University of Piraeus

SPOUDAI
Journal of Economics and Business
Σπουδαί
http://spoudai.unipi.gr

Non-Performing Loans and Economic Growth in Nigeria: A Dynamic Analysis

Akinola Ezekiel Morakinyo[a], Mabutho Sibanda[b]

[a]*Department of Accounting, Economics and Finance, School of Law and Management, University of KwaZulu Natal, Westville Campus, Durban, South Africa*
Email: akinmorakinyo@yahoo.com
[b]*The Dean, Department of Accounting, Economics and Finance, School of Law and Management, University of KwaZulu Natal, Westville Campus, Durban, South Africa*
Email: sibandam@ukzn.ac.za

Abstract

In this paper, utilising the endogenous growth model, we assess the joint long-run determination of economic growth by non-performing loans (NPLs) and by other factors that include bank credit to the economy, gross secondary school enrolment, government expenditure growth rate and the inflation rate in Nigeria using the bank-based approach. The quarterly data sample is between 1998 and 2014. We incorporate the NPLs level in a multivariate model using the ARDL procedure. The results from the bound test suggest the existence of long-run co-movement of these variables and economic growth. All variables in the model are statistically significant in the long run. The NPLs level and bank credit to the economy were found to have a negative and a direct impact on economic growth respectively. On the whole, financial pollution (NPLs) and positive financial utility (from bank credit to the economy) show a remarkable impact of financial development on economic growth in Nigeria. The error correction mechanism shows a very slow restoration to equilibrium in the next period once the system is distorted. The study recommends a higher level of proactive policies both to curb the growth of NPLs and to drive credit by banks to the economy's private sector.

Keywords: Cointegration, non-performing loans, financial depth, economic growth, ARDL.
JEL Classification: E51, G21, O47.

1. Introduction

Just as a healthy financial system promotes economic growth, a weak financial system grappling with non-performing loans (NPLs) and insufficient capital could undermine growth (Schumpeter (1969).

In modelling credit, Zeng (2012) views loans to the economy as boosting total consumption and hence yielding a positive social utility, while NPLs are viewed as a source of financial pollution (Minsky, 1964, 1995; Stiglitz & Weiss, 1981) that negates social utility. Zeng identifies two economic implications of NPLs. Firstly, economic growth could decline if NPLs grow, causing resource allocation inefficiency. Secondly, capital requirements will increase as a result of the growth of NPLs as erosion of capital occurs due to funds being trapped in such entities, making it impossible for the banks to fund new, economically viable ventures.

While the definition of non-performing loans (NPLs) is not uniform across countries, in the global financial stability report of the International Monetary Fund (IMF (2004) a general definition encompasses several formulations. A loan is deemed to be non-performing if payments (principal and/or interest) due have not been paid for at least 90 days. The Bank of International Settlement (BIS) five-tier system of classification categorises loans into five grades, namely, pass, special mention, substandard, doubtful and virtually lost, with the last three classified as NPLs. While the first category refers to a healthy loan, there may currently be no outstanding payments on a special mention loan, but a collections problem may be foreseen. However, the term *impairment* is used instead of *non-performing* by international accounting and banking standards. Sound Practices 7 and 11 of the Basel Committee on Banking Supervision and the International Accounting Standard (IAS) 39 refer to such loans as being impaired.

A major challenge confronting the banking sector in Nigeria is the prevalence of NPLs. This limits this sector's effectiveness in promoting economic growth (Boudriga, Taktak, & Jellouli, 2010). Nigeria has experienced financial sector problems in the past and NPLs were identified as the main cause of these (Adeyemi, 2011; Bebeji, 2013; Somoye, 2010).

In 1993, insolvent banks in Nigeria made up 20% and 22% of the banking system's assets and deposits, respectively. In 2010, this on-going concern resulted in the Nigerian government opting for a bailout solution; the National Assembly established the Asset Management Corporation of Nigeria (AMCON) to buy some non-performing loans from banks with an estimated five trillion naira of tax-payers' money (Kolapo, Ayeni, & Oke, 2012). In response to concerns regarding the recent increase in NPLs, in April 2015, the Central Bank directed banks to publish in three national daily newspapers a list of chronic debtors after giving them three months' grace to make their loans performing. By 1 August 2015, the banks had complied with the directive.

NPLs are one of the drivers of banking crises in any economy. Banks can create money through credit expansion and realise a significant portion of their earnings through offering new loans (Vodová, 2003). Banks take different risks in order to remain in business, but the main one is credit risk, which is positively related to banking crises (Fofack, 2005; Yang, 2003). The risk is that borrowers may not pay back the loan, thereby rendering such loans NPLs.

But, limited attention has been accorded NPLs in empirical studies of economic growth in the literature. The setting aside of funds to cover potential losses expected from loans granted leads to financial disintermediation (Caprio & Klingebiel, 2002). Further, the time involved in managing NPLs impinges on productivity. There is also the cost implication of outsourcing recovery or setting up enhanced units to track problem loans recovery activities. Since interest income is forgone through NPLs, repressed opportunity to reinvest ultimately hinders

profit (and bank credit to the economy). Also, the effect on reputational risk implies an attendant credit rating downgrade, which further limits credit extension (Chimkono, Muturi, and Njeru , 2013). Klein (2013) argues that the banks' financial intermediation role and ultimately the financial stability of an economy are grossly affected by the NPLs levels. For Lata (2014), accumulation of NPLs is a symptom of economic slowdown. For Karim, Chan, and Hassan (2010), in their study on the relationship between the NPLs level and bank efficiency in Singapore and Malaysia, they found results that suggest that cost efficiency of banks is affected by NPLs. The result from Tobit regression shows a negative relationship between the level of NPLs and cost efficiency in banks, thereby supporting the bad management hypothesis of Berger and DeYoung (1997). This inefficiency arises because of extra management time and the associated cost of directly and indirectly (through outsourcing sometimes) dealing with the problem loans. Additional attendant operating costs, among others, arise from the deployment of resources and time towards monitoring delinquent borrowers, obtaining judgement on debtors, collateralisation of loans and eventual sale of collaterals.

While governments in Nigeria have acknowledged this problem, policy initiatives have failed to rein-in NPLs, which have continued to increase in absolute terms between 2011 and 2014 by about 122% in Nigeria. Therefore, this study focuses on the health of banking systems, paying special attention to NPLs vis-à-vis their long-term impact on economic growth in Nigeria, with a view to justifying the serious attention paid by the country's monetary authorities to the drivers of economic growth in Nigeria. This study also contributes to existing knowledge regarding the linkages between finance and growth, and is the first empirical study on the long-run linkage between NPLs and economic growth in Nigeria, as far as we are aware.

The havoc that NPLs are capable of causing in relation to economic growth and social welfare (Barseghyan, 2010), particularly in Nigeria, is the core motivation of this study. Hence, our objective in this paper is to investigate the existence or absence of a long-run relationship between economic growth and non-performing loans in Nigeria.

2. Literature Review

The link between finance and growth has been widely discussed in the literature. There are basically four schools of thought: supply-leading or finance-led growth; demand-following or growth-led finance; the bi-directional; and the independent (Al-Yousif, 2002; Majid, 2007). The 'neutrals' or the independents' view in the literature on the link between finance and growth are of the opinion that neither cause the other (Graff, 1999). The supply-led view supports the opinion that financial development causes economic growth (King & Levine, 1993a, 1993b; McKinnon, 1973; Shaw, 1973). The demand-following theory is that economic growth leads to financial development. Robinson (1956) pioneered the theory that supports the hypothesis that the demand for financial services is influenced by the growth of the real sector of the economy. The hypothesis that economic growth and financial development both cause each other is the bi-directional causality school of thought.

Earlier economists focused on the importance of banks as a driver of economic growth. In 1911, Schumpeter argued that a weak banking system grappling with non-performing loans and insufficient capital or with firms whose credit worthiness has been eroded because of high leverage or declining asset values are examples of financial conditions that could

undermine growth, just as a healthy financial system promotes growth. Furthermore, financial development through capital efficiency and growth in productivity can affect the economic growth rate (Hondroyiannis, Lolos, & Papapetrou, 2005). Through its impact on the savings rate, capital accumulation can also be affected by financial development (Levine, 1997; Pagano, 1993). Turning to the debate on the direction of causality, which has been on-going for about half a century, Schumpeter (1969) noted the importance of the financial system in promoting innovation, positing that economies with relatively more efficient financial systems grow faster. In contrast, Robinson (1952) believed in reverse causality in that economies that have growth potential develop institutions. The other debate relates to the critical role banks play in efficient resource allocation within an economy. A well-oiled financial system can drive efficient allocation of resources and faster growth when the costs of transactions are tempered and market information is enhanced (Bencivenga & Smith, 1991; Bencivenga, Smith, & Starr, 1995; King & Levine, 1993c). While Boyd and Prescott (1986) argued that banks play a critical role in efficient resource allocation, the model developed by Allen and Gale (2000) suggests that banks repress market innovation and competition that are growth enhancing.

Schumpeter (1969) argued for the importance of the financial system in promoting innovations, positing that economies with relatively more efficient financial systems grow faster. This supply-leading argument is supported by the endogenous growth model, suggesting a positive long-term relationship between financial intermediation and a steady-state economic growth (Bencivenga & Smith, 1991; Greenwood & Jovanovic, 1990). The other side of this argument was led by Robinson (1952) who argued for a reversed causality in which economies that have growth potentials develop institutions. This demand-following argument has been supported by Deidda and Fattouh (2002); Friedman and Schwartz (1963); McKinnon (1988); Odedokun (1996); Patrick (1966); Rioja and Valev (2004).

Theoretically, the finance-growth nexus has three channels. The first one operates through the savings boost that galvanises loanable funds. The second one operates through efficient savings allocation, which makes for productivity of savings and investment. The third one operates through the increase of the social marginal product of capital.

Linking up with Schumpeter (1969), Hou and Dickinson (2007) maintained that the effect of NPLs on the economy is that resources are tied down in unproductive sectors thereby impeding economic growth and economic efficiency, which then impacts negatively on the banking system's lending behaviour. This outcome can ultimately lead to credit crunch, a situation where financial institutions restrict credit supply below the average level identified for a given market condition (Gertler & Kiyotaki, 2010). Banks shy away from engaging in new credit risk, which ordinarily would have resulted in an equilibrium position, hence creating a scenario of excess loan demand. This defensive action by financial institutions, which includes reducing credit extension to even viable projects, limits the ability of the overall economy to grow.

The NPLs level limits the ability of the financial sector to lend, hence obstructing financial deepening, which is linked to economic growth (Hou and Dickinson (2007). When the economic cycle is out of a boom period, the effect of NPLs deteriorates as economic agents, whose operational expansion has been curtailed by limited loanable funds, find it difficult to stay afloat and perform on their existing financial obligations. Hou and Dickinson therefore defined the ability to extend credit to the economy as being determined by changes in NPLs among other variables. This scenario underlines the critical role of changes in NPLs

impacting on the allocative efficiency of the financial system. Also, impeding credit growth is the channel by which the level of NPLs impacts adversely on economic growth (Impavido, Klingen, & Sun, 2012).

Financial depth has been widely used in the literature as a proxy for financial development. Traditionally, researchers used narrow or broad money stock over gross domestic product (GDP) to proxy financial depth (Goldsmith, 1969; King & Levine, 1993a, 1993b, 1993c; McKinnon, 1973). The downside of the use of this proxy lies in the uncertainty of the source of liabilities (that is, commercial bank, central bank or other financial intermediaries). This measurement is probably applicable to some developing countries where the public sector largely finances the economy (Hondroyiannis et al., 2005). Consequently, other researchers have used private sector credit to proxy banking system development (Beck, Levine, & Loayza, 2000; Hondroyiannis et al., 2005; Levine, Loayza, & Beck, 2000; Naceur & Ghazouani, 2007).

From the empirical perspective, results of studies by researchers have not been unanimous and always fall into any one the four schools of thought on the link between finance and economic growth. For instance, De Gregorio and Guidotti (1995) found a positive long-run impact of financial development on economic growth in a large sample of countries, but found varying effects across countries. On causality, they concluded that financial development seems to cause economic growth. This conclusion was corroborated by Rajan and Zingales (1996) and Darrat (1999). However, Hondroyiannis et al. (2005) found from both market-based and bank-based perspectives when using the variance autoregression (VAR) approach to the banking system in Greece, results that suggest a bi-directional causality in the long run.

On the other hand, using real GDP per capita as a proxy for economic growth, Odhiambo (2010), in his study of South Africa, used three proxies of financial development. The results of his study suggest that economic growth causes financial development, thereby supporting the demand-following theory. Investment was included as an intermittent variable based on its theoretical link with financial development. Also, Waqabaca (2004) in his study of Fiji, found results that suggest demand-following theory.

The bi-directional causality argument was also supported by Odhiambo (2005) in his study of Tanzania. This argument was corroborated by Akinboade (1998) in his study of Botswana. Espinoza and Prasad (2010) also supported this argument in their findings on the causality question in the six Gulf Cooperation Council (GCC) countries, namely, the United Arab Emirates, Saudi Arabia, Kuwait, Bahrain, Qatar and Oman.

Different studies have focused on the direction of causality between banking development and economic growth. Naceur and Ghazouani (2007) covered 11 countries in the Middle East and North Africa (MENA) region using generalised method of moments (GMM) estimators and found no significant and negative relationship between economic growth and banking development. They argued that the underdeveloped financial system in the region hampered growth. However, Hondroyiannis et al. (2005) studied the link between the banking system and economic performance in Greece, using 14-year data findings that suggested two-way causality between finance and economic growth. Their results were obtained using the variance autoregression (VAR) methodology. The study also utilised the error correction mechanism (ECM) to investigate the adjustment mechanism in the equilibrium process. This

follows the argument of Engle and Granger (1987) that an ECM exists in the presence of cointegration.

The findings of Hondroyiannis et al. (2005) were corroborated by Beck and Levine (2004) who used the GMM model on a 23-year data set. They employed a system panel estimator (Arellano & Bover, 1995) and concluded that banks positively influence economic growth.

The work of Nyasha and Odhiambo (2015) on the Australian economy is directly relevant to this study. They used annual data for 32 years and the auto-regressive distributed lag (ARDL) estimating technique to test both market-based and bank-based financial development's impact on economic growth. Their findings suggest a short-run positive impact on economic growth using the bank-based approach, but no significant impact using the market-based approach.

In conclusion, intermediation, both through the stock market and through banks has been examined in the literature. Also, theory and empirical study establish the finance-growth link but there is no agreement on the role of financial intermediaries (Hondroyiannis et al., 2005).

In traditional growth theory, and given a simplified production function of y=f(k) and a marginal product of capital, prominence is accorded the dynamic process that will result in a steady-state equilibrium of the economy when output per capital growth truncates. This convergence is made possible through the assumption of diminishing marginal productivity of capital (MPC). But in endogenous growth theory, the growth of capital does not lead to the convergence of MPC to zero. Thus, even if exogenous productivity growth is non-existent, real output per capita can still grow endogenously. In recent times, theories have tried to formalise the link between finance and economic growth by incorporating finance in endogenous growth models as Li and Liu (2005) argued that this relationship is increasingly endogenous. For instance, Greenwood and Jovanovic (1990) developed an endogenous growth model that constitutes economic growth and financial intermediation by assigning the critical role of analysing information for the purpose of allocating funds to the most profitable economic entity. The effect that financial development has on economic growth is two-fold. Firstly, the efficiency of capital accumulation may be enhanced when domestic financial markets are developed thereby increasing economic growth (Goldsmith, 1969). Secondly, savings rate can be raised by financial intermediation, which ultimately raises the rate of investment.

3. Methodology

Achieving our objective will help answer the following research question:

(i) Do NPLs affect economic growth in Nigeria?

From the standard growth equation (Beck et al., 2000; Zhang, Wang, & Wang, 2012), we have

GDP growth= $\alpha+\beta_1 F + \beta_2 C + e$ (3.3.1)

where F is the vector of variables that can be used to measure financial intermediation and disintermediation such as banks' total credit to the private sector and NPLs, respectively; C is the vector of variables used in the conditioning information set and serving as control

accounting for other factors that lead to growth, such as inflation rate, gross secondary school enrolment and government expenditure.

From the growth accounting equation, we derive the estimable form as follows:

$$\hat{Y} = a + b_1 \frac{F_D}{GDP} + b_2 NPLs + b_3 infr + b_4 grenr2 + b_5 gengvtconexpgr + e \quad (3.3.2)$$

We include inflation rate as control variable (Adu, Marbuah, & Mensah, 2013; Christopoulos & Tsionas, 2004), we have:

$$per\ capita\ real\ GDP\ Growth\ rate = a + b_1 btcr + b_2 NPLs + b_3 Infr + b_4\ grenr2 + b_5 gengvtconexpgr + e \quad (3.3.3)$$

Equation 3.3.3 represents an efficiency-related growth model expressing real output growth as a function of bank credit to the private sector, NPLs is non-performing loans, and 'grenr2', 'gengvtconexpgr' and 'infr' represent variables used as conditioners. The real GDP per capita expressed in USD has been logged to represent economic growth. The implication of equation (3.3.5) is that the real GDP per capita growth rate is a function of NPLs and bank credit to the private sector (both as a measure of efficiency), inflation rate, gross secondary school enrolment rate and general government expenditure. All variables are as described and measured in section 3.1.

The model in equation 3.3.3 is estimated using the ARDL model (M Hashem Pesaran, Shin, & Smith, 2001) to analyse Nigeria. This estimating technique is discussed as follows:

Estimating technique: ARDL model

The choice of this estimation procedure is primarily informed by the fact that it passes the fitness-for-purpose test. For instance, one option available to perform the co-integration test is the Engle-Granger approach, but its weakness lies in the fact that it is only able to use two variables. A multivariate analysis, such as that considered in this study, leads to the use of the Johansen and Juselius co-integration analysis(Johansen & Juselius, 1990) or ARDL model. These two models provide the statistical equivalence of the economic theoretical notion of a stable long-run equilibrium, but the choice will depend on the characteristics of the data. The guide that is followed in this study is that if all variables are stationary, I(0), an ordinary least square (OLS) model is appropriate and for all variables integrated of same order, say I(1), Johansen's method is very suitable. But when we have fractionally integrated variables, variables at different levels of integration (but not at I(2) level) or cointegration amongst I(1) variables, then ARDL is the best model.

This study is unable to use the Johansen procedure (an option) as all the variables used in this study are not completely I(1), that is, integration of order one. This assumption is a pre-condition for the validity of the Johansen procedure. Alternatively, the ARDL model is appropriate to run the short-run and long-run relationships (Shin, Yu, & Greenwood-Nimmo, 2014). Further, the choice of ARDL is informed by the advantages it portends. Firstly, it is not as restrictive in terms of the meeting of integration of the same order (as in Johansen). Secondly, it is not sensitive to the size of the data as small sample sizes can also be efficiently accommodated subject to non-compromise to the optimal lag-length selection affecting estimation efficiency owing to the consumption of the degree of freedom. Thirdly, it also produces unbiased estimates even in the presence of endogenous covariates (Harris & Sollis, 2003).

Under the bound testing, a set of critical values are based on the assumption that variables are I(0) while the other set is based on the assumption that variables are I(1) in the model. The selection criterion is then that H0 is rejected if the F-statistic is greater than the upper boundary. But, we shall fail to reject H0 if the F-statistic is lower than the lower boundary. The cointegration test is deemed to be inconclusive when the F-statistic value falls within the two boundaries.

The ARDL model will then be performed with the estimation of the formulated equation (M Hashem Pesaran et al., 2001) as below:

$$\Delta \mathrm{lrgdppc}_t = \beta_0 + \sum_{i=1}^{p} \beta_i \Delta \mathrm{lrgdppc}_{t-i} + \sum_{j=0}^{q_1} \propto_j \Delta \mathrm{btcr}_{t-j} + \sum_{k=0}^{q_2} \emptyset_k \Delta \mathrm{grenr2}_{t-k} + \sum_{l=0}^{q_3} \varepsilon_l \Delta \mathrm{gengvtconexpgr}_{t-l} + \sum_{v=0}^{q_4} \sigma_v \Delta \mathrm{infr}_{t-v} + \sum_{w=0}^{q_5} \rho_w \Delta \mathrm{bnpl}_{t-w} + \theta_0 bnpl_{t-1} + \theta_1 btcr_{t-1} + \theta_2 grenr2_{t-1} + \theta_3 gengvtconexpgr_{t-1} + \theta_4 infr_{t-1} + \theta_5 lrgdppc_{t-1} + e_t \quad (3.3.4)$$

where β0 represents the drift component, the variables are as described in section 3.1 and e_t represents the white noise.

According to Engel and Granger (1987), an error correction model exists once a long-run relationship exists among the variables. Through a simply expressed linear transformation, we can derive the error correction model (ECM) (Banerjee, Dolado, & Mestre, 1998). Without losing the long-run information, ECM helps to integrate short-run adjustments with long-run equilibrium (M Hashem Pesaran, Shin, & Smith, 2000). This is estimated below:

$$\Delta \mathrm{lrgdppc}_t = \beta_0 + \sum_{i=1}^{p} \beta_i \Delta \mathrm{lrgdppc}_{t-i} + \sum_{j=0}^{q_1} \propto_j \Delta \mathrm{btcr}_{t-j} + \sum_{k=0}^{q_2} \emptyset_k \Delta gengvtconexp_{t-k} + \sum_{l=0}^{q_3} \varepsilon_l \Delta grenr2_{t-l} + \sum_{v=0}^{q_5} \sigma_v \Delta \mathrm{infr}_{t-v} + \sum_{w=0}^{q_4} \rho_w \Delta \mathrm{bnpl}_{t-w} + \theta\, \mathrm{ect}_{t-l} + e_t \quad (3.3.5)$$

3.1 Definition of Variables

In this study, we have the dependent variable, the explanatory variables and the control variables which are defined as follows.

3.1.1 *Dependent variable*

$rgdppc$ is the real GDP per capita expressed in United States (US) dollars and measured in an average period, which is logged in the model to capture percentage changes;

3.1.2 *Explanatory variables*

$bnpl$ is the total bank non-performing loans which is the total of non-performing loans by banks measured as a percentage of gross loans;

$btcr$ is the banks' total credit to the private sector and is the financial loans to the private sector of the economy by banks which is measured as a percentage of the gross domestic product (GDP);

3.1.3 *Control variables*

$infr$ is the inflation rate measured as consumer price index which is the average period percentage change in costs in local currency;

$gengvtconexpgr$ is the final consumption expenditure of the general government expressed as a constant value in the local currency at the annual growth rate per period;

$grenr2$ is the gross secondary school enrolment rate of both sexes expressed as a percentage of the population total of the age group per period;

3.2 Data Sources and Scope

Data on the Nigerian banking sector NPLs, real GDP per capita expressed in United States (US) dollars, total bank credit to the domestic economy, inflation rate and the general government consumption expenditure growth rate are sourced from the World Bank Tables 2014 edition and the Central Bank of Nigeria. The gross secondary school enrolment expressed in percentages is sourced from the United Nations Educational, Scientific, and Cultural Organization (UNESCO) Institute for Statistics. The scope of data is 17 years (1998-2014). This period was selected because data for this period were available. The data were captured on a quarterly basis and data available annually were interpolated as in Chow and Lin (1971) and Tang (2008) to quarterly data for data uniformity.

4. Stylised fact

We use real per capita GDP as in Goldsmith (1969), who found a positive relationship between real GDP per capita and financial development. Human capital is measured by the gross secondary school enrolment for both sexes (Hasan, Wachtel, & Zhou, 2009).

Generally, school enrolment has a long-run positive impact on economic growth. The government consumption data captures stability in the domestic economy and is the growth rate of central government expenditure (Alfaro, Chanda, Kalemli-Ozcan, & Sayek, 2004). Bank total credit to the economy's private sector has been variously used to capture financial intermediation (or deepening) and this has largely been found to have a positive long-run impact on economic growth as expected (Levine, 1998; Levine et al., 2000). Inflation rate has been variously used as a conditioning variable (Adu et al., 2013; Christopoulos & Tsionas, 2004) and is expected to have a long-run negative impact on economic growth. Also, non-performing loans, as a sort of financial pollution (Zeng, 2012), are expected to have a long-run negative impact on economic growth.

5. Results and Discussions

Table 1: ADR, GL-ADF and Phillips Perron tests of stationarity

Variable	ADF (individual intercept)			GL-ADF (individual intercept)		Phillips Perron (individual intercept)		
	Order of integration	**t* Statistics**	**P Value**	**Order of integration**	**t* Statistics**	**Order of integration**	**t* Statistics**	**P- Value**
LRGDPPC	I(1)	-2.9616	0.0442**	I(1)	-1.8465*	I(1)	-4.2841	0.0010***
BNPL	I(1)	-3.334	0.0174**	I(0)	-2.2948**	I(1)	-4.7759	0.0002***
BTCR	I(0)	-2.6149	0.0954*	I(0)	-2.3961**	I(1)	-4.0461	0.0022***
GENGVTCO NEXPGR	I(1)	-3.0743	0.0341**	I(0)	-2.0622	I(0)	-3.137	0.0285**
INFR	I(0)	-2.8602	0.0560*	I(0)	-2.8859***	I(1)	-5.0004	0.0001***
GRENR2	I(1)	-2.6255	0.0934*	I(1)	-2.4521**	I(1)	-4.223	0.0013***

*"***", "**" and "*" represent statistical significance at 1%, 5%, and 10%, respectively*. (*Variables expressed in capital letters refer to the ones previously described in low letter cases*)
Authors' computation

Table 1 represents the results from unit root testing using the augmented Dickey-Fuller test (ADF), the modified augmented Dickey-Fuller test known as DF-GLS, and the Phillips Perron (PP) test (Phillips and Perron, 1988). The DF-GLS is an augmented Dickey-Fuller test (Dickey and Fuller, 1979, 1981), which is first generalised-least-square-transformed before conducting the test (Elliott, Rothenberg, and Stock (1996). This approach addresses the relatively weak power that is inherent in the ADF.

These tests are conducted under the null hypothesis, H0: variable is not stationary (that is, there is unit root) versus the alternative hypothesis of stationarity. The intention here is to establish that no variable is I(2). A variable or variables that are I(2) and higher will render invalid the F-statistics that are generated (Narayan & SMYTH 1, 2005; M Hashem Pesaran et al., 2001). Under the ADF, only the inflation rate and the bank credit to the economy's private sector are stationary at, while under the individual intercept shape of the GL-ADF, only the bank non-performing loans (bnpl) and the bank total credit to the private sector (btcr) are I(0) with the other variables stationary at I(1). Conversely, under the same shape and hypothesis using the PP approach, only the government expenditure growth rate (gengvtconexpgr) is I(0) while the other variables are I(1). All these results satisfy the condition for using ARDL (M Hashem Pesaran et al., 2001) since no variable was found to be stationary at I(2). We can then proceed with the other parts of the procedure such as determining the optimal lag length, running the cointegration and bound tests.

4.2 The ARDL Lag Determination

The optimal lag length for each variable is selected in the literature using the Akaike information criterion (AIC), the Schwarz Bayesian Criterion (SBC) or the Hannah-Quin criterion (HQC) estimation (Raza, Shahbaz, & Nguyen, 2015; Uddin, Sjö, & Shahbaz, 2013). The results, obtained from the Eviews 9 diagram (Figure 1) using the AIC are shown in Table 4.

One major advantage of using ARDL is that it tests for optimal lag length that is suitable for each of the variables. The results in Table 2 shows that lag 2 was chosen for LRGDPPC, lag 4 was chosen for GENGVTCONEXPGR and BNPL, lag 1 was chosen for GRENR2 and INFR and no lag was chosen for BTCR. In line with AIC, the lower the value, the better the model. In this case, -7.6210 represents the least of the values generated hence its choice as the one with optimal lag length. (Please note that these variables expressed in capital letters refer to the ones previously described in low letter cases).

Figure 1: The ARDL Lags Selection Criteria

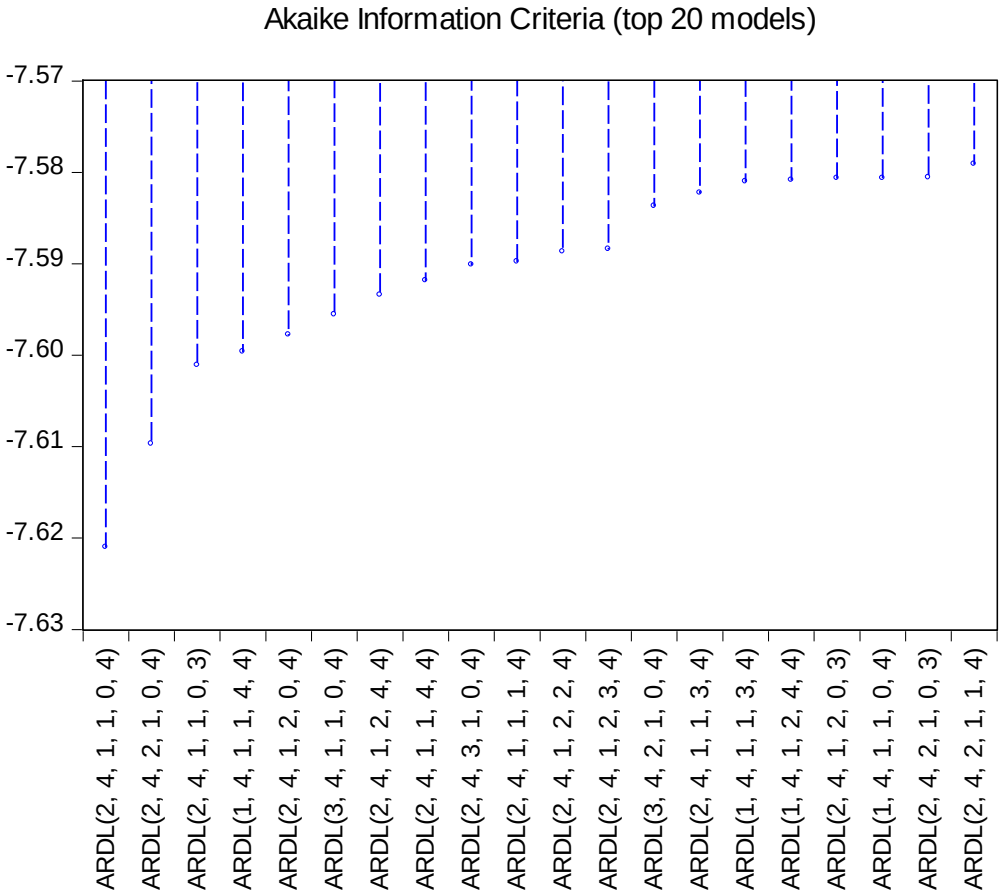

Table 2: The ARDL Lags Selection Criteria (Summary)

Serial No	Variables Name	Lags Selection
1	LRGDPPC	2
2	GENGVTCONEXPGR	4
3	GRENR2	1
4	INFR	1
5	BTCR	0
6	BNPL	4

(*Variables expressed in capital letters refer to the ones previously described in low letter cases*)
Authors' computation

Table 3: The ARDL Dynamic Regression for Short-run and Long-run Estimates

Dependent Variable: LRGDPPC				
Method: ARDL				
Sample: 1998Q01-2014Q04				
Model selection method: Akaike info criterion (AIC)				
Selected Model: ARDL (2, 4, 1, 1, 0, 4)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Long-Run Equation				
GENGVTCONEXPGR	0.0008	0.0001	6.9048	0.0000***
GRENR2	0.0405	0.0018	22.7407	0.0000***
INFR	-0.0136	0.0018	-7.5140	0.0000***
BNPL	-0.0025	0.0012	-2.1876	0.0338**
BTCR	0.0030	0.0013	2.2282	0.0308**
Short-Run Equation				
D(LRGDPPC(-1))	0.2159	0.0926	2.3310	0.0242
D(GENGVTCONEXPGR)	0.0003	0.0000	25.4670	0.0000***
D(GENGVTCONEXPGR(-1))	-0.0001	0.0000	-5.0171	0.0000***
D(GENGVTCONEXPGR(-2))	-0.0000	0.0000	-4.1677	0.0001***
D(GENGVTCONEXPGR(-3))	-0.0000	0.0000	-4.2255	0.0001***
D(GRENR2)	0.0013	0.0011	1.1104	0.2726
(INFR)	0.0006	0.0005	1.2616	0.2134
D(BNPL)	-0.0003	0.0003	-1.1346	0.2624
(BTCR)	0.0002	0.0005	0.3536	0.7252
D(BTCR(-1))	0.0008	0.0004	2.1907	0.0336**
D(BTCR(-2))	0.0007	0.0004	1.8690	0.0680*
D(BTCR(-3))	0.0006	0.0003	1.7321	0.0900*
CointEq(-1)	-0.1146	0.0144	-7.9614	0.0000***

*"***", "**" and "*" represent statistical significance at 1%, 5%, and 10%, respectively*
(*Variables expressed in capital letters refer to the ones previously described in low letter cases*)
Authors' computation

4.3 The ARDL Regression Models (Short-Run and Long-Run)

Based on the results obtained, NPLs (bnpl) show an inverse long-run relationship with economic growth as measured by the percentage change in real GPD per capita and this is significant at 5%. This relationship is in line with expectations, economic theory and empirical evidence (Boudriga et al., 2010; Zeng, 2012). Bank credit to the private sector (btcr), which has been variously used in the literature under the bank-based approach as proxy for financial depth, shows a result that suggests a positive long-run relationship with economic growth. This result is in support of the literature, economic theory and empirical evidence (Bencivenga & Smith, 1991; J. A. Schumpeter, 1936). The percentage growth rate of gross secondary school enrolment (grenr2) has a positive long-run relationship in line with endogenous growth theory and is found to be significant at 1%. Inflation rate (infr) is also in line with the literature and empirical evidence with the result showing a very significant level of 1% and a negative relationship with economic growth (Reinhart & Rogoff, 2010). Also significant at 1% in the long run is government expenditure (gengvtconexpgr) with results suggesting a positive relationship with economic growth. According to Devarajan, Swaroop, and Zou (1996), decomposing expenditure to capital and recurrent would throw more light on which is the major driver in Nigeria, and our results show that growth in government expenditure is positive and statistically impactful on economic growth. Also using the disaggregated approach, Nurudeen and Usman (2010) find that government expenditure on transport, communications and health have a positive impact on economic growth. The implication of these results is that in the long run, an increase in the NPLs level will dampen economic growth (Zeng, 2012) and an increase in bank credit to the private sector will increase economic growth (Beck & Levine, 2004; Levine, 1998). Also, as expected, an increase in inflation rate will impede positive long-run growth (De Gregorio, 1993) and increased enrolment in secondary education and growth in government expenditure positively impacts on long-run economic growth (Barro & Lee, 1994). In the short run, the level of non-performing loans, bank credit to the private sector, the growth rate of secondary school enrolment, and inflation rate are found to be statistically insignificant even though they all have the expected relationship, aside from inflation rate. All the other variables considered in the model are found to be statistically significant, hence affecting economic growth in Nigeria in the short run.

Further confirming the existence of the appropriate model and cointegration is the default parameter estimate of the short run coefficient (COINTEQO1), which is found to be both negative and statistically significant. However, it is shown that all the non-significance impacts in the short run transformed to high levels of significance in the long run. According to (Engle & Granger, 1987), an error correction mechanism exists for a cointegrated relationship.

Table 4: Bound Test

Test Statistic	Value	k
F-statistic	8.002487***	5
Bound Test Table		
Significance	I(0)	I(1)
10%	2.08	3.00
5%	2.39	3.38
2.5%	2.7	3.73
1%	3.06	4.15

The critical values are extracted from Eviews 9 Case II model, which provides for restricted intercept and no trend. The null is no cointegration. *, **, and *** Imply 10%, 5% and 1% level of significance, respectively.

4.3 The Bound Testing

Table 4 shows the bound test results. The bound test table is constructed with the assumption that all variables are I(0) for the set of lower boundaries and that all variables are I(1) for the set of upper boundaries. These are estimated for different levels of significance and the guide is that for an estimated F statistic that falls below the lower boundary, there is no evidence of cointegration. An F statistic that lies above the upper boundary implies the presence of cointegration, while cointegration is deemed to be inconclusive if the F statistic falls in between the two boundaries. As for our model, the F statistic lies above I(1) at 1% level of significance. We therefore reject the null hypothesis of no cointegrating relationship and accept the alternative hypothesis of the existence of a long-run relationship in the model. The F-statistic value of 11.99 is bigger than the upper band of the Pesaran critical value of 4.15 at 1% level (Pesaran and Pesaran, 1997:478). This again shows strong evidence of cointegration or a long-term relationship between these variables and economic growth in Nigeria.

4.6 The ARDL Error Correction Model

Using the ECM, the study investigates the short-run and long-run dynamics of the present model. The ECM coefficient shows how quickly or slowly (speed of adjustment) the variables return to equilibrium. As shown in Table 5, the negative coefficient sign of the ECM shows that there was disequilibrium in the past and the adjustment is in the right direction. The ECM value of -0.00003 as shown in Table 5 suggests the relatively low speed of adjustment from the short-run deviation to the long-run equilibrium of economic growth. More precisely, it indicates that about 0.003% deviation from the long-run economic growth in Nigeria gets corrected in the dynamic model. Putting this differently, it means that the speed towards long-run equilibrium is 0.003% or that 0.003% of the past period disequilibrium is corrected in the current period. Our results are consistent with Akinlo

(2004), Sari, Ewing, and Soytas (2008) and Omolade, Ashamu, and Morakinyo (2013) who argue that a negative error correction term is further proof of the existence of a long-run relationship.

Table 5: Error Correction Coefficient

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ECT(-1)	-3.43E-05	0.000192	-0.178912	0.8589

*"***", "**" and "*" represent statistical significance at 1%, 5%, and 10%, respectively*
Authors' computation

4.7 Diagnostic Tests

Figure 2 and tables 6 and 7 reflect the various diagnostic tests of our model to check for stability, presence of serial correlation and heteroscedasticity. The results show stability of the model and absence of serial correlation and heteroscedasticity.

Figure 2: Stability (CUSUM) Test

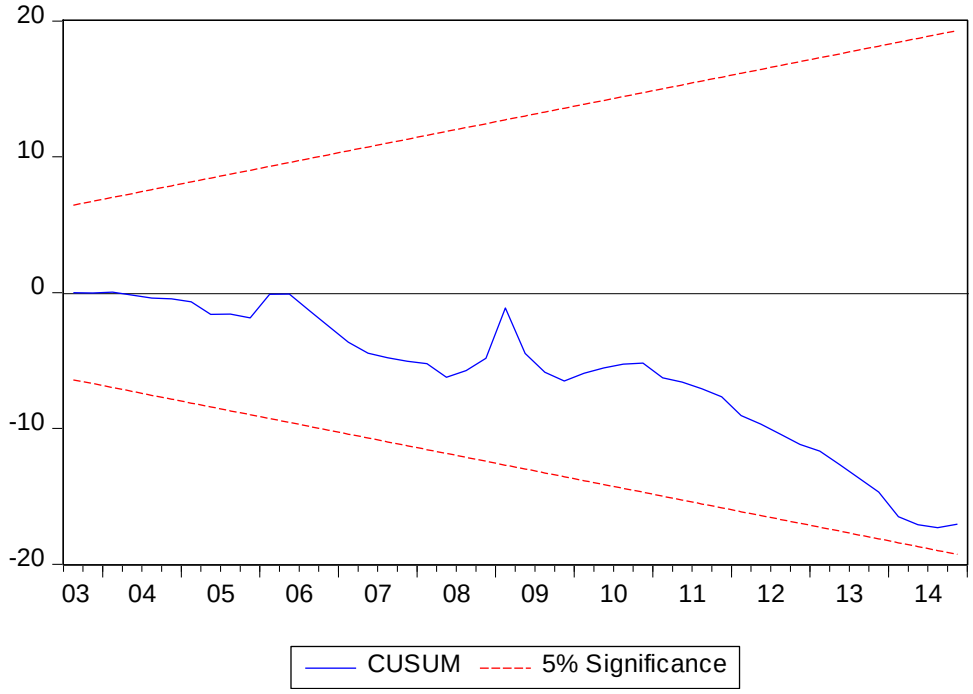

Table 6: Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.3190	Prob. F(2,44)	0.7286
Obs*R-squared	0.9146	Prob. Chi-Square(2)	0.6330

Authors' computation

Table 7: Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.2331	Prob. F(17,46)	0.2785
Obs*R-squared	20.0343	Prob. Chi-Square(17)	0.2725
Scaled explained SS	15.5957	Prob. Chi-Square(17)	0.5527

Authors' computation

5. Conclusions and Recommendations

This study investigates the dynamics of non-performing loans and economic growth in Nigeria. The empirical results suggest a long-run relationship between the level of non-performing loans and economic growth in Nigeria for a 17-year quarterly data period spanning 1998 to 2014. This result is consistent with and similar to De Gregorio and Guidotti (1995) study of financial development and economic growth using bank credit to the private sector as proxy for financial development. Our results indicate that the long-run economic growth of Nigeria could be affected by non-performing loans.

Secondly, the model is stable as shown by the Cumulative Sum (CUSUM) control chart for the CUSUM test and passed the diagnostic tests of serial correlation and heteroscedasticity. The error correction term (ECT) was also found to be negative but not significant, suggesting a re-confirmation of the existence of a long-term relationship also in line with the bound testing conducted. However, the system may not revert to equilibrium once there is a distortion in the model or the value of the variables changes. The integration of the short-run dynamics with the long-run equilibrium is evidenced by the error correction term keeping the long-run information intact. Thus, aside from showing that a long-run relationship exists between financial deepening as expressed by total bank credit to the economy, which aligns with various studies, the results show that there is a relationship between the non-performing loans level and economic growth in Nigeria and that long-run equilibrium can be attained ((Chowdhury & Rabbi, 2014)

Finally, aside from all variables employed in the model jointly determining economic growth in the long run, they all individually determine economic growth in Nigeria in a significant manner.

These results further suggest that for Nigeria to have long-term economic growth, the attention currently being given to curbing the growth of non-performing loans should be sustained. More importantly, a higher level of attention should be paid to proactive measures rather than the current scenario of an aftermath fire-brigade approach of pushing hard against bad loans entities and adverse pressure on financial institutions that bank these entities. Also, policies aimed at driving credit by banks as well as human capital via secondary school enrolment should be given more prominent attention.

References

Adeyemi, B. (2011). Bank failure in Nigeria: a consequence of capital inadequacy, lack of transparency and non-performing loans? *Banks and Bank Systems, 6*(1), 99-109.

Adu, G., Marbuah, G., & Mensah, J. T. (2013). Financial development and economic growth in Ghana: Does the measure of financial development matter? *Review of Development Finance, 3*(4), 192-203.

Akinboade, O. A. (1998). Financial development and economic growth in botswana: a test for causality/développement financier et croissance économique au botswana: un test de causalité. *Savings and Development*, 331-348.

Akinlo, A. E. (2004). Foreign direct investment and growth in Nigeria: An empirical investigation. *Journal of Policy modeling, 26*(5), 627-639.

Al-Yousif, Y. K. (2002). Financial development and economic growth: another look at the evidence from developing countries. *Review of Financial Economics, 11*(2), 131-150.

Alfaro, L., Chanda, A., Kalemli-Ozcan, S., & Sayek, S. (2004). FDI and economic growth: the role of local financial markets. *Journal of international economics, 64*(1), 89-112.

Allen, F., & Gale, D. (2000). Financial contagion. *Journal of political economy, 108*(1), 1-33.

Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics, 68*(1), 29-51.

Banerjee, A., Dolado, J., & Mestre, R. (1998). Error-correction mechanism tests for cointegration in a single-equation framework. *Journal of time series analysis, 19*(3), 267-283.

Barro, R. J., & Lee, J.-W. (1994). *Sources of economic growth.* Paper presented at the Carnegie-Rochester conference series on public policy, 40, 1-46.

Barseghyan, L. (2010). Non-performing loans, prospective bailouts, and Japan's slowdown. *Journal of Monetary economics, 57*(7), 873-890.

Bebeji, A. (2013). Consolidation and Asset Quality of Banks in Nigeria. *International Journal of Business and Management Invention, 2*(2), 12-20.

Beck, T., & Levine, R. (2004). Stock markets, banks, and growth: Panel evidence. *Journal of Banking & Finance, 28*(3), 423-442.

Beck, T., Levine, R., & Loayza, N. (2000). Finance and the Sources of Growth. *Journal of financial economics, 58*(1), 261-300.

Bencivenga, V. R., & Smith, B. D. (1991). Financial intermediation and endogenous growth. *The Review of Economic Studies, 58*(2), 195-209.

Bencivenga, V. R., Smith, B. D., & Starr, R. M. (1995). Transactions costs, technological choice, and endogenous growth. *Journal of Economic Theory, 67*(1), 153-177.

Berger, A. N., & DeYoung, R. (1997). Problem loans and cost efficiency in commercial banks. *Journal of Banking & Finance, 21*(6), 849-870.

Boudriga, A., Taktak, N. B., & Jellouli, S. (2010). *Bank specific, business and institutional environment determinants of banks nonperforming loans: evidence from mena countries.* Paper presented at the Economic Research Forum, Working Paper, 547, 1-28.

Boyd, J. H., & Prescott, E. C. (1986). Financial intermediary-coalitions. *Journal of Economic Theory, 38*(2), 211-232.

Caprio, G., & Klingebiel, D. (2002). Episodes of systemic and borderline banking crises. *Managing the real and fiscal effects of banking crises, World Bank Discussion Paper, 428*, 31-49.

Chimkono, E. E., Muturi, W., & Njeru, A. Effect of non-performing loans and other factors on performance of commercial banks in malawi. *International Journal of Economics, Commerce and Management, IV*, 1-15.

Chowdhury, M. B., & Rabbi, F. (2014). Workers' remittances and Dutch disease in Bangladesh. *The Journal of International Trade & Economic Development, 23*(4), 455-475.

Christopoulos, D. K., & Tsionas, E. G. (2004). Financial development and economic growth: evidence from panel unit root and cointegration tests. *Journal of Development Economics, 73*(1), 55-74.

Darrat, A. F. (1999). Are financial deepening and economic growth causally related? Another look at the evidence. *International Economic Journal, 13*(3), 19-35.

De Gregorio, J. (1993). Inflation, taxation, and long-run growth. *Journal of Monetary economics, 31*(3), 271-298.

De Gregorio, J., & Guidotti, P. E. (1995). Financial development and economic growth. *World development, 23*(3), 433-448.

Deidda, L., & Fattouh, B. (2002). Non-linearity between finance and growth. *Economics Letters, 74*(3), 339-345.

Devarajan, S., Swaroop, V., & Zou, H.-f. (1996). The composition of public expenditure and economic growth. *Journal of Monetary economics, 37*(2), 313-344.

Engle, R. F., & Granger, C. W. (1987). Co-integration and error correction: representation, estimation, and testing. *Econometrica: journal of the Econometric Society*, 251-276.

Espinoza, R. A., & Prasad, A. (2010). Nonperforming loans in the GCC banking system and their macroeconomic effects. *IMF Working Papers*, 1-24.

Fofack, H. (2005). Nonperforming loans in Sub-Saharan Africa: causal analysis and macroeconomic implications. *World Bank Policy Research Working Paper*(3769).

Friedman, M., & Schwartz, A. (1963). A Monetary History of the United States," Princeton University Press. *Princeton, NJ*.

Gertler, M., & Kiyotaki, N. (2010). Financial intermediation and credit policy in business cycle analysis. *Handbook of monetary economics, 3*(3), 547-599.

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

Graff, M. (1999). Financial Development and Economic Growth-A New Empirical Analysis. *Dresden Discussion Papers in Economics*(5/99).

Greenwood, J., & Jovanovic, B. (1990). Financial development and economic development. *Economic Development and Cultural Change, 15*, 257-268.

Harris, R., & Sollis, R. (2003). *Applied time series modelling and forecasting*: Wiley.

Hasan, I., Wachtel, P., & Zhou, M. (2009). Institutional development, financial deepening and economic growth: Evidence from China. *Journal of Banking & Finance, 33*(1), 157-170.

Hondroyiannis, G., Lolos, S., & Papapetrou, E. (2005). Financial markets and economic growth in Greece, 1986–1999. *Journal of International Financial Markets, Institutions and Money, 15*(2), 173-188.

Hou, Y., & Dickinson, D. (2007). *The non-performing loans: some bank-level evidences.* Paper presented at the 4th International Conference on Applied Financial Economics, Samos Island, Greece, B7-3010/2005, 105-139.

IMF. (2004). *Global Financial Stability Report, April 2004: Market Developments and Issues*: International Monetary Fund.

Impavido, G., Klingen, C. A., & Sun, Y. (2012). Non Performing Loans and the Macroeconomy. Chapter 2 of Working Group on NPLs in Central, Easter and Southeastern Europe, March 2012. http://ssrn.com/abstract=2156325. 1-23.

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, 52*(2), 169-210.

Karim, M. Z. A., Chan, S.-G., & Hassan, S. (2010). Bank efficiency and non-performing loans: evidence from Malaysia and Singapore. *Prague Economic Papers, 19*(2), 118-132.

King, R. G., & Levine, R. (1993a). Finance and growth: Schumpeter might be right. *The quarterly journal of economics*, 717-737.

King, R. G., & Levine, R. (1993b). Finance, entrepreneurship and growth. *Journal of Monetary economics, 32*(3), 513-542.

King, R. G., & Levine, R. (1993c). Financial intermediation and economic development. *Capital markets and financial intermediation*, 156-189.

Klein, N. (2013). Non-performing loans in CESEE: Determinants and impact on macroeconomic performance. IMF Working Paper N0. 13/72. http://ssrn.com/abstract=224724.

Kolapo, T. F., Ayeni, R. K., & Oke, M. O. (2012). Credit risk and commercial banks' performance in Nigeria: A panel model approach. *Australian Journal of Business and Management Research, 2*(2), 31.

Lata, R. S. (2014). Non-Performing Loan and Its Impact on Profitability of State Owned Commercial Banks in Bangladesh: An Empirical Study. In Proceedings of 11th Asian Business Research Conference. (pp. 26-27).

Levine, R. (1997). Financial development and economic growth: views and agenda. *Journal of economic literature*, *35*(2), 688-726.

Levine, R. (1998). The legal environment, banks, and long-run economic growth. *Journal of money, credit and banking*, 596-613.

Levine, R., Loayza, N., & Beck, T. (2000). Financial intermediation and growth: Causality and causes. *Journal of Monetary economics*, *46*(1), 31-77.

Li, X., & Liu, X. (2005). Foreign direct investment and economic growth: an increasingly endogenous relationship. *World development*, *33*(3), 393-407.

Majid, M. (2007). Does financial development and inflation spur economic growth in Thailand. *Chulalongkorn Journal of Economics*, *19*(2), 161-184.

McKinnon, R. I. (1973). *Money and capital in economic development*: Brookings Institution Press.

McKinnon, R. I. (1988). *Financial liberalization and economic development: a reassessment of interest-rate policies in Asia and Latin America*: Ics Pr.

Minsky, H. P. (1964). Longer waves in financial relations: financial factors in the more severe depressions. *The American Economic Review*, *54*(3), 324-335.

Minsky, H. P. (1995). Longer waves in financial relations: financial factors in the more severe depressions II. *Journal of Economic Issues*, *29*(1), 83-96.

Naceur, S. B., & Ghazouani, S. (2007). Stock markets, banks, and economic growth: Empirical evidence from the MENA region. *Research in International Business and Finance*, *21*(2), 297-315.

Narayan, P. K., & SMYTH 1, R. (2005). Temporal causality and the dynamics of democracy, emigration and real income in Fiji. *International Review of Applied Economics*, *19*(2), 245-261.

Nurudeen, A., & Usman, A. (2010). Government expenditure and economic growth in Nigeria, 1970-2008: A disaggregated analysis. *Business and Economics Journal*, *4*(1), 1-11.

Nyasha, S., & Odhiambo, N. M. (2015). Financial systems and economic growth: empirical evidence from Australia. *UNISA Economic Research Working Paper Series*, *05/2015*, 1-20.

Odedokun, M. O. (1996). Alternative econometric approaches for analysing the role of the financial sector in economic growth: Time-series evidence from LDCs. *Journal of Development Economics*, *50*(1), 119-146.

Odhiambo, N. M. (2005). Financial Liberalisation and Financial Deepening: Evidence from Three sub-Saharan African (SSA) Countries. *African Review of Money Finance and Banking*, 5-23.

Odhiambo, N. M. (2010). Finance-investment-growth nexus in South Africa: an ARDL-bounds testing procedure. *Economic Change and Restructuring*, *43*(3), 205-219.

Omolade, A., Ashamu, S. O., & Morakinyo, A. (2013). Monetary Policy and Nigeria's Economic Growth. *IOSR Journal of Economics and Finance*, *I*(3), 56-63.

Pagano, M. (1993). Financial markets and growth: an overview. *European economic review*, *37*(2), 613-622.

Patrick, H. T. (1966). Financial development and economic growth in underdeveloped countries. *Economic Development and Cultural Change*, *14*(2), 174-189.

Pesaran, M. H., & Pesaran, B. (1997). *Working with Microfit 4.0: interactive econometric analysis;[Windows version]*: Oxford University Press.

Pesaran, M. H., Shin, Y., & Smith, R. J. (2000). Structural analysis of vector error correction models with exogenous I (1) variables. *Journal of Econometrics*, *97*(2), 293-343.

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of applied econometrics*, *16*(3), 289-326.

Rajan, R. G., & Zingales, L. (1996). *Financial dependence and growth. National bureau of economic research. (N0. w5758)*. Retrieved from

Raza, S. A., Shahbaz, M., & Nguyen, D. K. (2015). Energy conservation policies, growth and trade performance: evidence of feedback hypothesis in Pakistan. *Energy Policy*, *80*, 1-10.

Reinhart, C. M., & Rogoff, K. S. (2010). Growth in a time of debt (digest summary). *American Economic Review, 100*(2), 573-578.

Rioja, F., & Valev, N. (2004). Does one size fit all?: a reexamination of the finance and growth relationship. *Journal of Development Economics, 74*(2), 429-447.

Robinson, J. The Accumulation of Capital (London, 1956). *RobinsonThe Accumulation of Capital1956*.

Robinson, J. (1952). The model of an expanding economy. *The Economic Journal, 62*(245), 42-53.

Sari, R., Ewing, B. T., & Soytas, U. (2008). The relationship between disaggregate energy consumption and industrial production in the United States: An ARDL approach. *Energy Economics, 30*(5), 2302-2313.

Schumpeter. (1969). The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle. London and Oxford: Oxford University Press, 1969. *Translated by Redvers Opie*.

Schumpeter, J. A. (1936). The general theory of employment, interest and money. *Journal of the American Statistical Association, 31*(196), 791-795.

Shaw, E. S. (1973). Financial deepening in economic development. http://agris.fao.org.

Shin, Y., Yu, B., & Greenwood-Nimmo, M. (2014). Modelling asymmetric cointegration and dynamic multipliers in a nonlinear ARDL framework *Festschrift in Honor of Peter Schmidt* (pp. 281-314): Springer.

Somoye, R. (2010). The variation of risks on non-performing loans on bank performances in Nigeria. *Indian Journal of Economics & Business, 9*(1).

Stiglitz, J. E., & Weiss, A. (1981). Credit rationing in markets with imperfect information. *The American Economic Review, 71*(3), 393-410.

Uddin, G. S., Sjö, B., & Shahbaz, M. (2013). The causal nexus between financial development and economic growth in Kenya. *Economic Modelling, 35*, 701-707.

Vodová, P. (2003). *Credit Risk as a Cause of Banking Crises.* Paper presented at the The Paper Prepared for the 5th International Conference Aidea Giovani, Milan. July. (pp. 3-4).

Waqabaca, C. (2004). *Financial development and economic growth in Fiji. http://rbf.gov.fj*: Economics Department, Reserve Bank of Fiji.

Yang, L. (2003). The Asian financial crisis and non-performing loans: evidence from commercial banks in Taiwan. *International Journal of Management, 20*(1), 69.

Zeng, S. (2012). Bank non-performing loans (NPLS): A dynamic model and analysis in China. *Modern Economy, 3*, 100-110.

Zhang, J., Wang, L., & Wang, S. (2012). Financial development and economic growth: Recent evidence from China. *Journal of Comparative Economics, 40*(3), 393-412.