

# **THE IMPACT OF FINANCIAL SECTOR REFORMS ON BANK GROWTH IN NIGERIA: MATTERS ARISING**

By

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## **ABSTRACT**

The paper empirically examined the impact of financial sector reforms on Bank growth in Nigeria and data spanning a period of thirty four years (i.e. 1971-2005) was analysed using the Panel Data Model. Earnings per Share (EPS), Returns on Capital Employed (ROCE) and Returns on Equity (ROE) were used as proxies for Bank growth (i.e. the dependent variables) while Interest Rate, Real Financial Savings and Exchange Rates were used as the proxies for financial sector reform (i.e. the independent variables).

A number of diagnostic tests were also conducted on the residuals to evaluate the models; these include the Breuch-Godfrey Serial Correlation Lagrange Multiplier (LM) Test, the Ramsey REST Test of Specification Error (i.e. to test for omitted variables, incorrect functional form, correlation between exogenous variables and error term) and the Cumulative Sum (CUSUM ) tests of parametric stability, the LM test of Serial Correlation showed that there was an absence of first order serial correlation in the residuals and cumulative sum tests also showed that observations are more stable during Pre-S.A.P (Structural Adjustment Programme) period than the Post-S.A.P era.

The result obtained showed that though the impact of financial sector reforms on bank growth in Nigeria for the period of study was significant, especially as measured by the proxies of Earnings per Share and Return on Equity, it was not significant enough to transform the nations' economy to the desired level.

Given the foregoing therefore, the study suggests among other things that what is needed is for financial sector reform to achieve its purpose, a stable macroeconomic environment is a prerequisite and it is germane to ensure that government fiscal policies are crafted to complement monetary policies.

**KEY WORDS; FINANCIAL SECTOR REFORMS, BANK GROWTH, INTEREST RATE, FOREIGN EXCHANGE AND FINANCIAL SAVINGS.**

## **INTRODUCTION**

Financial sector reforms involve liberalizing interest and exchange rates, promoting a market-based system of credit allocation, enhancing competition and efficiency in the financial system, and strengthening the regulating and supervisory framework.

Government interventions in the financial system have been the basis of the McKinnon-Shaw hypothesis of financial repression in developing countries (McKinnon, 1973; Shaw, 1973). It is thus suggested, that for sustainable growth, the banking sector has to be effective and efficient to respond favourably to the needs of the productive sector of the economy. In the face of grim reality of the worsening economy of the nation as evidenced in the economic indicators, the Nigerian government undertook a fundamental economic reform of structural imbalances in the nation's economy. The financial sector reform was a major aspect of Nigeria's economic reform programme announced in 1986. Picking the financial sector liberalization as the arrowhead in the new economic policy, the strategy could be ascribed to two main factors. The first was predicated on the primary role of the financial sector in the national economic development. More importantly is the fact that the financial sector promotes economic efficiency and sustainable growth and development (Ikhide 1996).

Financial sector, through intermediation process provides a viable medium of exchange and mobilizing the savings from sectors that generate surplus and channelling them into productive investment, a process which enhances the economy's productive capacity and overall output and employment (Ojo, 1989).

The second factor could be related to the historical evolution of financial systems in developing economies. At their elementary stages of development, financial systems are very robust but they tend to lose speed and momentum as government intervention becomes excessive or inappropriate. For instance, the Nigerian financial sector in the pre-SAP period, as argued by Ojo (1989), was said to have witnessed rapid structural changes and regarded to have generally performed

satisfactorily. But its growth potential, it was discovered, was limited by several constraints such as inadequate capital base, poor credit policies and especially inappropriate macro-economic policies.

The financial sector reforms initiated in 1986 sought mainly to reduce excessive controls and regulations and broadly to rely more on market factors in financial management. Prior to the financial sector reforms that were instituted in 1986 most salient features of repression in the financial sector include:

Restriction on entry into the Banking sector as well as limitation on foreign ownership of domestic financial institutions.

(A) Imposition of high liquidity and required reserve ratio, the liquidity ratio for Banks remained at 25 percent. Also the use of call-up special deposits and issue of stabilization securities;

(C) Imposition of interest rate ceilings in lending and deposit rates which resulted in increased real interest rates and wide margin between deposits and saving rates and

(D) Imposition of restrictions on the portfolio choices of financial institutions in the form of stimulating the maximum ceilings for required lending to specific activities and rediscounting of credit to real sectors at subsidized rates which resulted in edging out of the most productive investment in favour of the preferred sector (CBN, 1989).

Results of various studies, among which were Ikhide and Alawode (1994) Mrak, (1989) Seek and El Nil (1993), Agu (1992) Asogwa (2002) Dinc, (2005), Megginson (2005); Ojo (1993), Soyibo and Adekanbi (1992) revealed that the financial sector in most Sub-Saharan African countries is equated with the banking system and an examination of the roles of the banks in the mobilization of savings for the purpose of bridging the savings/investment gap come naturally with some concern issues like stabilization issues which tend to have far reaching implications and structures and nature of economic imbalances that necessitated the implementation of economic reform in these countries.

Over the period of 15 years, many countries in the Sub-Sahara Africa have undertaken one form of Structural Adjustment Programme or the other with a view to reversing their poor economic performance (Ikhide 1996) In all, about 20 Sub-Saharan African countries have made serious efforts

to transform their economies from traditional economy to a market-based economic system, while 15 other countries have adopted some limited form of structural adjustment programmes. Critics of the financial sector reforms in Nigeria such as Ojo (1989), Alawode and Soyibo (1998) argued that the Structural Adjustment Programme measures were not far reaching enough to solve the root causes of the Nigeria financial sector problem, and that reforms were not geared toward full liberalization of interests' rate policy that militates against the successful functioning of financial markets. Thus, two of the many relevant questions raised and yet to be fully answered include: (i) what are the remaining reforms issues and constraints to bank performance and savings mobilization in Nigeria? And (ii) to what extent has these policy reforms affected bank performance and savings mobilization? This study will attempt to find answers to these questions.

This paper examines the long run effect of financial sector reform on bank growth in Nigeria. It analyses the extent to which such factors as interest rate, foreign exchange rate and real financial savings affects bank growth in terms of what the banks get on return on capital employed, return on equity as well as earnings per share.

The nature of the study is both descriptive and empirical. The time span of this study is 1971-2005. This is to permit us to sufficiently compare two economic regimes of pre-SAP and post-SAP eras, and to give a balance report on the impact of financial sector reform on Bank growth in Nigeria.

**Table 1. Selected Banking and Macro-Economic Sector Indicators**

INDICATORS	2005	2006	2007	2008	2009	2010	2011
Prime lending rate (end period 1%)	17.8	17.83	16.4	15.3	19.6	15.7	16.8
Deposit rate (12 months fixed) (%)	8.8	7.5	8.0	12.4	12.2	3.5	7.1
Inflation rate (%)	11.6	8.5	6.6	15.1	13.9	11.8	10.3
GDP growth rate (%)	6.5	6.0	6.5	6.0	7.0	7.9	7.7
Bank branches (No)	3,535	4,579	4,579	5,134	5,565	5,799	5,810
Number of Banks	25	24	24	24	24	24	24
Average Exchange Rate(\$/N)	132.3	128.6	125.8	118.5	148.9	150.3	153.7

Sources: CBN Annual Report

Nigerian Banks are part of the key players in the global financial market with many of them part of the top 20 Banks in Africa and among the top 1000 Banks in the world. The various financial reforms have culminated in moderating the spread between the lending and deposit rates to 9.7 per cent according table 1 and as at the end of December 2011, from 12.2 per cent in 2010. This contributed to the stability of the macroeconomic variables with inflation moderating to 10.3 per cent as at the end of December, 2011. The hitherto volatility in the exchange rates witnessed in the foreign exchange market was brought under control. The premium was within the international standard of 5.0 per cent.

Also, the first phase of the banking reform, which started in July, 2004, was concluded on December 31, 2005, with the number of Banks reduced from the then 89 to 25. In 2005, the total assets of the banks sector increased by 29.7 per cent or by N996 Billion from N3.393 trillion in 2004 to N4.389 trillion in 2005. The aggregate balance sheet (Total asset and liability) of the Banking industry from 2001 to 2005 (Table 2) also showed a progression to growth with the reform programme translating to 100 percent increase.

Table 2: Aggregate Balance Sheet of Banks (2001-2005):

YEAR	TOTAL ASSETS	TOTAL LIABILITIES	PER CENT	
2001	2,031,390	4,389,327	100	
2002	2,479,117	3,392,940	100	
2003	2,767,777	2,767,777	100	
2004	3,392,940	2,479, 117	100	
2005	4,389,327	2,031,390	100	

Source: Bank Analysis System

## **THEORETICAL ISSUES**

It took the seminal works of McKinnon (1993) and Shaw (1993) to highlight the adverse effects of "financial repression" on economic development. Financial repression refers to the distortion of domestic financial markets through measures such as ceilings on interest rates and credit expansion, selective allocation of credit, and high reserve requirements.

McKinnon (1993) and Shaw (1993) pointed out that such misguided policies have damaged the economies of many developing countries by reducing savings and encouraging investment in inefficient and unproductive activities. The reducing savings and recommendation is then that positive real interest rates be established on deposits and loans by eliminating interest rate and credit ceilings, stopping selective credit allocation, and lowering reserve requirements. The true scarcity price of capital could then be "seen" by savers and investors, leading to improved allocative efficiency and faster output growth.

These recommendations have been implemented in several developing countries but with mixed results. While some studies have reported that certain countries experienced higher savings and investment following liberalization (Fry, 1978; De Melo, 1986; Khatkhate, 1988), others too have chronicled disasters in other economies that undertook financial liberalization; they include (Diaz-Alejandro, 1985; Corbo and De Melo, 1985; Barandian, 1987; Atiyas, 1989; Larrain, 1989). Countries in the latter category experienced considerable macroeconomic instability, massive capital outflows and widespread bank failures following financial liberalization.

Dornbusch and Reynoso (1993) also underscored the importance of attaining macroeconomic stability prior to financial reform. They noted that high and unstable inflation often increases the demand for financial liberalization, but this might trigger further increases in inflation especially if fiscal deficits are large and the exchange rate is depreciating rapidly. As the government finances its deficits through money creation, the higher interest rates resulting from financial liberalization would reduce government revenue from money creation; with a given budget, this induces further increases in inflation. The recommendation is therefore that fiscal deficits be substantially reduced and the exchange rate

stabilized before financial reform is embarked upon. Thus, Dornbusch and Reynoso (1993: 85) conclude that for Latin America, after a decade of financial instability, the path that will return the region to rapid long-run growth is orthodox realistic exchange rates, balanced budgets, and a favourable investment climate.

Thus, they emphasize a return to orthodoxy—stabilization policies as a prerequisite for successful financial reform policies. The issue of sequencing stabilization policies vis-à-vis structural adjustment policies has received a lot of attention in recent times. Smith and Spooner (1992) identified a number of reasons why stabilization measures are expected to precede supply-side measures in adjustment programmes. First, it is argued that the results of supply-side measures take time to be realized. Without demand restraints, the initial increase in balance of payments deficit that accompanies demand-side measures may become explosive and uncontrollable, especially where there is a constraint on external inflows. Second, stabilization measures are required to bring about a substantial improvement of the balance of payments. This is made possible by a drastic depreciation of the exchange rate to promote exports in order to provide funds for the importation of essential imports.

In order to sustain the exchange rate adjustment, appropriate monetary, financial and income policies have to be put in place as a prerequisite to the expansionary supply-side policies. Third, to enhance the growth of savings and hence investment, it is necessary to control inflation. The initial impact of devaluation and restrictive monetary policies is in most cases an increase in the level of prices (Crockett, 1981; Porter and Runney, 1982).

More often than not, when these policies are combined with huge fiscal deficits, which are inevitably financed by borrowing from the central banks, the result is quite destabilizing.

## **EMPIRICAL ISSUES**

*Liberalization as a catalyst for higher savings, (McKinnon-Shaw)*

McKinnon (1973) and Shaw (1973), analyzed the benefits of (if not eliminating) Financial Repression, 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 favoured 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 (1973) assumed that liberalization, which would be associated with higher real interest rates—as controls on these are lifted—would stimulate savings. The underlying assumption is, of course, that savings is responsive to interest rates. The higher savings rates would finance a higher level of investment, leading to higher growth. Therefore, according to this view, we should expect to see higher savings rates (as well as higher levels of investment and growth) following financial liberalization.



## METHODOLOGY

### Model Specification

The model tested in this study is rooted in the financial repression hypothesis as stated in the McKinnon-Shaw hypothesis, McKinnon (1973) and Shaw (1973). The theory sometimes referred to as the financial complementarity hypothesis, states that alleviating financial restrictions i.e. allowing market forces to determine real interest rates as interest rates rise toward their competitive market equilibrium. The simple model for the study is therefore derived as follows:

Bank Growth = f (financial reform)

Bank Growth is proxied by ROE, ROCE, EPS; While Financial reform is proxied by Interest Rate, Exchange Rate and Real Financial Savings.

Therefore the reduced form equations of the model are stated thus:

$$\text{ROE} = f(\text{INTR}, \text{EXR}, \text{RFS}) \dots\dots\dots (3.1)$$

$$\text{ROCE} = f(\text{INTR}, \text{EXR}, \text{RFS}) \dots\dots\dots (3.2)$$

$$\text{EPS} = f(\text{INTR}, \text{EXR}, \text{RFS}) \dots\dots\dots (3.3)$$

The regression form of the above equations of the model is given as follows:

$$\text{ROE} = \alpha + \beta_1 \text{INTR} + \beta_2 \text{EXR} + \beta_3 \text{RFS} + \mu \dots\dots\dots (3.4)$$

$$\text{ROCE} = \alpha + \beta_1 \text{INTR} + \beta_2 \text{EXR} + \beta_3 \text{RFS} + \mu \dots\dots\dots (3.5)$$

$$\text{EPS} = \alpha + \beta_1 \text{INTR} + \beta_2 \text{EXR} + \beta_3 \text{RFS} + \mu \dots\dots\dots (3.6)$$

Where:-

ROE = Return on equity

ROCE = Return on capital employed

EPS = Earnings per share

$\alpha$  = Intercept

$\beta_{1, 2, 3, \dots}$  = slopes

INTR = Interest Rate

EXR = Exchange rate

EFS = Real financial savings

$\mu$  = Error term

The theoretical a priori expectation assumes that only real financial savings (RFS) shows a positive relationship with Bank Growth, while interest rate and exchange rate have negative effect on bank growth.

That is:  $\text{Bank Growth} = \alpha + \beta_1 - \beta_2 - \beta_3$

In other words the higher the real financial savings for the banks, the more the loan able funds and the higher the capacity to create more money which by implication will increase bank growth.

As the rate of interest increases, the more the investors and the potential investors are discouraged from seeking loans from the bank which will adversely affect bank performance. It should be noted that the main source of banks' money creation is through issuing of loan, therefore the more loans are issued the more profit are made and the better for banks to perform. Exchange rate is the price paid by a country to obtain another currency. Banks purchase foreign currency on behalf of their customers in which they also make profit. Therefore, the higher the exchange rate the lower their customers' patronage and the lower the profit made by the banks on such transactions. In a nutshell, the higher the exchange rates the lower bank's growth.

### **Model estimation Technique**

The variables of interests are in two categories namely; the bank growth and the financial reform variables. The required variables are both dependent and

independent. The financial reform is the independent variable, while bank growth is the dependent. The proxies for independent variable include the following: Interest rate (INT), exchange rate (EXR), and real financial savings (RFS). While proxies for the dependent variables are return on equity (ROE), return on capital employed (ROCE) and earnings per share (EPS).

Adebiyi (2002) stressed that financial reform is best measured by the macroeconomic variables of interest rate, exchange rate, and the real financial savings. To buttress this, Sundarajon and Balino (2001), linked the use of these macroeconomic indicators, especially, the real financial savings with the McKinnon-Shaw hypothesis, the main theoretical analysis which provided a rationale for liberalization as a means of promoting financial development.

Following Adebiyi (2002), Sundarajon and Balino (2001), three variables are used as indicators for financial liberalization in this study. These variables were also adopted by

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Following Adebisi (2002), Sundarajan and Balino (2001), three variables are used as indicators for financial reform in this study. These variables were also adopted by Reinhart and Tokathidis (2001) and Movisset (1993) for Argentina. As regards the Banking industry variables, Ekanen (2003) identified two sets of indicators;

These are levels of Bank productivity and levels of Bank performance. According to Ekanen (2003), productivity in the banking output is defined as total loans and advances, while he identified Bank growth as being measured by the following indexes: Return on Asset, Return on capital employed, Return on equity and Earnings per share. These second sets of indicators are adopted in this study mainly because the focus of this study is on bank growth and not bank productivity. These indicators were also used by Kaminsky and Schmukler (2001) to examine both the short-run and the long-run effects of financial reform on Bank growth in some 28 developed and emerging economies.

The financial reform hypothesis assumes a linear relationship between financial reform and financial savings. However many adjustments have been made to these two variable models of McKinnon-Shaw. For example, Ekanen (2003) adjusted the model to include Bank productivity indicators, so also did Kaminsky and Schmukler (2001).

Following, the works of Ekanen (2003), therefore, this study modified the Mckinnon-Shaw model to include two other macroeconomic indicators of financial reform. Therefore, a comparative analytical model is generated by using three different bank performance indicators. Following the objective of this study which is to examine the long-run effect of financial reform on Bank growth, and as a way of modifying the static analysis common in the literature of this study area. The study therefore employed panel data technique.

## **DATA SOURCES**

This study covers the period 1971-2005 and models will be estimated on the annual data of the three Nigerian Banks, namely, Union Bank of Nigeria plc, United Bank of Nigeria plc and First Bank of Nigeria plc. In order to make easy comparative analyses, we chose these three Banks in Nigeria because other Banks did not have data spanning the period under view (1971-2005). Data used in

this study were sourced majorly from the: Central Bank of Nigeria’s statistical Bulletin; Central Bank of Nigeria’s Economic and financial Review; The Nigeria stock exchange fact Book; The Annual financial Reports of First Bank of Nigeria plc, Union Bank of Nigeria plc and United Bank for African plc. Various information obtained from the research departments of other financial institutions.

## EMPIRICAL ANALYSIS

This section presents and analyses the results of the panel data test. The data used in the study are grouped under the dependent variables which are the bank growth indicators of the three selected banks, and the independent variables. The dependent variables are proxied by the Return on Equity (ROE), Return on Capital Employed (ROCE) and the Earnings per Share (EPS), while the independent variables used are interest rate (INT), exchange rate (EXR) and real financial savings (RFS). A descriptive analysis of the data in table 3 is presented in figures 2,3and 4. The estimation technique adopted by this study estimates the long run relationship between the set of independent variables representing financial reform and bank growth in Nigeria. The first step of the technique is to study the time series properties of the variables using the unit-root test. The results are discussed in the next section. **RESULTS OF THE PANEL DATA MODEL ESTIMATION**

**TALE 3: RESULT OF THE EPS MODEL FOR PRE-SAP ERA (1971-1985)**

DEPENDENT VARIABLE	CONSTANT	EXPLANATORY VARIABLES			SUMMARY OF STATISTICS	
		INTR	RFS	EXR	R2	PROB. >F
Coefficient	7.460	5.60	-0.05	3.43	0.35	0.0000
Stand. Err	(121.94)	(3.95)	(0.02)	(4.25)		
T test	(0.06)	(1.42)	(0.46)	(0.81)		
P>/t/	0.96	0.16	0.65	0.42		

**Source:** Computed from raw data of the study.

The estimated EPS model in our result above shows that both the interest rate and exchange rate have positive relationship with bank performance in the pre SAP era, while the real financial savings had a negative relationship with bank performance during same period at 5% confidence level. In this result, the interest rate sign of 5.604188 is contrary to the sign produced in the ROCE model. In this era the charging of interest rate by the different banks was arbitrary thus the banks were able to make higher earnings for the period. Also the positive relationship between exchange rate and ROCE with a coefficient of 3.428721 typified the sharp practices like round tripping in Foreign Exchange currencies at the period.

The value of  $P > |t|$  is 0.000 which reveals that the coefficient is significant. The positive relationship result is expected for the period of pre-SAP because it was an era of fixed official exchange rate in Nigeria.

Meanwhile, the coefficient of real financial savings is  $-0.05$ . This indicates a negative relationship between the real financial savings and earnings per shares during Pre-SAP period. This is not farfetched as they are expected to have an inverse relationship with each other. This is because the more funds into real savings the lesser will be available for investors to put in shares of the banks and vice-versa. The  $R^2$  of the model is 0.3511 with prob.  $> f$  0.000. The parameters reveal that the relationship between bank performance (EPS) and all other independent variables are not significant.

The statistical coefficients of Interest rate, real financial savings and Exchange rate put together are not significant. In other words, it simply implies that 35% change in earnings per share is explained by interest rate, real financial savings and exchange rate. The remaining 65% change in earning per share is explained by other variables not captured in the model. The constant value of 7.46 shows that earnings per share will change only by 7.46, if all the independent variables remain constant.

**TABLE 4: THE RESULT OF EPS MODEL FOR POST SAP ERA (1986-2005)**

DEPENDENT VARIABLE	CONSTANT	EXPLANATORY VARIABLES			SUMMARY OF STATISTICS	
		INTR	RFS	EXR	R <sup>2</sup>	PROB. >F
Coefficient	15.0345	5.18869	0.1455	4.2297	0.79	0.0000
Stat. Err.	25.3764	6.00185	0.0216	3.7187		
T test	0.59	0.86	0.607	0.74		
P>/t/	0.554	0.387	0.402	0.460		

*Source: Computed from raw data of the study.*

The result of our R<sup>2</sup> from the regression model for the period of Post SAP earnings per share is quite high as expected. It shows that all the independent variables have significant effect on the dependent variables, given the R<sup>2</sup> value of 0.791. This implies that about 79% variation in earnings per share as a measure of Bank performance is explained and captured by the interest rate, real financial savings by the interest rate. This is higher than the value obtained during the pre- SAP period (a value of 0.35). The remaining 21% period (a value explained by other variables that are not included in the model. However, the prob. > F is 0.0000 showing that the proportion of variation in Earnings per Share explained by the independent variables included in the model is significant.

All the coefficients of the independent variables are positive and significant as shown by the coefficient and t-statistics in our table 4, but the constant value of 0.346 is however not significant with the prob.>/t/ value of 0.0554.

**TABLE 5 : RESULT OF ROCE MODEL FOR PRE-SAP ERA (1971-1985)**

DEPENDENT VARIABLE	CONSTANT	EXPLANATORY VARIABLES			SUMMARY STATISTICS	
		INTR	RFS	EXR	R <sup>2</sup>	PROB. >F
ROCE						
Coefficient	0.0875	0.0048	3.630	0.0046	0.694	0.0000
Stat. Err	0.4836	0.0098	3.860	0.0106		
T test	1.81	0.49	0.94	0.44		
P>/t/	0.070	0.424	0.348	0.66		

Source: Computed from raw data of the study.

The result of our model for Return on capital employed as a proxy for bank growth as against the independent variables of interest rate, real financial savings and exchange rate is high. In other words, the proportional change in ROCE as a result of change in independent variables is 69% while the remaining 31% is explained by other variables not captured in the model. Looking at the coefficients of the individual independent variables as shown by our table 5 reveals the coefficients are all positive. Moreover, all their coefficients are significant as indicated by the t-test.

**TABLE 6 :RESULT OF ROCE MODEL FOR POST-SAP ERA (1986-2005)**

DEPENDENT VARIABLE	CONSTANT	EXPLANATORY VARIABLES			SUMMARY STATISTICS	
		INTR	RFS	EXR	R <sup>2</sup>	PROB. >F
ROCE						
Coefficient	0.00655	0.00192	6.4108	0.0041	0.72	0.0000
t. Err.	0.02086	0.0517	1.8708	0.0492		
T test	3.13	0.37	3.43	0.84		
P>/t/	0.002	0.711	0.001	0.402		

Source: Computed from raw data of the study.

The rate at which return on capital employed responds to changes in real financial savings in the two periods of pre-SAP and post-SAP eras compared showed from our tables 5 and 6 respectively. That is, it is 3.630 in pre SAP era while in post SAP era it is 6.4108. Though they both have positive relationship but the intensity shows that the increased in real financial savings enables



the banks to mobilize more resources in terms capital accumulation and hence better returns on capital employed. While the coefficient of exchange rates in the two periods are not substantially different from each other, mainly because the era of round tripping in foreign exchange went away with the pre-SAP era, hence the lower coefficient of 0.0041 in post-SAP era compared to the coefficient of 0.46 of pre- SAP regime.

The  $R^2$  for the generated result as obtained from our table 5.28 is 0.7921. This clearly shows that the effect of interest rate, real financial savings and exchange rate on Bank performance as measured by return on equity is significant at 95% significant level as expressed by prob. >f.( 0.000). All the coefficients of the independent variables are positive except for interest rate which has a negative relationship with ROE and it is expected.

**TABLE 7: RESULT OF ROE MODEL FOR POST SAP ERA (1986-2005)**

DEPENDENT VARIABLE	CONSTANT	EXPLANATORY VARIABLES			SUMMARY STATISTICS	
		INTR	RFS	EXR	R <sup>2</sup>	PROB. >F
ROE						
Coefficient	0.1302	0.00636	5.5706	0.26598	0.971	0.0000
Stat. Err	0.6240	0.1045	3.7806	0.0995		
T test	0.21	-0.61	1.48	2.67		
P>/t/	0.835	0.542	0.140	0.008		

*Source: Computed from raw data of the study.*

The result for the Post-SAP period for return on equity model above showed a better positive relationship in all the independent variables (interest rate, real financial savings and Exchange rate), especially when compared as showed in the table 8, reveals that 97% of variation in dependent in the model is explained by the variables in the model leaving only 3% unexplained. Also, the effect of interest rate, real financial savings and exchange rate on return on equity is significant at 95% significant level as expressed by prob. >F( 0.0000)

**PARAMETRIC DIAGNOSTIC TESTS;** Some diagnostic tests were conducted on the residual to evaluate the panel data model tested. The tests conducted include:

The Breuch-Godfrey serial correlation Lagrange Multiplier (LM) tests, the Ramsey’s RESET test of specification error (Omitted variables, incorrect functional form, correlation between exogenous variables and error term) as well as the Cumulative Sum (usually known as CUSUM) parametric stability test. The LM test of serial correlation showed that there was an absence of first order serial correlation in the residuals.

### **SERIAL CORRELATION TEST**

The Lagrange Multiplier (LM) test was carried out to test for the possibility of serial correlation in the model. It was calculated for the twelfth order for both pre and post SAP periods. The LM test could be either in  $X^2$  form or F statistics form. The result of the auxiliary regression up to the 3<sup>rd</sup> lag in case of pre-SAP is presented in table 8. The F- statistics hypothesis is the coefficient of the lagged residuals is zero (0). The F. statistics is 2.728914 indicating that there is absence of serial correlation in the model.

Also the post-SAP result shows that F- statistics is 3.7549040 as shown in table 8 indicating the absence of serial correlation in the model. They are not significant even though the results are the auxiliary regression in post-SAP period is only 2 lag.

**TABLE 8: BREUSCH-GODFREY SERIAL CORRELATION LM TEST FOR PRE-SAP ERA (1971-1985)**

VARIABLE	COEFFICIENT	STD ERR	T-STATISTICS	PROB.
Constant	-0.161776	0.142983	-1.131431	0.2606
Interest rate	0.002774	0.005077	0.546389	0.5860
Real fin. Savings	-3.48007	1.98406	-0.176243	0.8605
Exchange rate	0.004255	0.005474	0.777348	0.4388
Residual (-1)	0.378780	0.099751	6.804718	0.0000
Residual (-2)	0.125201	0.104340	1.199932	0.2330
F statistics = 2.728914 Prob. 0.000 $R^2 = 0.479521$				

**Source:** *Computed from raw data of the study.*

**TABLE 9: BREUSCH – GODFREY SERIAL CORRELATION LM TEST FOR POST-SAP ERA (1986-2005)**

VARIABLE	COEFFICIENT	STD ERR	T-STATISTICS	PROB.
Constant	-0.271889	0.241938	1.13451	0.4512
Interest rate	0.002884	0.006078	0.646191	0.3860
Real fin. Savings	4.48008	2.98505	-0.271243	0.7506
Exchange rate	0.005366	0.006784	0.47521	0.3288
Residual (-1)	0.478750	0.098761	4.814611	0.0123
Residual (-2)	0.25211	0.21430	2.199932	0.12312
<b>F statistics = 2.728914 Prob.= 0.000 R<sup>2</sup> = 0.479521</b>				

Source: *Computed from raw data of the study.*

### **ERROR OF MIS-SPECIFICATION TESTS**

To ensure there are no errors of miss-specification or omitted variables in a model, Ramsey Reset test was carried out. Thus, it tested for the possibility of specific errors like serial correlation and heteroskedasticity. The test adds the squares and tests for the significance of this additional variable. It is an indirect way of testing whether the square of the regression is significant.

The original regression was first estimated and the fitted values of the regression, the dependent variable (Bank growth) are obtained, the regression was estimated against the powers, of the fitted values as additional regressor. The RESET test is a test of the fitted values. The tests statistics is calculated in F form with P-1 and (T-K, P-I) degrees of freedom.

**TABLE 10 : RAMSEY RESET TEST FOR EPS**

VARIABLE	COEFFICIENT	STD. ERR.	T-STATISTICS	PROB.
Constant	17.35997	2.84783	0.609586	0.05435
Int. rate	-4.439024	7.03558	0.630939	0.05295
Real fin. Savings	0.05809	0.00827	0.701915	0.4844
Exchange rate	-2.87233	4.125552	0.696231	0.4879
Fitted ^2	0.077997	0.133919	0.582418	0.5616
Fitted ^3	0.000206	0.000532	0.386912	0.6997
Fitted 4^	1.35E-07	6.98E.07	0.193134	0.8473
<b>F – statistics = 1.020652    Prob. = 0.000    R<sup>2</sup> = 0.688174</b>				

Source: Computed from raw data of the study.

The result for EPS model is as shown in our table 10 and the statistics are shown as F statistics = 1.020652, probability = 0.0000,  $R^2 = 0.688174$ . The statistics as shown reveals there is no evidence that the functional form is miss-specified in the direction for which the RESET tests have power. For example, the F-statistics is significant at 5% level and the  $R^2$  (0.6881740) is also significant. The probabilities of the coefficient of the power of the fitted values are 0.0000. This shows that they are significant at 5% level as shown in table.10

**TABLE 11: RAMSEY TEST FOR ROCE MODEL**

VARIABLE	COEFFICIENT	STD ERR	T-STATISTICS	PROB.
<b>Constant</b>	-0.112133	0.142985	-0.784226	0.4348
<b>Int. rate</b>	0.001219	0.001590	0.766994	0.449
<b>Real fin Savings</b>	3.70017	6.57E-07	0.563464	0.5744
<b>Exchange rate</b>	-0.000302	0.001253	-0.241146	0.8099
<b>Fitted ^2</b>	2.903415	2.035525	1.426371	0.1569
<b>F – statistics = 1.310508 Prob. = 0.0001 R<sup>2</sup> = 0.749809</b>				

**Source:** *Computed from raw data of the study.*

Table 11 shows that the error miss-specification tests for ROCE model. From the available data, F- statistics = 1.310508, Prob. = 0.0271283 and  $R^2 = 0.749809$ . This statistics shows that there is no evidence that the functional form is miss-specified in the direction for which the RESET Tests have power. For example, the F-statistics is significant at 5% level and the  $R^2$  (0.749809) is also significant. The probabilities of the coefficient of the power of the fitted values are 0.0001. This clearly shows that they are significant at 5% level.

## **SUMMARY AND CONCLUSION**

This study attempts to provide empirical evidence on impact of financial sector reform on bank growth in Nigeria. It assessed the various reform models, most of which focused on savings mobilization, behaviour of real interest rates and foreign exchange rates amongst others. This study also examined some models of bank growth, it tested three hypotheses. First, that interest rate liberalization has no significant effect on banks' return on equity, which focuses on the impact of financial sector liberalization on the behaviour of real interest rates as it affects banks' return from its equity. Second, that exchange rate liberalization has no major impact on banks' return on capital

employed, which investigates the effect of financial sector reforms on the relationship that exists between bank growth and foreign exchange rates. Third, that real financial savings have no significant effects on earnings per share, which also investigated the impact of savings mobilization on the earnings per share of the banks. The study essentially rejected the null hypotheses for the alternative hypotheses.

With respect to the financial reform hypotheses, the study provides some evidences that financial sector reforms have reduced financial repression in the banking system in Nigeria.

Though studies reviewed were found to be in support of the main propositions of the models, the panel data technique revealed that financial sector reform has a positive and significant effect on bank growth in Nigeria for the period reviewed, especially as measured by the proxies of earnings per share and return on equity but has not been significant enough to transform the nations' economy to the desired level. Hence, the study suggests among other things that a precondition for the efficiency of a reformed financial sector is a stable macroeconomic environment and it is essential to ensure that government fiscal policy are assigned to complement monetary policies not to work against monetary and fiscal policies and help restore domestic and international confidence in the Nigeria banking system.

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