DOES THRESHOLD OF FINANCIAL DEVELOPMENT MATTER IN REDUCING POVERTY LEVEL IN NIGERIA?

Saliu Adejare, Rauff PhD
Department of Economics,
Federal College of Education (Special), Oyo.

Abstract
The study examined threshold levels of financial development indices (overall financial development index (as baseline model), and financial institution index, financial market index (for robustness checks) that reduced poverty level in Nigeria between 1970 and 2023. Threshold regression technique was employed for the analysis of the data. Threshold values of between 15 to 17 per cent as minimum values upon which poverty level could be reduced was established in Nigeria for the overall financial development index. However, threshold value of not less than 17 per cent was found for financial institution index and it was significant. Meaning that financial institution was weak in Nigeria given the period under investigation. Meanwhile, a threshold of 18 per cent was found for financial market index. Albeit, not significant. The study therefore concluded that poverty level could only be reduced when financial development is promoted up to threshold level of between 15 to 17 percent in Nigeria.

Keywords: Financial development, Poverty level, Thresholds regression.

Introduction

A macro-level market economy based on a system is determined by four markets. They are the labour market, capital market, money market, and product market. Out of the four markets, the money and capital markets represent the financial industry. The financial industry complements the real sector of any economy. Financial development is the growth of an economy's financial sector. The existence of efficient, comprehensive, and well-monitored financial and real sectors is necessary for the economic system to operate at its best. The combined efforts of the financial and real sectors provide the essential and adequate conditions for the economic system to operate at its best. Any malfunction in one of the two sectors has an adverse effect on how well the other sector operates. Thus, long-term and stable equilibrium with both sectors of the economic system is reached in addition to internal communication (Kim & Lin, 2011).

In the 1980s and 1990s, the financial sectors of the majority of African nations, including Nigeria, implemented structural and policy changes. This was carried out as a component of more extensive economic reforms meant to boost economic growth and enhance the general efficiency of the banking industry and the economy (World Bank, 1989). The problem impeding economic progress in emerging countries was banking repression in the financial sector (Mackinnon, 1973 & Shaw, 1973). There were several indicators of this, including selective lending standards, high reserve requirements, entry barriers into the banking sector, and ceiled interest rates and credit expansion. The state of the financial system was affected by this, especially in terms of its capacity to raise capital and support profitable investment. In 1987, the Nigerian government initiated a significant financial sector reform as a part of the Structural Adjustment Programme (SAP). The financial industry

saw improvements in efficiency and competitiveness, exchange rates and interest rates were liberalized, credit was distributed through a market-based system, and the regulatory and supervisory frameworks were reinforced.

Nonetheless, issues still exist, namely with regard to the general public's inability to obtain financing and the poor condition of small and medium-sized businesses (SMEs). Furthermore, Africa's financial industry still lags behind other areas in terms of breadth and depth. As a result, opinions on the economic effects of these reforms have been divided; some claim that they have had a detrimental effect on income inequality and poverty.

An individual or community is said to be in poverty if they do not have enough money to meet their basic necessities. Additionally, while the United Nations (UN) defined poverty as a lack of opportunities, Lister (2004) defined poverty as a situation in which a group or individual lacks the necessities to maintain a minimal living standard in society. The United Nations General Assembly stated that economic, social, and political involvement were necessary for the reduction of poverty (World Bank, 2001). Raising the level of living for citizens has long been a top concern for governments universally. Global economies, and rising economies in particular, endeavor to enhance the welfare of their populace by initiating intervention initiatives that would reduce poverty via carefully considered fiscal and monetary policies, one of which was the banking sector's financial deepening (Sen,1999).

Additionally, research in the fields of finance and economics indicate that a healthy financial system can promote the physical accumulation of capital, increase economic efficiency, and thereby support long-term growth (Bekaert et al., 2001; Levine, 2003; Minier, 2003; Dometudes & Andrinova, 2004 & Christopoulos & Tsionas, 2004).

Financial development, according to Ndlovu and Toerien (2020), can have a major influence on distribution of income and level of poverty. The financial sector was said to have a larger role in the development of developing economies. This was because the vast majority of the impoverished have no access to credit or money. The literature has extensively documented the difficulties faced by citizens of developing economies, like Nigeria, in obtaining financial resources. Their lack of established connections with financial institutions and inability to satisfy the necessary collateral requirements were the reasons for this (Shahbaz et al. 2015; Ndlovu & Toerien, 2020, Ilori, 2020).

Notwithstanding these initiatives, Dabwor and Abimiku (2016) found that despite the country's vast riches, Nigeria's real poverty rate remained well over 50%. According to World Bank projections, 95.1 million Nigerians would live in poverty by 2022. Numerous studies on the impact of financial development on poverty have found considerable negative as well as positive effects. Claessens and Perotti (2007), for example, feel that formal financial sector's development can only benefit the wealthy. According to Beck et al. (2007), who investigated 72 developing and developed economies, income inequality and poverty decrease quickly in nations by larger levels of financial intermediaries. Kim and Lin (2011) study was an exception. They argue that countries can only enjoy reductions in income inequality and poverty if their financial sectors have attained a certain threshold of development. A few economists submitted that the influence of financial development on poverty was dependent on a country's threshold of financial development (Zarra-Nezhad, Anvari, & Hosseinpoor, 2015; Kollenthara & Qaisar, 2016; Qaiser, 2016; Khan et al., 2018). To put it another way,

they believe that before rising poverty can be alleviated, a certain threshold of financial sector development must be achieved. The question now is how much financial development is required in Nigeria to alleviate the effects of poverty. As a result, there is a gap in the literature, which could be valuable in defining the minimum level of financial sector growth that Nigeria needs to address the negative effects of income inequality and poverty. It is a gap because, few research have been done in this area in Nigeria. The question is: what is Nigeria's financial development threshold for poverty? This is focus of this study.

Literature review

From 1971 through 2013, Zarranezhad, Hosseinpoor, and Anvari (2015) examined the connection between financial development and income inequality in Iran adopting Threshold Error Correction Model (TVECM). The findings of TVAR and LR tests established that the model only has one threshold. In a similar vein, the TVECM model's findings showed that as financial development improved, income disparity widened before the threshold value was reached. When it reached a certain threshold, financial development, diminished wealth disparities in Iran.

In addition, Zahonogo (2017) employed data from 42 SSA nations from 1980 to 2012 to investigate how financial development influenced poverty metrics. The GMM estimation technique was used in this investigation. The study's findings revealed that there was a financial development threshold below which development was harmful to poor and over which development was connected with reduced poverty. Empirical findings pointed to an inverted U shape reaction, implying that relationship between financial development and poverty in SSA was not linear.

In a similar vein, Bolarinwa, Adegboye, and Vo (2020) used dynamic panel threshold (GMM) between 1996 and 2015 to investigate whether or not threshold existed between financial development and poverty in 40 African nations. The empirical findings demonstrated that in order to reduce poverty in Africa, a certain amount of financial development is required.

Methodology

Theoretical framework

All three of these issues — economic growth, income disparity, and poverty – may be linked positively, either directly or via other means. This lends credence to the Galor and Zheira (1993) linear theory. As illustrated in the direct relationship, financial sector development promotes poverty reduction and income inequality reduction, while the indirect link shows how economic growth benefits poverty reduction and income disparity reduction.

As Tchamyou et al. (2019a) explained, contradictory views on the impact of financial development on income distribution and poverty may be conveyed to the public through the theories of intensive and extensive margin. According to intense margin theory, income inequality and poverty are worsened by both direct and indirect financial sector development, as well as improvements in the services given to present consumers of financial institutions (Chipote, Mgxekwa & Godza, 2014). According to the Extensive Margin Hypothesis, financial development may benefit previously unbanked communities on an equal basis with those who are already banked. A section of the population that was previously unable to

benefit from a formal financial infrastructure may profit from steps to increase the value of formal financial development (Orji, Aguegboh & Anthony-Orji, 2015).

Specification of models

This sub-section presented a model to determine the threshold level of financial development for poverty level in Nigeria. To achieve this objective, the study employed threshold regression technique. The threshold regression was propagated by Hansen (1999, 2000) as a simple-split model in econometrics framework in which individual observation is classified with respect to the value of variable and estimate it by minimizing the sum of squared errors. The equation was modified to reflect threshold regression model for financial development. Following Zarranezhad, Hosseinpoor and Anvari (2015) the threshold model was specified as follows:

$$Y = \theta_1^{'} X_t + e_{1t} \quad \text{if} \quad q_t \leq \gamma \qquad 3.1$$

$$Y = \theta_2^{'} X_t + e_{2t} \quad \text{if} \quad q_t \geq \gamma \qquad 3.2$$

Where in the model q_t is the threshold variable and it divided the observation into two parts.

Given this study, the threshold variable is the financial development while Y is dependent variable (the Poverty level (LPOV), X_t is the independent variables vector which include financial development indicators FD_t; proxied by the three pillars (FD for baseline model while FI and FM for robustness checks) of financial development as explained in the Global Financial Development Database (GFDD). $LPGDP_t$ is the log of per capita GDP, INFL, GOVT, and LTOP represent log of Per capita GDP, Inflation rate, Government size and trade openness respectively. e_{it} *and* γ are error term and value of threshold variable respectfully. The models above show that as long as the threshold variable is smaller than the threshold value, regression equation would accord to function. If the threshold variable is larger than the threshold value, regression equation is function. Dummy variable $I_t(\gamma)$ is defined as $I_t(\gamma) = \{q_t \leq \gamma\}$ such that {.} represents the function sign. If $q_t \prec \gamma$ then I = 1, otherwise I = 0.

***A priori* expectation**

On apriori, an increase in financial development will first increase individual household's consumption expenditure and eventually reduces or alleviate poverty level in the country at large. The same goes for GDP per capita, government size and trade openness with the exception of inflation rate that is expected to reduce poverty by having negative result. This is because an increase in inflation rate lowers the consumption expenditure and hence increases poverty level on the aggregate.

Sources of data, description and measurement of variables

In order to carry-out the study's analyses, annual data from 1970 to 2023 were used. The International Monetary Fund's International Financial Statistics database served as the source for information on financial development indices (disaggregated into overall financial development index, financial institution index, and financial market index). The World Bank Development Indicator database was used to obtain information on household final

consumption expenditure (proxy for poverty), gross domestic product (GDP) per capita, inflation rate, trade openness, and government size.

The real GDP per capita, the government's size, trade openness, and the inflation rate were the factors accounted for when determining poverty. Because literature indicates a significant connection between income distribution and economic growth, real GDP per capita was included to account for the economic growth and wealth effect. Given that higher income levels are linked to less poverty. The government size and trade openness, which were included to represent the benefits of public spending and foreign trade openness. Inflation was included in the model in order to account for macroeconomic instability.

Estimation techniques

Stationarity test

The variables were tested for stationarity Augmented Dickey Fuller (ADF), before the specified models were estimated to meet the study objective.

Determining the threshold level of financial development for poverty in Nigeria.

Hansen (2000) threshold regression technique was adopted. There are two reasons why threshold models are so popular. Programmes with a threshold impact are very popular among policymakers. Second, the threshold model may be utilised to demonstrate parsimoniousness, and functional form is allowed to be flexibly implemented.

Empirical results, interpretation and discussion

Unit root results

Order of integration of concern variables form should be determined by using the Augmented Dickey-Fuller (ADF). This study deviated from majority of studies by accounting for structural breaks and incorporated to the final analyses. For the purpose of space, only the optimal values of the unit root tests were presented.

Tables 1 and Table 2 present the optimal values of the unit root results without breaks and with breaks respectively. It was observed that the order of integration are mixture of I(0) and I(1). In general, the use of Autoregressive Distributed Lag (ARDL) as an estimating technique is justified in terms of accuracy, according to Pesaran, Shin, and Smith (2001).

Table 1

Optimal Augmented Dickey-Fuller Unit Root Test Without Structural Break

Variables	Level	First Difference	Order of Integration
LPCGDP	-0.9247	-4.2101**,[a]	I(1)
LPOV_3	-4.6051***[b]	-5.7709	I(0)
LTOP	-2.2392	-7.5030***,[a]	I(1)
FD	-1.4278	-5.6823***,[a]	I(1)
INFL	-3.5014***,[a]	-6.1372	I(0)
GOVT	-1.0667	-6.5746***,[a]	I(1)
LGINI	-1.1987	-1.6732*,[c]	I(1)
FI	-1.4402	-6.1318***,[b]	I(1)
FM	-1.5369	-5.9135***,[a]	I(1)

Note: Intercept = a, Intercept and Trend and Intercept=b. ADF stands for Augmented Dickey Fuller unit root tests; 1%, 5%, and 10% levels of significance are represented by ***, **, and *, respectively. Stable at levels and the first difference, respectively, are represented by I(0) and I(1). Source: Author's Computation (2025).

Table 2

Optimal Augmented Dickey-Fuller Unit Root Test With Structural Break

Variables	Level	First Difference	Break Date	Order of Integration
LPCGDP	-6.9889***,[b]	-4.7281	2001	I(0)
LPOV_3	-6.3130***[a]	-8.9055	2000	I(0)
LTOP	-6.1530***,[b]	-8.3493	1988	I(0)
FD	-4.1928	-6.5318***,[b]	2007	I(1)
INFL	-5.5412***,[a]	-6.9325	1995	I(0)
GOVT	-5.4457***,[b]	-8.7296	2003	I(0)
LGINI	-4.5581	-4.7762*,[b]	1992	I(1)
FI	-2.8551	-6.5501***,[a]	1990	I(1)
FM	-3.8758	-6.9123***,[b]	2008	I(1)

Note: Intercept = a, Intercept and Trend =b. ADF is Augmented Dickey Fuller unit root tests while ***, ** and * represent 1%, 5% and 10% levels of significance, respectively. I(0) and I(1) represent stationary at levels and first difference respectively.

Source: Author's Computation (2025).

Threshold of financial development on poverty level in Nigeria

To attain goal of this study, which defines the optimal level of financial development that reduces poverty in Nigeria. At its core, this research employed a resilient heteroskedasticity and autocorrelation consistent specification (HAC), which is resistant to potential residual errors like heteroskedasticity and serial correlation. In order to conduct a thorough analysis, overall financial development index (FD) served as baseline model while financial institution index (FI) and financial market index (FM) both served as robustness checks were used for the analyses.

Threshold of overall financial development on poverty level in Nigeria

Table 3 depicts the influence of FD on households' consumption expenditure (LPOV_3) a proxy for poverty when it was on either side of its threshold value. FD was given a threshold value of 15 percent during the first regime and a range of threshold values which must be greater than 15 percent and not more than 17 percent in the second regime. Also, a threshold of equal or greater than 17 percent was recorded during the third regime below which poverty level would not reduce. First, FD had a negative but minor effect on LPOV_3, according to the threshold regression model. However, when the amount of financial development increased, this influence shifted from negative to positive. According to the findings, a certain degree of financial development was required for poverty reduction in Nigeria before the country can be considered prosperous. This was consistent with the results of Bolarinwa et al. (2021) and Zahonogo (2016).

The control variables' behaviours also revealed that Government size, per capita GDP and inflation, entered significantly and positively (except for GOVT which was negative and significant) and only trade openness that was not significant and positive; however, while the other variables continued to have a positive impact on poverty, only GOVT moved in the same direction as FD. As a whole, the finding indicated that there was a non-linear connection between FD and LPOV_3.

Table 3

Threshold Regression showing the effect of Financial Development (FD) at both sides of its Threshold Value LOG (POV_3)

Dependent Variable: LOG(POV_3)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FD < 0.15478899 -- 7 obs				
FD	-3.1241	5.7074	-0.5473	0.5888
C	-6.0121	1.7571	-3.4215	0.0021
L (POV_3(-1))	0.3169	0.2146	1.4768	0.1517
0.15478899 <= FD < 0.17374399 -- 6 obs				
FD	24.8498	8.6297	2.8795	0.0079
C	-12.9766	2.6703	-4.8595	0.0000
L (POV_3(-1))	1.0603	0.0659	16.0770	0.0000
0.17374399 <= FD -- 26 obs				
FD	1.8906	1.1495	1.6446	0.1121
C	-5.9548	1.4558	-4.0904	0.0004
L (POV_3(-1))	0.1904	0.1053	1.8083	0.0821
Non-Threshold Variables				
GOVT	-0.0332	0.0126	-2.6200	0.0145
L (TOP)	0.0502	0.0334	1.5016	0.1452
L (PCGDP)	0.7031	0.1346	5.2217	0.0000
INFL	0.0049	0.0025	1.9595	0.0609

NOTE: ***, ** and * represent 1%, 5% and 10% levels of significance, respectively.
Source: Author's computation (2025).

Robustness Checks

Threshold of financial institution on poverty level in Nigeria

Table 4 depicts the influence of FI on LPOV_3 when it was on either side of its threshold value. For FI, a threshold value of less than 18 percent was calculated during the first regime while in the second regime, threshold value of greater or equal to 18 percent was

equally calculated for the second regime. Initial results of the threshold regression showed that FI had a negative and statistically significant effect on LPOV_3. That is below the threshold value of 18 percent poverty was alleviated. As the amount of financial institution increased, this impact grew more negative and statistically insignificant. At the second regime, poverty was said to reduce if the threshold value was equal to or greater than 18 percent. During the period under consideration, the empirical data indicated that there was a negative association between FI and LPOV_3 in Nigeria.

Log of per capita GDP and Inflation rate entered significantly. Inflation had a negative and significant relationship with poverty. This is not in line with apriori expectation in Nigeria. The reason might be that high and increasing level of inflation has contributed negatively to increase in poverty level in the country.

Table 4

Threshold Regression showing the effect of Financial Institution (FI) at both sides of its Threshold Value LOG(POV_3)

Dependent Variable: LOG(POV_3)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FI < 0.1767794 -- 15 obs				
FI	-23.462	6.4483	-3.6384	0.0011
C	-0.2568	1.5373	-0.1670	0.8685
L (POV_3(-1))	1.1852	0.2146	5.5212	0.0000
0.1767794 <= FI -- 24 obs				
FI	-2.8242	1.8182	-1.5533	0.1312
C	-1.7981	1.4060	-1.2788	0.2111
L (POV_3(-1))	0.7628	0.1265	6.0274	0.0000
Non-Threshold Variables				
D(GOVT)	0.0180	0.0154	1.1654	0.2533
L (TOP)	-0.1360	0.0938	-1.4497	0.1579
L (PCGDP)	0.3066	0.1268	2.4177	0.0221
INFL	-0.0014	0.0008	-1.7712	0.0870

NOTE: ***, ** and * represent 1%, 5% and 10% levels of significance, respectively.
Source: Author's computation (2025).

Threshold of financial market on poverty level in Nigeria

Table 5 depicts the influence of FM on LPOV_3 when it was on either side of its threshold value. For the Financial Market threshold value of 18 percent was calculated given the first regime while the threshold value of equal or greater than 18 percent was calculated for the second regime. In the first regime, poverty level was reduced at a threshold value not less than 18 percent.The threshold regression showed that, initially, FM had a positive but

negligible effect on LPOV_3. With an increase in the degree of financial market, this impact became negative and insignificant. At the second regime, poverty was reduced if development in financial market was equal or greater than 18 percent. As the financial market (FM) increased, the amount of poverty decreased, and vice versa. The conclusion is consistent with the linear theory proposed by Galor and Zheira (1993) as well as Banerjee and Newman (1993).

The control variables, GOVT and TOP entered negatively but not significant while INFL was positive and equally not significant. However, log of per capita GDP was positive and significant.

Table 5

Threshold Regression Showing the effect of Financial Market (FM) at both sides of its Threshold Value LOG(POV_3)

Dependent Variable: LOG(POV_3)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FM < 0.1810276 -- 15 obs				
FM	2.1503	2.3438	0.9174	0.3665
C	-3.6111	1.9941	-1.8108	0.0805
L (POV_3(-1))	0.7337	0.1534	4.7831	0.0000
0.1810276 <= FM -- 24 obs				
FM	-0.0837	0.6184	-0.1354	0.8932
C	-0.5356	1.7371	-0.3083	0.7600
L (POV_3(-1))	0.0674	0.1887	0.3574	0.7233
Non-Threshold Variables				
D(GOVT)	-0.0114	0.0160	-0.7127	0.4817
L (TOP)	-0.1352	0.0834	-1.6209	0.1159
L (PCGDP)	0.3893	0.1591	2.4465	0.0207
INFL	0.00140.0018		0.8090	0.4251

NOTE: ***, ** and * represent 1%, 5% and 10% levels of significance, respectively.
Source: Author's computation (2025)

Conclusion

Over the period 1970 to 2023, researcher investigated the threshold of financial development indices that lower poverty level in Nigeria. Also, financial sector development threshold values that lowered poverty levels were determined between 15 and 17 per cents in Nigeria. The research, on the other hand, concludes that financial development may make a significant contribution to alleviating the scourge of poverty in Nigeria.

Recommendations

From the results of the analyses, the following recommendations emerged:

It has been found that Nigeria has financial development threshold values of between 15 to 18 percent that lowers poverty level; policymakers should take note of this. Nonetheless, policymakers should continue to pursue measures that improve financial sector development levels till the threshold level is reached.

This study suggests strategies to increase financial inclusion and access, allowing for the spread of financial intermediation and markets to benefit the entire population. Previously disadvantaged adults will be able to access financial services, participate in economic activities, and contribute to Nigeria's economic success.

The financial system in general should be more inclusive to care for small and medium enterprises, youths, women and people in rural areas in the country. Certain percentage of credit facilities should be made available for the poor. In order to assess financial inclusion measures, data on access to financial services in Nigeria must be collected on a regular and systematic basis. Also, agencies in charge of capital market should engage in reforms to correct the situation in Nigeria.

Effort should be made to improve on financial institution by deploring adequate infrastructural facilities such as improvement in financial technologies to assist the institution. Also, adequate legal and regulatory frameworks should be put in place to make people have confidence in the working of the financial institutions in Nigeria.

To solve the problem of poverty in Nigeria, government should pursue policies and programmes that ensure even redistribution of income. This can be achieved by subsidising necessity goods and imposition of heavier taxes on the luxury goods and development infrastructural facilities at a subsidised rate for the poor.

More poverty alleviation policies and programmes targeting more at the poor should be pursued rigorously. Small and Medium Scale (SME) loans and at a subsidised rate with moderate collateral security should be made available to the poor and ensure fair sharing to wealthy populace as well. This research supports the Central Bank of Nigeria, Financial Inclusion Strategies launched in 2012.

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