INTERNATIONAL DEMONSTRATION EFFECT AND DOMESTIC SAVINGS IN NIGERIA: AN ECONOMETRIC ANALYSIS

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Abstract

The paper attempted a validation of the "international Demonstration Effect Hypothesis in Nigeria. The study employed annual time series data sourced from world development Indicators for the period 1996 and 2021. Autoregressive Distributed lag model (ARDL model) was adopted as the estimation technique for the study. The empirical results of the estimated models do not support the hypothesis that international demonstration effect when proxied with percent of the population with access to the internet depresses savings mobilisation efforts in Nigeria over the period of the analysis. It is recommended that more rigorous analysis and alternative proxies be explored before a conclusive position could be taken on the proposition.

KEY WORDS: National Savings Determinants, Demonstration Effect, Capital Formation, Behavioural Economics

1.0 Introduction

National saving is a veritable means through which an economy can mobilize massive financial resources towards economic growth and development (Cavallo and Serebrisky, 2016). Yet countries in Sub-Saharan Africa including Nigeria have recorded some of the lowest national savings rates in the last four decades. The average saving rates was below 20 percent. This is in contrast with the high-growth countries of East-Asia that records savings rates that is above 30 percent. A key argument put forth by scholars is the possibility that aggregate consumption and resultantly savings rates are affected by international demonstration effect (Becerra, Cavallo and Noy, 2015; Rius, and Román, 2021). Nurkse (1953), viewed demonstration effect as the often propensity to consume foreign goods by consumers in developing countries, arising from imitating or emulating the consumption pattern of citizens of advanced –neighbouring countries. This could develop through access to internet, watching foreign Television channels, watching of foreign movies or firms, reading foreign magazines and visiting abroad. Since the citizen of the country are exposed to the consumption pattern and life style in the wealthy western countries, there is the tendency to mimic them. The direct consequence of such consumptions behaviour as witnessed over the years in Nigeria is the low national saving level and poor fixed capital formation- which has continued to put the economy among the poor of the poorest in the committee of nations.

This area of study has not enjoyed research interest by scholars in recent time. The preponderance of empirical studies attempts a partial approach to this all important research area by either looking at determinants of savings or how saving impact on economic growth in the economy. The practical and empirical analysis of international Demonstration effect hypothesis is novel in the context of research outcomes in Nigeria

In view of the foregoing, this study is motivated to test the validity of International Demonstration Effects on domestic savings drive. Specifically, the study will examine trends in domestic savings in Nigeria in the last three decades; analyze the effects of international demonstration effect and other identified determinants on domestic savings. The rest of the paper is as follows: Section two present the literature review, section three articulates the

methodology, section four focuses on the presentation and discussion of results, while section five concludes the paper,

2.0 Literature Review

2.1 Stylized facts about saving and Demonstration Effect

Over the last decade, savings in Nigeria have shown a mixed trend, with periods of growth and contraction.

According to data from the Central Bank of Nigeria, the ratio of savings to GDP in Nigeria increased from 13.5% in 2010 to 18.3% in 2013, before declining to 13.1% in 2016. Since then, savings have gradually increased to 14.4% in 2019, before dropping to 13.4% in 2020 (CBN Statistical Bulletin, 2020).

Figure 1: Trends in real gross domestic savings (RGDS) & International Demonstration Effects (IDE)
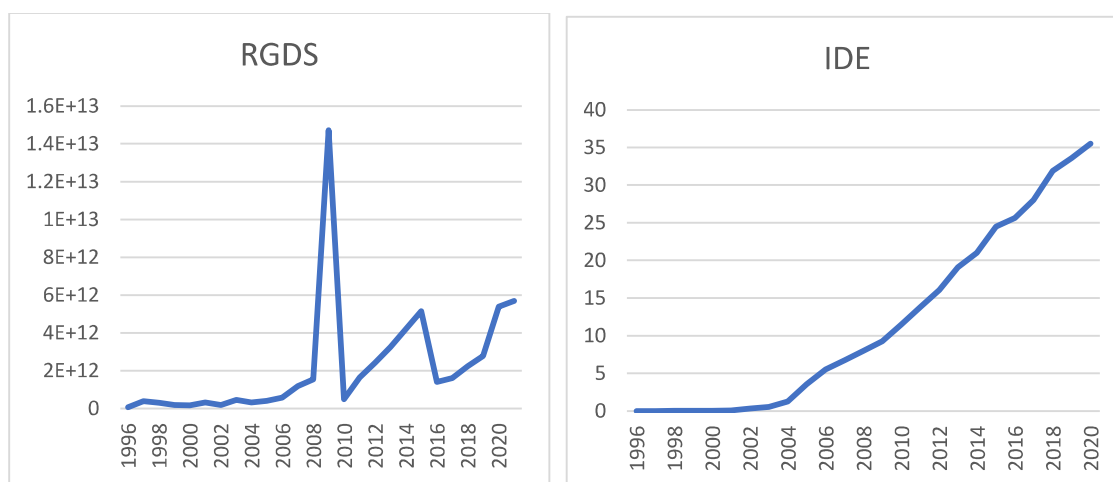
Source: Authors' Computation

One factor that may have contributed to the decline in savings in Nigeria over the last decade is the low-interest-rate environment. Interest rates in Nigeria have been low in recent years, which has made it less attractive for people to save in bank deposits or other low-risk instruments.

Additionally, high inflation has eroded the purchasing power of savings, making it more challenging for people to save and preserve the value of their savings.

However, the Nigerian government has taken steps to promote savings and investment, such as the introduction of various savings and investment schemes and the implementation of policies aimed at reducing inflation and increasing economic growth.

Overall, while the trend in savings in Nigeria over the last decade has been mixed, there are indications that efforts are being made to encourage a savings culture and support economic growth(see figure one). The value of gross domestic savings over the period 1996-2021 is generally increasing though not very much.

In the case of the measure of International Demonstration Effects measured by percent of the population that have access to internet increased marked from less than one percent in 1996 to about 35 percent in 2020.

2.1.1 Savings and Demonstration effect in developing countries

The international demonstration effect hypothesis suggests that individuals in developing economies are influenced by the consumption patterns and lifestyles of people in more developed countries, and may seek to emulate those patterns and lifestyles themselves. This can lead to increased demand for consumer goods and services, as well as changes in attitudes towards saving and investment (Chiang, 1959).

One potential link between private savings and the international demonstration effect hypothesis is that increased exposure to Western lifestyles and consumption patterns may lead to a shift away from traditional savings practices in developing economies. As individuals in these economies become more focused on consumption and consumer goods, they may be less inclined to save their income for the future (Chiang, 1959' Liu and Sun, 2005).

However, there are also arguments that exposure to Western lifestyles and consumption patterns may actually increase private savings in developing economies. For example, individuals who observe the high levels of personal savings and investment in Western countries may be motivated to save more themselves, in order to achieve similar levels of financial security and stability.

Generally, the relationship between private savings and the international demonstration effect hypothesis is complex and may vary depending on a range of factors, including individual attitudes towards saving, access to financial services, and broader economic and social conditions.

2.1.2 Saving and financial depth (Ms/GDP Ratio) in Nigeria

In general, financial depth refers to the size and activity of financial markets in an economy, while savings refer to the portion of income that is not consumed but set aside for future use. There is often a positive relationship between financial depth and savings, as a more developed financial system can provide more opportunities for savings and investment.

Financial depth which is also the measure of financial deepening is conceptualized as wider scope of financial services or markets providing financial intermediation to a wider spectrum of the society. Traditionally, proponents of financial deepening believed that the liberalization of the financial markets engendered enhanced saving mobilization and increased economic growth through the monetary transmission channels. This was the basis of financial reforms in Nigeria since the Structural Adjustment Program in 1986. The wisdom of the financial reforms in Nigeria was to increase the number and types of financial institutions offering wide range of financial services to impact the real sector positively. Meaning that there will be more liquidity in the economy and more investors will have access to loanable funds for investment purposes and hence economic growth (Nwosu et al, 2021; Shaw, 1973). However, financial reforms in Nigeria has not translated to sound financial system as the subsequent evidences demonstrated avalanche of bank failures occasioned by unprofessional practices, insiders abuses and poor qualities of financial assets.

For instance, CBN (Central Bank of Nigeria) has hitherto effected numerous financial reforms over the years, to boost the operational efficiency of Deposit Money Banks (DMBs), and its capacity to deliver financial intermediation effectively and as well strengthen the asset based of the institutions. Among other objectives. This ranges from the years of free banking to period of regulation, and then liberalization of the financial markets. Others include Banks' consolidation and the various financial development strategies (Bamidele, Jibrin and Isa,2015; Nwosu et al, 2021). And recently, the CBN's monetary policy stance on naira redesign policy, which hitherto led to untold financial hardship in the country. This analysis bring to the fore,

the failures of financial policy reforms of the CBN in curbing the myriads of problems militating the process of saving mobilization in Nigeria.

2.1.3 Saving and interest rate in Nigeria

The relationship between saving and interest rates in Nigeria, as in any other country, is generally positive. When interest rates rise, savers are incentivized to save more money because they can earn a higher return on their savings. Conversely, when interest rates fall, savers may be less inclined to save because the return on their savings is lower.

In Nigeria, the Central Bank of Nigeria (CBN) sets the monetary policy rate (MPR), which is the benchmark interest rate used to guide interest rates in the economy. Changes in the MPR can have a ripple effect on other interest rates in the economy, such as savings rates.

It's worth noting that other factors, such as inflation and economic growth, can also influence the relationship between saving and interest rates in Nigeria. High inflation can erode the purchasing power of savings, leading savers to demand higher interest rates to compensate for the loss of value. Economic growth, on the other hand, can boost income levels and increase the availability of savings, which can put downward pressure on interest rates.

In a nutshell, the relationship between saving and interest rates in Nigeria, as in any other economy, is complex and influenced by multiple factors. Particularly, interest rates on deposits in Nigeria is close to zero in Nigeria, hence the incentives for savings is not appeared to be no-existent in the country

2.1.4 Saving and inflation rate in Nigeria

The relationship between saving and inflation rate in Nigeria, as in any other country, is generally negative. High inflation erodes the purchasing power of money, which means that the same amount of money can buy fewer goods and services over time. This can discourage saving because savers will have less real value in their savings.

In Nigeria, high inflation has been a persistent problem over the years, with inflation rates averaging around 11% between 2010 and 2020 (CBN statistical Bulletin, 2021). This has made it challenging for savers to preserve the value of their savings, particularly those who save in low-yielding or fixed-income assets such as bank deposits, bonds, and other debt instruments.

To counteract the negative effects of inflation, savers in Nigeria may seek out high-yielding assets such as equities or foreign currency, which can provide some protection against inflation. However, these assets can also be risky and volatile, so savers need to be cautious when investing their savings.

Overall, the relationship between saving and inflation rate in Nigeria, as in any other economy, is complex and influenced by multiple factors such as interest rates, economic growth, and government policies.

2.1.5 Saving and real GDP per capita in Nigeria

The relationship between saving and real GDP per capita in Nigeria, as in any other country, is generally positive. Real GDP per capita is a measure of a country's economic output per person adjusted for inflation, and it is often used as an indicator of a country's standard of living. As a country's real GDP per capita increases, people generally have more disposable income, which can enable them to save more money.

In Nigeria, there has been a positive trend between real GDP per capita and savings over the years. As the Nigerian economy has grown, so has the average income of Nigerians, and this has allowed people to save more money. Additionally, a growing economy may provide more

opportunities for investment, which can encourage people to save in order to take advantage of these opportunities.

However, it's worth noting that the relationship between saving and real GDP per capita in Nigeria, as in any other economy, is complex and influenced by multiple factors. For example, government policies, inflation, interest rates, and exchange rates can all affect the incentives to save and invest. Overall, while a positive relationship exists between saving and real GDP per capita in Nigeria, other factors also play a role in determining savings behavior in the country.

2.1.6 Saving and Exchange rate volatility in Nigeria

The relationship between savings and exchange rate movement in Nigeria, as in any other country, is complex and can have both positive and negative effects.

On the one hand, a depreciating exchange rate in recent can increase the value of exports, which can boost economic growth and increase the income of people who work in export-oriented industries. This can create more opportunities for savings as people have more income to put away.

On the other hand, a depreciating exchange rate can also lead to higher inflation and increased import costs, which can erode the purchasing power of savings. This can discourage people from saving, as they may feel that their savings will be worth less in the future.

In Nigeria, the exchange rate has been a significant issue in recent years, with the Naira experiencing significant depreciation against major currencies like the US Dollar. This has made imports more expensive, which has put pressure on inflation and eroded the value of savings for those who have saved in local currency.

Overall, the relationship between savings and exchange rate movement in Nigeria, as in any other economy, is complex and influenced by multiple factors. Factors such as government policies, interest rates, inflation, and economic growth can all affect the incentives to save and invest, as well as the exchange rate movement.

2.1.7 Savings and Gini coefficient in Nigeria

The relationship between saving and the Gini coefficient in Nigeria, as in any other country, is complex and can have both positive and negative effects.

The Gini coefficient is a measure of income inequality that ranges from 0 to 1, where 0 represents perfect equality and 1 represents perfect inequality. In Nigeria, the Gini coefficient has been relatively high, indicating a high level of income inequality.

On the one hand, high levels of income inequality can make it more challenging for people on lower incomes to save, as they may struggle to cover basic living expenses. This can limit the pool of savings in the economy and reduce the overall level of savings.

On the other hand, high levels of income inequality can also create opportunities for savings, particularly for those on higher incomes who have more disposable income. Additionally, policies aimed at reducing income inequality, such as social welfare programs or progressive taxation, can increase the disposable income of lower-income earners and promote a savings culture.

Overall, the relationship between saving and the Gini coefficient in Nigeria, as in any other economy, is complex and influenced by multiple factors. Other factors such as interest rates, inflation, economic growth, and government policies can also affect the incentives to save and invest, as well as income distribution.

2.1.8 Impact of Government policies on saving in Nigeria

Government policies can have a significant impact on saving mobilization in Nigeria, as in any other economy. Here are some ways in which government policies can affect savings mobilization in Nigeria:

i. Interest rate policy: The Central Bank of Nigeria can set interest rates, which can influence the incentive to save. High interest rates can make it more attractive for people to save, while low interest rates can discourage saving and encourage borrowing. By adjusting interest rates, the government can encourage or discourage saving.

ii. Tax policies: Tax policies can also affect saving behavior. For example, tax incentives can encourage people to save for retirement, education, or health expenses. The government can also offer tax breaks for contributions to savings and investment accounts, such as pension funds or mutual funds.

iii. Pension reform: The Nigerian government has introduced reforms to the pension system, including the creation of the Contributory Pension Scheme (CPS), which requires employers to contribute a percentage of employees' salaries to a pension fund. These reforms aim to encourage long-term savings and retirement planning.

iv. Financial literacy programs: The government can promote financial literacy programs to educate the public on the benefits of saving and investing. Such programs can also provide information on different savings and investment options, such as bank deposits, mutual funds, or government bonds.

v. Economic growth and stability: Finally, government policies that promote economic growth and stability can indirectly encourage saving by providing people with more confidence in the future and better job prospects. A stable and growing economy can provide people with the resources and incentives to save and invest for the future.

Overall, government policies can play an important role in mobilizing savings in Nigeria. By promoting saving behavior and creating the right incentives, the government can encourage people to save and invest for the future, which can support economic growth and stability. However, the reverse is the case in Nigeria. It is pretty difficult at a policy of government over the years that has induced savings so far.

2.1.8 Conceptual issues in saving and Demonstration effect

The demonstration effect refers to the phenomenon where people's consumption and saving decisions are influenced by the behavior of others, particularly those in their social networks or those whom they admire or aspire to be like. This effect can have important implications for how people save and spend their money and can affect overall savings rates in an economy (Liu and Sun, 2005).

One conceptual issue related to the demonstration effect and saving is the question of how to measure the effect. While the effect is widely recognized, it can be challenging to quantify its impact on savings behavior, as it is difficult to isolate the effect of social influence from other factors that affect savings behavior.

Another conceptual issue is the relationship between the demonstration effect and cultural norms around saving. In some cultures, there may be strong social norms around saving and frugality that override the influence of the demonstration effect. In other cultures, the demonstration effect may be more pronounced, and people may feel pressure to spend more in order to keep up with their peers or social group.

A related issue is the role of advertising and marketing in shaping people's consumption and saving decisions. Companies often use advertising to create a sense of aspirational lifestyle and to influence people's consumption and saving behavior. This can reinforce the demonstration effect and make it more challenging for individuals to resist the pressure to spend.

Specifically, therefore, the demonstration effect is an important concept in understanding how social influences and cultural norms can affect saving behavior. However, it is important to consider the many factors that can affect savings behavior, including interest rates, inflation, government policies, and individual preferences and attitudes towards saving and spending.

2.2 Theoretical Review

Some prominent economic theories of savings:

Life-Cycle Theory: This theory suggests that individuals save in order to smooth consumption over their lifetime. According to this theory, people save during their working years to support consumption during retirement when they are no longer working. This theory assumes that people have a predictable income stream over their lifetime and that they aim to maintain a stable standard of living. In the same context, Permanent Income Theory suggests that people save based on their expected permanent income rather than their current income. Permanent income is the average income an individual expects to receive over an extended period of time. People save in order to smooth their consumption over time, regardless of fluctuations in their current income.

Precautionary Saving Theory: This theory suggests that people save to protect themselves against unexpected events, such as job loss, illness, or other emergencies. According to this theory, people save more in situations where the risk of unexpected events is high, and they save less in situations where the risk is low.

Behavioral Economics Theory: This theory suggests that saving behavior is influenced by psychological factors such as cognitive biases and social norms. People may be influenced by factors such as loss aversion, present bias, and social pressure, which can affect their decision to save.

Keynesian Theory: This theory suggests that saving behavior is influenced by economic conditions such as interest rates and government policies. According to this theory, low interest rates and government policies that promote saving can encourage people to save more.

Ricardian Equivalence Theory: This theory suggests that people do not save in response to changes in government policies that affect their income or consumption. According to this theory, people recognize that any increase in income or decrease in taxes is temporary and adjust their saving behavior accordingly.

In General, these theories offer different perspectives on why people save and how their saving behavior is influenced by a range of factors.

2.3 Review of Empirical Studies

A growing number of empirical studies on the subject of demonstration effect on savings revealed interesting outcomes. Deaton, (1992) examines the role of the demonstration effect on savings behavior in developing countries. The author finds that households in these countries are more likely to save if they live in areas with higher levels of savings by others in their community. Deaton argues that the international demonstration effect can have a negative impact on savings behavior in developing countries. He suggests that individuals who are exposed to high levels of consumption by individuals from developed countries may be less likely to save.

In the same vein, Rosenzweig, and Wolpin, (1993) looks at the role of social networks in influencing savings behavior in rural India. The authors find that households are more likely to invest in durable assets when they observe their peers doing so, indicating a demonstration effect at work.

Epaphra (2014)empirically examines the determinants of savings in Tanzania for the 1970-2010 period. The conceptual framework for the paper is derived from the life-cycle/permanent income hypothesis. Augmented Dickey Fuller and Phillips-Perron tests are used to test stationarity of all the time series. To test long-run relationship of the variables, Johansen test is applied. The of the study reveal that disposable income, real GDP growth, population growth and life expectancy have a positive impact on savings in Tanzania. The results also reveal that inflation, has a negative impact on national savings.

Bamidele, Jibrin and Isa(2015) investigated the determinants of savings in Nigeria and lessons for policy, using descriptive and econometric analyses. Long-run static and short-run dynamic error correction models were estimated for the period, 1960 to 2013. The results indicated that the per capita income, inflation and the real interest rate affect savings as predicted by theory. This fully supports the McKinnon and Shaw hypothesis. It also indicated that the Keynesian absolute income hypothesis is found to hold in Nigeria. Intuitively, this indicated that the low disposable income was a strong impediment to savings mobilisation in Nigeria.

Gugerty (2007) examines the role of social pressure in promoting savings behavior in Kenya. The author finds that individuals are more likely to save when they are part of a rotating savings and credit association (ROSCA) and feel a sense of social obligation to their peers.

Menkhoff, Rungruxsirivorn, Schröder, and Sothorn, (2014) on their part analyzed the impact of financial literacy training on savings behavior among migrant workers in Thailand. The authors find that individuals who receive financial literacy training are more likely to save and that this effect is stronger when individuals observe their peers also saving. This study is the basis of Financial inclusion strategies of Central Banks globally. Financial literacy is central to financial inclusion and savings mobilization. Overall, these studies looks at the positive impact of demonstration effects in terms of savings mobilization. suggest that the demonstration effect can play an important role in influencing savings behavior in developing countries, particularly when individuals are part of a social network or community that values savings.

Other dimension of demonstration effect studies include the work of Banerjee, and Duflo, (2011).The book provides a comprehensive overview of various studies on the demonstration effect in developing countries. The authors discuss how social networks and peer effects can influence consumption and savings behavior, and provide examples from several studies conducted in different countries.

Beaman, et al (2014) examines the role of social networks in influencing borrowing and savings behavior among farmers in Mali. Their studies reveal that individuals are more likely to participate in credit markets when they observe their peers doing so, indicating a demonstration effect at work.

Bernard, et al (2017) looks at how changes in agricultural productivity and income affect consumption and savings behavior in rural Ethiopia. The authors find that households are more likely to save when they observe their peers doing so, suggesting a demonstration effect.

Gertler, et al (2011 provides an overview of impact evaluation methods and includes several studies that examine the role of the demonstration effect in influencing consumption and savings behavior in developing countries. Heston, et al (2012) provides data on the consumption patterns of individuals in different countries, and suggests that individuals in

developing countries are often influenced by the consumption patterns of individuals in developed countries and as a result, savings are discouraged.

Nohara, H. (2014) examines the impact of the international demonstration effect on savings behavior in Japan. The author finds that individuals in Japan decrease their savings behavior as they observe individuals from developed countries spending money or engaging in risky financial behaviors. Ozmen, (2010) analyzes the transmission of fiscal shocks across countries and finds evidence of a negative international demonstration effect on savings. The author suggests that exposure to high levels of consumption by individuals in developed countries can reduce the propensity to save in developing countries.

In similar vein, Bazzi, and Clemens (2013) investigates the relationship between economic growth and savings in developing countries. The authors find that exposure to high levels of consumption in developed countries reduce the propensity to save in developing countries, particularly among low-income individuals. Ceballos, et al (2015 looks at the impact of a local development program in Colombia and finds that exposure to consumption patterns of individuals in developed countries can lead to a reduction in savings behavior among individuals in developing countries.

Rius and Román (2021) tested demonstration effect theories exploiting international data on savings, incomes, and means of global exposure. We use two methods of media communication given that their penetration peaked at different times in the sample period: TV and internet were a means of discovering foreign consumption standards. The study found some evidence in favor of a statistically significant negative association for the demonstration effect.

Overall, these studies suggest that exposure to high levels of consumption by individuals in developed countries can have a negative impact on savings behavior in developing countries. The findings highlight the importance of understanding the potential negative effects of the international demonstration effect on savings behavior in order to develop effective policies that can promote savings and economic growth in developing countries.

3.0 Methodology

3.1 Specification of the model

The study employed econometric analyses. The econometric analysis specified a model based on the empirical work of Epaphra (2014), Bamidele, Jibrin and Isa (2015) which used variables identified by the life-cycle/permanent income hypotheses, including other variables suggested by some empirical studies in Tanzania and Nigeria respectively. This is together with the study by Rius & Román (2021) that based their analysis on relative income or demonstration effect hypotheses introduced by Duesenberry (1949) and later extended by Nurkse (1953). Following the literature, the empirical investigation employed time series data from 1996 to 2021 in evaluating the impact of international demonstration effects on gross domestic savings in Nigeria. The annual data on the variables (see table 1) were sourced from the World Development Indicators by the world Bank (2022).

TABLE 1: Description and Measurement of variables

Variables	Description	Measurement/Source
RGDS	Real gross domestic saving adjusted for inflation with gdp deflator	Million naira local currency units
IDE	International Demonstration effect	Individuals using the Internet (% of population)
PGDP	Per capita GDP	Million naira local currency units
FDEP	Financial deepening	Broad money as a % of GDP
INTS	Interest rate spread	lending rate % minus deposit rate %
RINT	Real interest rate	Real interest rate (%) is the lending interest rate adjusted for inflation as measured by the GDP deflator.

Source: Authors' compilation, 2023

This functional relationship can be specified in an estimable equation as follows:

$$LRGDS_t = \beta_1 + \beta_2 IDE_t + \beta_3 LPGDP_t + \beta_4 FDEP_t + \beta_5 INTS_t + \beta_6 RINT_t + U_t \quad \ldots(1)$$

L before a variable represent logarithms of the variable.

$\beta_i \ldots \beta_n$ = coefficients

The apriori signs are: $\beta_2, \beta_5 \leq 0$; while $\beta_3, \beta_4 \, and \, \beta_6 \geq 0$

4.0. Estimation Results and Discussion

4.1 Descriptive Statistics

The nature of the distribution of the variables is presented in Table 2. The Jacque-Bera statistics accepts the null hypothesis of normal distribution (since probability of Jacque-Bera statistics is greater than 0.05) for the variables IDE, PGDP, FDEP, INTS and RINT while RGDS but the hypothesis of normal distribution is reject for RGDS.

TABLE 2: Summary of the Descriptive Statistics of the Variables

variables	RGDS	IDE	PGDP	FDEP	INTS	RINT
Mean	2.20E+12	11.84983	298578.3	18.74368	7.773209	5.821788
Median	1.30E+12	8.000000	315018.4	21.35585	7.590000	6.051613
Maximum	1.47E+13	35.50000	379251.6	27.37879	11.06417	18.18000
Minimum	6.54E+10	0.008833	202311.4	9.063329	3.268333	-5.627968
Std. Dev.	3.09E+12	12.19464	63605.00	6.234979	1.676480	5.987708
Skewness	2.757611	0.624413	-0.364867	-0.205800	-0.237487	-0.182146
Kurtosis	11.47224	1.979918	1.594695	1.383589	3.706754	2.494527
Jarque-Bera	110.7129	2.708472	2.716345	2.898123	0.785527	0.420562
Probability	0.000000	0.258144	0.257130	0.234791	0.675188	0.810357
Sum	5.71E+13	296.2457	7763036.	468.5921	202.1034	151.3665
Sum Sq. Dev.	2.39E+26	3569.019	1.01E+11	932.9992	70.26461	896.3163
Observations	26	25	26	25	26	26

Source : Authors' computation

Correlation Matrix

The correlation matrix provides preliminary exploration of the relationship among the variables. In addition, it indicates suspected multicollinearity among the independent variables thus guiding the variables that can be put together in the estimated equations. A summary of correlation matrix is presented in Table 3. All the variables except INTS exhibit positive correlation with the dependent variable RGDS. Furthermore, IDE exhibit high correlation with PGDP and FDEP pointing to problem multicollinearity among these independent variables. To avoid this problem this correlation argues that the variable may not be included together in the estimated equation.

Table 3: Summary of Correlation Matrix

VARRIABLES	RGDS	IDE	PGDP	FDEP	INTS	RINT
RGDS	1.000000	0.372385	0.457734	0.535639	-0.183038	0.553780
IDE	0.372385	1.000000	0.851465	0.827669	0.087465	0.180996
PGDP	0.457734	0.851465	1.000000	0.879368	0.021602	0.226346
FDEP	0.535639	0.827669	0.879368	1.000000	0.029892	0.399531
INTS	-0.183038	0.087465	0.021602	0.029892	1.000000	0.011139
RINT	0.553780	0.180996	0.226346	0.399531	0.011139	1.000000

Source: Authors' Computation

4.2 Time Series Properties

The importance of checking whether the variables included in the estimation satisfy the requirement of being stationary to ensure reliable estimate cannot be over emphasis. In addition, the order of itegration of each variable need to be determined to ensure appropriate approach to test for the existence of long run relationship among them. The stationarity test was conducted using Augmented Dickey-Fuller (ADF) statistic with and without break point as warranted. The result of unit roots tests are presented in table 4.

Table 4: Unit Root Test

Variables	ADF at level	ADF at 1st Diff.	ADF at 1st Diff. with Break point	ADF critical Value at 5%	Order of Integration
RGDS	-2.88345**			-1.955020	(0)
IDE	-2.134700	-4.196220**		-3.612199	(1)
PGDP	0.514798	-2.905569	-4.88450**	-3.603202	(1)
FDEP	-2.848229	-4.029655**		-3.622033	(1)
INTS	-3.68538**			-2.986225	(0)
RINT	-3.500500**			-2.998064	(0)

*significant at 10% **significant at 5% ***significant at 1%
Source: Authors' Computation

Bounds Cointegration test

The results of Unit Root test obtained in Table 4 indicates that the variables are integrated of different order. Some are I(0) while others are I(1). This scenario warranted the use of Autoregressive Distributed lag(ARDL)Bound testing for cointegration developed by Pesaran et al. (2001) and its extension by Narrayan(2005) was used to test cointegration of the variables

because its robust enough to accommodate when there is mixture of I(0) and I(1) variable. Another concern that was taken into consideration in doing the cointegration test is avoid putting variables that are highly correlated into the same equation, thus necessitating estimating more than one equation by modifying equation one. Furthermore, semi-logarithmic form where applicable was specified to linearize the relationship and directly estimate their elasticities as follows:

$$LRGDS_t = \beta_1 + \beta_2 LIDE_t + \beta_5 INTS_t + \beta_6 RINT_t + U_t \ldots\ldots\ldots\ldots(2)$$

$$LRGDS_t = \beta_1 + \beta_3 LPGDP_t + \beta_5 INTS_t + \beta_6 RINT_t + U_t\ldots\ldots\ldots(3)$$

$$LRGDS_t = \beta_1 + \beta_4 FDEP_t + \beta_5 INTS_t + \beta_6 RINT_t + U_t\ldots\ldots\ldots\ldots(4)$$

Results of Bounds test are presented in Table 5 show that the variables included in the equations do not have long run relationship as indicated by F-statistic being lower than critical F-values at $p<0.05$. The nonexistence of long run relationship between the variables estimation of the long run and Error Correction Models (ECM is not warranted.

Table 5: ARDL Bounds Cointegration test

Equations	Included variables	F. statistics	Narayan 2005 Critical F Statistics at 5%	
			I(0)	I(1)
TWO	LRGDS, LIDE, INTS, RINT	2.0499	3.71	5.018
THREE	LRGDS, LPGDP, INTS, RINT	2.8938	3.71	5.018
FOUR	LRGDS, FDEP, INTS RINT	2.8586	3.71	5.018

*significant at 10% **significant at 5% ***significant at 1%
Source: Authors' computation

4.3 ARDL Estimates

The result of the estimates of the ARDL in Table 6 revealed IDE, PGDP and RINT to be positively related with the RGDS while INTS to be negatively related with RGDS. This relationship is also statistically significant at 5%. The measure of financial development (FDEP) though positively related it's not significant even at 10 percent. The coefficients of INTS and RINT follows a prior expectation and it cohere with the findings of Epaphra (2014), Bamidele, Jibrin and Isa (2015) that per capita income and real interest rate are crucial positive determinants of domestic savings in Nigeria over the period of the analysis. In the same vein the widening spread between deposit rate and prime lending rate in the banking sector negatively impact on gross domestic savings in Nigeria for the coverage period. The coefficient of international demonstration effects (IDE) was not negative as expected and it's not in line with the findings of similar studies like Rius & Román (2021). This is not unlikely to the limitation of the proxy for IDE (percent of the population with access to internet) to capture the phenomenon of International demonstration effects adequately.

Table 6: Summary Results of ARDL estimates

Variable	Model one- ARDL (1,0,0,1) Dependent variable: LRGDS	Model Two- ARDL (1,0,0,1) Dependent variable: LRGDS	Model Three- ARDL (1,0,1,1) Dependent variable: LRGDS
constant	12.50264 (0.0119) **	-17.19391 (0.0762) *	14.10204 (0.0076) ***
IDE	0.034701 (0.0326) **		
LRGDS(-1)	0.575428 (0.0034) ***	0.443158 (0.0556) *	0.473513 (0.0252) **
LPGDP		2.662050 (0.0268) **	
FDEP			0.019080 (0.7186)
FDEP(-1)			0.077280 (0.1298)
INTS	-0.148260 (0.0322) **	-0.117114 (0.0807) *	-0.148499 (0.0324) **
RINT	0.084009 (0.0004) ***	0.080421 (0.0004) ***	0.069211 (0.0043) ***
RINT(-1)	-0.076756 (0.0065) ***	-0.067947 (0.0191) **	-0.087681 (0.0023) ***
R-Squared	0.857770	0.866370	0.871292
Adj R-Squared	0.818261	0.831204	0.825865
F. Statistics	21.71107 (0.000000) ***	24.63671 (0.000000) ***	19.18025 (0.000000) ***
D.W	2.522183	2.154252	2.498904

Probability values in bracket; *significant at 10% **significant at 5% ***significant at 1%
Source: Authors' computation

Table 7: Post Diagnostic Tests

Diagnostic Tests	Model one Dependent variable: LRGDS	Model Two Dependent variable: LRGDS	Model Three Dependent variable: LRGDS
Breusch-Godfrey Serial Correlation LM Test(F. Statistics)	4.407685 (0.0510) *	1.641649 (0.2164)	5.225494 (0.0362)
Heteroskedasticity Test: Breusch-Pagan-Godfrey(F. Statistics)	1.702605 (0.1850)	3.121481 (0.0319) **	0.453963 (0.8324)
Stability- Ramsey RESET Test(F.Statistics)	3.129516 (0.0948) *	6.086565 (0.0239) **	8.236754 (0.0111) **

Probability values in bracket;   *significant at 10% **significant at 5% ***significant at 1%
Source: Authors' computation

The R-Square and Adjusted R-Squared show that not less than 80% of the variation or a change in the gross domestic savings is accounted for by the explanatory variables in the models. The

probability of F-statistic is statistically significantly at 1% level and thus implies that the ARDL models are robust and fit to some extent.

The post diagnostic results presented in table 4.6 show the three estimated models are relatively stable but there is serial correlation issue with model two and three coupled with heteroscedastic issue with model one and three. This suggests the estimation could still benefit from further refinements.

Conclusion

This study attempted an assessment of international demonstration effect on the mobilization of gross domestic savings in Nigeria over the period 1996-2021. The empirical results of the estimated models seem not to support the hypothesis that international demonstration effect when proxied with percentage of the population with access to the internet depresses savings mobilisation efforts in Nigeria. It is recommended that more rigorous analysis and alternative proxies be explored before a conclusive position could be taken on the proposition.

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