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DYNAMIC ANALYSIS OF SAVINGS AND ECONOMIC GROWTH IN NIGERIA

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ABSTRACT

This study focuses on the direction of causality between savings and economic growth in Nigeria during the period 1980-2010. The study was motivated by the low and declining savings rate currently prevailing in Nigeria on the one hand and the dwindling level of economic growth experienced in the country during the 1980s, 1990s and 2000s on the other. Relevant literature having been reviewed, a trivariate dynamic Granger causality model with savings, economic growth and foreign capital inflows was adopted as against the weak bivariate Granger causality technique that is common in existing literature. Using the cointegration-based error-correction mechanism, it is found that there is uni-directional causality between savings and economic growth in Nigeria, and the direction runs from growth to savings. Overall, it is found that growth-led savings is predominant in Nigeria. The results show that foreign capital inflow and savings do not Granger-cause each other, while economic growth does not Granger-cause foreign capital inflow. It is recommended that in the short run, policies in Nigeria should be geared towards achieving both higher savings and growth in order to boost investors' confidence and to attract foreign capital inflow. However, in the long run, the country should shift its focus towards achieving higher economic growth in order to boost the domestic savings and to sustain a steady flow of foreign capital investment.

Key Words: Nigeria, Savings, Economic growth, Granger-causality

INTRODUCTION

The dynamic relationship between savings and economic growth has recently generated numerous debates in many developing countries. The thrust ofthese debates has been whether policy makers should first pursue higher savingsmobilisation policies, or economic growth, or both policies simultaneously. In other words, between higher savings and higher economic growth, which policy leads and which one lagin the dynamic process of economic development.The emerging consensus would seem to be that savings do have a positive impact on growth but theireffectiveness should be improved. A way of understanding the relationship between savings, economic growth and poverty is to look at the research literature on savings mobilisation and allocation.

The savings rate (marginal or average) is regarded as a key performance indicator by development economists, and foreign aid practitioners admonish their clients to increase their savings ratio as a primary condition for achieving a satisfactory rate of economic growth. However, not only have questions been raised regarding the significance of the savings effort as an independent determinant of economic progress, but the formulation of policies designed to increase savings propensity has suffered from the dearth of knowledge regarding the nature of savings function in developing countries like Nigeria. A number of alternative savings hypotheses (derived mainly from the literature relating to developed economies) have been advanced, but the paucity of reliable data has made it difficult to test these hypotheses and obtain results, which warrant a reasonable degree of confidence.

The savings-growth link in Nigeria is particularly unique because the determinants of savings in Nigeria cut across several diverse factors, ranging from economic and social to religious and fetish reasons. These make the Nigerian case an interesting relationship to look at. According to the prior-savings theory, higher savings lead to higher investment, which in

turn leads to higher economic growth. In this way, savings play an important role in the process of economic development. This is particularly critical for a developing country like Nigeria where the demand for loanable funds is assumed to exceed the supply, and where the constraint on investment is the supply rather than the demand for loanable funds (see McKinnon, 1973; Shaw, 1973).

In other words, when savings increase, investment and economic growth also increase; this then translates into a further increase in savings. In this way, economic growth will continue to increase, as savings increase until savings and investment stabilise. Although a number of studies have been conducted on the causal relationship between savings and economic growth in many developing countries, majority of these studies have concentrated mainly on Asia and Latin America, affording sub-Saharan African countries either very little or no coverage at all. Specifically, empirical studies on a sub-Saharan African country like Nigeria, where savings have dwindled considerably are very scanty. Even where such studies have been undertaken, the empirical findings on the direction of causality between savings and economic growth have been largely inconclusive (see Abu, 2010). The development economist's claim and agitations for more savings are based on a proposition that there is a positive relationship between the rate of capital inflow and economic growth. The notion is that a substantial inflow of financial resources in concessional terms is needed to generate sufficient savings and investments to accelerate economic growth so that, self-sustained growth can be achieved. Though a few studies have investigated the savings-growth relationship in Nigeria, most of these studies have not considered the role that domestic policies play in ensuring that higher savings rates pass through to economic development. This study investigates the relationship between savings and growth in Nigeria by analysing the relationship between these variables from 1980 to 2010, and by introducing control variables, which are used to capture the macroeconomic policy environment in Nigeria.

In the last 31 years (1980-2010), Nigeria's overall economic performance has been remarkable, with periods of high growth and even negative growth. Growth has been 3.48% on average, inflation has consistently been double digits, except for the most recent years, with single digits. Employment rates have deteriorated over the years, with official statistics from the National Bureau of Statistics (NBS) showing that in 2005, it was 11.5% and 13.4% in 2006. Moreover, national savings have increased dramatically, from extremely low levels of around 6% of GDP in the early 1980s to figures around 25 to 28% from 2003 to 2010. The problem that has motivated this research is that the increasing trend that has been observed in the national savings levels does not seem to have passed through to economic growth in Nigeria, as growth has remained very slow or even retrogressive. Theorists would have expected that the Nigerian growth experience should have been strongly linked to the higher national savings since increased national savings would provide the funds needed for investment and eventually, growth and substitute for external savings and foreign direct investments, which are highly volatile in the presence of political and macroeconomic instability in Nigeria. Hence, this research work seeks to examine the seemingly uncorrelated or weakly correlated relationship between savings and economic growth in Nigeria.

Review of Theoretical and Empirical Literature

The relationship between savings and economic growth has received increased attention in recent years especially in developed and emerging economies. This relationship is reviewed below.Studies by Gavin, Haussmann, and Tavli (1997), Saltz (1999) and Agrawal (2001) revealed that economic growth rates preceded savings growth rates while Cullison (1993) and recently Lorie (2007) found the reverse causality. The vast empirical literature, though contributing immensely to explaining the savings-growth nexus, suffers from a number of shortcomings. These include reliance on cross section data, which may not satisfactorily

address country specific issues, inappropriate econometric techniques and the concentration mainly on the use of the bivariate causality test, and the likely omission-of-variable bias. In fact, many studies omitted the complementary role of foreign resources inflow, especially in emerging and developing economies.

Quite a number of recent studies examine the dynamic relationship between savings and economic growth. Caroll and Weil (1994) used five-year averages of the economic growth rate and savings for OECD countries and found that economic growth Granger caused savings. However, when dummies were included in the estimation, the reverse was obtained. Also, addressing the relationship between domestic savings and economic growth for various economies with different income levels, Mohan (2006) concluded using cross section data from 1960 to 2001 and Granger causality methodology, that economic growth rate Granger caused savings growth rate in eight high income countries (HIC)–Sweden, Iceland, Finland, UK, Korea, Japan, Canadaand Norway–except in Singapore;3 lower-middle income countries–Algeria, Thailand, and Colombia–except Egypt and Ecuador; 2 low income countries–Nigeria and Senegal–except Indonesia. There was bi-directional causation in all upper-middle income countries–Chile, Argentina, Brazil, and South Africa–except Malaysia. Using the procedure developed by Toda and Yamamoto (1995) and Dolado and Lutkepohl (1996) and the inclusion of foreign resources inflow in multivariate systems, contrary to the reverse causation by Sinha and Sinha (2008), Alguacil, Caudros and Orts (2004) found evidence in favour of Solow's model prediction that higher savings lead to higher economic growth for Mexico. The observed conflicting results for Sri Lanka and Mexico might be connected with data, methodology, and the important role of omitted variable(s).

However, a cursory observation of the literature reveals that research has been focused on developed and emerging economies. Despite the importance and the likely policy guidance for development strategies for African economies, empirical research on African countries has been very scanty. Further, with the exception of Adebiyi (2005), available studies used cross section data. Using cross section data between 1960 and 1997 and Granger causality methodology, Anoruo and Ahmadi (2001) examined the causal relationships between the growth rate of domestic savings and economic growth for seven African countries–namely Congo, Cote d'Ivoire, Ghana, Kenya, Nigeria, South Africa and Zambia. Their study found that savings are co-integrated in all of the countries except for Nigeria and that economic growth Granger-causes the growth rate of domestic savings for all the countries considered except Congo where reverse causality was obtained. Further, for Cote d'Ivoire and South Africa, bi-directional causality was found.

According to endogenous growth models developed by Romer (1986) and Lucas (1988), higher savings and capital accumulation can achieve a permanent increase in growth. Empirical evidence shows that rapid development in many developed economies has been because of an increase in investment, caused by a proportionate increase in savings. Theoretically, there is a corollary between the stock of savings and economic growth. A low level of savings, prolonged over an extended period, may lock a country into a vicious cycle of low investment, low economic growth and low real per capita income. In this way, the level of savings sets the limit to which investment and economic growth can be increased in a country over a given period of time (Kazmi, 2004). In an attempt to examine the relationship among foreign aid, domestic savings and economic growth in LDCs, Irandoust and Ericsson (2005) found that domestic savings and foreign aid were to enhance economic growth in all countries in the sample. However, Mohan (2006) while examining the relationship between savings and economic growth in a number of countries, found the causal relationship between savings and economic growth to be sensitive to the income level. Overall, the author found economic growth to Granger-cause savings in 13 countries and savings to Granger-cause economic growth in only two countries. More recently, Sinha and Sinha (2008) examined the

relationships among household savings, public savings, corporate savings and economic growth in India. The authors found that contrary to the conventional wisdom, higher savings in India were a consequence of higher economic growth and not the cause. Unfortunately, the majority of these studies are mainly based on the bivariate causality test. Yet, it is now clear that a bivariate causality test may be very unreliable, as the introduction of a third important variable can change both the inference and the magnitude of the estimates (see also Caporale and Pittis, 1997; Caporale, Howells and Soliman, 2004; Odhiambo, 2008).

While some studies maintain that foreign capital inflow positively affects economic growth, others argue that the relationship between the two variables may be negative. Chenery and Straut (1966), while relying on empirical evidence, argued that foreign capital has a positive effect on economic growth in developing countries. Shabbir and Mahmood (1992) arrived at similar conclusions. The authors argued that foreign capital inflow might supplement domestic savings and distort the composition of investment, thereby leading to a reduction in the rate of economic growth.

Theoretical Models of Savings and Growth

The most relevant theoretical model linking economic growth with savings is the neoclassical model inspired by Solow (1956), which suggests a connection between higher savings and economic growth in the short-run as the economic transitions between alternative steady states. Savings models are grouped into two: The Keynesian and non-Keynesian. The ensuing sections examine both models.

Keynesian Savings Functions

The Keynesian savings (consumption) function, in its most commonly used form, is linear with a constant marginal propensity to save (MPS),

$$S = \alpha_0 + \alpha_1 Y_g \qquad (1)$$

Where S is gross domestic savings, Y_g is gross national product, and α_1 is the constant MPS. It is assumed that $\alpha_0 < 0$ and $0 < \alpha_1 < 1$, such that as the level of income rises, the average propensity to save (APS) will also increase. However, if the intercept α_0 is positive or α_1 is negative, then APS will decrease with increases in income.

Though (1) is the most popular specification of the absolute income hypothesis, several alternatives have been employed to achieve a good idea of the movement of the average savings effort over time. For example:

$$S = \beta_0 + \beta_1 LnY_g \qquad (2)$$

and

$$LnS = c_0 + c_1 LnY_g \qquad (3)$$

Equation (2) implies that the total level of savings, for $\beta_0 > 0$, will increase with income, but at an ever decreasing rate. Both the average and marginal propensities to save tend toward zero for high levels of income. One explanation is that the transition from low to moderate-income levels brings an increased awareness of modern consumption opportunities and thus leads to a decreased saving rate. In Equation (3), the term c_1 represents the constant income elasticity of national savings. Different values of c_1 imply alternative sets of relationships between the average and marginal propensities to save: if $c_1 = 1$, then APS = MPS; if $c_1 > 1$, then MPS > APS; and if $c_1 < 1$, then MPS < APS

Non-Keynesian Savings Functions

Studies of savings behaviour in developed countries have utilised three alternatives to the Keynesian savings-income relationship, namely;

1. The Dusenberry "Relative Income" hypothesis,
2. The Friedman "Permanent Income" hypothesis; and
3. The Modigliani-Brumberg-Ando (MBA) "Life Cycle" hypothesis.

Empirical results of several recent tests of (2) and (3) as they apply to the less developed countries are presented in this section. Empirical studies of the Dusenberry hypothesis would relate current savings to the ratio of previous peak income and present income. Although we are not aware of any statistical studies relating to the less developed countries that are specifically designed to test the "Relative Income" hypothesis, several studies have important implications for that hypothesis. Despite their differences all three of the hypotheses, which we shall refer to as the DFM hypotheses, reject the Keynesian consumption function.

Over a long period of steady state growth a rise in per capita income will not in itself bring about a higher savings ratio at least so far as personal income is concerned. In addition, all three hypotheses provide an explanation for the findings based on budgetary surveys that the average savings rate for higher income groups is higher than that for lower income groups. Finally, it may be inferred that a relatively rapid increase in the growth rate-giving rise to substantial increases in per capita income will increase the average personal savings rate.

This is because a rapid increase in the rate of per capita income growth changes relative income and lifetime consumption patterns, and increases transitory income in relation to permanent income. Unfortunately, none of these hypotheses can tell us what will happen at the end of a period of rapid rise in the rate of growth when the economy settles down to a new steady rate of growth. Will the average savings ratio return to the previous ratio or will it exhibit a higher constant ratio appropriate to a higher steady state growth rate?

Permanent Income and Long-Run Savings Functions

Friedman's "Permanent Income" hypothesis is the starting point for a variety of specifications of the savings-income relationship. In its simplest form, the linear equation is:

$$S = \alpha_0 + \alpha_1 Y_p{}^t + \alpha_2 Y_T{}^t \qquad (4)$$

where $Y_p{}^t$ is permanent income and $Y_T{}^t$ is transitory income in year t. Permanent income is defined in terms of a long-run expectation over a planning period, and transitory income is the difference between actual income, Y_t in any period, t, and permanent income.

The definition of permanent income used in any empirical study depends upon available statistical information. Most times, series of studies of less developed countries are conducted with at most 15 or 20 annual observations. To maintain large degrees of freedom, a moving average of from two to four years may be employed. Irrespective of the measure used, the crucial relationship from the standpoint of the empirical tests is the relative size of the marginal propensities to save out of permanent and transitory income. Friedman's hypothesis is that individuals consume virtually no transitory income (MPST = 1). This implies a heavy reliance on past behaviour as a determinant of consumption spending, but changes in transitory income will immediately lead to changes in the level of savings. Empirical studies for developing countries show quite divergent marginal propensities to save out of permanent and transitory income.

The Asset Adjustment Approach

Savings may be viewed as a means of accumulating assets, which perform specific functions for the saver. One assumption is that the desired level of assets is a direct function of permanent income and that the desired stock of assets is acquired only over a long period. Models employing assets have been formulated as follows: assume that the desired stock of

assets (A_t^*) is a function of permanent income, savings consist of a stock adjustment by which an individual closes the gap between actual and desired asset holdings (S_t') and some fraction of current transitory income that is set aside by the individual (S_t'').

$$A_t^* = d_0 + d_1 Y_p{}^t \quad (5)$$

$$S_t' = b_0(A_t^* - A_{t-1}), S_t'' = b_1 + b_2 Y_T{}^t \quad (6)$$

$$S_t = S_t' + S_t'' = c_0 + c_1 Y_p{}^t + c_2 Y_T{}^t + c_3 A_{t-1} \quad (7)$$

WhereA_{t-1} is the individual's stock of assets at time *t-1*, $b_0$is the stock adjustment coefficient, and the *c*s are simple linear combinations of the preceding coefficients. Sufficient data simply do not exist for the developing countries for testing equation (7).

Consequently, it is necessary to seek substitutes for the asset variables. One possibility is the technique employed by Swamy (1968), which is an attempt to reconcile the long-run savings functions of Houthakker and Taylor (1966) for the United States, estimated based on time series information, with that of Modigliani (1965) for several countries, but estimated based on cross-sectional information. Essentially the equation tested is as follows:

$$S_{ht}/Pop = k_1(S_{ht-1}/Pop) + k_2(Y_{ht}/Pop) \quad (8)$$

The values of k_1 range between 0 and 1.

METHODOLOGY

Model Specification

To investigate the relationship between savings and economic growth in Nigeria, the econometric model utilised by Odhiambo (2008) for South Africa and Abu (2010) for Nigeria was adapted. These studies have modelled the relationship between savings and economic growth using a Granger causality technique. Specifically,Odhiambo's (2008) model is adopted in this work. Hence, a dynamic Granger causality test is used to examine the direction of causality between savings and economic growth in Nigeria. The advantage of the Granger causality approach over other approaches is its favourable response to both large and small samples. Thus, a trivariate Granger causality model among savings, foreign capital inflow and economic growth was specified based on an error correction mechanism. Thus:

$$GDG_t = \delta_0 + \sum_{i=1}^{m} \delta_{1i} GDG_{t-i} + \sum_{i=1}^{n} \delta_{2i} LS_{t-i} + \sum_{i=1}^{m} \delta_{3i} LFCI_{t-i} + \delta_{4i} ECM_{t-1} + \mu_t \quad (9)$$

$$LS_t = \gamma_0 + \sum_{i=1}^{m} \gamma_{1i} GDG_{t-i} + \sum_{i=1}^{n} \gamma_{2i} LS_{t-i} + \sum_{i=1}^{m} \gamma_{3i} LFCI_{t-i} + \gamma_{4i} ECM_{t-1} + \varepsilon_t \quad (10)$$

$$LFCI_t = \varphi_0 + \sum_{i=1}^{m} \varphi_{1i} GDG_{t-i} + \sum_{i=1}^{n} \varphi_{2i} LS_{t-i} + \sum_{i=1}^{m} \varphi_{3i} LFCI_{t-i} + \varphi_{4i} ECM_{t-1} + \varepsilon_t \quad (11)$$

where GDG_{t-i} stands for the GDP growth rate, LS_t stands for the log of total savings in the economy, $LFCI_t$ stands for foreign capital investment, which is a source of savings from abroad, δ_0, γ_0, and φ_0 are the respective constants for the three equations, and δ_i, γ_i, and φ_i are the coefficients for the variables to be estimated.

A Priori Expectations

Following the models of savings and consumption (heretofore reviewed), the theoretical expectations from this model are as follows:

(i) all the δ_i parameters are expected to assume positive signs; and

(ii) all the γ_i parameters are also expected to assume positive signs.

The only parameters expected to be negatively signed are the parameters of the *ECM*. This is because the distortions in the long run relationship between savings and growth are expected to be corrected in the short-run. The parameter of the *ECM* tells the speed or period within which such disequilibrium will be corrected.

Estimation and Evaluation Procedure

Since time series data are adopted to conduct the analysis, it is appropriate that the data be scanned first for inconsistencies. Gujarati and Porter (2009) asserted that empirical macroeconomic studies usually involve non-stationary and trending variables. The presence of these two properties in time series macroeconomic variables (like the ones we are using) make them not amenable to regression analysis without some form of transformation.

Gujarati and Porter (2009) suggested that in carrying out analysis on time series data, tests of stationarity should precede tests of causality. Therefore, prior to testing for the direction of causality between savings and economic growth in Nigeria, scanning of the data sets for unit roots is carried out, using the Augmented Dickey Fuller (ADF) unit root test. The essence of the test is to show whether the time series have a stationary trend, and if non-stationary, to show the order of integration at which they become stationary. After testing for stationarity or otherwise of the time series, we also test whether the time series variables are co-integrated. This is to ensure that the resultsobtained are not spurious. Economically speaking, two variables are co-integrated if they have a long-term relationship (Gujarati and Porter, 2009). Because we are interested in the long-term relationship between economic growth and industrialisation of the Nigerian economy, co-integration test was conducted using the Johansen Co-integration model. The choice of the Johansen model is informed by its superiority to the Augmented Engle Granger model and Durbin-Watson test of co-integration.

The existence of a co-integrating equation would imply that there exists a long-run relationship between savings and economic growth in Nigeria. However, in the short-run, there may be deviations from this long-run relation and these deviations can be tracked and corrected using an error-correction model. This technique underpins the models specified above.

RESULTS AND DISCUSSION

Analysis of Integration Properties

Augmented Dicker-Fuller (ADF) unit root testwas applied on all the data series. Schwarz Information Criterion (SIC) was used for the selection of the optimal lag length. Specifically, a maximum lag value of 9 lags is accommodated.

For robustness checks, the specification of the ADF model was varied. Thus, the test was run under two different assumptions:

(1) with intercept, and

(2) with trend and intercept.

The results for the ADF test are presented in table 1

Table 1: Summary of Augmented Dicker-Fuller (ADF) Unit Root Test

	Levels		**1st Difference**			
Variable	Intercept	Intercept + trend	Intercept	Intercept + trend	Critical level 1%	Conclusion
LFCI	0.632	2.836	7.569	7.411	3.73	I(1)
LPCI	0.393	2.441	4.379	4.272	3.72	I(1)
GDPG	3.349	3.237	5.486	4.419	3.88	I(1)
LS	1.12	3.420	5.507	5.701	3.73	I(1)
SAVGDP	1.372	2.367	4.176	6.231	3.75	I(1)

The results of the unit root test as presented in Table 1 indicate that all the variables possess unit-roots at their levels. After transforming the variables to their first differences and applying the ADF test again, the variables became stationary. The results are robust since they lead to the same conclusion when we specify the ADF model with the assumption of an intercept term and when we include a trend specification. The implication is that the variables are integrated of order one i.e. I(1).

Given the fact that most of the variables became stationary after first differencing, non-stationary variables were further tested to ascertain whether they were cointegrated. In other words, the hypotheses were tested about the rank of the cointegrating relationships that existed among the variables. Johansen co-integration test procedure was utilised and both the Trace statistic criterion and the Maximum Eigen value criterion were used to determine the conclusion about the hypotheses of the rank of the cointegrating relationships. The decision criterion is that when the Trace Statistic is greater than the 5% critical value, the null hypothesis is rejected and it is concluded that there is a cointegrating relationship. The testing was continued in an iterative manner until the null hypotheses were no longer rejected to indicate no cointegrating relationship. Table 2 presents the Unrestricted Cointegration Rank Test using the Trace statistic.

Table 2: Unrestricted Co-integration Rank Test (Trace)

Hypothesised No. of CE(s)	Eigen value	Trace statistic	0.05 Critical value	Prob.**
None	0.551243	19.87572	29.79707	0.4313
At most 1	0.305799	6.254054	15.49471	0.6655
At most 2	0.002887	0.049150	3.841466	0.8245

Trace test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level

Table 2 indicates that there is no long-run relationship among savings, foreign capital investment and economic growth in Nigeria. This is because the Trace test for cointegration is not significant for any of the rank assumption at the 5% level of significance.

Table 3: Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesised No. of CE(s)	Eigen value	Max-Eigen Statistic	0.05 Critical value	Prob.**
None	0.551243	13.62166	21.13162	0.3968
At most 1	0.305799	6.204904	14.26460	0.5870
At most 2	0.002887	0.049150	3.841466	0.8245

Max-eigenvalue test indicates no cointegration at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

The conclusion about no long-run relationship among the variables is robust because the unrestricted cointegration rank test using the maximum eigenvalue criterion (presented in Table 3) also indicates that there is no cointegrating equation relationship among the variables. Since the trace test statistic and the maximum eigenvalue statistic both tell the same story i.e. no cointegrating relation among the variables, it is concluded that the savings-growth relationship in Nigeria does not have an equilibrium value.

The Dynamic Granger Causality Test

Table 4 displays the results from the dynamic Granger causality test specified. The tests with two lags of all the variables in the model were carried out. The first hypothesis tests for causality between economic growth in Nigeria and foreign capital investment. That is, the null hypothesis is that GDPG does not Granger cause FCI. The F-statistic of 0.964 was obtained, with a probability value of 0.408. These results are not robust enough to cause a rejection of the null hypothesis; hence, the null hypothesis is accepted implying that growth in the Nigerian economy is not a significant factor in attracting foreign savings into the Nigerian economy.

Table 4: Dynamic Pairwise Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Probability
LOG(GDPG) does not Granger Cause LOG(FCI)	17	0.96452	0.40885
LOG(FCI) does not Granger Cause LOG(GDPG)		0.26144	0.77422
LOG(SAVGDP) does not Granger Cause LOG(FCI)	23	2.03809	0.15927
LOG(FCI) does not Granger Cause LOG(SAVGDP)		6.97835	0.00571
LOG(SAVGDP) does not Granger Cause LOG(GDPG)	17	0.23578	0.79353
LOG(GDPG) does not Granger Cause LOG(SAVGDP)		6.86547	0.01029

In addition, the reverse of the hypothesis, that is, FCI does not Granger caused GDPG is not rejected by the F-test. This is because the probability value of 0.77 is higher than the

conventional 5% level of significance. This implies that foreign capital investments in Nigeria, which serve to boost savings, are not a significant contributor to growth in Nigeria.

The second set of pairwise causality we test is between savings as a ratio of GDP and foreign capital investment. Here, the first null hypothesis that SAVGDP does not Granger cause FCI in Nigeria is not rejected. This is very plausible given the weak financial system in Nigeria. What this implies is that the domestic savings to GDP ratio in Nigeria is not a significant factor that affects the inflow of foreign capital investments into Nigeria. On the other hand, the alternative hypothesis that FCI does not Granger cause SAVGDP in Nigeria is rejected. This is because with the F-statistic of 6.97 and a probability value of 0.005, statistical evidence was obtained to reject the null hypothesis. This result is theoretically plausible because it suggests that foreign capital investment in Nigeria significantly influences the savings rate in Nigeria. This is understandable because the additional savings that will be coming into Nigeria from abroad will serve as reinforcement, and will have multiplier effects on the Nigerian economy.

Finally, and most importantly, the last sets of hypotheses tested provide the baseline results for this research endeavour. The first hypothesis that the savings to GDP ratio does not Granger cause economic growth in Nigeria cannot be rejected. This is because of the low F-statistic of 0.235 with a high probability value of 0.793. This result implies that savings do not cause growth in Nigeria. On the other hand, the reverse hypothesis that economic growth Granger causes savings in Nigeria is rejected. The rejection of this null hypothesis is informed by the F-value of 6.86 with a probability value of 0.01, indicating that economic growth in Nigeria is causing savings to improve. In other words, there is a one-way causality from growth to savings in Nigeria, and not the other way round.

RECOMMENDATIONS

Following from the findings of this work, the following recommendations are put forth for policy.

1. The implication of the results is that it is growth in the real sector that drives savings in the economy, and not savings driving growth. Therefore, policy makers should pay more attention to developing the industrial sector in the economy, to foster more growth and savings.
2. There is the need for mobilisation of savings. The need to enhance investment and economic growth potentials calls for mobilisation of savings, both in the short and long runs. This can be achieved through financial liberalisation, savings enlightenment programmes, and introduction of more savings instruments as well as policy in favour of the environment where savings are made. In addition, vigorous promotion of the capital market and sustenance of the reformed pension funds will mobilise cheap savings that can form a pool of funds to be channelled as investment into the real sector, which will have positive and direct effect on economic growth.
3. Improvements of infrastructural facilities: Investors, both domestic and foreign, are naturally hesitant to invest in countries where basic infrastructure, such as good roads, health services and utilities are inadequate. In economies suffering from inadequate infrastructure, investors may be compelled to provide their own back-up power supply, medicare and access roads. These increase the cost of doing business and reduce the rate of return on investment, thus turning away investors. Hence, there is need to vigorously pursue policies that priority attention to infrastructural development.
4. Need for political stability: Investments in the real sector are mostly in the form of fixed assets. In situations of frequent political instability, investors prefer portfolio investment, which facilitates capital flight especially at short notice. For this reason, a

lot of the investments that should have been channelled to the real sector are diverted to other countries that are more stable or other sectors from which capital flight is easier. In order to avert this situation, there is need for true democratic governance that has the interest of the masses and of the economy at heart.

5. Waging war against corruption: Corruption has been identified as major factor impeding the flow of investment into most developing countries. It tends to increase the cost of doing business and to impact negatively on investment. Investors would not like to invest in an economy where there is no transparency.To achieve economic growth, there is need to wage war against corruption. In other words, Nigeria must make definite efforts to stem corruption in all its facets and ramifications. There should be anti-corruption campaign in every sphere of the economy and the offenders should be severely punished.
6. Need for an Improved Legal System: The predictability of legal, regulatory and administrative machinery is one of the foundation stones on which investors' confidence is built. There is need for initiating and implementing practicable legal system geared toward improving savings and investment in the economy and consequently enhancing the economic growth.

CONCLUSION

In this work, attempt has been made to show the empirical relationship that exists between savings and economic growth in Nigeria i.e. whethersavings really act as an engine of economic growth, as postulated by the classical economists or economic growth drives accumulation of savings. The studywas motivated by the low and declining savings rates currently prevailing in Nigeria onthe one hand, and by the dwindling level of economic growth experienced in the country during the 1980s and 1990s on the other. Given the weakness associated with the bivariate causality tests, the current study has adopted a trivariate causality setting, which allows for the inclusion of a third variable in the causality model. For this purpose, the foreign capital inflow was included in the trivariate model as a third important variable affecting both savings and economic growth.

Using the dynamic Granger causalitymethod and error-correction mechanism, the empirical results reveal that there is a uni-directional relationship between savings and economic growth. The direction is from growth to savings and not the other way round. Other illuminating results from the study are that savings do not cause growth; savings do not cause foreign investments; foreign investments do not cause savings and foreign investments do not cause growth in Nigeria. These results are not surprising because of the structure of the Nigerian economy, and the known attitudinal savings behaviour of less developed countries. Since the financial system is perceived to be fragile and underdeveloped, its ability to attract savings from a paranoid society would be little. However, when the economy grows, the income of individuals and firms too would grow and the extra monies they have will be channelled into savings. The results provide a characterisation of what may also be obtained in most developing countries with fragile financial sectors and an open economy.

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APPENDIX I: DATA SET USED FOR ANALYSIS

YEAR	SAV	GDP	SAVGDP	GDPG
1980	5769.9	47619.66	NA	NA
1981	7514.4	49069.28	NA	NA
1982	9443.9	53107.38	0.121166	3.04
1983	10988.1	59622.53	0.153139	8.23
1984	12521.8	67908.55	0.177827	12.27
1985	13934.1	69146.99	0.184294	13.9
1986	18676.3	105222.84	0.184392	1.82
1987	23249	139085.3	0.201514	52.17
1988	23801.3	216797.54	0.177493	32.18
1989	29651.2	267549.99	0.167156	55.87
1990	37738.2	312139.74	0.109786	23.41
1991	55116.8	532613.83	0.110825	16.67
1992	85027.9	683869.79	0.120902	70.63
1993	108460.5	899863.22	0.103484	28.4
1994	108490.3	1933211.55	0.124333	31.58
1995	134503.2	2702719.13	0.12053	114.83
1996	177648.7	2801972.86	0.056119	39.8
1997	200065.1	2708430.86	0.049766	3.67
1998	277667.5	3194014.97	0.063401	-3.34
1999	385190.9	4582127.29	0.073868	17.93
2000	488045.4	4725086	0.086934	43.46
2001	592094	6912381.25	0.084064	3.12
2002	655739.7	8487031.57	0.103288	46.29
2003	797517.2	11411066.9	0.085657	22.78
2004	1316957.4	14572239.1	0.077264	34.45
2005	2693554.3	18564594.7	0.06989	27.7
2006	2195884.9	23280715.4	0.090374	27.4
2007	2444719.6	20922655.8	0.080132	27.6
2008	1332152.9	22101685.2	0.085253	27.5
2009	1888436.5	21512170.5	0.082693	27.6
2010	1610294.2	21806928.7	0.083973	27.6

Source: Central Bank of Nigeria Statistical Bulletin (Various Issues

APPENDIX II: VEC ESTIMATES

Vector Error Correction Estimates

Cointegrating Eq:	CointEq1
LOG(FCI(-1))	1.000000
LOG(GDPG(-1))	-2.476489 (1.02864) [-2.40754]
LOG(SAVGDP(-1))	13.92560 (3.38401) [4.11512]
C	25.54460

Error Correction:	D(LOG(FCI))	D(LOG(GDPG))	D(LOG(SAVGDP))
CointEq1	0.058484 (0.04340) [1.34740]	0.227021 (0.14833) [1.53050]	-0.054638 (0.01493) [-3.65993]
D(LOG(FCI(-1)))	-0.394234 (0.32489) [-1.21343]	-1.165877 (1.11029) [-1.05007]	-0.014032 (0.11174) [-0.12557]
D(LOG(FCI(-2)))	-0.475444 (0.29061) [-1.63600]	-0.670155 (0.99314) [-0.67478]	-0.033974 (0.09995) [-0.33990]
D(LOG(GDPG(-1)))	-0.125044 (0.16225) [-0.77069]	0.117537 (0.55447) [0.21198]	-0.213045 (0.05580) [-3.81767]
D(LOG(GDPG(-2)))	-0.041783 (0.15156) [-0.27570]	0.150141 (0.51792) [0.28989]	-0.067610 (0.05213) [-1.29704]
D(LOG(SAVGDP(-1)))	-1.116024 (0.89558) [-1.24615]	-0.352289 (3.06054) [-0.11511]	0.016172 (0.30803) [0.05250]
D(LOG(SAVGDP(-2)))	0.248480 (0.57734)	-0.421757 (1.97299)	0.362183 (0.19857)

	[0.43039]	[-0.21377]	[1.82394]
C	0.511801	0.384647	0.017374
	(0.16120)	(0.55088)	(0.05544)
	[3.17498]	[0.69824]	[0.31337]
R-squared	0.515316	0.432222	0.822958
Adj. R-squared	0.091218	-0.064583	0.668046
Sum sq. resids	1.401955	16.37287	0.165848
S.E. equation	0.418622	1.430597	0.143983
F-statistic	1.215086	0.870003	5.312433
Log likelihood	-3.225245	-22.88731	13.85115
Akaike AIC	1.403156	3.860914	-0.731394
Schwarz SC	1.789450	4.247208	-0.345100
Mean dependent	0.335065	-0.017444	-0.012161
S.D. dependent	0.439129	1.386525	0.249903

Determinant resid covariance (dof adj.)	0.004643
Determinant resid covariance	0.000580
Log likelihood	-8.493789
Akaike information criterion	4.4324
Schwarz criterion	5.740467