

Impact of Financial Liberalization on Private Investment: Empirical Evidence from Nigerian Data

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Abstract: This study examines the nature of the relationship between financial liberalization and private investment in Nigeria from 1970 to 2012. The regression analysis reveals that financial liberalization, proxied by real interest rate (RINTR) has a statistically significant positive impact on private investment. Furthermore, the Chow-test result shows that there was a structural break between financial liberalization and private investment in Nigeria within the period under review. This change in relationship can be attributed to the Structural Adjustment Programme (SAP) embarked upon by the Nigerian government in 1986 which liberated the financial sector from acute repression. In addition, the Granger causality test shows that although there was dependence between financial liberalization and private investment, none caused the other. This study therefore concludes that private investment which is enhanced by private savings, financial liberalization and other key variables, is fundamental in the achievement of sustainable economic growth and development. The study therefore recommends that government should create enabling environment for private investment to thrive.

JEL Classifications: E22, E44, G21, O16

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1. Introduction

Studies on financial sector reforms and private investment outcomes have become a prominent feature of recent empirical endeavors (Guzici 2007; Fowoye 2011 and Asare 2013). The seminal works of McKinnon (1973) and Shaw (1973) actually gave birth to the modern economic analysis of financial liberalization and financial policy in developing countries as we have it today. As opined by Williamson (1998), both authors drew attention to the widespread "financial repression" in developing countries. Agenor and Montiel (1996) argue that financial repression describes an environment where the financial system is repressed or marginalized by series of government interventions that have the effect of keeping interest rates that domestic banks offer to savers very

low and sometimes negative. This low interest rate discourages savings, makes investment unattainable and economic growth becomes elusive. Shane (2013) and Achy (2005) equally contend under the financial repression regime, the monetary authorities impose high reserve requirements, bank-specific credit ceilings and selective credit allocation, mandatory holding of treasury bills and bonds issued by the government, and finally a non-competitive and segmented financial system. Since financial repression has been most commonly associated with government fixing of interest rates and its adverse consequences on the financial sector as well as on the economy, financial liberalization, in turn, has come to be most commonly associated with freeing of interest rates. This approach to financial liberalization is pretty much the old view.

We now understand financial liberalization as a process involving a much broader set of measures geared toward the elimination of various restrictions on the financial sector, such as the removal of portfolio restrictions on the banking sector, the reform of the external sector, as well as changes in the institutional framework of monetary policy (Murat Ucer, 1998). Also, the term financial liberalization is used to cover a whole set of measures, such as the autonomy of the Central Bank from the government; the complete freedom of finance to move into and out of the economy, which implies the full convertibility of the currency; the abandonment of all "priority sector" lending targets; an end to government-imposed differential interest rate schemes; a freeing of interest rates; the complete freedom of banks to pursue profits unhindered by government directives; the removal of restrictions on the ownership of banks, which means de-nationalization, full freedom for foreign ownership, and an end to "voting caps"; and so on (Patnaik, 2011). In addition, financial liberalization is the removal or loosening of restrictions imposed by the government on the domestic financial market (Sulaiman, Oke and Azeez, 2012 & Agu, Orji and Eigbiremolen, 2014). It encompasses those policies aimed at freeing up financially-repressed economies from the effects of such growth-retarding financial policies like ceilings on interest rates, directed credit to priority sectors, and a small number of banks which are mainly government owned and very inefficient (Fowowe, 2011, Murat 1998).

Private Investment on the other hand is an investment made by businesses, institutions or investors rather than the government. In others words, private investment refers all other kinds of investment outside that made by the government.

Before the advent of the Structural Adjustment Programme (SAP) in Nigeria in 1986, the financial sector was dominated by static and relatively low interest rates, mandatory sectoral allocation of bank credit and quantitative ceilings on bank credit to the private sector, all of which engendered inefficiencies and distortions. The Pre-SAP period was seen an era of financial repression characterized by the policies of directed credit and interest rate ceiling, believed to have caused imperfections in the operations of the financial market (Akingunola et al., 2013). Consequently, the government of Nigeria embarked upon financial liberalization as part of its Structural Adjustment Programme (SAP) in 1987 with the belief that reduction of all sorts of regulation on the financial sector would engender economic growth. Specifically, the Nigerian financial sector liberalization or reforms began with the deregulation of interest rates in August 1987 (Ikhide and Alawode, 2001). Prior to this period, the financial system, as earlier stated, operated under financial regulation and interest rates were highly repressed. The resulting low or negative interest rates discourage saving mobilization and channeling of the mobilized savings through the financial system. Proponents of liberalization argue that it keeps interest rate relatively high and competitive, encourages savings mobilization, motivates private investment and engenders economic growth while repression has a negative impact on the quantity and quality of investment and hence economic growth (Obamuyi and Olorunfemi, 2011).

Despite the liberalization efforts of Nigeria, the World Bank report of 2010 noted that level of savings and investment rate in Nigeria has remained inadequate and insufficient to fuel the growth needed to raise living standards and attain full capacity utilization of resources. However, Dipo (2008) suggests that private investment in Nigeria within 1970-1995, contributed significantly to the gross domestic product. Although investment typically represents a much smaller component of aggregate demand than does consumption, it determines the rate at which physical capital is accumulated. Amongst the components of aggregate demand, Private investment is identified as having more impact on the economy. Consequently, private sector and market led economy have been stressed while de-emphasizing heavy public sector participation in production. In the light of these policy shifts, the Private sector led development has been encouraged in Nigeria (Kalu and James, 2012).

From the literature, the theoretical and empirical arguments on the relationship between financial liberalization and private investment are still inconclusive (Baliamoune-Lutz 2007; Demir 2008; Fowowe 2011; Kalu and James 2012). Hence, this study is an attempt to contribute to the literature by critically examining the impact of financial liberalization on private investment in Nigeria and also check for the presence or absence of structural break as well as the direction of causality between financial liberalization and private investment in Nigeria.

The rest of the study is outlined as follows: section two briefly reviews various related literature, section three discusses the methodology, section four presents the analysis and interpretation of findings and section five provides the conclusion and recommendations.

2. Literature Review

A number of studies have been conducted to empirically examine the relationship between financial liberalization and private investment. There seems to be an agreement from a number of studies that financial liberalization positively impacts private investment. However, the bulk of such studies have been carried out in the international scene, with very little done in Nigeria. A review of some of the empirical literature is provided below.

Arbeláez and Echavarría (2002) evaluated the degree to which Colombian firms face credit restrictions that alter their investment decisions. The study analyzes whether the evolution of the financial sector during the 1990s, characterized by an intense financial liberalization, an increase in size and a deepening of the activity, reduced the credit restrictions faced by firms and stimulated investment. It also explores whether, on the contrary, financial restrictions intensified during the recent 1998-2000 crisis. The study provides empirical evidence suggesting that Colombian firms are indeed restricted by external resources and are compelled to resort to internal resources. It also demonstrates that financial liberalization and the greater credit availability reduced such restrictions, and that the financial crisis had a strong and negative effect on investment and its financing.

Galindo, Schiantarelli and Weiss (2003) in another study, used firm level panel data from twelve developing countries to examine whether financial liberalization improved the efficiency with which investment funds are allocated to competing uses. They developed a summary index of the efficiency of investment allocation that measures whether, and to which extent, investment funds are going to firms with a higher marginal return to capital. They then examine the relationship between this index and various measures of financial liberalization. The results suggest that in the majority of cases financial reform has led to an increase in the efficiency with which investment funds are allocated.

In another study, Gezici (2007) study 165 Turkish manufacturing firms for the period 1985-2003. He adopted the Generalized Moment of Methods (GMM) in analyzing investment under financial liberalization. The econometric tests and survey results provide evidence for a negative relationship between firm level investment and uncertainty variables, and a positive relationship with liquidity and sales variables. The negative impact of uncertainty on investment is worsened under financial liberalization due to nonlinearities in investment-uncertainty relationship as suggested by Post Keynesian theory. There is no evidence for a declining importance of liquidity.

Demir (2008), using firm level panel data, analyzed the impacts of rates of return gap between financial and fixed investments under uncertainty on real investment performance in three emerging markets, Argentina, Mexico and Turkey. Employing a portfolio choice model to explain the low fixed investment rates in developing countries during the 1990s, the study suggests that rather than investing in irreversible long term fixed investments, firms may choose to invest in reversible short term financial investments depending on respective rates of returns and the overall uncertainty in the economy. The empirical results show that increasing rates of return gap and uncertainty have an economically and statistically significant fixed investment reducing effect while the opposite is true with respect to financial investments.

Fowowe (2011) conducted an empirical investigation of financial sector reforms on private investment in selected Sub-Saharan African countries. He developed an index which was used to track the gradual progress made with implementation of the phases of the reforms. The results of econometric estimations show that financial sector reforms (measured by the index) have had a positive effect on private investment in the selected countries, thus offering support to the financial liberalization hypothesis.

Kalu and James (2012) examined the determinants of private Investment in Nigeria's manufacturing sector for 1970-2010. The study adopted the Vector Error Correction Model approach, estimated using the Ordinary Least Square estimator. The results show that manufacturing output significantly responds to the contemporaneous perturbation in the values of nominal exchange rate, policy lending rate and the corporate income tax. These series also show a high tendency of recovery from the deviation from their equilibrium values in subsequent periods.

3. Methodology

In order to estimate the impact of financial liberalization on private investment, the linear regression model based on the ordinary least square (OLS) technique would be employed. Ordinary least square (OLS) is extensively used in regression analysis primarily because it is intuitively appealing and mathematically much simpler than any other econometric technique (Gujarati, 2004). Real interest rate (RINTR) would be used as a proxy for financial liberalization as this has been used severally in the literature (Bandiera et al., 2007; Fry, 1997 and among others). Also, since financial repression has been most commonly associated with government fixing of interest rates and its adverse consequences on the financial sector as well as on the economy, financial liberalization, in turn, has come to be most commonly associated with freeing of interest rates. That is, an interest rate determined by the forces of demand and supply can be used to explain financial liberalization to a very high extent. In order to obtain robust estimates, this study would include private savings and inflation as related control variables. The general functional form of the linear regression model could be stated as follows:

$$PI = f(RINTR, PS, INF) \quad (1)$$

Where, PI = Private Investment; RINTR = Real Interest Rate; PS = Private Savings; INF = Inflation. The econometric form of equation (1) is specified as follows:

$$PI_t = \beta_0 + \beta_1 RINTR_t + \beta_2 PS_t + \beta_3 INF_t + U_t \quad (2)$$

Where, β_0 is the intercept of relationship in the model; β_1 , β_2 , and β_3 are coefficients of each exogenous or explanatory variable, respectively. And U_t stands for stochastic error term.

In a bid to determine the presence or absence of structural break or change in the relationship between financial liberalization and private investment in Nigeria in a period of 42 years (1970-2012), the Chow-Test invented by Gregory Chow in 1960 would be employed. The Structural Adjustment Programme (SAP) of 1986 implemented by the Nigeria government played a major role in liberating its financial sector. Such an important economic programme is expected to affect the relationship between financial liberalization and private investment. To see if this happened, we shall categorize our data set into three periods: 1970-1985 (which is the pre-SAP era); 1986-2012 (which is the post-SAP era); and 1970 – 2012 (which is the pooled period). This will give three possible regression stated as:

$$\text{Time period 1970-1985: } PI_t = \lambda_0 + \lambda_1 RINT + U_{1t} \quad n_1 = 16 \quad (3)$$

$$\text{Time period 1986-2012: } PI_t = \psi_0 + \psi_1 RINT + U_{2t} \quad n_2 = 27 \quad (4)$$

$$\text{Time period 1970-2012: } PI_t = \alpha_0 + \alpha_1 RINT + U_t \quad n_3 = 43 \quad (5)$$

Equation (5) assumes that there is no difference between the two time periods and therefore estimates the relationship between financial liberalization and private savings for the entire time period consisting of 43 observations. In other words, this regression assumes that the intercept as well as the slope coefficient remains the same over the entire period; that is, there is no structural change. If this is in fact the situation, then $\alpha_0 = \psi_0 = \lambda_0$ and $\alpha_1 = \lambda_1 = \psi_1$. Equation (3) and (4) assume that the regressions in the two time periods are different; that is, the intercept and the slope coefficients are different.

The Chow Test assumes:

1. $U_{1t} \sim N(0, \sigma^2)$ and $U_{2t} \sim N(0, \sigma^2)$. That is, the error terms in the sub period regressions are normally distributed with the same (homoscedastic) variance σ^2 .
2. The two error terms U_{1t} and U_{2t} are independently distributed.

To check for the presence or absence as well as the direction of causality between financial liberalization and private investment, the Granger causality test will be used. It can be stated thus:

$$RINTR_t = \sum_{i=1}^m \alpha_i PI_{t-i} + \sum_{j=1}^n \beta_j RINTR_{t-j} + U_{1t} \quad (6)$$

$$PI_t = \sum_{i=1}^m \lambda_i PI_{t-i} + \sum_{j=1}^n \delta_j RINTR_{t-j} + U_{2t} \quad (7)$$

Where U_{1t} and U_{2t} are assumed to be uncorrelated.

4. Analysis and Interpretation of Findings

Some basic statistical analyses of the key variables in this study are presented in table 1 below prior to the tests and analyses proper.

Table 1. Basic statistical analysis

Variable	Obs.	Mean	Std. Dev.	Min	Max
PI	43	21.68518	4.039224	13.82	31.92
RINTR	43	-2.152562	13.2776	-32.06	25.13
PS	43	808177.4	1700080	336.7	6531913
INF	43	19.40873	15.78667	3.2	72.8

4.1 Stationarity Test

To avoid running a spurious regression, a stationary test was carried out to make sure that all the variables are mean reverting. That is; they have constant mean, constant variance and constant covariance. In other words, that they are stationary. The Augmented Dickey-Fuller (ADF) test was used for this analysis since it adjusts for serial correlation. The test was done with the following hypothesis:

Null hypothesis (H_0): Variable contains unit root and hence is non-stationary.

Alternative hypothesis (H_A): Variable does not contain unit root and hence is stationary.

Decision rule: If the calculated ADF Test statistic is greater than the MacKinnon critical values (both in absolute term) at the chosen level of significance, reject the null hypothesis of non-stationarity and accept the alternative hypothesis of stationarity, otherwise do not reject the null hypothesis of non-stationarity. The results are summarized in Table 2 below.

Table 2. Results of ADF unit root test

Variable	ADF Test Statistics	5% critical value	Order of integration
PI	-3.430213	-2.933158	I(0)
RINTR	-6.479810	-2.9320	I(0)
PS	-4.145699	-2.9358	I(2)
INF	-3.303306	-2.9320	I(0)

The result from table II above shows that PI, RINTR and INF are all stationary at level form, while PS is stationary at second difference. Therefore, this evidence suggests that first and second differencing are both sufficient in modeling in this study.

4.2 Cointegration

Cointegration tests prove that the combination of such variables has a long-term relationship. Economically speaking, two variables will be cointegrated if they have a long-run or an equilibrium relationship between them (Gujarati, 2004). To test for cointegration among the variables, we will use the Engel Granger approach which entails performing ADF test on the regression residuals. The ADF unit root test on the residuals work with the same decision rule as unit root test. For cointegration, it tests for unit root in the residuals obtained from the ordinary least square (OLS) regression results. The cointegration test result is summarized in Table 3 below.

Table 3. Cointegration test result

ADF Unit Root Test on Residuals	
<i>ADF Test Statistics</i>	<u>-4.35064</u>
1% Critical Value	-3.5930
5% Critical Value	-2.9320
10% Critical Value	-2.6039

The result in Table 3 shows that the ADF test statistics (-4.35) is greater than the 1% critical value (-3.593) in absolute terms. This implies that the residuals are stationary, leading us to conclude that the variables are co-integrated. That is, the linear combination of these variables cancels out

the stochastic trend in the series. This will prevent the generation of spurious (i.e., non-meaningful) regression results. Therefore, the estimates of the linear regression model are summarized in table 4 below.

Table 4. Regression Estimates

Variable	Coefficient	t-statistics	Probability
Constant	20.67343	20.57538	0.0000***
RINTR	0.095685	3.582002	0.0009***
PS	0.000923	3.3332	0.0019***
INF	-0.024165	-0.076751	0.5569

Note: *** indicates significance at 1% level; Private Investment (PI) is the explained variable

The result of the regression in Table 4 shows that financial liberalization, proxied by real interest rate (RINTR) has a statistically significant positive impact or effect on private investment in Nigeria. That is, the more liberalized the Nigerian economy is, the higher the level of investment the private sector would embark upon. Specifically, for every unit increase in the financial liberalization process in Nigeria, private investment grows by 0.096 units on the average, holding all other variables constant. This positive impact between financial liberalization and private investment is consistent with existing empirical findings, such as Fowoye (2011) and Galindo, Schiantarelli and Weiss (2003). As expected, the result further reveals that private savings also has a statistically significant positive impact on private investment Nigeria. That is, every other thing held constant, as private savings increases, the level of private investment would increase as well in Nigeria. On the other hand, the result shows that high level of inflation discourages meaningful private investment in Nigeria.

4.3 Chow Test

The estimates of the Chow test are presented below

$$F_{cal} = \frac{(RSS_R - RSS_{UR}) / k}{(RSS_{UR}) / (n_1 + n_2 - 2k)} \sim F [k, (n_1+n_2-2k)]$$

Decision rule: Reject the null hypothesis (no structural break) if F calculated is greater than F tabulated at the chosen level of significance, otherwise, do not reject.

$$F_{cal} = \frac{(674.2866 - 454.9706) / 2}{(454.9706) / 39} = 9.39$$

From the F table we find that for 2 and 39 df, the 1% critical F value is approximately 5.20. Since the F calculated is greater than the F tabulated, we reject the null hypothesis and conclude that there was indeed a structural break or change in the relationship between financial liberalization

and private investment in Nigeria in the periods of 1970-2012 as suspected. This change in relationship is obviously, to a large extent, due to the Structural Adjustment Programme (SAP) embarked upon by the Nigeria government in 1986 which liberated the financial sector from repression.

4.4 Granger Causality

The Granger causality testing procedure is stated as follows:

$$F = \frac{(RSS_R - RSS_{UR}) / m}{RSS_{UR} / (n - k)}$$

Where, m is the number of lagged M terms, k is the number of parameters estimated in the unrestricted regression and n is the number of observations.

Decision rule: If the computed F -value exceeds the critical F value at the chosen level of significance (5% level for this study), we reject the null hypothesis, otherwise, we do not reject.

The Granger causality test between financial liberalization and private investment is presented in table 5 below.

Table 5. Granger Causality between PI and RINTR

Null Hypothesis	Computed F value	Critical F value (5%)
RINTR does not Granger cause PI	0.15030	4.08
PI does not Granger cause RINTR	0.54457	4.08

Evaluating the results in table V based on our decision rule, we conclude that there is no causal relationship between financial liberalization and real private investment. This outcome is in consonance with the common saying that relationship or dependence/correlation does not necessarily imply causality (Engber, 2012; Gujarati, 2004). That is, although financial liberalization and private investment depends on one another, they do not necessarily cause each other.

5. Conclusion and Recommendations

This study, using the OLS regression analysis, Chow test and the Granger causality test, empirically examines the nature of the relationship between financial liberalization and private investment in Nigeria from 1970-2012. The regression analysis reveals that financial liberalization, proxied by real interest rate (RINTR) has a statistically significant positive impact or effect on private investment in Nigeria. That is, the more liberalized the Nigeria economy is, the higher the level of investment the private sector would be able to undertake. Furthermore, the Chow test result shows that there was indeed a structural break or change in the relationship between financial liberalization and private investment in Nigeria in the periods of 1970-2012 as suspected. This change in relationship can be attributed to the Structural Adjustment Programme (SAP) embarked upon by the Nigeria government in 1986 which liberated the financial sector from repression and regulations. In addition, the Granger causality test shows that although there is dependence between financial liberalization and private investment, none causes the other.

This study clearly shows that private savings mobilization is very important and in fact indispensable in achieving meaning private investment that would in turn engender sustainable economic growth in Nigeria.

Based on the above findings, we therefore recommend the following:

1. There should be concerted effort by the government and other stakeholders to encourage more careful liberalization of the financial sector since it has a direct positive impact on private investment and indirect positive impact on economic growth.
2. Government and policy makers should put in place, practical policies, programmes and incentives that would help to adequately mobilize private savings across the country with the ultimate aim of achieving economic growth through robust private investment.
3. Savings deposit rate should be enhanced by the banks to encourage private savings mobilization. This is because when the interest rate on savings is attractive to depositors, they will be encouraged to save more. This subsequently makes credit more available for bank and other financial institutions to lend to private investors.
4. From our model results, it is clear that inflation is negatively related to private investment. We therefore recommend that the government and policy makers should evolve policies that will enhance price stability. As a macroeconomic panacea, this will definitely impact positively on private investment and economic growth.

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