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# The Influence of Interest Rates Dynamics on Financial Deepening in Nigeria

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**Abstract**
Examining how interest rate reforms affect Nigeria's financial deepening is the paper's primary goal. The Co integration, Error Correction Model (ECM), and Ordinary Least Square (OLS) techniques as estimate methods were adopted. In this study, time series data from 1990 to 2020 are examined. The findings suggest that interest rates and financial deepening have a long-term relationship. We also discover that the interest rate reform has a favorable and considerable impact on Nigeria's financial deepening. The findings point to the need for policy makers to implement policies that support financial development, economic growth, the liquidity reserve ratio, the domestic savings/GDP ratio, and reforms to ensure the efficiency and development of the financial system.
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## Introduction

A key role in the liberalization process has been played by interest rate reform as a finance sector policy. Interest rate change aims to increase monetary segment efficiency and foster financial deepening. Financial deepening is the process of creating a financial system that is mainly free of financial repression Nnanna and Dogo (1998). The actions of lenders and borrowers in this case should be governed by the market. According to Odhiambo and Akinboade (2009), financial liberalization entails reforming interest rates, reducing credit controls, allowing for free entry into the banking sector, giving the banking sector autonomy, allowing for private participation in banking, and liberalizing capital flows. Financial deepening is defined as an increase in the relative size and importance of the financial system in an economy. Financial deepening, according to Tuaneh and Ewubare (2016), is relevant to economic development.

The liberalization of interest rates in 1987, according to Ikhide and Alawode, (2001) marked the beginning of Nigeria's financial reforms. Interest rates were suppressed and the financial system was governed by laws before this time. The main cause of financial repression is when a nation sets low-relative-to-inflation ceilings on deposit and lending rates. Negative interest rates in the banking sector therefore frequently discourage saving, which has an impact on the volume of investment and economic expansion. A higher real interest rate may encourage savers to do so, which would lead to increased investment, according to McKinnon- Shaw (1973). Thus, the potential for interest rate change was to promote domestic savings and increase the availability of loanable funds in the banking sector.

The development of financial systems has received acknowledgment on a global scale. Greater family and corporate access to financial services tends to lessen income disparities and promote economic growth, World Bank (2015). Therefore, improved access to financial services can significantly contribute to the expansion and development of the economy through the fair distribution of income. According to Nwanna and Chinwudu (2016), financial deepening was expected to boost economic conditions in the economy due to increased spirited competence in the financial markets and the related beneficial spillover effects in the real sector.

The United Nations, the World Bank, and the World Economic Forum (WEF) evaluated the need for countries to provide greater access to financial services for both individuals and businesses as a pathway for equitable distribution of income and poverty reduction. This was done in recognition of the role that financial deepening plays on interest rates. Nations were urged to give financial inclusion a priority in their monetary policy frameworks for swift economic development. According to the World Bank (2012), the financial sector should promote competition and provide individuals with suitable incentives in order to accelerate the decrease of poverty and allocate resources fairly. In order to foster quick growth and sustainable development, the Central Bank of Nigeria (CBN) has persisted in advocating for the strengthening of the Nigerian financial system. The CBN encourages real sector development with enhanced potential for lowering poverty and income inequality

 

through the use of monetary policy tools.

The CBN launched the National Financial Inclusion Strategy in 2012 with the goal of lowering the percentage of financial exclusion from 46.3 percent in 2010 to 20 percent in 2020. In order to further increase the financial system's inclusivity and create chances for the development of the economies, the Apex Bank also launched the Anchor Borrower's Programme (ABP) and licensed 25 mobile money operators CBN (2017). In order to ensure that microfinance banks (MFBs) are in a strong position to provide sustainable microfinancing services in line with the overarching goal of NFIS, the capital requirement for MFBs has also been enhanced. The rate of financial inclusion and innovation has continued to be below average despite increased demand for Enhancing Financial Innovation and Access (EFInA).

Between 2009 and 2018, the GNI index, which measures income inequality, has an average ranking of 45.27 percent CBN (2018). Again, according to ILOSTAT (2018) statistics from the International Labour Organization, the labor force participation rate averaged 55.39 percent between 2009 and 2018. This has sparked a discussion over the macroeconomic efficiency of financial deepening in supporting economic development by creating jobs and more equal income distribution. Once more, the amount of development in the financial system of Nigeria implies that monetary measures intended to encourage financial deepening are strangely inefficient in supporting economic development.

However, the CBN intended to play a crucial part in overseeing the financial industry in order to improve and facilitate the development of business-friendly settings. However, some externalities, notably those resulting from fiscal policy, have impacted how monetary policy is implemented in Nigeria, which has limited the CBN's capacity to carry out its duty of fostering a sound financial system. As at 2016, 41.6 percent of adults in Nigeria were financially excluded, EFInA (2016). It was paradoxical that despite attempts to strengthen the Nigerian financial system, high rates of income inequality, poverty, and low labor absorption capacity have persisted in the Nigerian economy, according to the CBN (2017) report. Though numerous attempts to explain the success of financial deepening have been made in the past, the focus has been on economic development with little to no attention paid to interest rate reform. Therefore, by evaluating the empirical relationship between the influences of interest rate dynamics on financial deepening in Nigeria from 1990 to 2020, tries to close this research gap.

A country's financial development is likely to be hampered by a strategy of financial repression that discourages saving. However, the complete implementation of the liberalization program that followed resulted in increased deposit rates and a strengthening of the country's financial system. This suggests that interest rate reform has helped the financial system become more complex, which has helped economic growth by raising investment productivity. The previous literature assessment led us to the conclusion that financial reform causes financial deepening, which promotes low interest rates and economic expansion. This essay will look at how Nigerian financial deepening is affected by interest rate reforms.

**Literature Review**

Interest rate is concerned with its equilibrating influence on supply and demand in the financial sector. Interest rate premiums on financial assets and liabilities have a significant impact on how savings are invested and who incurs financial responsibilities Colander (2001). The interdependent relationship between the financial and real sectors shapes the role of interest rates. Through such a relationship, the impact of interest rates on the financial sector is transferred to the real sector. In order to attain price stability, the fiscal authorities then modify the policy rate, which has an impact on the amount of savings and the availability of credit.

Financial institutions must be able to successfully deploy savings for investment purposes if financial deepening is to occur. Financial deepening, according to Nnanna and Dogo (1999), is a system devoid of financial repression. Mbutor and Uba (2016) offered a general view of financial inclusion, making available financial services such as savings, credit and insurance to the disadvantaged and low-income population at affordable costs. Today, financial inclusion is a significant international policy goal, included as an enabler of many of the UN Sustainable Development Goals (SDGs).

The classical hypothesis holds that savings and investment are the only factors that affect the rate of interest. The theory describes how the factors of supply and demand for cash drive interest rates. As a result, the money that is lent to investors for their purchases of capital goods comes from the savings that other people have generated from their present wages. By delaying consumption, they free up resources for the creation of capital goods. It was also emphasized that savings are elastic to interest rates. Therefore, consumers will be incentivized to save more money if the interest rate is higher. According to Uchendu (1993), the classical approach sees the interest rate as the yield on equity, return on investment, or opportunity cost of delaying present consumption.

The neo-classical loanable funds hypothesis states that the rate of interest is established when the supply and demand of loanable funds are equal. This demonstrates categorically that the theory is a development of the conventional theory, which holds that the rate of interest depends on savings and investment. The Keynesian theory of interest rates views interest as a compensation for releasing liquidity for a predetermined amount of time, as opposed to savings. People can decide how much of their money they want to save and how much they

 

want to spend. The level of compensation for holding money in bonds or other assets as opposed to holding it in cash determines the interest rate. The relationship between investments and savings affects it. The Keynesians also hold that changes in the money supply and prices have an indirect and nonproportional link through the interest rate.

Interest rates were defined by Jhingan (2005) as the rental payment for the utilization of credit by borrowers and the return for lenders parting with their cash. Similar to other pricing, interest rates ration the finite supply of credit among the numerous competing requests. The interest rate can also be thought of as the cost of credit, which may be vulnerable to inflation-related distortions. A borrower pays interest for the usage of money they borrow from a lender at a certain rate, according to Wikipedia (2005). It is sometimes expressed on an annual basis and can also be thought of as a rate that is charged or paid for the use of money. Credit availability may not be linear for additional private investment Guncavdi, (2008). In other words, if we assume that credit constraints exist at all interest rate levels, then when the impact of a rise in real interest rates on the loan supply exceeds the cost brought on by an increase in rates due to asymmetric information problems, a decrease in the sensitivity of private lending

Furthermore, investments in loans with higher interest rates should be anticipated. Jorhenson (2013) formalized the relationship between real interest rates and private (real sector) investment spending by deriving the desirable stock of capital as a function of real output and the opportunity cost of capital. A representative firm optimizes the current value of its projected future cash flows in this scenario. The targeted capital stock is inversely correlated with capital cost and directly correlated with production. An increase in the desired capital stock and investment spending results from a decline in the real interest rate since it lowers the opportunity cost of capital.

Government interest rate fixing and its detrimental effects on the financial system and economy are referred to as financial repression. An investment function that reacts adversely to the effective real rate of interest and favorably to the growth rate is one of the fundamental claims made for the McKinnon-Shaw model. The demand for money, which is defined as savings and term deposits as well as checking accounts and other currency, increases as the proportion to national income, which in turn encourages growth; this leads to financial deepening, or a higher level of intermediation Ucer (1997). Ucer (1997) asserts that the elimination of interest rate regulations is a key component of the liberalization process due to the significance of interest rates in savings, investment, and economic growth.

Olawumi, Lateef, and Oladeji (2017) investigated the impact of financial deepening on the profitability of a number of Nigerian commercial banks. Financial deepening (M2/GDP), the ratio of credit to the private sector to GDP, and the ratio of deposit liabilities to GDP were used by the researchers to empirically investigate the relationship between financial deepening and bank performance. Profitability was used as the performance measure of interest. In order to investigate the impact of financial deepening on bank performance, they used a descriptive research design. The data were analyzed using descriptive and empirical methods, and the models' adherence to predictions, statistical significance, and explanatory power were assessed using pertinent statistics. This presents empirical evidence that financial deepening contributed positively to the degree of profitability of the chosen commercial banks in Nigeria. Findings showed that each component of financial deepening indicators has a strong association and is statistically significant. According to the study's findings, each financial deepening component significantly and positively affects the performance of a few selected commercial banks.

For the years 1970–2013, Karimo and Ogbonna (2017) looked at the causal relationship between financial development and economic expansion in Nigeria. The study used the Toda-Yamamoto augmented Granger causality test, and the findings revealed that in Nigeria, the relationship between growth and financial deterioration is consistent with the supply-leading hypothesis. This indicates that financial deepening precedes growth rather than the other way around. The report suggested, among other things, that governmental initiatives should be focused on removing barriers that impede the expansion of lending to the private sector and must regain investors' faith in stock market operations.

Paul (2017) used secondary source data to investigate the effects of financial deepening on economic growth in Nigeria (1986-2015). He used the Co integration, Error Correction Model (ECM), and Ordinary Least Square (OLS) techniques as estimate methods. To determine whether the variables were stationary, the Augmented Dickey-Fuller (ADF) and Philips-Perron (Pp) tests were both run. His findings demonstrated that the financial depth indexes had an impact on long-term economic growth in Nigeria. Additionally, financial deepening and economic growth are favorably and significantly correlated. Therefore, he advocated for financial inclusion, financial reforms, infrastructure development, efficient payment systems, and increased public confidence in the stock market and money market to encourage investment and effective resource allocation.

For a 33-year period, from 1981 to 2013, Okafor, Onwumere, and Chijindu (2016) conducted a causality and impact analysis on financial deepening and economic growth in Nigeria. The Phillips-Peron test for unit root was employed in the study to determine whether or not the variables are stationary. To ascertain whether the data set was normally distributed, the VEC residual normality test and the Histogram-Normality test were applied.

 

The Johansen cointegration test was used to test for a long-term association. Both the Granger causality test and the Error Correction Model were used. The results showed that there is a long-term relationship between economic growth, a large money supply, and private sector lending. This relationship is also characterized by a high rate of adjustment toward a long-term equilibrium.

The findings also showed that whereas private sector credit has a negative and insignificant impact on growth, broad money has a positive and non-significant impact on it. According to the results of the Granger causality test, neither a large money supply nor private sector credit can cause economic growth. The study thus suggests that policies that are supportive of the private sector be put in place to guarantee that investors not only have access to credit but also that this credit is available at a reasonable cost, or at a relatively low interest rate. The economic goal of continuous growth and stability should be attained through the coordination of monetary and fiscal policies.

High interest rates on loans are bad for productive investment and consequently for economic growth. According to Soyibo and Olayiwola (2000), borrowers with profitable assets may be deterred from applying for loans, which could have a negative impact on the caliber of applicants. Once more, high lending interest rates could lead to a situation where borrowers take out loans to avoid bankruptcy rather than making investments or financing working capital. The behavior of the interest rate structure tends to favor large spreads between the maximum lending rate and savings rates, which may stimulate speculative financial activities. The interest spread or interest margin of banking institutions is a frequently used metric to assess the benefits of financial sector reforms, as suggested by Edirisuriya (2008). The gap between interest revenue and interest expenses is known as the interest spread. According to theory, interest margins decrease as banks compete with one another.

Recently, the Nigerian financial system has undergone a number of changes, including the structural Adjustment program as a result of heavy regulation, stifled competition, improper resource allocation, improper management of interest rates, and poor banking structure, among other economic indicators Otieno (2013 ). The expansion of financial schemes with the intention of expanding its activities was the main driver behind the change. As a result, Nigeria's financial sector has expanded, and among other things, the financial market has grown more rapidly due to financial deepening. Despite efforts to deepen the Nigerian financial system, high occurrences of income gap, poverty and low labour assimilation capacity had dogged to prevail in the Nigerian economy. Although attempts to explain the success of financial deepening have been made in the past, the focus has been on economic growth with little to no consideration paid to development. By evaluating the empirical relationship between the influences of interest rate dynamics on financial deepening in Nigeria from 1990 to 2020, this study aims to close this research gap.

**Methodology**

This study examines the influences interest rates dynamics on financial deepening in Nigeria. The study hypothesized that interest rates do not significantly affect financial deepening in Nigeria. To test the hypothesis, annual time series data of relevant variables from 1990 to 2020 were obtained from Central Bank Nigeria Statistical Bulletin 2020 and the World Bank data 2020. Model of the study is built on previous empirical researches and employed the econometric techniques of Autoregressive Distributed Lag.

**Model Specification**

The general form for Autoregressive Distributed Lag is given in the form below:

$GDP = f(FD_t)$ ---------- (1)

$FD_t = (IRT_t, LR_t, MSG_t, PCG_t, STD_t)$ ----------(2)

Where:

$GDP_t$ = Gross Domestic Product

$FD_t$ = Financial Deepening

IRT = interest rate defined as lending rate minus inflation

LR = lending rate

MSG = Money supply/GDP ratio ($M_2$/GDP)

PCG = Ratio of Private Sector Credit to GDP

(PSC/GDP)

STD = Savings and Time Deposit

The null hypothesis suggests that no long run relationship exists when the estimated F-statistics value is less than the lower bound critical values, I(0) and the I(1) critical bound which reveals no long-run correlation between the regress and regressors. Consequently, bounds test indicates that co-integration (long run connectivity) exists amongst variables.

$$\Delta GDPR_t = \beta_0 + \sum_{i=1} \alpha\, j\Delta GDR_{t-j} + \sum_{i=1} \alpha\, j\Delta IRT\_GDP_{t-j} + \sum_{i=1} \alpha\, j\Delta LR\_GDP_{t-j} + \sum_{i=1} \alpha\lambda j\Delta M_2\_GDP_{t-j} + \sum_{i=1} \alpha\, j\Delta PCG\_GDP_{t-j} \sum_{i=1} \alpha\, j\Delta STD_{t-j} + \delta_1 GDPR_{t-1} + \delta_2 IRT\_GDP_{t-1} + \delta_3 LR\_GDP_{t-1}\ \delta_4 M_2\_GDP_{t-1} + \delta_5 PCG\_GDP_{t-1}\ \delta_6 STD_{t-1} + \mu_t \text{-------(3)}$$

 

Where Δ = first-difference operator; p = maximum lag order. Existence of long run relationship is tested through F-statistics. The coefficient ( λ , β, α) corresponds with short-run model dynamics,( $\mu_t$ ) represent the residual while ($\delta_1$, $\delta_2$, $\delta_3$, $\delta_4$, $\delta_5$, $\delta_6$) represents the long-run relationship.

$H_0$: $\delta_1 = \delta_2 = \delta_3 = \delta_4 = \delta_5 = \delta_6 = 0$ (null, i.e. the long-run relationship does not exist)

$H_1$: $\delta_1 \neq \delta_2 \neq \delta_3 \neq \delta_4 \neq \delta_5 \neq \delta_6 \neq 0$ (Alternative, i.e. the long-run relationship exists)

Given that co-integration exists, thus, we estimate the coefficient of the long run model, whose specification is shown below,

$$\Delta GDPR_t = \beta_0 + \delta_1 GDPR_{t-1} + \delta_2 IRT\_GDP_{t-1} + \delta_3 LR\_GDP_{t-1} + \delta_4 M_2\_GDP_{t-1} + \delta_5 PCG + \delta_6 STD_{t-1} + \mu t \text{ ---- (4)}$$

Liew (2004), in other to specify the right ARDL Model, appropriate lag selection criterion such as AIC should be used provided the sample size is less than 60. Given that the study used annual data, 2 is the maximum lag (p) that should be selected Pesaran, Shin & Smith, (2001). In conclusion, all the short-run coefficient model are coefficients that justify short-term dynamism which shows the meeting point of this model to (δ) and represents the re-parameterization of errors produced in one period and rectified in the next period.

**Presentation of Results and Discussion**

In an attempt to verify the stationarity of variables, Augmented Dickey Fuller (ADF) t- statistics were employed to be sure of non-existence of second differenced variable which makes bound tests result unreliable since they are based on the criteria of stationarity at level and/or at first difference. Table I shows the result of ADF test. Variable-stationarity is stationary when ADF t-stat is above its critical values at 5% significance. It is non stationary when ADF t-stat is below critical values at 5% significance. ADF unit root test shows that the model's variables are I(0) and I(1), thus, the usage of Autoregressive Distributed Lag is being justified. ARDL or bound test procedure would be embarked upon to ascertain the influence of financial deepening on national growth. Such technique is used when variables are stationary at levels and first difference i.e. combining both I(0) and I(1). The results of the ADF test are presented in the table below.

**Table 1: Stationarity of the Time Series Data (ADF)**

| Variables | Absolute test statistic with intercept | Absolute Critical values @ 5% | probability | Order of Integration |
|---|---|---|---|---|
| FD | 5.3433 | 2.9421 | 0.0025 | 1(1) |
| IRT | 5.3012 | 2.9385 | 0.2876 | 1(1) |
| LR | 6.3764 | 2.9385 | 0.5969 | 1(1) |
| MSG | 7.1684 | 2.9385 | 0.0730 | 1(1) |
| PCG | 3.2210 | 2.9385 | 0.0831 | 1(1) |
| STD | 4.5832 | 2.9367 | 0.0000 | 1(1) |

Source: Author's Computation 2022

The unit root result above shows that all the variables were stationary at first difference that is 1(1) series. The result from the stationary test therefore calls for long –term relationship.

Johansen Co-Integration Test

The co-integration test establishes whether a long –run equilibrium relationship exist among the variables. To establish co-integration, the likelihood ratio must be greater than the mackinnon critical value 5% levels of significance. Cointegration is the long –run relationship that exists among two or more variables. To establish cointegration, we employ the Johansen cointegration test as show in table 2 below

 

**Table 2: Johansen Cointegration Test Results**

Date: 14/06/22 Time: 03:09
Sample (adjusted): 1990 – 2020
Included observation: 30
Trend assumption: Linear deterministic trend
Series: FD IRT LR MSG PCG STD

| Hypothesized No. of CE(s) | Eigenvalue | Trace statistic | 0.05 Critical value | prob.** |
|---|---|---|---|---|
| None* | 0.991044 | 78.23096 | 47.85613 | 0.0000 |
| At most 1 | 0.743469 | 21.64640 | 29.79707 | 0.3186 |
| At most 2 | 0.357182 | 5.320316 | 15.49471 | 0.7739 |
| At most 3 | 0.743469 | 21.64640 | 29.79707 | 0.3186 |
| At most 4 | 0.357182 | 5.320316 | 15.49471 | 0.7739 |
| At most 5 | 0.001465 | 0.017594 | 3.841466 | 0.8944 |

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
*denotes rejection of the hypothesis at the 0.05 level
*Mackinnon – Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

| Hypothesized No. of CE(s) | Eigenvalue | Max-Eigen statistic | 0.05 Critical value | prob.** |
|---|---|---|---|---|
| None* | 0.991044 | 78.23096 | 47.85613 | 0.0000 |
| At most 1 | 0.743469 | 21.64640 | 29.79707 | 0.3186 |
| At most 2 | 0.357182 | 5.320316 | 15.49471 | 0.7739 |
| At most 3 | 0.357182 | 5.320316 | 15.49471 | 0.7739 |
| At most 4 | 0.357182 | 5.320316 | 15.49471 | 0.7739 |
| At most 5 | 0.001465 | 0.017594 | 3.841466 | 0.8944 |

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
*denotes rejection of the hypothesis at the 0.05 level
*Mackinnon – Haug-Michelis (1999) p-values

Having establish the existence of cointegration between financial deepening and interest rate variables, the earlier specified long –run equation in levels form will be estimated and presented in table 3

**Table 3: Long –run Coefficients, dependent variable is FD**

Levels Equation
Case 3: Unrestricted Constant and No trend

| Variable | coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| IRT | 0.865323 | 0.117431 | 0.734322 | 0.4850 |
| LR | 0.195640 | 0.142618 | 1.325763 | 0.1823 |
| MSG | -0.473412 | 0.166839 | -2.90437 | 0.0127 |
| PCG | 0.425842 | 0.053114 | 7.798172 | 0.0000 |
| STD | 0.129731 | 0.026530 | 4.354717 | 0.0008 |

FD = (0.8653*IRT + 0.1956*LR + -0.4734* MSG + 0.4258*PCG + 0.1297* STD)

**Source: Author's Computation 2022**

The coefficients of interest rates in the above table display the percentage change in the financial deepening variable due to changes in interest rates. The findings demonstrate a considerable relationship between money supply and interest rates and Nigeria's financial deepening. Even though there was a negative, significant association between saving and financial deepening, this data corroborated the theoretical predictions. According to Gbenga, James, and Adeyinka (2019), financial institutions reduce lending availability in response to fiscal thinning, which is manifested by a rise in interest rates. This supports McKinnon's (1973) theoretical claim that financial repression results from interest rate regulation. The estimation's findings confirmed the expectation that the money supply would have a favorable impact on financial deepening. It was found that the money supply

 

ratio corresponded to a rise in financial deepening of around 42.5 percent. This result supports the claim made by Otalu, Aladesanmi, and Mary (2014) that the money supply has a statistically significant impact on the amount of credit created by banks through savings and deposits.

Financial deepening was found to be significantly benefited by savings and deposits. According to estimates, a change in the real interest rate accelerates financial deepening by roughly 12.97%. The actual interest rate has been increasing, according to an analysis of interest rate spread in Nigeria. Interest rates were roughly -2.61 percent between 1987 and 1999, when liberalization was completely implemented and before universal banking was enacted. It continued to increase, reaching 4.25 percent between 2000 and 2006, before the banking consolidation reform, and reached 7.39 percent after the reform until the review period of 2020. The financial liberalization theory's theoretical tenet that "high level of interest rates enhances the level of financial deepening" is supported by a considerable interest rate, according to Eke and Inyang (2015). Interest rates are not a reliable indicator of financial repression, according to De Gregorio and Guidotti (1995). Finally, lending and interest rates have no statistically significant impact on Nigeria's financial development. Table 2's average lending rate of 15.47 percent is regarded as being too high to support the credit of the private sector. This is consistent with Ekpo's (2017) argument that private investors in Nigeria are discouraged by high lending rates. Contrarily, the minimal influence of interest rates is a symptom of ineffective financial intermediation, according to Sheriff and Amoako (2014). The inefficiency results from the fact that although low deposit rates discourage saving, high lending rates incentivize banks to lend.

After the ARDL long-run model has been established and estimated, it is necessary to estimate the error correction model within the ARDL framework. Table 4 presents the estimation of the error correction model for financial deepening.

**Table 4: Error Correction Model Estimates**

| **ARDL Error Correction Regression** | | | | |
|---|---|---|---|---|
| **Dependent Variable: D(FD)** | | | | |
| **Selected Model** | | | | |
| **Variable** | **Coefficient** | **Std. Error** | **t-statistic** | **Prob.** |
| C | 5.952487 | 0.768824 | 7.742326 | 0.0000 |
| D(FD (-1) | 0.757396 | 0.128275 | 5.904488 | 0.0000 |
| D(FD (-2) | 0.397882 | 0.157198 | 2.531078 | 0.0240 |
| D(IRT) | -0.16921 | 0.082688 | -2.046371 | 0.0600 |
| D(IRT (-1) | -0.276686 | 0.103328 | -2.677735 | 0.0180 |
| D(IRT (-2) | 0.156634 | 0.067261 | 2.328746 | 0.0082 |
| D(LR) | -0.226252 | 0.073488 | -3.078744 | 0.6575 |
| D(LR (-1) | 0.044664 | 0.098585 | 0.453048 | 0.0876 |
| D(LR (-2) | -0.126913 | 0.069103 | -1.836583 | 0.0000 |
| D(MSG) | 0.462063 | 0.073332 | 6.300998 | 0.1151 |
| D(MSG (-1) | 0.182785 | 0.108805 | 1.679933 | 0.0578 |
| D(MSG(-2) | -0.215899 | 0.104472 | -2.066577 | 0.0000 |
| D(PCG) | 0.116183 | 0.016949 | 6.854886 | 0.0001 |
| D(PCG(-1) | -0.102427 | 0.018638 | -5.495481 | 0.0051 |
| D(PCG(-2) | -0.044799 | 0.013498 | -3.318864 | 0.0000 |
| D(STD) | -0.226252 | 0.073332 | -3.078744 | 0.6567 |
| D(STD (-1) | 0.044664 | 0.108805 | 0.453048 | 0.0643 |
| D(STD (-2) | -0.126913 | 0.104472 | -1.836583 | 0.03061 |
| ECT (-1)* | -1.176439 | 0.149754 | -7.915247 | 0.0000 |
| **R-squared** | **0.938105** | **F_-statistic** | **19.64386** | |
| **Adjusted R-squared** | **0.871032** | **Prob (F-statistic)** | **0.000000** | |
| **Durbin-Watson stat** | **2.336198** | | | |

**Source: Author's computation 2022**

Our financial deepening model converges to its long-run equilibrium at a speed of adjustment of 1.17.64 percent, according to the negative coefficient of the error correction term (ECT). A durbin-Watson statistic of 2. 336198 indicates that the model is not affected by first order autocorrelation, and an F-statistics probability of 0.000000 suggests that the model is significant overall.

A diagnostic test was used to check for serial correlation and residual series. It was found that there is no serial correlation and that the residual series are normally distributed and homoskedastic. The tests in question are the LM test, the ARCH and Berusch-Godfrey tests for serial correlation, and the Jacque Berra test for normalcy. Below the estimates from diagnostic tests

 

**Table 5: Diagnostic Tests Estimates**

| Diagnostic Tests | Probability of F-Statistics | Remark |
|---|---|---|
| Jarque-Bera | 0.8672 | Normal distribution |
| Heteroskedasticity Test: Breusch-Pagan –Godfrey | 0.8236 | Homoskedastic distribution |
| Breusch-Godfrey Serial Correlation LM Test: | 0.4667 | No Serial Correlation |

Source: Author's Computation 2022

The results of the three tests indicated that the null hypothesis is accepted because the p-value of the F-statistic in each of them was greater than 0.05. The researchers draw the conclusion that the data series are homoskedastic, normally distributed, and not serially associated. Once more, it demonstrated the model's stability and fitness.

**Findings and Policy Implication**

The results point to a long-term connection between interest rates and financial deepening. We also learn that Nigeria's financial development has been positively and significantly impacted by the interest rate change.

The outcome shows that a 15.47 percent increase in the lending rate deterred private investors, led to poor job creation, and indirectly hurt the real sector of the economy.

The research shows that policies supporting financial development, economic growth, the liquidity reserve ratio, the domestic savings/GDP ratio, and reforms to ensure the efficiency and development of the financial system are necessary for policymakers to adopt.

**Conclusion and Recommendation**

The findings suggest that interest rates and financial deepening have a long-term relationship. It was also shown that interest rate reform has a favorable and considerable impact on Nigeria's financial deepening. The results support Asamoah's (2008) theory that financial reforms increase financial market competitiveness, which raises interest rates to promote saving and free up capital for investment. Economic growth is the result of this process.

The study concluded that in order to ensure the effectiveness and expansion of the financial system, policymakers should have an impact on financial deepening, interest rates, the liquidity reserve ratio, the domestic savings/GDP ratio, and implement financial reforms. The results will lead to financial decisions that support the nation's economy.

Therefore, we urge Nigeria's monetary authorities to lower loan interest rates in order to promote investment and accelerate economic growth. To push the government to combat the rising inflationary rates.

To promote economic growth, policymakers should consider policies that would lower interest rates cautiously and implement internal control mechanisms.

Future studies on how financial reforms affect economic growth should take into account both the size of the impact and the degree of democratization in the nation.

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