STRUCTURAL BREAK, FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH: EVIDENCE FROM NIGERIA

Umar Muhammad Bello
Department of Economics, Federal University Lafia,, Nigeria
+2348037179271 ubsanda@yahoo.c om

Abstract
Structural breaks do occur in time series data and this may affect the nature and quality of the relationship between economic variables. This paper investigates the influence of structural break on the relationship between financial development and economic growth in Nigeria. Annual data for the period 1960 to 2014 were analysed using Gregory and Hansen cointegration approach and vector error correction model. The results indicate that structural break is important for the nature and quality of the relationship between financial development and economic growth in Nigeria. And that financial development has significant negative long run relationship with economic growth in Nigeria. The results are important as they reveal that ignoring the influence of the breaks could lead to spurious results and consequently distortions to policies.

Key Words: Structural Breaks, Financial Development, Economic Growth, Cointegration, VECM
JEL Code: C32 E44 O55

INTRODUCTION

The idea that the financial system of an economy might affect its growth has had a long history. Its origin can be traced to the works of Bagehot (1873) and Schumpeter (1911). However, the empirical works of Goldsmith (1969) and McKinon (1973) lay the foundations of the formal studies on the subject matter. Subsequently, many studies have investigated the subject matter which has now developed into many branches (Beck, Levine & Loayza, 2000; King & Levine, 1993a, 1993b; Levine, 1997, 2005).

Furthermore, a number of investigations have been carried out for different countries (Ardic & Damar, 2006; and Mohammed & Sidiropoulos, 2008) and across different countries (Barajas, Chami & Yousefi, 2013; Greenwood, Sanchez & Wang, 2012; Ndebbio, 2004 and Wong & Zhou, 2011). Calderon and Liu (2003) and Chinaemerem and Chigbu (2012) assessed the causal relationship between financial development and economic growth while Nzotta and Okereke (2009) studied the impact of financial development on economic development. A number of other studies have also been carried out to assess the influence of time and financial crises on the relationship between the two variables (Mahlberg, Haiss & Juvan, 2011 and Rousseau & Wachtel, 2011). Barajas et al (2013) and Samargandi, Fidrmuc and Ghosh (2013) investigated whether the relationship between financial development and economic growth is the same for all countries. However, the results of these studies are generally mixed.

Many of these studies found a significant positive relationship between financial development and economic growth (Adelakun, 2010; Calderon & Liu, 2003; Greenwood et al, 2012 and Wong & Zhou, 2011) while others found significant negative relationship between the variables (Ardic & Damar, 2006; Bloch & Tang, 2003; Mahlberg *et al*, 2011; and Ohwofasa & Aiyedogban, 2013). Some other studies however found no significant relationship between the variables (Adekunle, Salami, & Adedipe, 2013; Mohammed & Sidiropoulos, 2008; and Samargandi, et al, 2013). This therefore suggests that the findings on the relationship between the variables are inconclusive. This study therefore tries to further investigate the relationship between financial development and economic growth taking Nigerian economy as a case study.

However, a number of investigations have been carried on the Nigerian economy (Adekunle *et al*, 2013; Adelakun, 2010; Chinaemerem & Chigbu, 2012; Nkoro & Uko, 2013; Odeniran & Udeaja, 2010; Ohwofasa & Aiyedogban, 2013; and Torruam, Chiawa & Abur, 2013). But this paper differs from them in many respect. First none of these studies have accounted for the

influence of structural breaks in their analyses. While this study assessed the influence of structural break in the unit root test, cointegration and vector error correction model (VECM). Second, some of the studies that used Nigeria as the case study have used small observations of less than 30 (for instance, Adekunle *et al*, 2013; Adelakun, 2010; Nzotta & Okereke, 2009; Ohwofas & Aiyedogban, 2013; and Torruam *et al*, 2013). On the other hand, this study uses larger set of observations (55) from 1960 to 2014 and therefore the results are bound to be more robust. This paper therefore investigates the influence of structural break on the relationship between financial development and economic growth in Nigeria over the period 1960 to 2014.

The rest of the paper is organized into four sections. Following this introduction is the methods used for the analyses in the paper. It has two subsections which deal with the identification of the appropriate methodology and the specification of the econometric model used in the analyses. Section three presents the results of the study. It has subsections on data, unit root tests, cointegration analysis, and vector error correction. While discussions of findings are presented in section five and the paper concludes in section six.

METHODOLOGY

Identification of the Appropriate Method

The object of this paper is to determine the influence of structural break on the relationship between financial development and economic growth in Nigeria. To achieve this, cointegration approach will be the suitable method since the dataset is time series. On the other hand, cointegration analyses require that all the variables are integrated of order one. In addition, cointegration with structural breaks have to be proved before such breaks can be captured in the VECM. Different variants of this approach are available, such as Gregory and Hansen (1996a, b), Hatemi-J (2008) and Johansen, Mosconi, and Neilson (2000) approaches. Gregory and Hansen and Hatemi-J account for single and double unknown breaks respectively. While Johansen *et al* accounts for double known structural breaks. However, the break dates need to be known *apriori* to implement the Johansen *et al* (2000)

approach. But such dates are not available for this study. On the other hand, Hatemi-J's approach is not easily accessible using common statistical software.

In this paper, proxies were obtained for variables of interest and control variables and were tested for unit root. In addition, unit root with structural break were also tested for each of the variables. This identified different break periods for the variables thus excluding the possibility of using Johansen *et al* (2000) as it is difficult to determine the break period that will influence the cointegration relationship. This paper therefore adopts the Gregory and Hansen (1996a) cointegration approach which accounts for single unknown structural break. The approach is adopted because it is simple to implement and will capture the relationship among the variables adequately. The coefficients of the long run relationship between the variables are then captured using VECM.

Econometric Model

Gregory and Hansen (1996a, b) cointegration approach and vector error correction model were used. The model specification starts with the functional relationship between the variables and continues with the Gregory-Hansen cointegration approach which involves unit root test, cointegration test, and the vector error correction model. The model is specified as follows:

$$GDP = (DTG, CIM, NRI) \qquad 1$$

Where GDP is the nominal Gross Domestic Product the proxy for economic growth, and DTG is the ratio of deposits to nominal GDP, the proxy for financial deepening. CIM is the contract intensive money and is the proxy for institutions. NRI stands for natural resources intensity, the ratio of oil export to nominal GDP and it is the proxy for natural resources.

Unit root tests were carried out to ensure that the variables are suitable for analyses using cointegration approach. The augmented Dickey-Fuller (ADF) and Phillips-Perron unit root tests were used to assess the stationarity and order of integration of the variables

under investigation. Several steps were involved in these tests such as the determination of whether constant and trend should be part of the model, and the choice of optimal lag.

In addition, single break additive outlier model of Clemente, Montanes and Reyes (1998) unit root test was also used to assess the impact of structural break on the unit root of the series variables under investigation. This is imperative because the ADF and Phillips-Perron unit root tests often confuse breakpoints with non-stationarity of a variable. However, the results of the ADF and Phillips-Perron unit root tests are more reliable when there is no evidence of structural break in the dataset (Baum, 2005).

Gregory-Hansen approach was then used to determine the existence or otherwise of cointegration among the variables in the presence of a single structural break. The break period is endogenously estimated by this model (see Gregory & Hansen, 1996a, and b). The model tests for the null hypothesis of no cointegration in the presence of single unknown structural break (Gregory & Hansen, 1996, b).

The Gregory and Hansen approach has four models which account for single break in level shift, C, level shift with trend, C/T, regime shift, C/S, and regime shift with trend, C/S/T. Level shift occurs when there is change in the intercept of the model while the slope parameters are held constant and this is given by equation 2. Level shift with trend, which is given by equation 3, occurs when time trend is introduced into level shift. While regime shift occurs when both the intercept and slope parameters change, and this is given by equation 4. And finally regime shift with trend, which is given in equation 5, occurs when time trend is introduced into regime shift.

$$Y_t = \alpha_1 + \beta_2 D_{tk} + \gamma_3 X_t + \varepsilon_t \quad (2)$$

$$Y_t = \alpha_1 + \beta_2 D_{tk} + \delta t + \gamma_3 X_t + \varepsilon_t \quad (3)$$

$$Y_t = \alpha_1 + \beta_2 D_{tk} + \gamma_3 X_t + \varphi_4 X_t D_{tk} \quad (4)$$

$$Y_t = \alpha_1 + \beta_2 D_{tk} + \delta t + \gamma_3 X_t + \varphi_4 \quad (5)$$

Where Y is the dependent variable and X is the independent variable, β_1 is the intercept of the model before break in K and β_2 measures the shift that occur after the break. β_3 is the slope parameter of the cointegrating vector, β_4 measures the change in the cointegrating vector after the regime shift, α is the slope parameter of time trend, t , and ε is error term. D is dummy variable which accounts for the break period and is defined as:

$$D_t = \begin{matrix} 1 \ if \ t>k \\ 0 \quad otherwise \end{matrix}$$

Gregory & Hansen (1996a) propose three tests of the residual series as follows:

$$ADF^* = \inf_{k \in T} (ADF(k)) \qquad 6$$

$$Z_t^* = \inf_{k \in T} Z_t(k) \qquad 7$$

$$Z_\alpha^* = \inf_{k \in T} Z_\alpha(k) \qquad 8$$

Vector error correction models were specified to get the normalized coefficients of the cointegrating vectors. Following the works of Romano and Scandurra (2009) the influence of the identified structural break is captured in the VECM using a dummy variable. The VEC model is specified as follows (see Romano & Scandurra, 2009).

$$\Delta X_t = \delta + \psi X_{t-1} + \sum_{i=1}^{p-1} \Phi \, \Delta X_{t-i} + \boldsymbol{D}_{k,t} + \mu_t \qquad 9$$

Where δ is vector of constants, X is the matrix of endogenous variables, and ε is the vector of the intervention variables which is used to account for the influence of structural breaks in the VECM (Romano & Scandurra, 2009). ψ is a reduced rank coefficients matrix which can be decomposed into α and β, while μ, the vector of dummy variables, is defined as:

$$\vartheta_{k,} = \begin{cases} 1, & if t > k \\ 0 & otherwise \end{cases} \qquad I = \begin{cases} 1 \text{ if } t=k \\ 0 \text{ other wise} \end{cases}$$

Where is the break dummy, while I is an indicator variable. The indicator variable provides the structural stability for the model when the breakpoint is known *apriori* (Baum, 2006; and Joyeux, 2007).

The error correction equation is specified in equation (10) with the break dummy and residual of the cointegration regression as the error correction term.

$$\Delta GDP_t = \beta_o + \sum \alpha_i \Delta DTG_{t-i} + \sum \beta_i \Delta CIM_{t-i} + \sum \rho_i \Delta NRI_{t-i} + \sum \delta_i \Delta DUM_{t-i} + \alpha_i res_{t-1} + \mu_t \quad 10$$

The error correction term which adjusts for disequilibrium in the model is expected to be negative and significant with value less than one (Johansen & Juselius, 1990).

Data

The data used for the analyses in this paper are annual time series dataset. They are obtained from the Central Bank of Nigeria (CBN) Statistical Bulletin (2011) and (2014). Statistical Bulletin for 2011 reports data from 1960 to 2011 while the reporting period for the 2014 statistical Bulletin starts from 1981 for most of the data. Therefore the two were merged for the relevant data to obtain data for the period 1960 to 2014. Thus a set of 55 observations were used.

Nominal GDP served as the proxy for economic growth. Nominal values are used for this variables because all the dependent and control variables are also reported in nominal terms. For financial development, the ratio of nominal deposits to nominal GDP served as its proxy. This follows the works of Ardic and Damar (2006) and Nzotta and Okereke (2009). Data on these variables were

obtained from the CBN Statistical Bulletin.

Following the extant literature, institutions and natural resources served as the control variables in this study. Following the work of

Clauge, Keefer, Knack and Olson (1999) institutions are represented by contract intensive money. This is computed as broad money supply (M2) less currency outside banks divided by M2. While natural resources intensity served as the proxy for natural resources. This is computed as the value of nominal oil exports divided by nominal GDP. To ensure that all variables are measured on the same scale, nominal values were used for each of the variables.

Furthermore, natural log of the variables were obtained to normalize them. In addition, data in the 2011 Statistical Bulletin were reported in millions of naira while those in the 2014 were reported in billions of naira. Therefore the 2014 dataset were converted to millions to standardize them with those of the 2011.

RESULTS

Unit Root Tests

This subsection presents the results of unit root tests for each of the variables under investigation. Two sets of unit root tests were carried out. The first test used the Augmented Dickey-Fuller and Phillips-Perron unit root tests. In addition, the Clemente *et al* (1998) unit root test was used to account for the influence of structural breaks in the unit root test of each of the variables. Results of the ADF and Phillips-Perron unit root tests are presented in Table 1 while those of Clemente *et al* in Table 2.

Table 1: ADF and Phillips-Perron Unit Root Test Results

Variables	ADF Statistics		Phillips-Perron	
	Level Values	First Difference	Level Values	First Difference
Natural Log of Nominal GDP	-2.654(1)	-4.853(1)***	-2.614(1)	-6.457(1)***
Ratio of Deposit to Nominal GDP	-2.607(1)*	-	-2.513(1)	-7.014(1)***
Contract Intensive Money	-1.497(1)	-4.529(1)***	-1.526(1)	-6.815(1)***
Natural Resources Intensity	-1.889(1)	-6.965(1)***	-2.259(1)	-8.530(1)***

Notes: Values are stationary at 1% (***), 5% (**), and 10% (*). Values in parenthesis are the optimum lag(s) used in the tests.

Table 1 presents the results of ADF and Phillips-Perron unit root tests for the variables under investigation. The results in the Table indicate that log of nominal GDP is stationary at first differenced value using both methods of unit root. Thus, it is integrated of order one and therefore suitable for analyses using cointegration approach. The results in the Table further show that the ratio of deposits to GDP is stationary at level value using ADF unit root test. However, the variable is integrated of order one using Phillips-Perron unit root test. This will therefore supersede the weak conclusion drawn by ADF. Furthermore, the results in Table indicate that both contract intensive money and natural resources intensity are stationary at first differenced values.

Table 2 presents the results of single break Clemente *et al* additive outlier unit root test. This accounts for sudden change in the mean of the series variables.

Table 2: Clemente et al (1998) Unit Test Results (Additive Outliers One Structural Break)

Variables	Level Values		First Difference Values	
	Struct ural Break	Unit Root	Struct ural Break	Unit Root
Log of Nominal GDP	1997***	-6.900(1)*		
Ratio of Deposit to Nominal GDP	1972***	-6(1)	2006	-7.137(1)*
Contract Intensive Money	2003***	6(1)	1992	-7.530(1)*
Natural Resources Intensity	1984***	-8(1)	2003	-7.955(1)*

Note: Dates and values are significant at 1% (***), 5% (**), and 10% (*) respectively. Values in parenthesis are the optimum lag(s) used for the tests.

The results in the Table indicate that nominal GDP is stationary at first differenced value with a structural break in 1966. In addition, financial deepening, contract intensive money and natural resources intensity are all stationary at first differenced values despite the structural breaks at level values. Therefore, all the variables are integrated of order one and thus can be analysed using cointegration approach. Furthermore, the results for the ratio of deposits to GDP

supersedes that of ADF which might have confused the existence of structural break with unit root in the variable.

Cointegration Tests

This subsection presents the results of cointegration test using Gregory and Hansen approach. The approach tests for four models and has three statistics, but only the ADF statistic is reported here.

Table 3: Gregory and Hansen (1996) Cointegration Test with Structural Break

Model	Level shift	Level Shift & Trend	Regime Shift	Regime Shift & Trend
ADF Statist ic	-5.52**	-5.36*	-5.00	-4.44
Break Date	1990	1994	1989	1984

Notes: values are significant at 1%(***), 5% (**), and 10% (*) respectively.

Table 3 presents the results of Gregory and Hansen cointegration tests for the variables under investigation. The results indicate that the model with level shift is significant at 5% with a structural break in 1990. Thus we reject the null hypothesis of no cointegration and accept the alternative hypothesis. Therefore, there is long run relationship among the variables under investigation when shift in level is accounted for. The break period identified by the model (1990) coincides with the increase in crude oil price as a result of Gulf war. This might have led to increased government spending which was hitherto low due to the structural adjustment programme pursued since the late 1980s.

The results in Table 3 further show that the model with level shift with trend is significant at 10% with a structural break in 1994. In addition, the results show that the models with regime shift and regime shift with trend are not significant. We therefore conclude that there is no long run relationship among the variables when regime shift and regime shift with trend are considered. Therefore, this paper works with level shift as it is the only with reliable significance level.

Vector Error Correction Model

The summary results of the VECM is presented in this section. It

presents the coefficients of the long run cointegration regression and the adjustment parameter of interest.

Table 4 presents the results of the normalized coefficients of the VECM. It presents arguments about the influence of structural break on the nature and direction of the relationship between financial development and economic growth in Nigeria. The results in column 1 of Table 4 show that financial development has positive long run relationship with economic growth which is significant at 1%. This means that a unit improvement in financial development variable increases economic growth by 1.558. The adjustment parameter has the correct sign and is significant at 5%. This suggests that about 3% of any short run disequilibrium will be adjusted annually. However, this model did not account for the influence of structural break.

Table 4: Summary of the Results of the Normalized Long Run Coefficients of the Cointegration Regression

Dependent Variable: Natural Log of Nominal GDP			
Independent variables	1	2	3
Financial Development	1.558 (7.04)***	-0.121 (-3.70)***	-0.121 (-3.42)***
Structural Break Dummy (1990)		3.637 (5.45)***	4.246 (19.30)***
Adjustment Parameter	-0.003302**	-0.4432***	-0.3496***
R-Squared	0.7218	0.7527	0.7320
Chi-squared	80.4327***	97.4033***	90.1443***

Note: values in parenthesis represent the calculated z-values. Parameters are significant at 1% (***); 5% (**); and 10% (*). Column 1 does not include structural break dummy, while columns 2 and 3 do. In addition, Column 2 is for level shift while column 3 is for level shift with trend.

Column 2 accounts for the structural break identified by the Gregory and Hansen cointegration test. It indicates that financial development has significant negative long run influence on

economic growth in Nigeria. This suggests that introducing structural break dummy into the model changed the direction of influence from positive to negative. In addition, the structural break dummy variable is positive and significant at 1%. This indicates that the underlying cause of the break in the dataset has positive long run influence on growth in Nigeria. Moreover, the adjustment parameter is now 44% and significant at 1%. This also shows that accounting for structural break increases the speed of adjustment from short run disequilibrium. Furthermore, the R-squared for the 2 models also point to the fact that accounting structural break in VECM contributes to the quality of the model to better explain economic growth in Nigeria.

Column 3 presents the results of VECM that captures level shift with trend. It shows that the results are basically the same with those of column 2, except for the drop in the rate of adjustment and the slight increase in the influence of structural break. Overall, the results in Table 4 support the argument that accounting for structural break in VECM produces better results of the relationship between the variables.

DISCUSSIONS

The paper examines the influence of structural break on the nature and quality of the relationship between financial development and economic growth in Nigeria. The results reveal that financial development has significant negative long run relationship with economic growth in Nigeria when structural break is accounted for. This finding is in line with the works of Ardic and Damar (2006), Bloch and Tang (2003), Mahlberg *et al* (2011) and Ohwofasa and Aiyedogban (2013). But it contradicts those of Adekunle, et al (2013), Adelakun (2010) Chinaemerem and Chigbu (2012), Nkoro and Uko (2013), Odeniran and Udeaja (2010), Ohwofasa and Aiyedogban (2013) and Torruam *et al* (2013). The increase in crude oil prices in 1990 might have increased deposits to the financial institutions in the country. However, instead of channelling these deposits to the real sector, the banks might have channelled them to speculative activities in

the stock and foreign exchange markets thus reducing their contributions to growth.

The results further indicate that the structural break has significant positive long run influence on economic growth in Nigeria. This means that the underlying factor causing structural break in the cointegration relationship is important in explaining growth in Nigeria. In this case, increase in the price of crude oil as a results of the Gulf war has important influence on growth.

The results also indicate that accounting for structural break is important for the nature of the relationship between financial development and economic growth in Nigeria. It turns the relationship between the variables from positive, when the break period is not accounted for, to negative when it is accounted for. This means the existence of the structural break confuses the model to conclude the existence of positive relationship between the variables, while in reality it is negative. Thus when the break is accounted for the true relationship between the variables appears.

The results also show that capturing structural break in the VECM is important for the quality of the estimates as well as the overall model fitness. The results reveals that as the influence of structural break is captured in the model, the significance of the individual parameters, and the overall model fitness, is further enhanced. Thus accounting for structural break results in a model that has better statistical adequacy.

CONCLUSION

This paper investigates the relationship between financial development and economic growth in Nigeria while accounting for the influence of structural break in the dataset. The results indicate that financial development has significant positive long run influence on economic growth in Nigeria when structural break is not accounted for. However, when structural break is accounted for, the long run influence of financial development on economic growth in Nigeria turns negative and significant. In addition, the break period is important for nature and quality of the relationship

between the variables under investigation. Furthermore, structural break has significant long run influence on economic growth. This therefore indicates that structural break is important for the significance and direction of the relationship between the variables under investigation.

The study is important as it exposes the true relationship between financial development and economic growth in Nigeria. This will guide future policies for better growth. In addition, the paper also demonstrated that accounting for structural breaks in VECM results in model with reliable estimates and robust parameters. Therefore, studies in the future should account for the influence of structural breaks in their analyses.

However, the results are not robust to lags selection. Changing the optimum lags is bound to change the results reported. In addition, Gregory and Hansen cointegration approach accounts for single structural break and single cointegrating vector. The variables might have more than one cointegrating vector among them and thus the method fails the captured them. However, this will not jeopardize the reliability of the results estimated. In addition, conclusions drawn are based on single structural break captured by the model used. Future studies may consider the influence of double-break

References

Adekunle, O. A., Salami, G. O., & Adedipe, O. A. (2013). The impact of financial sector development on the Nigerian economic growth. *American Journal of Business and Management*, 347 - 356.

Adelakun, O. J. (2010). Financial sector development and economic growth in Nigeria. *International Journal of Economic Development Research and Investment*, 25 - 41.

Ardic, O. P., & Damar, H. E. (2006). *Financial sector deepening and economic growth: Evidence from Turkey.* Germany: MPRA Paper 4077, University Library of Munich.

Bagehot, W. (1873). *Lombard street: A description of the money market.* New York: Scribner Amstrong & Co.

Barajas, A., Chami, R., & Yousefi, S. R. (2013). The finance and growth nexus re-examined: Do all countries benefitted equally? *IMF Working Paper 13/130*, 1 - 33.

Baum, C. F. (2005). Stata: The language of choice for time-series analysis? *The Stata Journal, 5*(1), 46 - 63.

Baum, C. F. (2006). *An introduction to modern econometrics using Stata.* College Station, Tex: Stata Press.

Beck, T., Levine, R., & Loayza, N. (2000). Finance and the sources of growth. *Journal of Financial Economics*, 261 - 300.

Bloch, H., & Tang, S. H. (2003). The role of financial development in economic growth. *Progress in Development Studies, 3*(3), 243 - 251.

Calderon, C., & Liu, L. (2003). The direction of causality between financial development and economic growth. *Journal of Development Economics*, 321 - 334.

CBN. (2011). *Statistical bulletin.* Abuja: Central Bank of Nigeria.

CBN. (2014). *Statistical bulletin.* Abuja: Central Bank of Nigeria.

Chinaemerem, O. C., & Chigbu, E. E. (2012). An evaluation of financial development and economic growth of Nigeria: A causality test. *Kuwait Chapter of the Arabian Journal of Business and Management Review*, 27 - 44.

Clauge, C., Keefer, P., Knack, S., & Olson, M. (1999). Contract intensive money: Contract enforcement, property rights and economic growth. *Journal of Economic Growth*, 185 - 211.

Clemente, J., Montanes, A., & Reyes, M. (1998). Testing for a unit root in variables with a double change in the mean. *Economic Latters*, 175 - 182.

Goldsmith, R. W. (1969). *Financial structure and development.* New Haven: Yale University Press.

Greenwood, J., Sanchez, J. M., & Wang, C. (2012). Quantifying the impact of financial development on economic development. *Review of Economic Dynamics, Elsevier*, 1 - 22.

Gregory, A. W., & Hansen, B. E. (1996a). Residual-based tests for cointegration in models with regime shifts. *Journal of Econometrics, 70*(1), 99 - 126.

Gregory, A. W., & Hansen, B. E. (1996b). Tests for cointegration in models with regime and trend shifts. *Oxford Bulletin of Economics and Statistics, 58*(3), 555 - 560.

Hatemi-J, A. (2008). Tests for cointegration with two unknown regime shifts with an application to financial market integration. *Empirical Economics, Springer, 35*(3), 497 - 505.

Johansen, S., & Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration, with applications to the demand for money. *Oxford Bulletin of Economics and Statistics*, 169 - 210.

Johansen, S., Mosconi, R., & Nielsen, B. (2000). Cointegration analysis in the presence of structural breaks in deterministic trend. *Econometric Journal, 3*, 216 - 249.

Joyeux, R. (2007). How to deal with structural breaks in practical cointegration analysis? In B. B. Rao (Ed.), *Cointegration for the Applied Economist* (pp. 195 - 221). New York: Palgrave Macmillan.

King, R. G., & Levine, R. (1993a). Finance, entreprenuership, and growth: Theory and evidence. *Journal of Monetary Economics*, 513 - 542.

King, R. G., & Levine, R. (1993b). Finance and growth: Schumpeter might be right. *The Quarterly Journal of Economics*, 717 - 737.

Levine, R. (1997). Financial development and economic growth: Views and agenda. *Journal of Economic Literature*, 688 - 726.

Levine, R. (2005). Finance and growth: Theory and evidence. In P. Aghion, & S. N. Durlauf, *Hand Book of Economic Growth* (pp. 865 - 934). Amsterdam: Elsevier, North Holland.

Mahlberg, B., Haiss, P., & Juvan, H. (2011). *The impact of financial crises on the finance-growth relationship: A European perspective.* Retrieved from Social Science Research Network:

http://dx.doi.org/10.2139/ssrn.1505968

McKinon, R. I. (1973). *Money and capital in economic development.* Washington D. C.: The Brooking Institution.

Mohammed, S., & Sidiropoulos, M. (2008). *Finance-growth nexus in Sudan: Empirical assessment based on an application of autoregressive distributed lag (ARDL) model.* Kuwait: API Working Paper.

Ndebbio, J. E. (2004). *Financial deepening, economic growth and development: Evidence from Sub-Saharan countries.* Nairobi: African Research Consortium, AERC Research Paper 142.

Nkoro, E., & Uko, A. K. (2013). Financial sector development-economic growth nexus: Empirical evidence from Nigeria. *American International Journal of Contemporary Research*, 87 - 94.

Nzotta, S. M., & Okereke, E. J. (2009). Financial deepening and economic development in Nigeria: An empirical investigation. *African Journal of Accounting, Economics, Finance and Banking Research*, 52 - 66.

Odeniran, S. O., & Udeaja, E. A. (2010). Financial sector development and economic growth: Empirical evidence from Nigeria. *CBN Economic and Financial Review*, 91 - 124.

Ohwofasa, B. O., & Aiyedogban, J. O. (2013). Financial deepening and economic growth in Nigeria, 1986 - 2011: An empirical investigation. *Journal of Economics and Development, 1*(1), 24 - 42.

Romano, A. A., & Scandurra, G. (2009). Impact of exogenous shocks on oil products market prices. In S. Ingrassia, R. Rocci, & M. Vinci (Ed.), *New Perspectives in Statistical Modelling and Data Analysis* (pp. 109 - 118). Catania: Italian Statistical Society.

Rousseau, P. L., & Wachtel, P. (2011). What is happening to the impact of financial deepening on economic growth? *Economic Inquiry*, 276 - 288.

Samargandi, N., Fidrmuc, J., & Ghosh, S. (2013). Is the relationship between financial development and economic growth monotonic for middle income countries? *World Development, 68*, 61 - 81.