Published in Slovak Republic
European Journal of Economic Studies
Has been issued since 2012.
E-ISSN: 2305-6282
2018, 7(1): 48-55

DOI: 10.13187/es.2018.7.48
www.ejournal2.com


# National Savings and Financial Sector Reforms in Nigeria: Econometric Evidence

David Umoru [a, *], Rita Efe Etsemitan [b]

[a.] Edo University, Edo State, Nigeria
[b.] Delta State Polytechnic, Otefe Oghara, Nigeria

**Abstract**

This study seeks to evaluate the exact effect that financial reforms have on national savings in Nigeria from 1985 to 2015 using ARDL estimation technique based on Bewley transformation. The study found that both variables of financial reforms namely, interest rate spread and exchange rate spread had inverse and significant coefficient estimates. Hence, we accept the alternative hypothesis that financial reforms plummet aggregate savings in Nigeria. The study thus recommends the need for the CBN to create adequate financial instruments that are flexible enough to meet risk preferences of financial operators.

**Keywords:** savings, reforms, Nigeria, ARDL, financial, institutions, exchange rate spread, interest rate spread, Bewley, policy.

## 1. Introduction

Financial reforms refer to the structural and institutional changes of financial institutions to include new financial products. Recently, the Nigerian financial system has become volatile in an attempt to keep pace with the global economic phenomenon (Eta and Annabori, 2015). To this effect, the sector has been adorned by various reform strategies (Stefan, 2002; Hanson, 2006 and Adeyemi, 2007). A number of banks were pruned down through the recapitalization programme.

One of the major problems of Nigeria is inadequate savings and investment that ought to increase creative capability of the country. This is because a deficiency in national savings put investment on the knife edge. So, in line with Kama (2006), decline in national savings imply a multiplied repercussion on national income.

Regrettably, the policy dilemma facing Nigeria is the problem of sustaining growth in the face of falling savings mobilization. According to Sanusi (2010), the policy problem emanating from the recession that confronted the country after the reform period resulted in negative real interest rates with disincentive effect on savings mobilization.

The resulting low or negative interest rates depress savings and credit creation of banks and investment suffers (Ojo, 2010 and Ogun, Akinlo, 2011). It so bad that channeling of the mobilized savings is most often not carried out through the financial system.

Dependence on unpredictable foreign sources of capital could further plummet the Nigerian nation into a higher debt service burden and this is capable of putting additional severe pressures on the country's exchange rate which is already devalued. Commercial lending to SMEs is virtually in non-existence (Bloch, Tang, 2003; Ogujiuba, Obiechina, 2011). While the risk management of

* Corresponding author
E-mail addresses: david.umoru@yahoo.com (D. Umoru)

financial sectors, and lending practices are inadequate, the stock of non-performing loans is becoming enormous.

In lie with the forgoing, we intend to ask if interest rate spread and exchange rate spread increases or decreases aggregate savings in Nigeria. The basic objective of this study is to empirically ascertain the impact of interest rate spread and exchange rate spread on aggregate savings in Nigeria. This research paper is divided into five parts. The introduction which is followed by the literature review. The methodology of the research, discussion of regression results and conclusion.

## 2. Literature Review

The theoretical literature on financial sector liberalization plus reforms is vast dating back to theory of McKinnon (1973) and Shaw (1973). The theory upholds the fact that the financial sector is a driver of economic advancement via financial growth. Accordingly, when a financial sector is repressed then it can only respond inertly to real-sector needs (Onwioduokit, 2006; Soludo, 2005; 2007).

In Nigeria, Ikhide and Alawode (2001) examined the impact of financial reforms on macroeconomic stability. Using discriminant analysis, they found wrong sequencing as cause of poor performance of the financial reforms. Okpara (2011) found little or no significant impacts of financial reforms on financial deepening.

To Iganiga (2010) and Omankhanlen (2012), increase in scope of financial reforms is a process instead of event to consolidate the emerging confidence in financial institutions. Ogwumike and Ofoegbu (2012) found that financial liberalization is significant determinant of financial stability. Obviously, this section provides a concise empirical review of financial reforms in relation to savings. This is so given that empirical studies on the impact of financial reforms on national savings are few hence the present study.

## 3. Theoretical Framework

The theory guiding this study is rooted on capital accumulation theory. With capital accumulation, it is finance, and not saving, along with entrepreneurial long-term expectations, which are the prerequisites to capital accumulation. Savings, plays role of preservation of monetary stability of economy (Ziorklui, 2001 and Yang, 2012).

Increased household access to consumer credit or housing finance works to decrease private savings. Hence, when financial sector is autonomous, then the market can pool funds and efficiently allocate funds. The market signal of price allows funds to move to where it marginal product is highest.

In the face of a large pool of financial resources, the bank seeks investors and freeing the credit allocation function from the monetary authorities and placing it in the hands of the market ensures that funds will not go to borrowers that cannot ensure a meaningful return on the money.

Model Specification

Considering the following specification of $ARDL(1,0)$ model of financial reforms containing I(1) regressors and direct deterministic trend,

$$\phi(L)z_t = \partial_0 + \partial_1 t + \beta' y_t + \upsilon_t, \quad t = 1,2,3,...,T \qquad (3.1)$$

where $z_t$ is a scalar, $\phi(L) = 1 - \phi L$, L is one-period delay operator, $y_t$ is a $(k \times 1)$ vector of regressors integrated of order one so that:

$$y_t = y_{t-1} + \varepsilon_t \qquad (3.2)$$

and $\beta = (k \times 1)$ vector of unknown parameters. Applying the decomposition $1 - \phi L = (1 - \phi) + \phi(1 - L)$ to (3.1), $z_t$ can be expressed as in line with Patterson (2000):

$$z_t = \alpha + \gamma t + \delta' y_t + \mu_t \qquad (3.3)$$

Where,

$$\alpha = \frac{\partial_0}{1-\phi} - \left(\frac{\phi}{1-\phi}\right)\gamma$$

$$\mu_t = \sum_{i=0}^{\infty} \phi^i \upsilon_{t-i} - \phi \sum_{i=0}^{\infty} \phi^i \delta^{'} s_{t-i}$$

From (3.1) and (3.3) it is clear that $z_t$ and $y_t$ are individually I(1), and must be co-integrated hence we obtain:

$$z_{t-1} = \alpha_1 + \gamma t + \delta' y_t + f_t \qquad (3.4)$$

Where,

$$\alpha_1 = \alpha - \gamma,$$

$$f_t = \mu_{t-1} - \delta^{'} s_t$$

and $f_t$ is an I(0) process with variance $\sigma_f^2$. Given that the asymptotic properties of the OLS estimators of the short-run and long-run parameters are to be derived within the context of the $ARDL(1,0)$ model, we thus transform equation (3.1) to the partitioned regression model in the matrix form as:

$$z_T = X_T b + z_{T-1}\phi + e_T \qquad (3.5)$$

Where,

$$z_T = (z_1, ..., z_T)', \quad z_{T-1} = (z_0, ..., z_{T-1})'$$

$$\tau_T = (1, ..., 1)', \quad t_T = (1, ..., T)'$$

$$Y_T = (y_1, ..., y_T)', \quad X_T = (\tau_T, t_T, X_T)$$

$$e_T = (e_1, ..., e_T)', \quad b = (\partial_0, \partial_1, \beta')'$$

Given the $ARDL(p,q)$ model in line with Patterson (2000),

$$Z_t = \partial_0 + \sum_{j=0}^{q} \beta_j L^j Y_t + \sum_{i=1}^{p} \Im_i L^i Z_t + s_t \qquad (3.6)$$

With L denoting the lag operator, equation (3.6) can be reparameterized to have:

$$\left(1 - \sum_{i=1}^{p} \Im_i L^i\right) Z_t = \partial_0 + \sum_{j=0}^{q} \beta_j L^j Y_t + s_t \qquad (3.7)$$

Such that:

$$\sum_{j=0}^{q} \beta_j L^j Y_t = \sum_{j=0}^{q} d_j Y_t - \sum_{j=1}^{q} \beta_j Y_t + \sum_{j=1}^{q} \beta_j Y_{t-1}$$

$$- \sum_{j=2}^{q} \beta_j Y_{t-1} + \sum_{j=2}^{q} \beta_j Y_{t-2} - \sum_{j=3}^{q} \beta_j Y_{t-2} + ... - \beta_q Y_{t-q+1}$$

$$= \sum_{j=0}^{q} \beta_j Y_t - \sum_{j=1}^{q} \beta_j \Delta Y_t - \sum_{j=2}^{q} \beta_j \Delta Y_{t-1} - ... - \beta_q Y_{t-q+1}$$

$$= B_0 Y_t - \sum_{j=0}^{q} B_j \Delta Y_{t-j+1} \qquad (3.8)$$

Where,

$$B_0 = \sum_{j=0}^{q} \beta_j$$

$B_1 = \sum_{j=1}^{q} \beta_j, ..., B_q = \beta_q$

Similarly,

$$\left(1 - \sum_{i=1}^{p} \Im_i L^i\right) Z_t = Z_t - \sum_{i=1}^{p} \Im_i L^i Z_t$$

$$= Z_t - \sum_{i=1}^{p} \Im_i Z_t + \sum_{i=1}^{p} \Im_i Z_t - \sum_{i=1}^{p} \Im_i Z_{t-1} + \sum_{i=2}^{p} \Im_i Z_{t-1}$$

$$- \sum_{i=2}^{p} \Im_i Z_{t-2} + \sum_{i=3}^{p} \Im_i Z_{t-2} + ... + \Im_p Z_{t-p}$$

$$= \left(1 - \sum_{i=1}^{p} \Im_i\right) Z_t + \sum_{i=1}^{p} \Im_i \Delta Z_t + \sum_{i=2}^{p} \Im_i \Delta Z_{t-1} + ... + \Im_p \Delta Z_{t-p+1}$$

$$= (1 - \Gamma_1) Z_t + \sum_{i=2}^{p} \Gamma_i \Delta Z_{t-j+1} \quad (3.9)$$

Where,

$\Gamma_1 = \sum_{i=1}^{p} \Im_i$

$\Gamma_2 = \sum_{i=2}^{p} \Im_i, ..., \Gamma_p = \Im_p$

Thus, a re-specification of equation (3.7) becomes:

$$Z_t = \frac{\partial_0}{1 - \Gamma_1} + \frac{B_0}{1 - \Gamma_1} Y_t - \left(\frac{\sum_{i=1}^{q} B_j}{1 - \Gamma_1}\right) \Delta Y_{t-j+1} - \left(\frac{\sum_{i=1}^{p} \Gamma_i}{1 - \Gamma_1}\right) \Delta Z_{t-j+1} + \frac{s_t}{1 - \Gamma_1} \quad (3.10)$$

When,

$$p = q = 1, \ \Gamma_1 = \Im_1$$
$$B_0 = \beta_0 + \beta_1, \ B_1 = \beta_1$$

Equation (3.10) reduces to:

$$Z_t = \frac{\partial_0}{1 - \Im_1} + \frac{\beta_0 + \beta_1}{1 - \Im_1} Y_t - \frac{\beta_1}{1 - \Im_1} \Delta Y_t - \frac{\Im_i}{1 - \Im_1} \Delta Z_t + \frac{s_t}{1 - \Im_1} \quad (3.11)$$

Owing to contemporaneous links between variables, we adopted the Bewley transformation which utilizes instrumental variables such that $Z_{t-1}$ becomes the instrument for $\Delta Z_t$. In any case, the $ARDL(p,q)$ model specification is augmented with suitable number of lagged changes in regressors. Degree of augmentation essential is influenced by condition $q > w+1$ or not. The augmented form of (3.11) becomes:

$$z_t = \partial_0 + \partial_1 t + \sum_{i=1}^{p} \phi_i z_{t-i} + \beta' y_t + \sum_{i=0}^{m-1} \gamma_i' y_{t-i} + v_t \quad (3.12)$$

$$\Rightarrow \Delta \ln(ngs)_t = \partial_0 + \partial_1 t + \sum_{i=1}^{p} \partial_2 \Delta \ln(ngs)_{t-i} + \beta' y_t + \sum_{i=0}^{p} \partial_3 \ln(irs)_{t-i}$$
$$\sum_{i=0}^{p} \partial_4 \ln(exr)_{t-i} + \sum_{i=1}^{p} \partial_5 \Delta \ln(cin)_{t-i} + \mathrm{B}ecm + v_t \quad (3.13)$$

*where* $\beta' y_t = \beta_1 \ln(ags)_{t-1} + \beta_2 \ln(irs)_{t-1} + \beta_3 \ln(exr)_{t-1} + \beta_4 \ln(cin)_{t-1}$

$$m = max(q, w+1),$$
$$\gamma_i = \beta_i^* - A_i' g,$$
$$i = 0,1,2,\ldots,m-1,$$
$$A_0 = I_k$$
$$\beta_i^* = 0 \quad \forall i \geq q,$$
$$A_i = 0 \quad \forall \geq w,\ I_k = (k \times k)$$

In this augmented specification, no contemporaneous correlation exists and OLS estimators of the short-run and long-run parameters of (3.12) are efficient. The variables utilized in the specification and estimation are savings-GDP ratio (ngs), interest rate spread (irs), exchange rate spread (exr), currency intensity (cin). In the above model, Δ is the first-difference operator, $\partial_2, \partial_3, \partial_4, \& \partial_5$ are short-run coefficients while $\beta_1, \beta_2 \,\&\, \beta_3, \& \beta_4$ are long run coefficients.

### 3.1. Data Description and Sources

Exchange rate spread is difference between official exchange rate and parallel (black market) rate. In this study, we utilized Bureau de Change (BDCs) as a proxy for black market rate. Interest rate spread is difference between lending and savings rate. Cash intensity was measured by the ratio of currency in circulation to broad money supply. Given inception of smart money and technological advancement in financial sector, this variable captures the ratio of cash in circulation to broad money supply. The data on variables were acquired from the publications of CBN.

## 4. Empirical Analysis

The time series property of the variables was ascertained using both Augmented Dickey Fuller and Phillip-Perron tests. All variables were found to be non-stationary at their level since each reported absolute t-value is not greater than Mackinnon 5 % critical values of 3.896 and 5.428 for ADF with PP test respectively. The results reported in Table 1 nevertheless, confirm that all the variables in the study are integrated of order one.

**Table 1.** Stationarity Test Results

| Variables | ADF Test Results | | PP Test Results | |
|---|---|---|---|---|
| | No Trend | Trend | No Trend | Trend |
| Ln(ngs) | 1.384 | -1.579 | 1.869 | -1.586 |
| Ln(irs) | -1.721 | -2.862 | -2.954 | -6.703 |
| Ln(exr) | -2.542 | -1.578 | -2.725 | -1.591 |
| Ln(cin) | -1.546 | -1.756 | -2.856 | -1.169 |
| Δ Ln(ngs) | -8.672 | -8.645 | -7.586 | -8.486 |
| Δ Ln(irs) | -9.586 | -5.251 | -5.635 | -6.2867 |
| Δ Ln(exr) | -9.572 | -5.792 | -6.236 | -5.419 |
| Δ Ln(cin) | -8.425 | -5.580 | -6.928 | -5.357 |

From the Bounds testing results in Table 2, there is co-integration between financial reforms and savings in Nigeria. This is made evident by an F-statistic 5.28 which is significant at 5 % level for both the upper and lower bounds.

**Table 2.** ARDL Bounds Testing Results

| Test Statistic | Computed F-Statistic | 5 % Critical Bounds. Upper Bound: I(1) | 5 % Critical Bounds. Lower Bound: I(0) |
|---|---|---|---|
| Bounds Test | 5.28* | 4.72 | 3.45 |
| * denotes rejecting null hypothesis of no co-integration at 5 % level. | | | |

### 4.1. Analysis of Short-run Estimates

The short-run estimates of the ARDL model are presented in Table 3 and we wish to state that the ARDL short-run estimates are parsimonious, parsimonious in view of coefficient estimates up to lag 3 were estimated but to avoid unwieldy analysis, we restricted analysis to lag 1. The short-run results reveal a statistically significant relationship between national savings and interest rate spread and exchange rate spread in Nigeria.

The sign of the short-run co-efficient estimate for interest rate spread at one-lag (-0.243) is inverse and it conformed to theoretical expectations. Also, the coefficient estimate of exchange rate spread of the CBN (-0.163) is negative just as expected. In effect, a rise in elasticity of the exchange rate spread and interest rate spread both reduces aggregate savings in Nigeria. Specifically, a 10 % increase in exchange rate spread and interest rate spread would generate about 2.43 % and (1.63) decrease in national savings.

In addition, the undertakings in the exchange rate market affects savings as some economic agents save currencies in their domiciliary accounts for the rationale of speculation. There is insignificant direct relationship concerning savings and cash intensity. The positive coefficient of cash intensity (1.038) is an indication that recent financial reforms are reducing too much paper money in circulation and as such creating avenue for cashless economy. In effect, financial reforms could reduce the transaction and maintenance cost of paper money. However, its effect is weak.

The error correction coefficient (-0.935) is negative besides statistically significant. This indeed implies that with variation in interest rate spread, exchange rate spread together with cash intensity, about 93 % of the disequilibrium error in national savings in Nigeria would be adjusted annually. The speed of adjustment is rather rapid.

**Table 3.** ARDL Results for National Savings in Nigeria

| Variables | Short-run Estimates | Long-run Estimates |
|---|---|---|
| $\Delta$ Ln(ags)$_{(t-1)}$ | 0.532 (7.148)$^{A}$ | |
| $\Delta$ Ln(irs)(-1) | -0.243 (-4.591)$^{A}$ | |
| $\Delta$ Ln(exr)(-1) | -0.163 (-2.734)$^{AA}$ | |
| $\Delta$ Ln(cin)(-1) | 1.038 (1.296) | |
| Ln(irs) | | -1.541 (-3.957)$^{A}$ |
| Ln(exr) | | -0.528 (-2.134)$^{AA}$ |
| Ln(cin) | | 1.369 (0.345) |
| ect$_{(t-1)}$ | -0.935 (-18.379)$^{A}$ | |
| t | | 1.462 (5.698) |
| C | 1.258 (2.163)$^{AA}$ | 2.462 (19.379)$^{A}$ |

| |
|---|
| R-squared = 0.851, A. R-Squared = 0.824,<br>F-statistic = 146.9 (0.000), DW =2.086<br>Note: [A] ([AA]) indicates significance @ 1%(5%) respectively |
| R-squared = 0.936, A. R-Squared = 0.914,<br>F-statistic = 157.9 (0.000), DW =1.946<br>Note: [A] ([AA]) indicates significance @ 1%(5%) respectively |

### 4.2. Analysis of Long-run Estimates

The long-run estimates conform to short-run estimates and value of adjusted coefficient of determination re-validates about 91.4 % goodness of statistical fit. In effect, about 91 % of the systematic variation in aggregate savings is explained by the variation in interest rate spread, exchange rate spread and cash intensity. This shows the existence of a linear and proportionate relationship between national savings, interest rate spread, exchange rate spread and cash intensity.

So, in the long-run, a 10 % growth in interest rate spread reduces national savings up to the tune of 15.41 %. Also, 10 % rise in the spread of exchange rate reduces national savings as a percentage of GDP in the current period by 5.28 %.

The F-statistic of 157.9 explains a good statistical fit of the national savings model to variables of financial reforms. With a Durbin Watson test statistic of 1.946, presence of positive autocorrelation was denied. This undeniably signifies that the short-run variation did not merely result from the use of multiple variables in the model. Thus, the empirical evidence emanating from the error correction results was relied upon for policy decisions. The CUSUM test provides further evidence to stability of our model at the 5 % level as shown in the figure below.

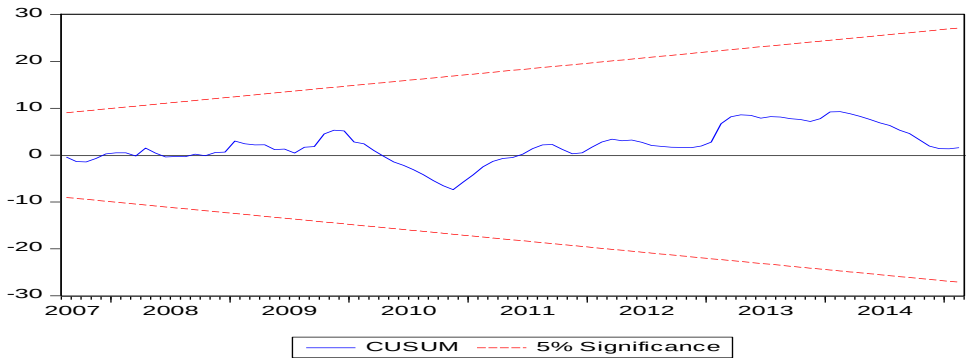


**Fig. 1.** CUSUM Test Plot

### 4.3. Policy Implications of Results

• Excessive interest rate spread and exchange rate spread discourages savings mobilization in Nigeria. Hence, the empirical evidence upholds that financial reforms in Nigeria do not intensify but rather plummet aggregate savings.

• Interest rate and exchange rate spreads create disincentive to aggregate savings in Nigeria. It points to huge gap between savings and lending rate in Nigeria. However, structure of Nigerian money market could be responsible for inability of savings to respond favorably and positively to interest rate spread. Rise in exchange rate spread increases currency speculation and discourages savings mobilization. This could be pointing to round tripping in forex market. In addition, the undertakings in forex market affects savings as some economic agents save currencies in their domiciliary accounts for the rationale of speculation.

• Cash intensity is a positive stimulant to national savings in Nigeria. Thus, recent financial reforms with instrumentality of ATMs, electronic banking and POS are reducing excessive paper money in circulation and as such creating avenue for cashless economy. In effect, financial reform reduce the transaction and maintenance cost of paper money.

## 5. Conclusion

Empirically, we evaluated effects of financial reforms on national savings in Nigeria. The empirical evidence shows that interest rate and exchange rate spreads create disincentive to savings in Nigeria. In effect, a huge gap between savings and lending rate exists in Nigeria. The instrumentality of cash intensity is an innovation to efficacious operation of financial reforms in Nigeria.The findings in this study makes it imperative for recommending the need for CBN to create adequate financial instruments that are flexible enough to avert risk preferences of financial operators.

## References


Adeyemi, 2007 – *Adeyemi, K.* (2007). Banking Sector Consolidation in Nigeria: Issues and Challenges. Union Digest.

Bloch, Tang, 2003 – *Bloch, H., Tang, H.* (2003). The role of Financial Development in Economic Growth. Progress in Development Studies, 3(3), 243-251.

Eeta, Anabori, 2015 – *Eeta, A., Anabori, M.* (2015). Financial sector reforms and economic growth in Nigeria. International Journal of Economics, Commerce and Management, 3(9), 151.

Hanson, 2006 – *Hanson, J.* (2006). Financial Liberalization: The Good and the Bad: Finance and Development. 10.

Iganiga, 2010 – *Iganiga, B.* (2010). Evaluation of the Nigerian financial sector reforms using behavioural models. Joural of Economics, 1(2), 65-75.

Ikhide, Alawode, 2001 – *Ikhide, S.I., Alawode, A.A.* (2001). Financial Sector Reforms, Macroeconomic Instability and the order of Economic Liberalization: The evidence from Nigeria. AERC Research Paper, 112.

Kama, 2006 – *Kama, U.* (2006). Recent Reforms in the Nigerian Banking Industry: Issues and Challenges. CBN Bullion, 30(3).

Ogujiuba, Obiechina, 2011 – *Ogujiuba, K., Obiechina, M.* (2011). Financial sector reforms in Nigeria: Issues and challenges. International Journal of Business and Management, 6(6), 222-233.

Ogun, Akinlo, 2011 – *Ogun, T., Akinlo, A.* (2011). Financial sector reform and the performance of the Nigerian economy. The Review of Finance and Banking, 47-60.

Ogwumike, Ofoegbu, 2012 – *Ogwumike, F., Ofoegbu, D.* (2012). Financial liberalisation and domestic savings in Nigeria. The Social Sciences, 7(4), 635-646.

Ojo, 2010 – *Ojo, J.* (2010). The Nigerian maladapted financial system: Reforming tasks and development dilemma.

Okpara, 2011 – *Okpara, G.* (2011). Bank reforms and the performance of the Nigerian banking sector: An empiriical analysis. International Journal of Current Reasearch, 2(1), 142-153.

Omankhanlen, 2012 – *Omankhanlen, A.* (2012). The financial sector reforms and thier effect on the Nigerian economy. Economy Transdisciplinarity Cognition, 45-57.

Onwioduokit, 2006 – *Onwioduokit, E.A.* (2006). Financial Liberation and Saving Mobilization in Nigeria. CBN Bullion, 30(1), 52-62.

Patterson, 2000 – *Patterson, K.* (2000). An Introduction to Applied Econometrics: A Time Series Approach. St.Martin's Press, New York, U.S.A.

Sanusi, 2010 – *Sanusi, L.* (2010). CBN Reforms: Assessing industrial Sector's prospects for Revamp. Punch Newspaper, p. 22.

Soludo, 2005 – *Soludo, C.* (2005). N25 Billion Naira Capitalization: The Journey So Far and its Likely Implications on the Nigerian Economy. Retrieved from Nigeria Business Info: NigeriaBusinessInfo.com

Soludo, 2007 – *Soludo, C.C.* (2007). Nigeria's Financial System Strategy 2020 Plan Paper by the Governor, Central Bank of Nigeria. FSS International Conference, 20. Abuja-Nigeria.

Stefan, 2002 – *Stefan, I.* (2002). Meeting the Challenges for the Chinese Financial Sector: What Have We Learned from Other Countries? Second China Financial Forum. Beijing, China.

Yang, 2012 – *Yang, D.T.* (2012). Aggregate savings and external imbalances in China. Journal of Economic Perspertives, 125.

Ziorklui, 2001 – *Ziorklui, S.* (2001). The impact of financial sector reform on bank efficiency and financial deepening for savings mobilization in Ghana. African Economic Discussion Paper.