Unit root testing results**

<b>ADF Tests (at the Level) I(0)</b>					
Variables	GN	FDI	CB	DC	M
T-stat. and p-values *	-2.753* (0.075)	-2.794* (0.070)	-1.925 (0.317)	-1.982 (0.292)	-2.026 (0.274)
<b>At the first difference I(1)</b>					
Variables	GN	FDI	CB	DC	M
T-stat. and p-values *	-8.508*** (0.000)	-4.991*** (0.000)	-3.459** (0.015)	-6.424*** (0.000)	-5.828*** (0.000)
<b>P-P test (at the level) I(0)</b>					
Variables	GN	FDI	CB	DC	M
T-stat. and p-values *	-2.736* (0.078)	-1.934 (0.313)	-1.363 (0.588)	-1.988 (0.290)	-2.190 (0.213)
<b>At the first difference I(1)</b>					
Variables	GN	FDI	CB	DC	M
T-stat. and p-values *	-8.360*** (0.000)	-5.684*** (0.000)	-3.473** (0.015)	-6.383 (0.000)	-5.828*** (0.000)

Note: \* Represents the single-sided probabilities according to MacKinnon (1996). Whereas, \*, \*\*, \*\*\* denote significance at 10%, 5%, and 1% level.

Source: own processing

Assessing the structural breakdowns of the data being studied allows for a more thorough evaluation of the sequence of integration. To continue the investigation, we used the dickey fuller test of a structural break. A similar stable condition of the data is provided by the empirical findings of the structural break test in Table 5 as calculated for the ADF and PP tests in the earlier unit root tests. Based on the results the majority of the variables,

namely GN, CB, DC, and M, highlight stationarity at the first difference with a structural break in 2009, 2017, 1998, and 2009, respectively. Conversely, FDI inflows is integrated at a level with a fundamental break in both 2008 and 2009.

**Table 5. Structural break unit root test**

Variables	Exogenous	I(0)		I(1)		Decision
		T-stat	Time break	T-stat	Time break	
GN	Trend and intercept	-4.751	2008	-8.839***	2009	I(1)
FDI	Trend and intercept	-9.049***	2005	-7.041***	2007	I(0) I(1)
CB	Trend and intercept	-2.976	1998	-5.169**	2017	I(1)
DC	Trend and intercept	-4.837	2008	-7.030***	1998	I(1)
M	Trend and intercept	-4.742	1999	-6.500***	2009	I(1)

Notes: \*, \*\*, and \*\*\*, show the significance level, i.e., 1%, 5%, and 10%, respectively.

Source: own processing

According to Table 6's Granger causality assessments, there is no indication of bi-directional causation and GN only affects DC and M in a specific direction at a 5% level of significance. These outcomes suggest the presence of one-way causality between gross national saving, domestic credit to the private sector, and money supply. This implies that the availability of domestic credit to the private sector spurs investment and economic activity, leading to higher income levels. Hence, rise in income and encourages greater savings, influencing the overall pool of gross national savings.

Moreover, the flow of funds from savings into the banking system is a pivotal factor. When individuals or businesses save, they often deposit their surplus funds into banks. This contributes to the pool of available funds within the banking system. Banks, in turn, utilize these deposits to extend loans to individuals, businesses, and even the government. This process of lending creates new money, expanding the overall money supply in the economy. Additionally, the level of interest rates set by central banks plays a significant role in influencing savings behavior. Higher interest rates incentivize saving, as depositors can earn more on their savings. Conversely, lower interest rates encourage borrowing, stimulating economic activity. Accordingly, the funds borrowed from banks are typically invested in various economic activities. This investment leads to increased economic activity, generating income. A portion of this income is saved, contributing to the gross national savings. This entire process sets off a multiplier effect. As banks lend out a portion of their deposits, those funds are redeposited in the banking system, allowing for further lending and the creation of additional deposits.

**Table 6. Granger causality results**

Null Hypothesis	Decision	F-Statistics	Prob
FDI → GN	No causality	0.852	0.4372
GN ← FDI		1.629	0.2140
DC → GN	One-way causality	1.551	0.2296
GN ← DC		2.819*	0.0766
CB → GN	No causality	1.844	0.1769
GN ← CB		0.468	0.6307
M → GN	One-way causality	1.077	0.3542
GN ← M		2.838*	0.0755

Notes: \*, shows the significance level, i.e., 5%, and 10%, respectively.

Source: own processing

Further asymmetry in the sample data was examined using the BDS test after determining the static situation and direction of causation of the data. The disclosed results in Table 7 explicitly demonstrate that the null hypothesis of linearity is rejected at a 1% level of significance for the money supply, gross national saving, FDI inflows, central bank assets, and domestic credit to the private sector, indicating that the actual outlined series is non-

linear and not randomly dispersed, reflecting the presence of significant asymmetries. Moreover, Liu et al. (2020), as well as Ahad and Anwer (2021) noted that the basic ARDL limits assessment technique is inefficient for assessing long- and short-run connections across variables when sample data comprises a blended sequence of integration, one-way causality, and dynamic asymmetries. As a result, in this scenario, the NARDL model is used to assess the long- and short-run correlations between the variables and to address this issue.

**Table 7. Results of the BDS test**

Embedding Dimension = B					
Variables	B=2	B=3	B=4	B=5	B=6
GN	0.082***	0.136***	0.159***	0.163***	0.163***
FDI	0.110***	0.171***	0.207***	0.213***	0.209***
CB	0.117***	0.210***	0.244***	0.268***	0.276***
DC	0.164***	0.268***	0.339***	0.374***	0.391***
M	0.087***	0.138***	0.174***	0.180***	0.169***

\*\*\* implies a significance level of 1%.

Source: own processing

This analysis examined the impact of FDI inflows, domestic credit to the private sector, central bank assets, and money supply on gross national savings in Djibouti using the NARDL approach. According to the AIC, the F-statistic should be generated in a reasonable amount of time in favor to execute the limits test with the cointegration evaluation (Akaike Information Criterion). As per Table 8, the F statistic generates clinically important estimates and demonstrates the existence of a long-term association between the variables. Because the aggregate statistical significance is 13.59418, and it is more than the upper bound limit, hence suggesting the study components are co-integrated.

**Table 8. Bound test outcomes for the NARDL model**

Model	F-statistics	Significance	I(0)	I(1)	Remark
GN = f (FDI, DC, CB, M)	13.59418	10%	2.26	3.34	Co-integration exists
	8	5%	2.55	3.68	
		2.5%	2.82	4.02	
		1%	3.15	4.43	

Source: own processing

In the previous table after validating the existence of prominent long run correlations, the NARDL analysis is used to investigate the positive and negative effects that every explanatory variable (FDI, DC, CB, and M) has on the reliant variable (GN). Starting with the long-run estimates, Table 9's findings demonstrate that in the case of positive shocks an increase of 1% in FDI inflows raises gross national saving by 0.42%, whilst in the negative shocks an increase of 1% in FDI inflows reduces gross national saving by 0.01%. The positive impact of FDI inflows on gross national savings during positive shocks can be attributed to the fact that foreign direct investment often brings capital, technology, and job opportunities to Djibouti. This attracts more investments, creates income for residents, and encourages savings. While, the small reduction in savings during negative shocks may suggest that Djibouti's economy has become somewhat dependent on consistent FDI inflows. When these inflows decrease unexpectedly, it can lead to decreased economic activity and reduced income, impacting savings slightly. In regard to the connection between domestic loans granted to the private sector and gross national savings, we find a negative correlation in both the positive and negative shocks, demonstrating that a 1% increase in domestic credit granted to the private sector results in a 1.70 decline in Djibouti's gross national savings. This phenomenon can be understood as follows: When the private sector has easier access to credit, individuals and businesses may prioritize borrowing and spending over saving. This behavior can lead to lower savings rates. Moreover, the central bank's assets to GDP and money supply have a detrimental but minor impact on gross national savings in terms of positive shocks. On the other hand, we detect that a reduction of 1% in both the central bank assets to GDP and money supply results in a 2.83% and 0.54% increase in the gross national saving of

Djibouti. The detrimental but minor impact of central bank assets to GDP and money supply during positive shocks suggests that an expansionary monetary policy, which may involve increased money supply or central bank assets, does not significantly stimulate savings. This could be because such policies are more focused on boosting economic activity rather than encouraging saving.

There is also a presentation of the short-run dynamics. The results of the short-run estimate illustrate that the connection between long-run and short-run patterns did not change, despite changes in the components' amplitudes and degrees of significance. At the 1% critical threshold, the error correction term is negative and statistically significant, suggesting that the factors are changing to equilibrium at a pace of 2.52 times per year. It follows that a 1% decline in FDI inflows results in a reduction in gross national savings of 0.88% to 1.40% in the short run. This is due to the negative shocks of FDI inflows. Similar to this, the short-term reduction in Djibouti's gross national savings is caused by both the positive shocks of domestic credit given to the private sector and the central bank's asset to the GDP with an estimation of 2.78% to 7% respectively. It's noteworthy to observe how Djibouti's gross national saving decreases as central bank assets as a percentage of GDP decline. Finally, the money supply reveals distinctive results in lag, for instance, at lag order one a decrease of 1% in money supply enlarges the gross national saving while at lag order two the outcomes are inverse.

**Table 9. Non-Linear ARDL outcomes (long-run and short-run)**

<b>Long-run NARDL results</b>			
NARDL Model : (3, 0, 2, 1, 2, 2, 2, 0, 2)			
<b>Variable</b>	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-Statistic</b>
FDI <sup>+</sup>	0.422313***	0.082624	5.111261
FDI <sup>-</sup>	-0.014259	0.144711	-0.098536
DC <sup>+</sup>	-1.701940***	0.216294	-7.868648
DC <sup>-</sup>	-0.508608***	0.102454	-4.964269
CB <sup>+</sup>	-1.771180	0.977514	-1.811922
CB <sup>-</sup>	2.837294*	1.389998	2.041222
M <sup>+</sup>	-0.060784	0.082400	-0.737670
M <sup>-</sup>	0.542391***	0.068021	7.973896
<b>Short-run NARDL results</b>			
<b>Variable</b>	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-Statistic</b>
Constant	-4.840897***	0.896085	-5.402274
GN (-1)	1.051095***	0.099560	10.55736
GN (-2)	0.616169***	0.052867	11.65506
FDI_NEG	-0.884674***	0.114066	-7.755775
FDI_NEG (-1)	-1.401504***	0.155381	-9.019768
DC_POS	-2.719453***	0.229614	-11.84359
DC_NEG	-0.485465***	0.088276	-5.499390
DC_NEG (-1)	0.149760	0.097271	1.539615
CB_POS	-2.788518**	1.137231	-2.452024
CB_POS (-1)	-7.372213***	1.185787	-6.217146
CB_NEG	33.03480***	3.815255	8.658609
CB_NEG (-1)	20.00447***	3.366985	5.941360
M_NEG	0.160880**	0.058416	2.754046
M_NEG (-1)	-0.473631***	0.075423	-6.279697
ECM (-1)	-2.523422***	0.161316	-15.64274

Note: \*, \*\*, and \*\*\* represent significance level at 10%, 5% and 1%, respectively.

Source: own processing

Finally, we conducted tests for autocorrelation (Durbin-Watson), serial correlation (Breusch-Godfrey LM), heteroskedasticity (Breusch-Pagan-Godfrey test, ARCH, and Glejser), and the normality test (Jarque-Bera) to confirm that the NARDL model was accurate. Table 10 provides evidence that the model is normally distributed and is free of the issues of autocorrelation, serial correlation, and heteroskedasticity.

Table 10. Diagnostic test

Tests	Coeff/prob.
R <sup>2</sup>	0.9708
Durbin-Watson test	2.8374
Jarque-Bera test for normality	0.8639 (0.6492)
Heteroskedasticity Test: Breusch-Pagan-Godfrey	0.9659 (0.5609)
Heteroskedasticity Test: ARCH	0.8906 (0.3531)
Heteroskedasticity Test: Glejser	1.1886 (0.4232)
Breusch-Godfrey for Serial Correlation LM Test	2.0304 (0.2121)

Source: own processing

We additionally employed the CUSUM and CUSUMQ plots to examine the approach for parametric and variance stability. Figure 1 demonstrates the model's robustness and fall inside the 5% criterion of the significance zone except for the year 2019.

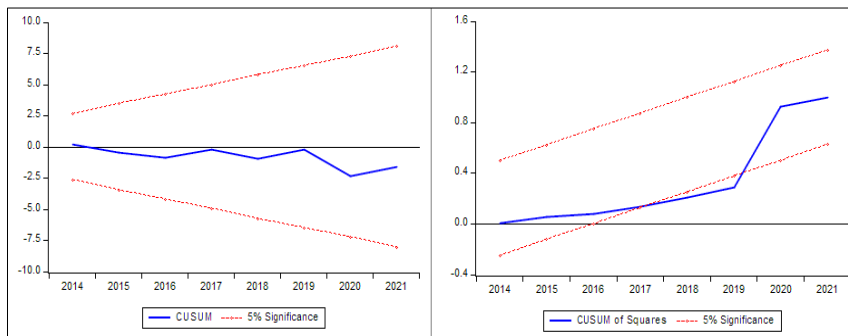


Figure 1. CUSUM and CUSUMQ test

Source: own processing

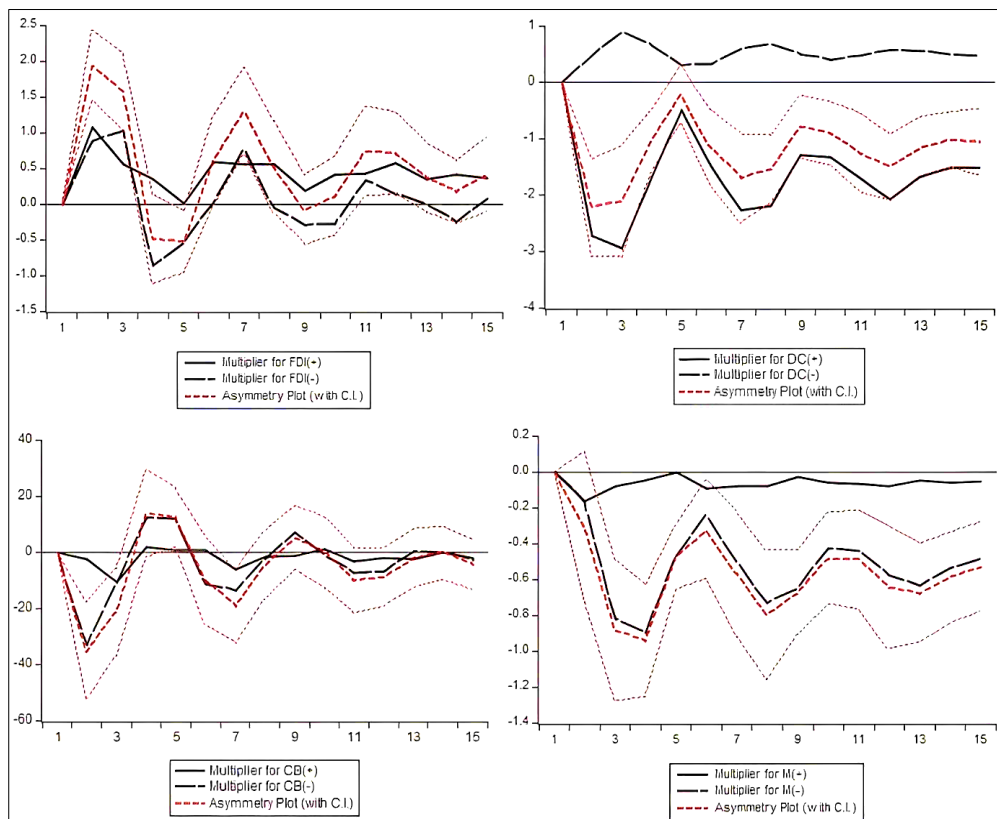


Figure 2. Dynamic multiplier visualizations combining the explanatory factors with the dependent variable

Source: own processing



The asymmetric NARDL static multiplier effects in Figure 2 emphasize the positive and negative shocks of all the predictor factors on gross national savings. The graphic shows the components' positive and negative effects on gross national savings as depicted by the thick and dotted black lines, respectively. The substantial asymmetry between the positive and negative shocks in respect of domestic credit to the private sector and money supply to gross national savings is apparent in this NARDL multiplier effects figure. Moreover, the dynamic multiplier graphs were employed to test the stability of the projected long-term results. These graphs also demonstrate that all variables, with the exception of the consumer price index, exhibit long-run asymmetries because the zero line (dotted solid red line) is noticeable and remains between positive and negative change, with the exception of FDI inflows, which seem to linger above the positive and negative shocks.

## **Conclusion**

Sustaining economic growth and progress, as well as ensuring a long-term economic order, is critical for both established and emerging countries. The reason that nations' growth rates fluctuate is sometimes linked to disparities in their savings and investment rates. The major sources of an economy's economic improvement are savings and the investments into which those savings are finally turned. Savings, particularly domestic savings, are the primary source of funding for wealth creation and investment. Higher levels of national savings and greater capital stock enhance country development by assuring the long-term sustainability of growth. In the event of insufficient national savings, current account deficits would occur, exposing the country to exogenous shocks as reliance on foreign funds would increase for funding output, jeopardizing the sustainability of economic growth. As a result, the causes of domestic savings and the elements that might be successful in growing domestic savings are among the significant study subjects that many researchers and policymakers are interested in.

One of the main aspects affecting a country's potential gross national savings is the growth of its financial sector. Inadequate savings rates are the most significant impediment to long-term growth and development, particularly in emerging nations. Saving rates must be adequate for Djibouti to finance long-term and sustainable growth projects. National saving rates in Djibouti, on the other hand, have been declining since the early 2009s. The national saving rate, which was 23.91% of GDP in 2009, has fallen to 5.25% by 2021. Raising domestic savings in order to achieve high and stable growth rates and reduce foreign dependency is one of the primary goals to be achieved during the next ten years. Within this scope, the present paper investigated the impact of the financial sector on the gross national saving of Djibouti from the period 1987 to 2021. The paper used the country's Gross national savings (% of GDP) as a dependent variable. Additionally, to carry on with the examination Non-Linear Autoregressive Distributed Lag (NARDL) model and Granger causality test are performed to capture the long-run and short-run dynamic relationship among the variables. As well as to determine the direction of these relationships.

Starting with the long-run association, the model revealed that the positive shocks of FDI inflows rises the gross national saving of Djibouti substantially, while the negative shocks of FDI inflows reduce the national saving. These results are in line with Nagawa et al. (2020) who investigated the determinants of gross domestic savings in Uganda. The author used a conventional ARDL model and found that FDI has a notable and positive impact on the domestic saving of Uganda. On the other hand, the findings are conflicting with the results of Chani et al. (2010) who discovered the existence of a causal link that runs in both directions between FDI and gross domestic savings in Bangladesh, whereas the current paper revealed no permanent causality between the FDI and national savings of Djibouti. Consequently, the positive shocks from FDI increase capital, stimulate economic activity, and enhance productivity. Which leads to higher income levels, a multiplier effect on national income, increased exports, and job creation. Conversely, negative shocks may crowd out domestic investments, cause resource misallocation,

create dependency, and affect savings based on investment terms. Various factors, including government policies and economic conditions, influence this relationship. This can be explained by the fact Djibouti does not have an attractive market, nor cheap labor that may capture the international firms. Not only that but also the Djiboutian market is monopolized by government-owned companies hence, imposing restrictions and high taxes on foreign investments.

Next, both the positive shocks of the central bank assets to GDP and money supply exhibited to cause a detrimental influence on the national savings of Djibouti. On the other hand, a reduction of those financial components increases national savings in the long run. The positive shocks of central bank assets to national savings are supporting the result of Aleemi et al. (2015) which displayed that the real interest rate maneuvered by the central bank negatively affects the national saving of Pakistan. And, the doctoral dissertation of Olkamo (2021) which uncovered that during the short run, the deposit interest rate negatively decreases the national saving of Ethiopia by 2.07%. Moreover, the negative outcome of the money supply in proportion to the gross national saving of Djibouti is in conformity with the findings of Khan et al. (2017) and Touny and Khder (2013). Because, the authors demonstrated an increase in the money supply in countries such as (Pakistan, China, Singapore, Japan Turkey, Saudi Arabia, and Russia) rises considerably the national savings. In a typical economic scenario, an increase in the money supply can lead to higher spending and investment, potentially stimulating economic growth. However, if this increase is excessive or not well-managed, it can lead to inflation. Inflation erodes the purchasing power of money, which can discourage people from saving in traditional forms like cash or low-interest savings accounts. Therefore, in the context of Djibouti, if positive shocks to the central bank and an increase in the money supply are leading to detrimental effects on national savings, it might suggest that: The increase in the money supply is not being effectively absorbed by productive investments or consumption, potentially leading to excess liquidity in the system. Inflation may be eroding the real value of savings, discouraging people from saving in Djibouti's domestic currency. Or worst, there might be structural issues in the economy that are not allowing the increased money supply to translate into sustainable economic growth.

Finally, both the negative and positive shocks of domestic loans offered to the private sector demonstrated to causes a decrease in the national saving of Djibouti. These outcomes are in conflict with the results of Narayan and Siyabi (2005). Since, both authors unveiled that credit provided to the private sector in Oman rises the country's savings by 0.89%, whilst the current paper is saying otherwise. Additionally, the findings are challenging the results of Ojo and Adepoju (2021) who observed that credit to the private sector is responsible for an increase in National savings in Nigeria. In accordance with these findings, we determine that the financial sector of Djibouti is still in its infancy phase and yet to contribute significantly to stimulating the national savings of the country. Nevertheless, considerable components of the financial sector development such as the positive shocks of FDI inflows, and both the negative shocks of central bank assets and money supply expressed to favorably stimulate the gross national saving of Djibouti.

Although the mechanism of overseas monetary inflows to stimulate Djibouti's economy and driving financial sector growth is rather skeptical considering the fact the country's level economy freedom. For instance, according to the heritage foundation that deals with economic freedom, the Republic of Djibouti scores 56.1 and ranks 112 worldwide respectively. Indeed, A nuanced cornerstone in the strategy of banking and financial institutions aimed at fostering domestic savings is discernible through the prism of a nation's level of economic freedom, which, in retrospect, wields considerable influence over the influx of foreign direct investment (FDI). Caetano and Caleiro (2009) embarked on a comprehensive inquiry into Economic Freedom Index (EFI) and its components variables' on FDI trends, scrutinizing the Middle East and North Africa, as well as the European region, employing a cluster analysis methodology. Their discerning findings underscored a salient connection: Economic Freedom and the inward flow of FDI exhibit a positive and symbiotic relationship, particularly within clusters characterized by higher

levels of economic freedom. Furthermore, Mohamed and Sidiropoulos (2010) delved into an extensive exploration of FDI dynamics and its determinants across 12 Middle East and North African countries, encompassing Egypt, Jordan, Lebanon, Syria, Algeria, Tunisia, Morocco, Yemen, Kuwait, UAE, Oman, and Saudi Arabia. Their discerning analysis unveiled a constellation of pivotal factors steering the course of FDI inflows. These encompassed institutional variables, the strategic leverage of natural resources, the dimensions of government size, and the host economy's overarching characteristics. Additionally, the authors highlighted the catalytic role of government initiatives in shaping FDI patterns, including the imperative reduction of corruption, the establishment of robust institutions, the dismantling of trade barriers, and the cultivation of a resilient financial infrastructure.

Generally, banks play a crucial role in capital allocation and savings aggregation in the majority of economies. There is much debate over the relationship between a healthy banking system and strong economic growth, with strong arguments positing that this connection is beneficial. Notably, the heart of the economic development paradigm is the issuance of credit by banks (Ben Ali et al., 2016). And, generally, due of the banking sector's obvious susceptibility during crisis periods, recent crises have significantly pushed this topic to the fore of study and policy concerns. In this context, various studies stress that the strength of institutional frameworks has a significant impact on bank performance that extends beyond the bounds of the banking system's basic features (Barth et al., 2007). The destructive influence of corruption appears as a strong barrier to the life and operation of the banking industry as regulatory authorities work to create a more effective institutional framework for financial intermediation. Furthermore, Boateng et al. (2019) underscores the profound influence of institutional quality on the propensity of individuals and entities in the region to engage in savings activities, contributing to a richer understanding of economic dynamics within this context.

On the supply side, unscrupulous bankers may succumb to bribes in exchange for granting preferential treatment to high-risk loan applicants. On the demand side, individuals engaging in corrupt practices as defaulters may resort to bribery to mitigate their penalties, consequently elevating the likelihood of loan defaults (Goel & Hasan, 2011). Hence, in the absence of efficacious policies aimed at combating corruption and the absence of a transparent government framework that strategically organizes and furnishes incentives to the banking sector, the prospect of witnessing an elevation in the prevailing savings rate remains improbable.

As a potential recommendation from a financial perspective to encourage national savings, we propose that Djibouti must assist financial innovation by implementing structural frameworks that motivate the deployment of new technologies, laws that sustain venture capital, and start-up initiatives that facilitate cooperation among firms. Second, governments may create a framework for savings policy that outlines specific goals and tactics for fostering savings growth. This framework could entail actions like defining standards for savings, devising a national savings plan, and putting policies in place that encourage savings development. Finally, incentives for saving might be offered by the government in the form of tax breaks, financial aid, or matching contributions. Governments might, for instance, give subsidies for low-income households to obtain insurance products or grant tax exemptions for contributions made to retirement savings accounts. Finally, financial institutions can create products that relate savings to a particular objective or purpose, such as saving for retirement, housing, or education. This can provide people with a concrete reason to save money and make it simpler for them to create and meet their financial objectives. Ultimately, from a financial standpoint, raising gross national savings necessitates a multifaceted strategy including the government, financial institutions, and people. By putting the aforementioned suggestions into practice, policymakers may create an atmosphere that encourages savings growth and aids people and households in reaching their financial objectives.

Several policy implications can be extracted from this paper. First, promoting Financial Inclusion, this involves ensuring that a wider segment of the population has access to

financial services. Measures may include expanding the reach of banks, promoting mobile banking, and encouraging the establishment of microfinance institutions. By including more people in the formal financial system, the overall savings rate can potentially increase. Second, introducing a variety of savings instruments like fixed deposits, government bonds, and pension schemes provides individuals and businesses with options to save and invest their money. Offering tax incentives or subsidies on specific savings instruments can incentivize people to put more money into savings. Third, effective regulation of interest rates to ensure that they remain fair and competitive. This prevents predatory lending practices and maintains an environment where individuals and businesses can earn reasonable returns on their savings. Fourth, investing in financial education programs can empower individuals to make informed decisions about saving and investing. This can lead to more prudent financial behavior and an increase in overall national savings. Fifth, creating an attractive environment for investment, through measures such as reducing bureaucratic hurdles, providing incentives for businesses, and ensuring political stability, can encourage both domestic and foreign investment. This, in turn, can stimulate economic growth and potentially lead to higher savings. Furthermore, establishing a sound regulatory framework for the financial sector is crucial. This includes effective supervision of banks and financial institutions to ensure stability and prevent excessive risk-taking that could negatively impact savings. Finally, ensuring coordination between monetary and fiscal policies is essential. For instance, maintaining a stable inflation rate and interest rate environment can positively impact saving behavior. By implementing these policies, Djibouti can work towards leveraging financial sector development to stimulate gross national savings, which, in turn, can contribute to sustainable economic growth and development.

To sum up, the current paper will assist policymakers and nations in the effective way of exploiting the financial sector to improve gross national savings. It will also provide evidence on how to put in place long-term strategies that can reduce government debt and stimulate savings. Not forgetting the paper also offer insights into the importance of long-term investments.

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