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The Nexus of Private Savings and Economic Growth in Emerging Economy: A Case of Nigeria

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Abstract

This study discusses the trend in Nigerian saving behaviour and reviews policy options to increase domestic saving. It also examines the determinants of private saving in Nigeria during the period covering 1970 – 2007. It makes an important contribution to the literature by evaluating the magnitude and direction of the effects of the following key policy and non-policy variables on private saving: Income growth, interest rate, fiscal policy, and financial development. The framework for analysis involves the estimation of a saving rate function derived from the Life Cycle Hypothesis while taking into cognizance the structural characteristics of a developing economy. The study employs the Error-Correction modelling procedure which minimizes the possibility of estimating spurious relations, while at the same time retaining long-run information. The results of the analysis show that the saving rate rises with both the growth rate of disposable income and the real interest rate on bank deposits. Public saving seems not to crowd out private saving; suggesting that government policies aimed at improving the fiscal balance has the potential of bringing about a substantial increase in the national saving rate. Finally, the degree of financial depth has a negative but insignificant impact on saving behaviour in Nigeria.

Keywords: Private Saving, Saving Rate, Macroeconomic Policy, Interest Rate, Economic Growth.

Introduction

Researchers and policy makers are known to be having growing concern among researchers and policy makers over the declining trend in saving rates and its substantial divergence among countries. This is due to the critical importance of saving for the maintenance of strong and sustainable growth in the world economy. Over the past three decades, saving rates have doubled in East Asia and stagnated in Sub-Saharan Africa, Latin America and the Caribbean (Loayza, Schmidt-Hebbel and Serven, 2000). The personal saving rate has been drifting downward for the last two decades. According to the latest statistics, personal saving declined from about 10% of disposable income in the early 1980s to 1.8% in 2004. The decline has received particular attention recently because saving was negative in 2005 for the first time since the Great Depression. Although saving declined in other developed countries during this period, the U.S decline was more pronounced than in most of the three countries.

Development economists have been concerned for decades about the crucial role of domestic saving mobilization in the sustenance and reinforcement of the saving-investment-growth chain in developing economies. For instance, Aghevli et al (1990) found that the saving rate and investment in human capital are indeed closely linked to economic growth. The relationship among saving, investment and growth has historically been very close; hence, the unsatisfactory growth performance of several

developing countries has been attributed to poor saving and investment.

This poor growth performance has generally led to a dramatic decline in investment. Domestic saving rates have not fared better, thus worsening the already precarious balance of payments position (Chete, 1999). In the same vein, attempts to correct external imbalances by reducing aggregate demand have led to a further decline in investment expenditure, thus aggravating the problem of sluggish growth and declining saving and investment rates (Khan and Villanueva, 1991). In addition, low personal saving has created short-run concerns that a sudden increase in the saving rate could reduce growth of consumer spending, and output and employment.

Statement of the Problem

The strong positive correlation which exists between saving, investment and growth is well established in the literature. The dismal growth record in most African countries, relative to other regions of the world has been of concern to economists. This is because the growth rate registered in most African countries is often not commensurate with the level of investment. In Nigeria for instance, the economy witnessed tremendous growth in the 1970s and early 1980s as a result of the oil boom and this led to the investment boom especially in the public sector. However, with the collapse of the oil market in the 1980s, investment fell, thereby resulting in a fall in economic growth. For instance, during the investment boom, gross investment as a percentage of Gross Domestic Product (GDP) was 16.8 and 31.4 percent in 1974 and 1976 respectively, whereas it declined to 9.5 and 8.9 percent, respectively in 1984 and 1985(CBN 2008).

One question begging for an answer is: What is the impact of saving and investment on growth? It has been argued that saving affects investment, which in turn influences growth in output. The transformation of initial growth into sustained output expansion requires the accumulation of capital and its corresponding financing. An output expansion in turn sets in motion a self reinforcing process by which the anticipated growth encourages investment, which supports growth, as well as financial development. It is certain that without a significant increase in the level of investment (public and private), no meaningful growth in output would be achieved. Indeed if private investment remains at the current low level, it will slow down potential growth and reduce long run level of per capita consumption and income, thereby leading to low savings and investment.

Objective of the Study

- This study has the following objectives:
- To know the impact of private saving in economic growth in Nigeria.
- To also carry out an analysis of the sources and trend of saving in Nigeria.
- To also know the motivations of saving and how savings are measured.
- To also know how saving affects the economic performance in the country.
- To also evaluate the impact of the main determinants of saving identified in the literature on private saving in Nigeria.

Method of the Study (Methodology)

The framework for this analysis is derived from the life-cycle model which has withstood the test of time in explaining the changes in private saving over time. It is appropriately modified to accommodate the peculiarities of a developing country and builds on the existing cross-country literature on saving which quantifies the effects of a variety of policy and non-policy variables on private saving. Its attractiveness lies in its elegant formulation of the effects of interest rate and growth on saving. In addition, its flexibility makes it possible for other relevant theoretical considerations to be incorporated, thus forming an integrated analytical framework, without altering its fundamental structure. This framework makes a new contribution to the literature by employing time series data in evaluating the determinants of private saving in Nigeria

between 1970 and 2009. It does this while explicitly addressing some of the econometric problems arising from the use of time-series data.

Literature Review, Theoretical Framework and Empirical Evidence

Introduction

Keynes (1936) defined savings as the excess of income over expenditure on consumption. Meaning that savings is that part of the disposable income of the period which has not passed into consumption (Umoh, 2003 and Uremadu, 2005). Given that income is equal to the value of current output; and that current investment (i.e. Gross capital formation) is equal to the value of that part of current output, which is not consumed; savings is equal to the excess of income over consumption. Hence, the equality of savings and investment necessarily follow thus:

Income = Value of output = Consumption + Investment

Savings = Income – Consumption

Savings = Investment ex-post.

There abound numerous theoretical evidences concerning the functional relationships between savings and a wide range of causal variables. For instance, Juster and Taylor (1975) report that savings is an increasing function of income. Moreover, Modigliani (1970), Madison (1992), Bosworth (1993), Caroll and Weil (1993), Schmidt-Hebbel, Sarven and Solimano (1994), Modigliani (1992), Jappeli and Pugano (1994), Edwards (1995), Collins (1991) and Uremadu (2000) maintain that there exists a positive relationship between savings and income growth rates. Aghevli (1990) in Ozigbo (1999) reported that there is consensus that the level of savings is largely determined by the level of income.

In Nigeria and other developing economies, there are other evidences that interest rate has significant effect on financial savings especially time and savings deposits while the structure of deposits was determined by differentials in deposit rates as has been demonstrated in Ndekwu, (1991). He also showed using monthly data that interest rates deregulation in Nigeria have a positive impact on financial savings during the period, 1984-1988.

Literature Survey

Franco Modigliani in his Life Cycle model determined that over the typical individual's lifetime his level of income will fluctuate from low levels in his younger years, to high levels in his middle-aged working years, back to low levels in his retirement years. However, this individual prefers to maintain a relatively stable level of consumption. In order to maintain this steady consumption, the individual will be forced to borrow during his younger years, save during his middle-aged years and then spend down his savings in his retirement years. From estimating his model, Modigliani concludes that individuals have a marginal propensity to consume (MPC) out of income of approximately 0.70 and an MPC out of net worth if approximately 0.07 to 0.08. (Ando and Modigliani, 1962)

Many researchers have studied the possible determinants of private savings behavior. In Amaoteng's survey article, he shows that saving has been found to be positively correlated with income, wealth, education, age, a high level of risk tolerance, and a favorable perception of one's own financial status; and negatively correlated with a larger family size. (Amaoteng 2002) Modigliani's life cycle model illustrates that age structure can have a strong impact on the level of savings in an economy. Since individuals in the middle-aged working years (which we will define as ages 25-55) tend to save more than individuals in the younger (ages 0-24) or retirement years (ages 56+), a population with a higher concentration of individuals in the middle-aged range will have higher savings rates. (Amaoteng 2002)

Trend of Saving in Nigeria

In mobilizing funds from the surplus units of the economy, banks incur some costs mainly in interest payments on deposit accounts. In order to recover the cost of deposit mobilization and other operating overheads, banks lend at higher interest rates. The difference between the two types of rates is referred to as

the interest rate spread or the intermediation spread. The spread measures the efficiency of the intermediation process in the market, such that, a high intermediation spread implies that there is inefficiency in the market, especially as it discourages potential savers and borrowers, thus, hampering investment and growth.

Prior to the deregulation of the banking sector, interest rates were administratively determined by the Central Bank. Both the deposit and lending rates were fixed by the CBN on the basis of policy decisions. At that time, the major goals were socially optimum resource allocation, promotion of orderly growth of the financial market, as well as reduction of both inflation and the internal debt service burden on the government. During the period 1970 to 1985, the rates were unable to keep pace with prevailing inflation rate, resulting in negative real interest rates. Moreover, the performance of the preferred sectors of the economy was below expectation, thus, leading to the deregulation of the interest rate in August 1987 to a market-based system. This enabled banks to determine their deposit and lending rates according to the market conditions through negotiations with their customers.

However, the minimum rediscount rate (MRR) which is the central bank's nominal anchor continued to be determined by the CBN. The lack of responsiveness of the structure of deposit and lending rates to market fundamentals makes the interest rate inefficient. The wide divergence between the deposit and lending rates (interest rate spread) is inimical to economic growth and development of the Nigerian economy. Between 1980 and 1984, interest rate differentials averaged 3.9 per cent. Even though this was reasonable within the accepted limit, the spread widened between 1985 and 1989, averaging 4.3 per cent per annum. This impacted negatively on the amount of loanable funds available to the private sector for investment.

The interest differential further widened to an average of 7.9 per cent between 1990 and 1994. Thereafter, the yearly interest rate spread maintained an upward trend, rising from 8.2 per cent in 1995 to 24.6 per cent in 2002, before declining to 15.7 per cent in 2005 (see Figure 1). The widening gap between the deposit and lending rates reflects the prevailing inefficiencies in the Nigerian banking sector and has deterred potential investors from borrowing, and thus lowered the level of investment in the economy.

Interest Rate Spread (in Percentage)

Source: Central Bank of Nigeria i) Statistical Bulletin, 2006 and

ii) Annual Report and Statement of Accounts, various years.

The use of interest rate spread has however been criticized given that higher levels of interest rates are usually associated with higher inflation rates, and therefore a higher cost of holding money. In addition, higher inflation rates tend to be associated with higher country premia. As a result of these disadvantages of interest rate spread as an indicator of efficiency, net interest margin has been proposed as a better alternative. Net interest margin is equal to total interest revenues minus total interest expenditure divided by the value of assets. Higher values of net interest margin indicate a higher spread on deposit and lending rates and therefore lower efficiency.

Figure 2 shows the interest rate figures in Nigeria between 1970 and 2009. A cursory look reveals that the nominal interest rate was institutionally determined by the monetary authorities throughout the 1970s and the first half of the 1980s. However, with the advent of the structural adjustment programme in the mid 1980s which brought with it a rash of financial sector reforms, Nigeria abandoned its fixed interest rate regime that saw nominal interest rates rising from 9.3 percent in 1985 to 26.8 percent in 1989, and reaching a peak of 29.8 percent in 1992. The figure has since hovered between 13.5 percent and 24.4 percent. It stood at 16.5 percent in 2009.

Real Interest Rate (in Percentage)

Source: Central Bank of Nigeria i) Statistical Bulletin, 2006 and

ii) Annual Report and Statement of Accounts, various years.

The real interest rate figures present an interesting picture. Between 1970 and 2009, the figure was negative 20 times, attaining positive figures on 18 occasions. The fixed interest rate regime of the 1970s and early 1980s no doubt contributed to this negative trend by fixing the interest rate at artificially low levels. For instance, in the first two decades (1970 to 1989) when the fixed regime dominated, real interest rate was negative 14 times and positive only 6 times. However, in the last two decades (1990 to 2009), when market forces took over, the real interest rate was negative on only 6 occasions. The inflation rate also played a very important role in making the real interest rate negative for most of the period. A cursory glance at figure 2 shows that the years when the real interest rate was negative usually coincided with those of double-digit inflation rates.

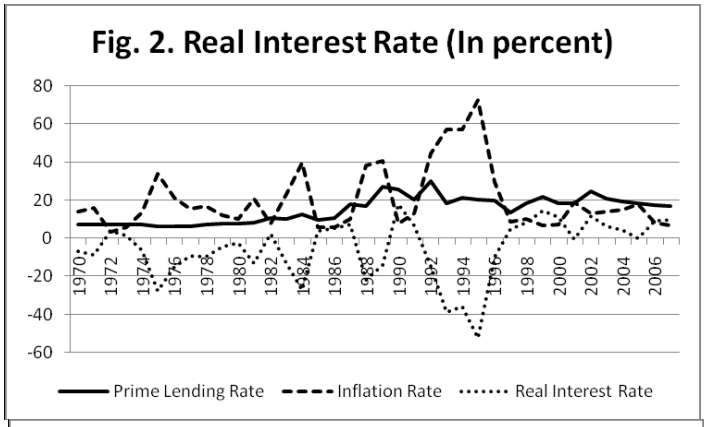
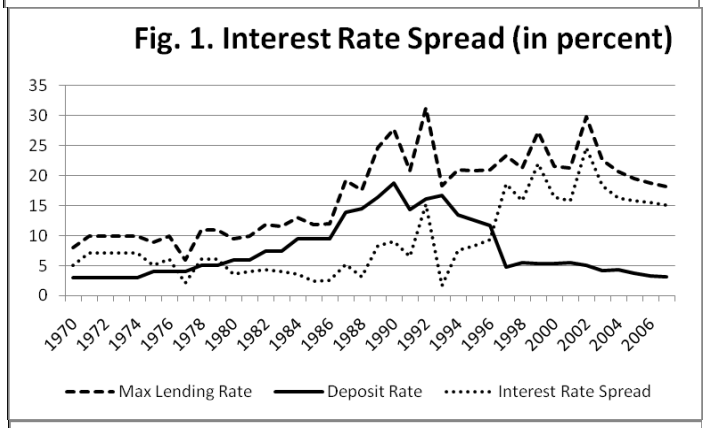
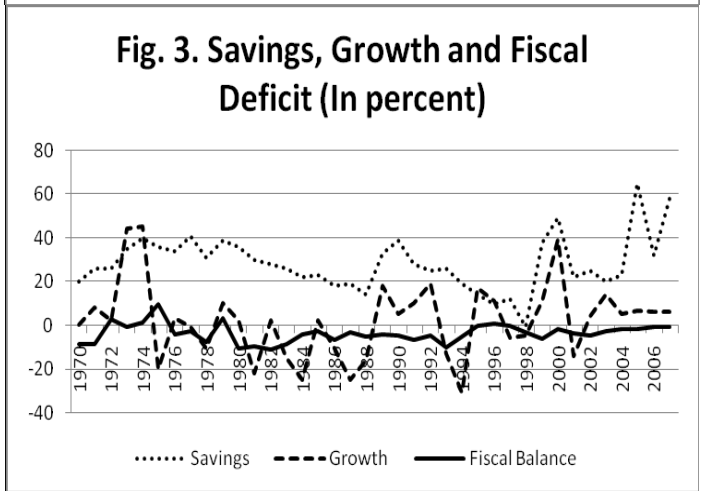


Table 1 shows the components of saving in Nigeria including savings and time deposits with deposit money banks, the national provident fund, federal savings bank, federal mortgage bank, life insurance funds and other deposit institutions. Saving and time deposits in banks is by far the single most important component of saving in Nigeria and has witnessed a continuous growth over the years. Beginning with a sum of N337 million in 1970, it rose to N5.2 billion in 1980. By 1990, the figure had climbed to N23.1 billion, rising further by 2000 to N343.2 billion. As at 2005, the figure stood at N1.3 trillion.



Its contribution to total saving has however been mixed. In 1970, savings in banks consisted of 98.8 percent of total saving, with this figure reducing gradually to 89.5 percent in 1980, and further declining to 78 percent in 1990. From then the percentage of savings in banks in total saving has witnessed an upward trend, rising to 89.1 percent in 2000. Since 2003, this percentage has been 100 percent showing that it has become the only component of saving.



The National Provident Fund and the Federal Mortgage bank were both established in 1974. Beginning with N130 million, the National Provident Fund rose to N724 million in 1990, reaching a peak of N1.37 billion in 1998. The fund maintained this figure till 2002 when it was scrapped by the government. The Federal Mortgage Bank on the other hand experienced a more rapid growth, rising from a paltry N7.3 million at its inception in 1974 to N305 million in 1990. By 2002 when it ceased to

exist, it had mobilized N22.3 billion. The figures for the Federal Savings Bank have been mixed. It stood at N4.9 million in 1970, increasing to N8.1 million in 1978. It thereafter declined to N4.0 billion in 1982, after which the figure climbed steadily till it reached N37.5 billion in 1989 when it was discontinued. Life insurance funds were established in the same year 1989 with the sum of N1.1 billion. The figure rose sharply to N19.4 billion in 1994 thereafter witnessing a rapid decline. The amount mobilized stood at N8.5 billion in 2002 when the federal government scrapped it.

Savings, Growth and Fiscal Deficit (in percent)

Notes:

i) Savings is the ratio of private saving to Gross National Disposable Income (GDNI);

ii) Growth is the growth rate of real per capita GNDI;

iii) Fiscal Balance is the surplus or deficit of the entire federation as a percentage of GDP.

Source: Central Bank of Nigeria

i) Statistical Bulletin, 2006 and

ii) Annual Report and Statement of Accounts, various years.

Figure 3 shows the other macroeconomic variables of interest, including private saving rate, growth and fiscal balance. The Nigerian economy has witnessed several fluctuations in its chequered history, with economic growth fluctuating between 45 percent and -31 percent in the period between 1970 and 2009. In the 27 year period between 1974 and 2001, the economy experienced negative growth 14 times, while making a positive showing only 13 times. However, growth has been positive since 2002. Fiscal balance was even more troubling given that Nigeria experienced a budget surplus only six times out of the 38 year period between 1970 and 2009. The State governments have been as culpable as the government at the centre, with each level seemingly competing to outspend the other.

Private saving witnessed much less volatility, with the variable recording a negative value only once in the 38 year period. The saving rate fluctuated between 20 percent and 41 percent between 1970 and 1979. This figures changed to 14 percent and 36 percent in the next decade. Between 1990 and 1999, the saving rate hovered between -0.6 percent and 39 percent, reaching an impressive range of between 20 percent and 65 percent in the period 2000 to 2009. The private saving rate stood at 58 percent in 2009.

Theoretical Framework

The life-cycle hypothesis was formulated by Modigliani (1970) and is the principal theoretical underpinning that has guided the study of savings behaviour over the years. A critical analysis of this theory however shows that it seems to mirror what happens in developed economies with little or no regard to the peculiarities of developing countries like Nigeria. There are a number of reasons that make it imperative for saving behaviour in developing countries to be modelled separately from that in developed economies. First, at the microeconomic level, developing-country households tend to be large and poor. They have a different demographic structure, more of them are likely to be engaged in agriculture, and their income prospects are much more uncertain. The problem of allocating income over time thus looks rather different in the two contexts, and the same basic models have different implications for behaviour and policy.

Second, at the macroeconomic level, both developing and developed countries are concerned with saving and growth, with the possible distortion of aggregate saving, and with saving as a measure of economic performance. However, few developing countries possess the sort of fiscal system that permits deliberate manipulation of personal disposable income to help stabilize output and employment. Third, much of the literature in the last five decades expresses the belief that saving is too low, and that development and growth are impeded by the shortfall. Sometimes the problem is blamed on the lack of government policy, other times on misguided policy. Lastly, saving is even more difficult to measure in developing than in advanced economies, whether at the household level or as a macroeconomic aggregate. The resulting data inadequacies are pervasive and have seriously hampered progress in answering basic questions.

Given the above, and following Deaton (1989), this paper appropriately modifies the life-cycle theory by developing a model of households which cannot borrow but which accumulate assets as a buffer stock to protect consumption when incomes are low. Such households dissave as often as they save, do not accumulate assets over the long term, and have on average very small asset holdings. However, their consumption is markedly smoother than their income.

Following McKinnon (1973) and Shaw (1973), we argue that for the typical developing country, the net impact of a change in real interest rate on saving is likely to be positive. This is because, in the typical developing economy where there is no robust market for stocks and bonds, cash balances and quasi-monetary assets usually account for a greater proportion of household saving compared to that in developed countries. In addition, in an environment where self-financing and bank loans constitute the major source of investment funds, accumulation of financial saving is driven mainly by the decision to invest and not by the desire to live on interest income. Given the peculiarities of saving behaviour, in addition to the fact that the bulk of saving comes from small savers, the substitution effect is usually larger than the income effect of an interest rate change.

Empirical Evidence

There is an abundance of empirical studies that deal with the impact of the different variables of interest on savings mobilization. Some authors have found a strong positive relationship between real per capita growth and saving rates (see for example, Modigliani, 1970; Bosworth, 1993; and Carrol and Weil, 1994). However, its structural interpretation is controversial, since it is viewed both as evidence that growth drives saving (Modigliani, 1970; and Carrol and Weil, 1994) and that saving drives growth through the saving-investment link (Levine and Renelt, 1992; and Mankiw, Romer and Weil, 1992).

Given the importance of controlling for the joint endogeneity of saving and income growth, a panel instrumental-variable approach to estimate the effect of income growth on saving was carried out by Loayza, Schmidt-Hebbel, and Serven (2000). They found that a one percentage point rise in growth rate increases the private saving rate by a similar amount, although this effect may be partly transitory. In their study, they utilized the world saving database, whose broad coverage makes it the largest and most systematic collection of annual time series on country saving rates and saving-related variables, spanning 35 years (1960 – 1994) and 134 countries (112 developing and 12 industrial). Obadan and Odusola (2001) employed both graphical analysis as well as Granger Causality tests to determine the impact of growth on saving. Their results revealed that growth of income does not Granger-cause saving, suggesting that saving is not income-induced in Nigeria. Evidence on the reverse causation argument also shows that saving does not Granger-cause growth. The findings therefore do not show any direct relationship between saving and income growth.

Analytically, the effect of financial liberalization on private saving rates works through the expansion of the supply of credit to previously credit-constrained private agents. This allows households and small firms to use collateral more widely, and reduces down payments on loans for consumer durables and housing. Quantitative evidence strongly supports the theoretical prediction that the expansion of credit should reduce private saving as individuals are able to finance higher consumption at their current income level. Loayza, Schmidt-Hebbel, and Serven (2000), find that a 1 percentage point increase in the ratio of private credit flows to income reduces the long-term private saving rate by 0.75 percentage point. Bandiera and others (2000), on carrying out a deeper analysis of eight episodes of financial liberalization, failed to find a systematic direct effect on saving rate: it was positive in some cases (Ghana and Turkey), clearly negative in others (Mexico and Korea), and negligible in the rest.

These studies however, have a number of shortcomings. To begin with, each of them focuses on only one of the determinants of saving. They therefore do not identify the determinants of saving and analyze their impact on the saving rate. In addition, the conclusion of Essien and Onwioduokit (1998) should be taken with a measure of caution. This is because the time span of their study is relatively short (1987-1993). It is therefore difficult to separate the effect of financial development from the effect of recovery and increased capital inflow to the economy, all of which were taking place concurrently. Our study will try to overcome this problem of simultaneity by using a longer time frame dating from 1970-2009.

Research Methodology

The methodology used in this study is the Cointegration and Error-Correction Methodology (ECM). The ECM is made up of models in both levels and differences of variables and is compatible with long-run equilibrium behaviour.

Model Specification

Drawing from the analysis above on the life cycle framework, the following model was specified:

$PSR = \beta_0 + \beta_1 GRCY + \beta_2 RIR + \beta_3 FB + \beta_4 DFD + \varepsilon$

Where: β_1 β_2 and $\beta_4 > 0$, while $\beta_3 < 0$ and

PSR = private saving rate

GRCY = growth rate of real per capita GNDI

RIR = real interest rate

FB = fiscal balance

DFD = degree of financial depth

The saving equation was estimated using annual data for the period 1970-2009. The estimation period was determined largely by the availability of adequate data on all variables.

Descriptive Statistics.

The characteristics of the distribution of the variables are presented in Table 1 below. Jarque-Bera is a test statistic for testing whether the series is normally distributed. The test statistic measures the difference of the skewness and the kurtosis of the series with those from the normal distribution. Evidently, the Jarque-Bera statistic rejects the null hypothesis of normal distribution for the real interest rate. On the contrary, the null hypothesis of normal distribution is accepted for degree of financial depth, fiscal balance, income growth and private saving.

In Nigeria, as in most developing countries, due to the absence of detailed statistical coverage of sectoral financial activity, most of the data on saving are obtained from the national accounts statistics as the difference between measurable aggregates. This residual or indirect approach to the calculation of saving has some drawbacks. First, the saving of one group of economic units used by another for consumption is not captured. Second, capital gains and losses induced by price changes are not treated adequately. Third, consumer durables and certain elements of government expenditure are also not adequately treated (see Shafer, Elmeskov, and Tease, 1992). For these reasons, the results obtained should be interpreted with caution.

Table 2. Summary of the Descriptive Statistics of the Variables

	DFD	FB	GRCY	PSR	RIR
Mean	24.24	-3.46	2.02	28.69	-5.31
Median	24.00	-3.50	3.00	26.00	-0.60
Maximum	35.00	9.80	45.00	65.00	18.00
Minimum	12.00	-11.10	-31.00	-0.60	-52.60
Std. Dev.	6.39	4.29	17.84	12.79	16.01
Skewness	-0.07	0.52	0.48	0.56	-1.05
Kurtosis	2.009	4.01	3.33	4.05	3.74
Jarque-Bera	1.54	3.24	1.61	3.65	7.61
Probability	0.46	0.20	0.45	0.16	0.02

Sum	897.00	-127.99	74.70	1061.40	-196.40
Sum Sq. Dev.	1472.81	661.12	11459.88	5886.52	9229.21
Observations	37	37	37	37	37

Source: National accounts statistics

Results of Stationarity Tests

Testing for the existence of unit roots is a principal concern in the study of time series models and cointegration. The presence of a unit root implies that the time series under investigation is non-stationary; while the absence of a unit roots shows that the stochastic process is stationary (see Iyoha and Ekanem, 2002). The time series behaviour of each of the series using the Augmented Dickey-Fuller and Phillips-Perron tests are presented in Tables 3 and 4, respectively. The results show that while the private saving rate (PSR), growth rate of real per capita GNDI (GRCY) and fiscal balance (FB) are I(0) variables (stationary before differencing), real interest rate (RIR) and the degree of financial depth (DFD) are I(1) variables (stationary after first differencing). This is deduced from the fact that the absolute values of both the ADF and PP test statistics of RIR, GRCY and FB before differencing are greater than the absolute value of the critical values at the 1 percent significance level. For the other variables, this is the case only after differencing once.

Table 3. Results of Augmented Dickey Fuller (ADF) Unit Root Test

Variable	ADF Value before Differencing	ADF Value After Differencing	Critical Value	Level of Integration
PSR	-3.657*	n.a	3.621	I(0)
GRCY	-5.068*	n.a	3.627	I(0)
RIR	-3.204	-6.275*	3.621	I(1)
FB	-4.450*	n.a	3.621	I(0)
DFD	-1.979	-5.784*	3.621	I(1)

Notes: * denotes significant at 1 percent; the null hypothesis is that there is a unit root. n.a = not applicable

Table 4. Results of Phillips-Perron (PP) Unit Root Test

Variable	PP Value Before Differencing	PP Value After Differencing	Critical Value	Level of Integration
PSR	-3.683*	n.a	3.621	I(0)
GRCY	-5.019*	n.a	3.627	I(0)
RIR	-3.045	-13.017*	3.621	I(1)
FB	-4.405*	n.a	3.621	I(0)
DFD	-2.047	-5.784*	3.621	I(1)

Notes: * denotes significant at 1 percent; the null hypothesis is that there is a unit root. n.a = not applicable

Cointegrated Models

In this study, the method established by Johansen (see Johansen, 1991) was employed in carrying out the cointegration test. This is a powerful cointegration test, particularly when a multivariate model is used. Moreover, it is robust to various departures from normality in that it allows any of the five variables in the model to be used as the dependent variable while maintaining the same cointegration results.

Accordingly, Johansen's test was carried out to check if the saving equation is cointegrated. Table 5 shows that both the Trace and Maximum Eigen statistics rejected the null of no cointegration at the 5 percent level; while Trace test indicated that there are two cointegrating equations at the 5 percent level; Maximum Eigen test indicated only one cointegrating equation at the 5 percent level. The implication is that a linear combination of all the five series was found to be stationary and thus, are said to be cointegrated. In other words, there is a stable long-run relationship between them and so we can avoid both the spurious and inconsistent regression problems which otherwise would occur with regression of non-stationary data series.

Table 5 Johansen's Cointegration Test Results

Maximum Eigenvalue Test					Trace Test			
Null Hypothesis	Alternative Hypothesis	Eigen-value	Critical Value		Alternative Hypothesis	LR Ratio	Critical Value	
			95%	99%			95%	99%
r = 0	r = 1	39.79*	37.52	42.36	r ≥ 1	108.69**	87.31	96.58
r ≤ 1	r = 2	31.30	31.46	36.65	r ≥ 2	68.90*	62.99	70.05
r ≤ 2	r = 3	18.02	25.54	30.34	r ≥ 3	37.60	42.44	48.45
r ≤ 3	r = 4	16.09	18.96	23.65	r ≥ 4	19.58	19.58	30.45
r ≤ 4	r = 5	3.49	12.25	16.26	r ≥ 5	3.49	12.25	16.26

Notes: * denotes significant at the 5% level

** denotes significant at the 1% level

Long run Model

We now present the results for the long run relationship.

PSR = +0.4013 +0.5016GRCY +0.0028RIR -0.0190FB -0.1226DFD

(3.346)** (2.233)* (3.769)** (0.459)

As postulated by our modified version of the lifecycle hypothesis, the income growth variable (GRCY) is an important determinant of the private saving rate. The coefficient of GRCY is both positively signed and statistically significant at the 1 percent level. An increase in the growth rate by one percent leads to a long-run increase in the saving rate by 0.5 percent. These results are consistent with those obtained by Modigliani (1970), Maddison (1992), Bosworth (1993) and Carroll and Weil (1994). Thus, as the incomes of private agents grow faster, their saving rate increases. This is consistent with the existence of consumption habits and our modified version of the Lifecycle model. The implication is that any policy that encourages income growth in the long run will have a strong impact on private saving rate. Given the historical close link between saving and investment rate, a rise in growth rate will lead to a virtuous cycle of higher income and saving rates.

The result for the real interest rate variable suggests that the real rate of return on bank deposits has a statistically significant positive effect on saving behaviour in Nigeria. A one percent increase in RIR is associated with a 0.003 percentage point increase in the private saving rate. This finding is consistent with the McKinnon-Shaw proposition which states that, in an economy where the saving behaviour is highly intensive in money and near-money assets, the direct incentive effect of high real interest rates on saving behaviour (i.e. the income effect) generally overwhelms the substitution of other assets for financial assets in response

when faced with such interest rate changes (i.e. the substitution effect). The implication is that government should find an effective mechanism for increasing the abysmally low interest rate on bank deposits if the present crusade to increase the private saving rate is to achieve any measure of success.

The result for fiscal balance points to a significant substitutability between public and private saving in the Nigerian context. However, there is no support for full Ricardian equivalence, which predicts full counterbalancing of public saving by private dis-saving. Specifically, an improvement in the fiscal balance by one percent is associated with 0.019 percentage point reduction in the private saving rate. The rather weak private saving offset to changes in the fiscal balance behaviour may be explained by substantial uncertainty in the economy, widespread liquidity (or wealth) constraints, tax-induced distortions and limits in households' attempts to smooth consumption over time. Thus in the Nigerian context, policies geared to improvement in fiscal balance has the potential of bringing about a substantial net increase in total domestic saving. This finding is consistent with cross-country results of Corbo and Schmidt-Hebbel (1991) and those of Athukorala and Sen (2004) for India.

The degree of financial depth failed to attain statistical significance in the saving function. Thus, there is no empirical support for the view that the development of the financial sector has contributed to the growth in private saving. The implication is that financial deepening may not bring about an automatic improvement in the saving rate. For this, one requires a deeper analytical understanding of the various factors at work here.

Empirical Results

Dynamic Error-Correction Model

Having identified the cointegrating vector using Johansen, we proceed to investigate the dynamics of the saving process. Table 6 reports the final parsimonious estimated equation together with a set of commonly used diagnostic statistics. The estimated saving function performs well by the relevant diagnostic tests. In terms of the Chow test for parameter stability conducted by splitting the total sample period into 1970-1986 and 1987-2009 there is no evidence of parameter instability.

The results show that the coefficient of the error-correction term for the estimated saving equation is both statistically significant and negative. Thus, it will rightly act to correct any deviations from long-run equilibrium. Specifically, if actual equilibrium value is too high, the error correction term will reduce it, while if it is too low, the error correction term will raise it. The coefficient of -0.4415 denotes that 44 percent of any past deviation will be corrected in the current period. Thus, it will take more than two years for any disequilibrium to be corrected.

The Keynesian absolute income hypothesis is found to hold for saving behavior in Nigeria. The coefficient for real per capita GNDI (GRCY) is positive and statistically significant at the 1 percent level. Thus the Nigerian experience provides support for the argument that, for countries in the initial stages of development, the level of income is an important determinant of the capacity to save. In this respect, our results are consistent with the cross-country results of Modigliani (1993), Hussein and Thirlwall (1999), Loayza et al (2000) and the results for India of Athukorala and Sen (2004). This implies that the high unemployment rate which results in low disposable income is a strong impediment in raising the saving rate in Nigeria.

Contrary to the postulation of the Life-Cycle Model, the income growth variable (GRCY) was found to have a significant negative impact on the private saving rate. This result is interesting given that it does not conform to those obtained from earlier studies (see Modigliani, 1970; Madison, 1992; Bosworth, 1993 and Carroll and Weil, 1994). Our Nigerian experience seems to provide support for the simple permanent income theory which predicts that higher growth (i.e. higher future income) could reduce current saving. In other words, at sufficiently high rates of economic growth, the aggregate saving rate may decrease if the lifetime wealth of the young is high enough relative to that of their elders (see Athukorala and Sen, 2004). There are two plausible explanations for this finding. The first is the penchant of Nigerians to indulge in conspicuous consumption. As a result, growth in per capita income could actually lead to a

decrease in saving. The second is that income growth was actually negative in roughly half of the period under observation.

Table 6. Estimated Short Run Regression Results for the Private Saving Model Dependent Variable: DPSR

Included observations: 35 after adjusting endpoints.

Variable	Coefficient	T-Statistic	Probability
C	0.1137	2.9728	0.0063
DPSR(-1)	0.0303	0.1952	0.8467
DGRCY	0.3047	3.5435	0.0015
DRIR(-1)	-0.0016	-1.6013	0.1214
DFB	-0.0054	-1.2194	0.2337
DDFD	0.8020	1.6733	0.1063
ECM(-1)	-0.4415	-3.3118	0.0027
Adjusted R-squared	0.3356	S.D Dependent Var.	0.1064
S.E of regression	0.0867	F-Statistic	3.6936
Durbin-Watson stat	2.2200	Prob. (F-statistic)	0.0087

JBN – $\chi 2$ (1) = 0.33 LM – $\chi 2$ (1) = 1.92

Probability (JBN) = 0.85 Probability (LM) = 0.18

ARCH – $\chi 2$ (1) = 1.0 CHOW – $\chi 2$ (1) = 1.6

Probability (ARCH) = 0.32 Probability (CHOW) = 0.20

Furthermore, it is only the income growth variable that is statistically significant at the 1 percent level, indicating that in the short run, it is only growth in income that has a relationship with the private saving rate. The implication is that short run changes in private saving rate that correct for past deviations emanate principally from changes in income growth. The coefficient estimate shows that a unit change in income growth will bring about a 0.3 percent change in private saving. The other four explanatory variables (PSR (-1), RIR, FB and DFD) do not have any short run impact on the private saving rate. This result is in keeping with the long run relationship where over 50 percent of changes in private saving are explained by changes in income growth.

Conclusion

This paper has investigated the determinants of private saving in Nigeria for the period 1970-2009. In the first place, it attempts to shed more light on the problems associated with the conventional models of determinants of saving. Drawing on econometric analysis, it goes on to propose the alternative of an Error-Correction Model of the determinants of saving function. The estimation results for the long run model point to the growth in income and the real interest rate as having statistically significant positive influences on domestic saving. There is also a clear role for fiscal policy in increasing total saving in the economy, with the private sector considering public saving as an imperfect substitute for its own saving. The Ricardian equivalence was thus, found not to hold in Nigeria contrary to what obtains in industrialized and semi-industrialized economies. Finally, financial development seems not to have any impact on the saving rate. We began this study by asking what the relevant policies for raising the Nigerian saving rate are. Our results help to understand the effectiveness of policy variables in raising the saving rate in terms of their magnitude and direction.

Policy Implications

A stronger policy framework is imperative in bringing about improved macroeconomic performance. The government should sustain its National Economic Empowerment and Development Strategy (NEEDS) programme which is partly responsible for the increasing diversification emerging in the economy. The growing contribution of non-oil sectors in GDP growth in recent years is a positive development and should be encouraged. Agriculture has grown strongly in recent years and was the largest industry contribution to GDP in 2009. With about 70 per cent of the working population employed in the agricultural sector, the strong agricultural contribution to GDP bodes well for employment. More importantly, government's efforts to diversify the economy appear to be yielding results and should be sustained.

Recommendations

Some major recommendations for policy can be drawn from the analysis. First, the focus of development policy in Nigeria should be to increase the productive base of the economy in order to promote real income growth and reduce unemployment. For this to be achieved, a diversification of the country's resource base is indispensable. This policy thrust should include a return to agriculture; the adoption of a comprehensive energy policy, with stable electricity as a critical factor; the establishment of a viable iron and steel industry; the promotion of small and medium scale enterprises, as well as a serious effort at improving information technology.

Second, contrary to popular belief, income growth has a negative influence on private saving in Nigeria. Policy makers should thus take explicit account of this result in the formulation of economic policy. For instance past experience has shown that rapid increases in wages of urban sector workers did not result in any appreciable increase in private saving. Rather, the extra income was used in the purchase of mainly imported consumer goods, thus increasing our dependence on imports.

Third, public saving has been shown to be a complement rather than a substitute for private saving in Nigeria. Government should therefore sustain its oil- price-based fiscal rule (OPFR) which is designed to link government spending to notional long run oil price, thereby de-linking government spending from current oil revenues. This mechanism will drastically reduce the short term impact of fluctuations in the oil price on government's fiscal programmes. State governments should also desist from spending their share of excess crude oil revenue indiscriminately. This is because this practice can severely test the absorptive capacity of the economy in addition to risking the fuelling of inflation. The challenge is for state governments to save excess revenue or spend it directly on imported capital goods in order to sustain Nigeria's hard-won macroeconomic stability.

Fourth, monetary policy should focus on ways of increasing the abysmally low real interest rate on bank deposits. It should also devise means of substantially reducing the interest rate spread. Lastly, it is pertinent to note that even though this paper has concentrated on Nigeria, its results can be applied to other African countries not previously studied. They contain some valuable lessons for informing policy measures in the current thrust towards greater mobilization of private saving in the African continent.

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