



Full Length Research Paper

Financial liberalization and investments – the Nigeria experience

***¹Dr. Agbaeze E. K and I. O. Onwuka²**

¹Department of Management, University of Nigeria, Enugu Campus, Nigeria

²Department of Banking and Finance, University of Nigeria, Enugu Campus, Nigeria

*Corresponding authors e-mail: cool4nationale@gmail.com

ABSTRACT

The early hypotheses of McKinnon and Shaw assumed that financial liberalization, which would be associated with higher real interest rates - as controls on these are lifted—would stimulate saving. The underlying assumption is, of course, that saving is responsive to interest rates. The higher saving rates would finance a higher level of investment, leading to higher growth. Therefore, according to this view, we should expect to see higher saving rates (as well as higher levels of investment and growth) following financial liberalization. But this is not the case in Nigeria. Empirical data from Nigeria shows that investment especially private sector investments have not improved following financial liberalization in the country in the late 1980s. The sequencing of the liberalization process and hostile macroeconomic environment has combined to minimize the expected benefits of financial liberalization. We recommend that apart from the current tinkering and re-tooling of the liberalization process in the country, government should promote monetary stability, ensure sound macroeconomic environment and provide infrastructures to enable private investment to thrive in the country.

Keywords: Financial Liberalization, Investment, Economic Growth.

INTRODUCTION

The current global economic and financial crisis which has largely been blamed on the fall-outs of financial liberalization has led to a renewed interest on the role of financial liberalization in economic growth. This focus has been heightened by two key factors. The first one is rightly, the global financial crisis that has ravaged (and in some cases still ravaging) the economies of the world especially the western world and the apparent inability of the classical and neo-classical economic models to adequately address the crisis. Second, the government interventionists' activities in the financial systems of various countries of the world have called to question the McKinnon-Shaw hypothesis of financial liberalization as a catalyst for economic growth and the Schumpeterian 'creative destruction' logic of free and liberalized economies (Ogbu, 2010).

According to Ogbu (2010), the current global economic and financial crisis, the huge bailout of the financial and non-financial institutions across the world and the rather uncertain and timid response to these massive government interventions in the functioning of

the market are together producing four-fold theoretical-conceptual outcomes. One, the empirical scenario is re-defining or re-evaluating the capitalist market economy. Two, it is exposing the limits of 'creative destruction' logic of Schumpeter (1911). Three, it calls to question the adequacy of the current economic modeling and analytical tools. Four, it is leading the way to the emergence of a 'new market economy'. Ogbu (2010) argued further:

"Not since the great depression of the 1930s has the world experienced this kind of economic down-turn. Now, unlike then, the effects have been widespread, global and faster and the amounts involved staggering. Unfortunately, the lessons of the 1930s could not be relied upon to provide answers for the current economic crisis. As each country tries on its own to deal with the problems, the governments are getting more involved with market activities outside the previously accepted limits for a functioning market economy especially in the financial system". Theoretically, it is widely accepted that liberalizing the financial system could play a vital role in

economic development. Since the original theoretical analysis which provided a rationale for financial sector liberalization as a means to promote economic development was laid by McKinnon (1973) and Shaw (1973), a lot of theoretical and empirical research has been carried out examining the concept in different contexts, countries and time periods (see for example, Abel (1980); Romer (1994); Lucas (1982); Bandiera et al. (2000); Khan and Reinhart (1990); and King and Levine (1990), Demir,(2005). A number of writers question the wisdom of financial repression, arguing that it has detrimental effects on the real economy. Goldsmith (1969) argued that the main impact of financial repression was the effect on the efficiency of capital. McKinnon (1973) and Shaw (1973) stressed two other channels: first, financial repression affects how efficiently savings are allocated to investment; and second, through its effect on the return to savings, it also affects the equilibrium level of savings and investment. In this framework, therefore, investment suffers not only in quantity but also in quality terms since bankers do not ration the available funds according to the marginal productivity of investment projects but according to their own discretion. Under these conditions the financial sector is likely to stagnate. The low return on bank deposits encourages savers to hold their savings in the form of unproductive assets such as land, rather than the potentially productive bank deposits. Similarly, high reserve requirements restrict the supply of bank lending even further whilst directed credit programmes distort the allocation of credit since political priorities are, in general, not determined by the marginal productivity of different types of capital. Arestis (2005) remarked further:

“The policy implications of this analysis are quite straightforward: remove interest rate ceilings, reduce reserve requirements and abolish directed credit programmes”. In other words, liberalize financial markets and let the free market determine the allocation of credit, where it is assumed that there will be a ‘free market’ with just a few banks, thereby ignoring issues of oligopoly and, of course, of credit rationing problems”

With the real rate of interest adjusting to its equilibrium level, at which savings and investment are assumed to be in balance, low yielding investment projects would be eliminated (Schumpeter’s ‘creative destruction logic’), so that the overall efficiency of investment would be enhanced. Also, as the real rate of interest increases, saving and the total real supply of credit increases, this in turn will induce a higher volume of investment. Economic growth would, therefore, be stimulated not only through the increased investment but also due to an increase in the average productivity of capital. Moreover, the effects of lower reserve requirements reinforce the effects of higher saving on the supply of bank lending, whilst the abolition of directed credit programmes would lead to an even more efficient allocation of credit thereby stimulating further the average

productivity of capital. The rest of the paper is structured as follows.

REVIEW OF RELATED LITERATURE

Financial liberalization can be viewed as a set of operational reforms and policy measures designed to deregulate and transform the financial system and its structure with a view to achieve a liberalized market-oriented system within an appropriate regulatory framework (Johnston and Sundararan, 1999). Financial liberalization has been variously characterized in the empirical literature but Niels and Robert (2005) observed that whatever characterization, financial liberalization usually include official government policies that focus on deregulating credit controls, deregulating interest rate controls, removing entry barriers for foreign financial institutions, privatizing financial institutions, and removing restrictions on foreign financial transactions. In other words, financial liberalization has both domestic and foreign dimension. Moreover, it focuses on introducing or strengthening the price mechanism in the market, as well as improving the conditions for market competition. As opposed to financial liberalization financial repression (the inverse of financial liberalization) is evidenced by ceilings on interest rates and credit expansion, selective credit policies, high reserve requirements, and restriction on entry into the banking industry (Ikhide and Alawode, 2001).

Niels and Roberts (2005) in their work provided an extensive review of the literature on financial liberalization and investment starting with a review of McKinnon-Shaw (1973) treatise. According to them, modern literature on financial liberalization-investment nexus commenced with the seminal work of McKinnon (1973) and Shaw (1973). McKinnon and Shaw (1973) analyzed the benefits of (if not totally eliminating) financial repression, but at least reducing its impact on the domestic financial system within developing countries. Their analyses (sometimes referred to as the Complementarity Hypothesis) concluded that alleviating financial restrictions in such countries (mainly by allowing market forces to determine real interest rates) can exert a positive effect on growth rates as interest rates rise toward their competitive market equilibrium. According to this tradition, artificial ceilings on interest rates reduce savings, capital accumulation, and discourage the efficient allocation of resources. Additionally, McKinnon pointed out that financial repression can lead to dualism in which firms that have access to subsidized funding will tend to choose relatively capital-intensive technologies; whereas those not favored by policy will only be able to implement high-yield projects with short maturity.

Another effect of financial repression, to which the original hypothesis made only scant reference, stemmed from the implicit “credit rationing” effect which results

from the Feast and Famine consequences of excessive government intervention in money and credit markets in developing countries. Given that real interest rates are prevented from adjusting to clear the market, other “non-market” forms of clearing have to take their place. These can include various forms of “queuing” arrangements to “ration” the available credit such as auctions, quantitative restrictions (for example quotas), as well as different types of “bidding” systems which themselves may be open to nepotism or even outright corrupt practices. In essence, these manifestations of financial repression mean that not only is the quantity of savings (and investment) low, or at the very least irregular; it also means that the level of activity which does occur is of poor quality. This is really what the term financial repression entails. If the real interest rate is not allowed to clear the money and credit markets, both the overall level as well as the quality of savings and investment will be repressed. The quantity and the quality effects compound each other. In a Feast and Famine environment, the typical borrower may borrow too much (too little) and this very tendency will reinforce the Feast and Famine problem itself.

The early hypotheses of McKinnon and Shaw assumed that liberalization, which would be associated with higher real interest rates - as controls on these are lifted—would stimulate saving. The underlying assumption is, of course, that saving is responsive to interest rates. The higher saving rates would finance a higher level of investment, leading to higher growth. Therefore, according to this view, we should expect to see higher saving rates (as well as higher levels of investment and growth) following financial liberalization.

The seminal works of McKinnon (1973) and Shaw (1973) opened the floodgate of research on financial liberalization studies. Since their separate but complementary publications, several papers have been published on the relationship between financial liberalization and growth. Some studies focus on the quantity effects of liberalization while others concentrate on the quality effects of liberalization. These studies use firm-level as well as cross-country data (see Niels and Robert, 2005). Laeven quoting from Niels and Robert (2005), in a study finds evidence for the hypothesis that financial liberalization reduces financial constraints of firms. His study was based on information from 13 developing countries. Similarly, positive effects of liberalization on reducing financial constraints are found, among others, by Koo and Shin (2004) for Korea, Harris, Schiantarelli and Siregar (1994) for Indonesia, Guncavdi, Bleaney and McKay (1998) for Turkey and Gelos and Werner (2002) for Mexico. At the same time, however, studies by Jaramillo, Schiantarelli and Weiss (1996) on Ecuador and Hermes and Lensink (1998) on Chile find much less supportive evidence for the positive effect of financial liberalization on reducing financial constraints and inducing investment. Other studies have used cross-

country panel data. Nazmi (2005) uses data for five Latin American countries and finds evidence that deregulation of financial markets increases investment and growth. Bekaert, Harvey and Lunblad (2005) for a large sample of countries look at liberalization of the stock market in particular, opening them up to foreign participation and find support for the view that a type of liberalization spurs economic growth through reducing the cost of equity capital and increasing investment. Other cross-country analyses are less positive about the quantity effect of financial liberalization. For instance, Bonfiglioli (2005) using information for 93 countries shows that financial liberalization marginally affects capital accumulation and hence investment. Moreover, Bandiera et al. (2000) reviewed the impact of financial liberalization on saving based on information from eight developing countries over a 25-year period and found that savings rates actually fall, rather than increase, after financial liberalization. All these mixed results point to one thing – that the link between financial liberalization and investment performance is not yet unequivocal and more works are still needed to analyze the purported benefits of financial liberalization on investment both at cross country and firm-level.

For more than two decades after independence, the Nigerian financial system was repressed, as evidenced by ceilings on interest rates and credit expansion, selective credit policies, high reserve requirements, and restriction on entry into the banking industry. This situation, according Ikhide (1996) inhibited the functioning of the financial system and especially constrained its ability to mobilize savings and facilitate productive investment. To reverse this situation and in line with the orthodoxy of the time, Nigeria like other developing countries embraced financial liberalization as one of the major planks of Structural Adjustment Programme in 1986.

The process of liberalizing the financial sector in Nigeria have fallen under five main headings – reform of the financial structure, monetary policy reforms, foreign exchange reforms, liberalization of capital movement and capital market reforms. Reform of the financial structure includes measures designed to increase competition, strengthen the supervisory role of the regulatory authorities and strengthen public sector relationship with the financial sector. In this direction, some measures undertaken include: enhancing bank efficiency through increased competition and management by granting licenses to more banks to operate. Conditions for the licensing of new banks were relaxed. In response, the number of banks increased dramatically from 40 in 1986 to 120 in 1992. A comparable increase in the number of non-bank financial institutions occurred. Strengthening banks supervision and increasing their viability through adequate regulations regarding minimum capital requirements, specifying the range of assets and liabilities they can acquire, introduction of uniform

accounting standards for banks to ensure accuracy, reliability and comparability. Two banking laws were promulgated with effect from June 1991, the CBN Decree No. 24 of 1991 and the Banks and Other Financial Institutions Decree (BOFID), No. 25, 1991 (CBN, 2004).

There was also monetary policy reforms designed mainly to stabilize the economy in the short run and to induce the emergence of a market-oriented financial sector. Such reforms included: rationalization of credit controls; although credit ceilings on banks were not completely removed, the sector specific credit distributions target were compressed from 18 in 1985 to 2 in 1987 - priority (agriculture and manufacturing) and non-priority (others). Other credit measures enacted were the elimination of exceptions within the ceiling on bank credit expansion, giving similar treatment to commercial and merchant banks in relation to required liquidity ratios and credit ceiling, the modification of cash reserve requirements which is now based on the total deposit (demand, savings, and time deposits), rather than on time deposits only, and the reintroduction of stabilization securities (CBN, 2004).

Interest rate liberalization was aimed at enhancing the ability of banks to charge market-based loans rates and also guarantee the efficient allocation of scarce resources. In 1989, banks were encouraged to pay interest on current account deposits. The rate to be paid was to be negotiated between banks and their customers. There was a shift from direct to indirect system of monetary control in June 1993 with the introduction of open-market operations (OMO). Under the scheme, OMO was to be conducted exclusively through licensed discount houses, which were supposed to constitute the open market for government securities. The introduction of OMO was meant to replace the use of direct controls for managing liquidity in the economy.

All these reform measures were aimed at removing distortions in efficient allocation of resources to productive investments especially in the private sector. For according to Khan and Reinhart (1990), economic growth can only be efficient and sustainable if it is coming primarily from the private sector.

In spite of these measures however, theoretical evidence suggest that the impact of financial liberalization on private investment in Nigeria is at best marginal (see Busari, 2007; Akinlo and Akinlo, 2007, Ayadi et al, 2009, Uchendu, 1993 and Ndebibo, 2004). The global crisis has further compounded the purported benefits of financial liberalization. Most countries are currently re-examining their economic models and financial architecture in response to the economic down-turn. After over two decades of operating a liberalized economic and financial model, it has become imperative to empirically examine the purported benefits of financial liberalization on investment and economic growth in

Nigeria. This will be achieved through a time serial study of private sector investments for the period 1991 to 2011.

Data

The study uses indicators of financial liberalization, macroeconomic measures of uncertainty and firm investment. Firm level investments serve as dependent variable while various measures of financial liberalization and macroeconomic measures of uncertainty serve as independent variables. The definition and justification for the use of these variables are given below.

Dependent Variable (Investment)

Investment is the dependent variable in the study. In common discourse, investment refers to financial assets such as deposits, bonds and shares. Economists see investment as capital formation, the production of new capital assets, including such intangible assets such as research and development. Researchers on the subject have used various definitions of investment yet there appears to be no consensus on what constitute investment, at least, in the context of firm level analysis. Investment is the value of machinery, plants, and buildings that are bought by firms for production purposes. Accordingly, this study used annual changes in total fixed asset as proxy for investment such as machinery, land and building bought for productive purposes. This is in line with the approach adopted by Gezici (2007). Investment therefore is the change in capital stock during a given period. Consequently, unlike capital, investment is a flow variable and not stock variable. The investment flow in period t (I_t) can be calculated in real terms as the difference between the capital stock at the end of the period and the capital stock at the beginning of the period.

$$\text{Investment} = \Delta K_t = K_t - K_{t-1} + \delta K_{t-1} = K_t - (1 - \delta) K_{t-1} \quad (1)$$

where K_t is the capital stock at the end of period t and K_{t-1} is the stock of capital at the end of period $t-1$ (and thus at the beginning of period t), and δ is the physical depreciation rate of capital. In the expression above, I_t is a net measure of investment, as replacement capital is excluded from the capital stock.

Independent Variables

The independent variables include liquid liabilities (M^2) as a ratio of GDP, Credit to the Private Sector/GDP, Credit to the Public Sector/GDP, Stock Market Capitalization/GDP, and macroeconomic measures of

uncertainty, namely, inflation, interest and exchange rates.

Liquid Liabilities (M_2) as a Ratio of Gross Domestic Product (GDP)

This is broad money aggregate and measures the depth of financial sector development and has inducement to saving-investment. This was determined by dividing the value of liquid liability (M_2) with real gross domestic product. Liquid liability as a ratio of GDP was used as proxy for financial liberalization to indicate bank size in the economy. This is in line with the works of King and Levine (1993a) and Beck, Demirguc-Kunt and Levine (2001).

Liquid Liabilities = Value of Liquid Liabilities (M_2)/GDP (2)

Private Sector Credit-GDP Ratio

Private Credit equals the value of credits by financial intermediaries to the private sector divided by GDP. The measure isolates credit issued to the private sector and therefore excludes credit issued to governments, government agencies, and public enterprises. Also, it excludes credits issued by central bank. This was determined by dividing the value of deposit money bank credits to the private sector with gross domestic product. Bank credit to the private sector as a ratio of GDP was used to proxy financial liberalization in terms of bank intermediation activity. This proxy measures the impact of bank lending to the private sector on investment and economic growth. This is in line with the works of Levine and Zervos (1998), Levine, Loayza and Beck (2000), and Beck, Levine and Loayza (2000).

Private Credit = Bank Credit to the Private Sector/GDP (3)

Stock Market Capitalization-GDP Ratio

The market capitalization equals the value of listed shares in a country's stock market. In terms of economic significance, the assumption behind market capitalization is that the market size is positively correlated with the ability to mobilize capital and diversity risk. For example, Pagano (1993) motivates his theoretical model by observing the great variation in market capitalization and the number of listed companies in different economics. The total market capitalization ratio is measured by dividing the total market capitalization with the GDP. This has remained the used standard for measuring stock market development and stock market size in particular (Argarwal, 2000; Arestis, Demetriades and Luintel, 2001, Yartey and Adjasi, 2007; Yartey, 2008; Rousseau and

Wachtel, 1999; Capasso, 2003; Mohtadi and Agarwal, 2004; Nieuwerburgh, Buelens and Cuyvers, 2005).

Stock Market Capitalization Ratio = Total Market Capitalization/GDP (4)

Public Sector Credit-GDP ratio

This is a measure of total domestic credits that accrue to government and is indicative of whether crowding out effect has occurred or not. This was determined by dividing the value of deposit money bank credits to the public sector with gross domestic product. Credit to the public sector include credit to the three tiers of government and other government agencies. Bank credit to the public sector as a ratio of GDP was used as one proxy of financial liberalization to determine if there is crowding out effect in bank intermediation. A crowding out occurs where the proportion of aggregate bank credit to the government is higher than the portion extended to private sectors, This is in line with the works of Levine and Zervos (1998), Levine, Loayza and Beck (2000), and Beck, Levine and Loayza (2000).

Public Sector Credit = Public Sector Credit/GDP (5)

Growth Rate of Gross Domestic Product Per Capita

This is a measure of growth of the economy in annual basis. This was determined by dividing real gross domestic product with the total population and obtaining the growth rate. The population figures were projections from the 1991 and 2006 official census figures. The projections were based on the 2.8 per cent annual growth rate (CBN Annual Reports and Statement of Accounts, various). The per capita GDP growth was used to proxy economic growth. This is in line with the works of Demirguc-Kunt and Levine (1996), Levine and Zervos (1996), Demirguc-Kunt and Makismovic (1996), Levine and Zervos (1998).

Economic Growth = Gross Domestic Product/Population (6)

Macroeconomic Measures of Uncertainty

Uncertainty is the unconditional variance of a particular economics series (e.g. demand, price, inflation, exchange rate, interest rate, etc) which managers are presumed to be uncertain about. According to Gecizi (2007) there are various methods of constructing an uncertainty variable in the empirical literature. One approach is to incorporate some direct measure of uncertainty, generally from business surveys. A second approach is to compute the unconditional variance of a particular economics series, (commonly, demand, price, inflation, exchange rate, interest rate, etc) which, managers are presumed to be

uncertain about. A third approach is to estimate a statistical model of the process (such as ARCH/GARCH or ARIMA models) determining the conditional variance of the same related series and use this as a proxy for uncertainty. The computation of conditional variance via such models requires high frequency of data which are not always available especially in developing country like Nigeria.

The study used an unconditional volatility measure of inflation, interest and exchange rates as macroeconomic measures of uncertainty. Many empirical works (see Price, 1995; Huizanga, 1993; Driver and Moreton, 1991; Goldberg, 1993; Campa and Goldberg, 1995 and Darby et al, 1999) have used various macroeconomic variables as proxies for measurement of uncertainty. Huizinga (1993) used conditional volatility of US inflation, real wages and real interest rates as measures of uncertainty. Price (1995) utilizes the conditional variance of the growth rate of GDP and inflation as uncertainty variables. Driver and Moreton (1991) model uncertainty using the standard deviation of 12 months forward predictions of output growth and inflation rate across 12 forecasting terms. Goldberg (1993) and Campa and Goldberg (1995) derived their measure of uncertainty using exchange rate volatility from the standard errors of the residuals from a moving average representation of the exchange rate using US data.

Looking specifically at exchange rate volatility and investment, Darby et al. (1999) using model based on Dixit and Pindyck (1994) suggest that there are situations where exchange rate uncertainty depress investment and situations where it will not. In the empirical section of their work, Darby et al. (1999) find, using a neoclassical model, Tobin's Q and moving average exchange rate variance, that uncertainty has a significant and negative impact on investment for the US, Germany and France. Thus we derive the volatility by using an autoregressive moving average mode, the proxy being the standard deviation of the model's residual as used by Goldberg (1993)"

$$\text{Uncertainty} = ER_t = \alpha_1 ER_{t-1} - \epsilon_t - \beta_1 \epsilon_{t-1} \quad (7)$$

Control Variables

In order to identify the specific effects of financial liberalization on firm level investments, the study controlled for the effect of firm size, firm age and firm orientation.

Firm Size

Size is a time-invariant identifier for firms based on the three most widely used proxies, i.e. net sales, total assets and number of employees (see Muth and Donaldson, 1998). The study chose to categorize sample firms based

on their total assets. To this end, a firm shall be classified as being small if the value of its total assets falls below the average total assets of the manufacturing firms quoted in the Nigeria Stock Exchange. We define the small firms as firms with assets below the median of assets in the sample and construct the small size dummy variable accordingly. On the other hand, large firms are those whose total assets are above the market level (see Ezeoha, 2007). From literature, small firms are considered more financially constrained to pursue investment opportunities than large firms and so will be affected differently by financial liberalization.

$$\text{Firm Size} = \text{Average Value of Total Assets} = \mu(\text{TA}) \quad (8)$$

Firm Age

Firm age refers to the number of years for which a firm has been in operation (e.g. Arsher and Faerber 1966; Leeth and Scott 1989) or the number of years since incorporation (e.g. Johnson 1997). In view of the fact that mandatory incorporation of public companies became enforceable from 1979, the study chose to use the latter classification. That is, firm age shall be based on the date of incorporation and not date of formation.

$$\text{Firm Age} = \text{Log of years since incorporation} = \text{LogAg} \quad (9)$$

Firm Orientation

Firm orientation refers to whether a firm is export oriented or produce for home market. Export orientation is a time invariant identifier for firms based on the ratio of the firm's foreign sales to their total sales. If the average of the foreign sales ratio over all the years that data are available is higher than 25%, the firm is classified as an exporter. If the average of the ratio is below 25% the firm is considered to be domestic oriented. To quantify this variable, there is need for a dummy, which takes a value of 1 if the firm is export oriented and 0 is otherwise. Thus:

$$\text{Firm orientation} = \left. \begin{aligned} &\text{if average of foreign sales} > 25\% = 1 \\ &\text{if average of foreign sales} < 25\% = 0 \end{aligned} \right\} \quad (10)$$

Econometric Methodology

Since this is a time series study, we adopted the time serial linear multiple regression, with the following general model:

$$Y_i = B_0 + B_1 X_{1i} + B_2 X_{2i} + U_i \quad (11)$$

Where; The subscript i runs over observation, $i = 1, \dots, n$; Y_i is the dependent variable or the regressand ; $X_{1i} + X_{2i}$ are the independent variables or the regressors, $B_0 + B_1 X$

+ B_2X are the population regression lines or population regression function; B_0 is the intercept of the regression line; $B_1 + B_2$ are the slope of the population regression line; and U_i is the error term (Stock and Watson, 2007). The study applied the Generalized Least Square (GLS) model to estimate the coefficients. Generalized Least Square assigns equal weight or importance to each observation and therefore is capable. Generalized Least Square is Ordinary Least Square on the transformed variables that satisfy the standard least square assumptions. The preference for Generalized Least Square regression over pooled Ordinary Least Square regression is due to the important assumptions of homoskedasticity and no serial correlation in Pooled Ordinary Least Square (Wooldridge, 2002). Pooled Ordinary Least Square requires the errors in each time period to be uncorrelated with the explanatory variables in the same time period, for the estimator to be consistent and unbiased. A Generalized Least Square regression is more suitable in that it corrects for the omitted variable bias, and presence of autocorrelation and heteroskedasticity in pooled time series data.

The base investment model took the following form:

$$\text{Investment} = f(\text{PSC/GDP}, \text{CPS/GDP}, \text{SMC/GDP}, \text{M}_2/\text{GDP}, \text{CS}, \text{uncertainty}) \quad (12)$$

The following empirical specification is designed for this purpose.

Base model of Investment:

$$(I/K)_{it} = \beta_0 + \beta_1 U_{it} + \beta_2(\text{PSC})_{it} + \beta_3(\text{CPS})_{it} + \beta_4(\text{M}_2)_{it} + \beta_5(\text{SMC})_{it} + \beta_6(U)_{it} + \alpha_t \quad (13)$$

Where = β 's are parameters, i subscript denotes the firm, and the t subscript denotes the time period. $\beta_1 U_{it}$ represent uncertainty term; $\beta_2(\text{PSC})_{it}$ public sector credit, $\beta_3(\text{CPS})_{it}$ credit to the private sector, $\beta_4(\text{M}_2)_{it}$ liquid liabilities and $\beta_5(\text{SMC})_{it}$ stock market capitalization.

A second linear logarithmic model is specified to test whether including an additional variable increases the predictive power of the first model specified:

$$(I/K)_{it-1} = \beta_0 + \beta_1 U_{it} + \beta_2(\text{PSC})_{it} + \beta_3(\text{CPS})_{it} + \beta_4(\text{M}_2)_{it} + \beta_5(\text{SMC})_{it} + \beta_6(U)_{it-1} + \alpha_t \quad (14)$$

Equation (13) was estimated for firm categories based on size, export orientation and years of establishment. As with the base investment model, different types of firms might be affected by the financial deepening process differently.

Financial liberalization (FIN_t) variable was included in the regression to represent and capture the impact of macroeconomic environment in which firms make investment decisions. Given the volatile post liberalization environment in Nigerian economy, coefficients of these variables (β_{2-5}) are expected to be negative. Changes in two determinants of investment in this macroeconomic environment are of particular interest to our discussion: Sensitivity of investment to capital stock and uncertainty variables respectively. By including interaction terms of aggregate assets and uncertainty with FIN_t variable, we

test whether the effect of these two determinants of investment change with financial liberalization.

For the capital stock, the coefficient of interest is β_5 . As argued by Gezici (2007), and as opposed to prediction of financing constraints literature, there is no a priori reason to expect that financial liberalization and deepening would reduce information asymmetries in financial markets for the borrowing firms. Therefore in line with Gezici (2007), we will not treat any change in the sensitivity of capital stock as a sign of elimination of asymmetries, but as the impact of moving from one system of financial allocation before 1990's into another one. A significantly positive coefficient would imply that manufacturing firms rely even more on internal capital stock under liberalization, hence the changes in the financial system and the macroeconomic conditions in Nigeria results in the allocation of fewer funds into productive investment. A significantly negative coefficient, on the other hand, would tell us that internal capital stock lost their importance and possibly other sources of external funding took their place, indicating a better allocation of credit in favor of productive investment. Given the discussion on the credit ratio of Nigeria banking system and dependency of non-financial firms on bank credit, we will not expect to find any decline in the importance of internal capital stock due to financial liberalization.

Regarding the interaction term of uncertainty and the financial liberalization, the coefficient of interest is β_6 . Prior expectation is that the financial deepening would provide manufacturing firms with the opportunities and instruments to hedge themselves against uncertainties in future. Assuming that deepening would bring access for firms to these financial markets for options and other hedging instruments both domestically and internationally, we would expect that the impact of uncertainties on investment behavior would be lessened with deepening in financial markets. However Nigerian economy displayed heightened volatilities and crises especially after opening of the capital account, therefore, we will anticipate that the impact of uncertainty on firm level investment will not be reduced, but rather has become more intense under financial liberalization.

RESULTS

Result based on the descriptive analysis show that the average investment growth of manufacturing firms in the sample is 7% (mean = 6.9). This is considered low when compared with average firm investment in Egypt 26.7% (Collier and Gunning 2009), Morocco 18.5% (Marco et al., 2011) and South Africa 32.5% (Michael et al., 2009). Such level of private sector investment cannot guarantee the desired growth rate in economy-wide basis. Table 1 Considering the bank credit to the private sector scaled

Table 1. Descriptive Statistics

Variable	Mean	Median	Maximum	Minimum	Std Deviation
Investment	6.897917	7.282564	8.303878	3.775610	1.094669
BPS_GDP	2.980483	1.458227	14.235443	0.1519716	3.927039
M ₂ _GDP	3.87139	3.147468	15.01832	0.329716	3.749725
MCP_GDP	3.966794	1.436606	20.96110	0.087158	5.635177
PSC_GDP	0.824099	0.579069	2.828047	0.071125	0.865934
CS_GDP	0.65245	0.423566	2.445437	0.034112	0.674434
LogInterest	1.282559	1.295347	1.380030	1.131619	0.058055
LogInflation	1.267794	1.170262	1.863917	0.819544	0.314904
LogExchange	1.876960	2.003461	2.171609	0.994757	0.355742
LogSize	0.192556	0.194750	0.220264	0.159581	0.018492
LogAge	1.290114	1.488551	1.599883	0.477121	0.368624
LogMkt Orientation	0.724592	0.778151	0.954243	0.301030	0.195594

Source: Computed from data picked from NSE Factbook (E-View Computation)

by the GDP, Table 5.1 indicate that the average growth rate of bank credit to the private sector is 3% (mean = 2.9). This growth rate is dismal when compared with the growth rates within the same periods in Australia 34.2%, Canada 35.5%, United States 58.4, United Kingdom 45.6% (Aleksander et al., 2009) or Tunisia 34.2% (Gunning and Mangistae 2011) and South Africa 38.7% (Michael et al., 2009 and Marco et al 2011).

For the average growth rate of liquid liabilities, the result shows that this grew at an average of 4% and compared less favourably with growth rates within the same periods in Egypt 38.8% (Mlambo and Oshikoya, 2011), Ghana 27.7% (Marco et al., 2011) and South Africa 51.4% (Michael et al., 2009) or Barbados 51.6%, India 32.9% and Italy 77.4% (Aleksander et al., 2009). Investment growth through stock market capitalization as a ratio of the GDP, the result show that this grew at approximately 4% (mean = 3.9). This result is also poor when compared with results from Cote d'Ivoire 33.4% (Rodrick, 2001), Kenya 26.6% or Tanzania 23.4% (AfDB, 2009).

Table 5.1 also shows that credit to the public sector as a ratio of GDP grew at less than one percent (mean = 0.82). This confirms our earlier assertion that credit to the public sector have been dismal suggesting growth in government securities as alternative means of funding government expenditure with its obvious crowding out effect. Capital stock of firms as a ratio of GDP grew at approximately 1 percent. This is considered very low and confirms our priori theory that investment has not impacted much on assets growth of firms in the country.

In terms of age, it is found that the average age of firms in Nigeria is 13 years. The maximum age of any firm in Nigeria based on our selected sample is 15 years while the youngest firm is 10 years. This trend could be attributed to the fact that some companies got listed on

the Nigerian Stock Exchange the same year they were incorporated. This practice has serious implication on the integrity of those companies especially as it affects investors due to asymmetric information.

Moreover, results based on the descriptive statistics show that growth size of firms in the sample based on total assets is very low. The growth trend is less 1 percent with mean value of 0.19. This is very disturbing and explains why investment is also very low when compared with other countries among them in the African continent like Cote d'Ivoire 22.3%, Guinea 15.4%, Senegal 17.8% and Togo 12.4% (Marco et al., 2011).

Market orientation is a dummy variable taking the value of 1 if the firms produce for export market and 0 if otherwise. For a firm to qualify for export classification, it must be exporting on the average 25 percent of its total produce and will be considered as home market producer if otherwise. The result from the descriptive statistics shows that on the average less than one percent of all the firms in the sample produce for export market. This result suggests that most Nigerian firms manufacture for the home market only and are not competitive in the international market.

Furthermore, the result of the descriptive statistics shows that inflation grew at an average of 12.6 percent per annum for the entire period of the study. This is considered high when compared with average growth rates within the same period in UK 7.8%, Germany 3.6%, Australia 7.3%, Austria 4.5%, France 6.9% and South Africa 9.6 (Michael et al 2009). Such high rate of inflation is a great disincentive to private savings and investment.

For interest rate, the result of the descriptive statistic shows that this grew at the rate of 12.8 percent on the average for the period of study. This rate is also considered very high when compared with growth rates

Table 2.Correlation Matrix

VARIABLES	INVESTMENT	BPS_GDP	M2_GDP	MCP_GDP	PSC_GDP	CS_GDP	LOGINT	LOGEX	LOGINF	LOGSIZE	LOGAGE	LOGMKT
Investment	1											
BPS_GDP	0.559054	1										
M2_GDP	0.6299	0.55905	1									
MCP_GDP	0.458989	0.6299	0.96321	1								
PSC_GDP	0.5301	0.45889	0.79576	0.94528	1							
CS_GDP	0.5345	0.52302	0.83478	0.76678	0.5423	1						
LOGINT	-0.3466	0.53104	0.9055	-0.4489	-0.37771	-0.2457	1					
LOGEX	-0.932737	-0.3468	-0.39287	0.4617	0.53099	-0.4025	-0.3323	1				
LOGINF	-0.37837	0.9327	0.48996	-0.25927	-0.5606	0.52158	0.58315	0.52345	1			
LOGSIZE	0.83324	-0.37837	-0.30975	0.70657	0.81181	-0.41216	0.88296	-0.57238	-0.41234	1		
LOGAGE	0.42967	0.83324	0.771026	-0.7695	-0.8259	0.25231	-0.4022	0.140459	-0.6873	0.4347	1	
LOGMKT	-0.22965	-0.42967	-0.81883	0.2646	0.2613	-0.00872	-0.2046	-0.13492	0.01359	-0.3236	0.2653	1

Source: Computed from data picked from the NSE Factbook (Various) using E-View

Table 3(a).Result of ADF Unit Root Test

Variables	ADF Test Statistics Value	5% McKinnon Critical Value	Decision Rule		Remarks
			H ₀	H ₁	
Investment	-2.675452	-3.0114	Accept		Non-stationary
BPS_GDP	-1.433125	-3.0114	Accept		Non-stationary
MCP_GDP	-1.559157	-3.0113	Accept		Non-stationary
M2_GDP	-1.887654	-3.0113	Accept		Non-stationary
PSC_GDP	-2.322456	-3.0113	Accept		Non-stationary
CS_GDP	-2.245702	-3.0113	Accept		Non-stationary

Source: Author's computation

Table 3(b).Result of ADF Unit Root Test

Variables	ADF Test Statistics Value	5% McKinnon Critical Value	Decision Rule		Remarks
			H ₀	H ₁	
Investment	-3.345776	-3.0199	Reject	Accept	Stationary
BPS_GDP	-3.843889	-3.0199	Reject	Accept	Stationary
MCP_GDP	-3.965743	-3.0199	Reject	Accept	Stationary
M2_GDP	-4.23054	-3.0199	Reject	Accept	Stationary
PSC_GDP	-4.65789	-3.0199	Reject	Accept	Stationary
CS_GDP	-4.33217	-3.0199	Reject	Accept	Stationary

Source: Author's computation

within the same period in UK 4.5%, US 2.5% (Aleksander et al., 2009) and South Africa 5.5% (Michael et al., 2009).

Finally, the result of the descriptive statistic shows that exchange rate depreciated at the rate of 18.8% on the average against the US Dollar for the period of study. This rate of fluctuation is considered high and acts as a disincentive to private sector investment when compared with South African rand which appreciated over 30% on the average against the US Dollars for the same period (Rahman and Serletis, 2009; Berg and Miao, 2010).

To test for the presence or likelihood of multicollinearity given the nature of the time series data, table 2 shows the result of the pair-wise correlation matrix. The correlation between the pairs of the explanatory variables shows that the correlations between the variables either positive or negative were non-significant. Therefore, the coefficients are weak and this may on face value, indicate the presence of multicollinearity. But as observed by Woolridge (2002) only in case of micro-numerosity or very small sample, would multicollinearity present a problem. To this end, even though there is likely chance of multicollinearity, the degree of such existence may be too remote to affect the result of the regression estimates. Table 3 and 4

Tests for Robustness

To test for the robustness of the parameters and to avoid the problem of spurious regression, we tested for unit root, co-integration and structural stability of the estimated coefficients using cumulative sum (CUSUM) and cumulative sum squares (CUSUMSQ).

Unit Root Tests

It is almost a convention in time series analysis, to verify the order of integration for each series usually to avoid the potential problem of spurious regression (see

Granger and Newbold, 1974; Phillips, 1986). The enquiry into the stationary property of each variable is conducted using Augmented Dickey-Fuller (Dickey and Fuller, 1979) and Phillips-Perron (Phillips and Perron, 1988) test procedures. The Phillips-Perron test method which computes a residual variance that is robust to auto-correlation is employed as alternative to the Augmented Dickey Fuller (ADF). The results of the unit root tests, (shown in tables 3a&b in the appendix), suggest that at both level and first-difference, the unit root hypothesis cannot be rejected at 1 percent significance level for all the variables. This in effect suggests that all the employed data series are non-stationary and thus quite suitable for the purpose intended.

Testing for Co-integration

Given the results of the above unit-root tests suggesting that all the variables are integrated of the order 1(1), we proceed to the next step by employing the Johansen (1991) and Johansen and Juselius (1990) procedures to test for co-integration among the variables. The Johansen methodology is a generalization of the Dickey-Fuller test. Two likelihood ratio tests (trace and maximum eigenvalue) were used to test the hypotheses regarding the number of co-integrating vectors. The results of tests for co-integration among the variables of financial liberalization and investment growth estimation equation are as reported in tables 4 in the appendix. Beginning with the rejection of the null hypothesis of no co-integration ($r = 0$) among the seven variables of Investment, CPS, PSC, SMC, Inflation, Exchange rate and Interest rate, the Trace Statistic yielded the maximum co-integrating rank of $n-1$, which suggests $r = 7$, and for Maximum Eigenvalue $r = 4$, where r represents the number of co-integrating vectors and n , the number of variables in the estimation equation. This verifies the existence of an underlying long-run stationary steady-state relationship between financial liberalization and private sector investment in Nigeria.

Table 4. Result of Johansen Co-integration

Eigen Value	Likelihood Ratio	5% Critical Value	1% Critical Value	Hypothesized No of CE(s)
0.876534	115.9788	90.65	97.44	None**
0.745786	62.44	53.12	70.78	At most 1*
0.654881	54.55	50.33	62.34	At most 2
0.543356	40.67	48.33	54.72	At most 3
0.465654	25.22	29.56	32.56	At most 4
0.297765	9.67	14.98	18.87	At most 5
0.122876	2.65433	6.32	8.65	At most 6

*(**) denotes rejection of the hypothesis at 5% (1%) significance level\
 L.R test indicates 2 co-integrating equation(s) at 5% significance level
 Source: Researcher's computation

Figure 1: CUSUM TEST

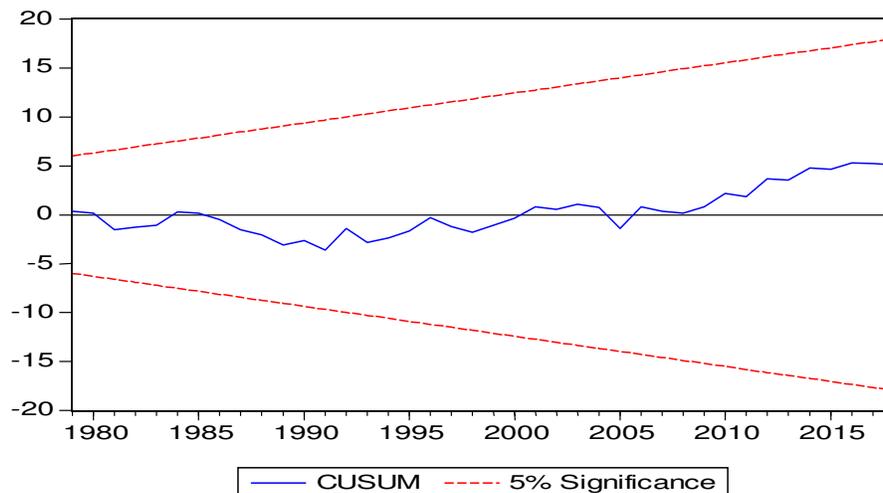
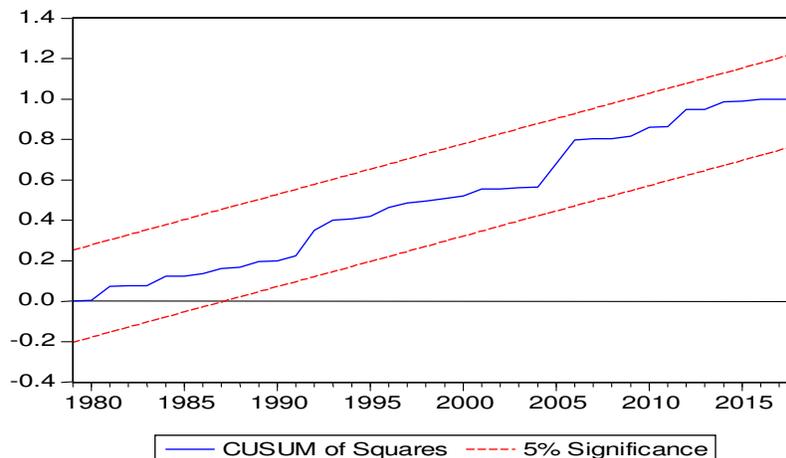


Figure 2: CUSUM OF SQUARE TEST



Structural Stability

To test for structural stability of the estimated coefficients and verify if there is likelihood of functional misspecification, we plot the cumulative sum (CUSUM) and cumulative sum squares (CUSUMSQ) using the information contained in the estimated residuals. According to the CUSUM (figure1) and CUSUM OF SQUARE (figure 2) test results in the appendix, the recursive residuals are within the critical 5% significant lines, which indicate the absence of structural change or misspecification in the estimated model. This suggests that the stability of the estimated coefficients is verified.

CONCLUSION

The study in the main assesses the impact of financial liberalization on firm investments in Nigeria. Specifically, the study examines two important standpoints in the financial liberalization literature. That is whether financial liberalization has removed the constraints on external financing by firms and the impact of uncertainty in the investment decision of firms. The regression result using private sector investments and macroeconomic data in Nigeria for the period 1991-2011 shows that financial liberalization has not removed the binding constraints on external financing for private sector firms in Nigeria. On the contrary, the result shows that private sector investment is still sensitive to the firms' cashflows. In other words, private sector firms still rely largely on internal financing for their capital stock accumulation and investment. Moreover, financial liberalization has worsened the state of uncertainty faced by firms in making investment decisions due to increased crises and financial fragility.

Policy Implication

It used to be a long-held view and orthodoxy of recent past that liberalizing the financial market would help remove the binding constraints on firm external financing. But the analysis of this study revealed a lot of contradictions with the predictions of the theories behind financial liberalization in Nigeria and the envisaged policy outcomes. For instance, the interest rate deregulation negatively affected the performance of private non-financial firms in Nigeria. A critical look at the interest rates differential between Nigeria and other countries; US, Europe and even countries in Africa notably South Africa, Botswana, Cote d'Ivoire clearly show that manufacturing firms in Nigeria stand no chance of competition with manufacturers from these countries. Again, the deregulation of exchange rate did not discourage the importation and consumption of imported finished goods in Nigeria instead it increased the cost of

financing new raw materials from both local and international sources. This also significantly affected manufacturing firms and is linked to one of the reasons why some manufacturing firms changed their business objectives from manufacturing to retail business as it was clearly cheaper to import than to manufacture the same product in Nigeria. Moreover, financial liberalization did not solve the problem of access to finance for private manufacturing firms despite the increase in the number of financial institutions. It was observed that assets of manufacturing firms did not increase remarkably over the period and it was obvious that firms' investment is still highly sensitive to their cash flows because of high interest rate in spite of financial liberalization. The policy implication is that efficient allocation of financial resources and proper functioning of the financial market cannot be complete without appropriate government intervention. For the financial liberalization policy to have meaningful impact on private sector growth in Nigeria, the government needs to re-adjust and review the present policy of unregulated interest rates and floating exchange rates. This is in addition to taking appropriate steps to address the macroeconomic instability and infrastructure problems faced by manufacturing firms in Nigeria.

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