

Microcredit Operations and Human Development Nexus in Nigeria: A Multi-Sectoral Analysis

Ikechukwu. S. Nnamdi^{1*} Daniel E. Eniekezimene²
snnamdi95@gmail.com dan.enieke@gmail.com

* - Department of Finance and Banking, University Of Port Harcourt, Port Harcourt, Nigeria.

*E-mail of the corresponding author: snnamdi95@gmail.com

ABSTRACT

Motivated by the need to evaluate the extent to which microcredits disbursed to classified sectors of economic activity as utilized by the active poor do influence Nigeria's human development index in both the short and long run, this study employs published data obtained from Central Bank of Nigeria over the period 1992 to 2016 (25 years). Estimation techniques involving Stationarity, Multiple Regression, Johansen's Cointegration and Vector Error Correction tests were employed. While the Cointegration results indicate significant long run relationship among the study variables, the Multiple Regression and Vector Error Correction estimates both point to microcredits allocated to mining/quarrying, real estate/construction and transport/general commerce sectors as the sectoral microcredits that significantly influence Nigeria's human development index both in the short and long terms respectively. The study concludes that microcredits allocated to mining/quarrying, real estate/construction and transport/general commerce are the sectoral microcredit allocations which are important in predicting Nigeria's human development index. On the whole, it is recommended that (i) operating microcredit institutions should increase their quantum of lending to the mining/quarrying, real estate/construction and transport/general commerce sectors (ii) Nigerian microcredit institutions should be encouraged to invest more in development of microcredit and deposit products in order to enhance their sectoral lendings and consequently Nigeria's human development index.

Keywords: Microcredit, Sectoral Credit, Human Development Index.

1. INTRODUCTION

In a world where quality of human life and consequent reduction in poverty derive increasingly from quantum of prevailing economic and financial opportunities open to the citizenry, it becomes imperative to assert that the nature of operations of financial institutions is consequently becoming paramount. Despite the assertion of Schumpeter (1934) that financial institutions act as handmaids to enterprise thereby, attributing a demand-following role to financial institutions in a nation's economic growth process, micro finance institutions have been empirically verified as strategic in enhancing economic growth of nations. In this respect, Nnamdi and Nwiyordee (2014), Nwakanma *et al.*, (2014), Nnamdi and Torbira (2015; 2016) find substantial evidences to assert that microcredit institutions have gained increased relevance with respect to economic growth.

In recent times, the relevance of microcredit institutions has advanced from their capacity to contribute to economic growth of nations (usually conceived as their capacity to improve a nation's gross domestic product) to economic development. Quite a qualitative concept, economic development is widely proxied by several indices including the very popular human development index (HDI). HDI according to Ul-Haq (1995, 2003) as well as Mastropieri and Scruggs (2017), largely reflects improvements in economic and financial opportunities for the citizenry. Human Development Index consequently, measures the level of improvement in the well-being of the citizenry resulting from several economic and financial undertakings aimed at improving their standard of living.

Feldman (2016) observes that human development index as a measure, employs a value weighted mean of the constituent parameters in a typical basket of measures. In this sense, Wikipedia (2017) asserts that human development index reflects a value-weighted representation of the elements of life-expectancy, education, health, per capita income, standard of living, child mortality rates etc, as they prevail in any particular economy at a given point in time. Accordingly, HDI can be presented in a scale of very high, high, medium and low tiers, as well as a scale of zero to one (0-1), which represents two extremes with other values falling within.

Various government policies and programmes have been designed and implemented in Nigeria aimed at using microcredit institutions as a veritable tool or vehicle to advance the financial opportunities for the active poor, improve their financial capabilities, enhance their contributions to Nigeria's economic growth and ultimately, improve the wealth and standard of living of the active poor. The programmes include as observed by Adeyemi (2007) and Agene (2011), establishment of Nigeria's Agricultural Co-Operative and Rural Development Bank,

Agricultural Credit Guarantee Scheme, Rural Banking Scheme, Community Banking Scheme, Various Co-Operative Societies and of recent, Microfinance Banking Scheme.

Some of the empirical studies on microcredit and finance operations have concentrated on the influence of microcredits on economic growth of nations. Accordingly, they focus on the effect of microcredits on the growth of economies of specified nations generally, or on sectoral basis through credits advanced to micro enterprises.

To this extent, while Sharma and Puri (2013) evaluate the effect of microcredits on Indian economy, Nwakanma et al., (2014), as well as Nnamdi and Torbira (2015, 2016) evaluate the influence of microcredits on Nigeria's economy, all on the employment of gross domestic product as proxy for the nation's economic growth. On the other hand, while Okpara (2010), Nwigwe et al., (2012), Idowu and Oyeleye (2012), Idowu and Salami (2010) and Audu and Achegbulu (2011) evaluate the effect of microcredit operations on household incomes with a consequent reduction in poverty index, the studies of Yunus (2003,2008) fundamentally provide strong advocacy for propagation of the significant capacity of micro finance operations to alleviate the conditions of the active poor worldwide. Obviously, the studies listed above can be categorized into three. The first group consists of those that although empirical, concentrate on the influence of microcredit/finance on national economic growth through employment of gross domestic product. The second category as represented by Okpara (2010), Nwigwe et al., (2012), Idowu & Oyeleye (2012), Idowu and Salami (2010), evaluate relationships between micro finance operations and poverty reduction by the employment of households as basic economic units. The third group consists of the lead and path breaking advocacy studies of Yunus (2003, 2008) relating to the potency of microfinance and credit institutions with respect to both poverty alleviation and national economic growth.

This study rests on the premise that although the literature on microcredit operations is to say the least growing, the obvious dimension of estimating the prevailing nature of empirically verifiable short and long run relationships which prevail between microcredit disbursements to classified sectors of economic activity in Nigeria and human development in the country has not been sufficiently estimated. The drive to achieve this objective and consequently contribute towards minimization of the existing gap in literature in that respect, constitutes the core problem of this study.

On the whole, this study generally aims at estimating the nature of short and long run relationships that prevail between microcredits disbursed to various sectors of Nigeria's economy and corresponding human development index in the country. While the results of this study are hoped to provide valuable information to policy makers and microcredit administrators generally, they are specifically hoped to aid in the achievement of targeted human development objectives and schemes in Nigeria as they relate to microcredit disbursements, associated policy adjustments and controls.

While the introductory section has been presented above, the rest of this study is presented in four parts. Section two offers the theoretical framework and review of previous studies, while section three deals with materials and methods of analysis. Section four presents the results and analysis of same while section five concludes the study with the discussions, conclusions and policy recommendations.

2. THEORETICAL FRAMEWORK AND REVIEW OF PREVIOUS STUDIES:

For clarity, this section is subdivided into:

2.1 Theoretical Framework:

To establish a theoretical connection, a review of the following theories and their relevance to the subject at stake are presented as follows;

2.1.1 The Theory of Financial Intermediation:

Early studies of Schumpeter (1934) bring to the fore, the capacity of the financial system in providing credits to support entrepreneurship. The Novelty of Schumpeterian theory derives from recognition of financial institutions as sufficiently endowed with the capacity to fund the credit needs of entrepreneurship through formal intermediation process, although in a demand-following manner. In this wise, the study argues that financial institutions act as hand-maids to entrepreneurship. The ever-increasing potential of financial institutions to meet and often, exceed the credit requirements of operating enterprises for expansion in production of goods and services in the economy therefore, results in extensive leaps in national economic growth and attendant business booms.

Although Nnamdi (2015) argues that one of the functions of formal financial market institutions in any economy is to guarantee efficient mobilization and allocation of mobilized financial resources to the needy sectors, the earlier studies of Robinson (1952), Goldsmith (1969), McKinnon (1973), Bencivenga and Smith (1991), Patrick (1976) as well as Shaw (1976) articulate the capacity of financial institutions, especially under liberalized policy environments, to propel economic growth. This is achieved through proper management of real interest rates which drive economic growth through savings-investment process. In that wise, liberalized interest rate management policies theoretically result in significant economic growth, while repressive policies would produce the converse.

2.1.2 The Exigency, Gap and Catalyst Theses:

Closely observed by Nwankwo (1985) as providing significant framework for accelerated embracement of microcredit programmes by less developed economies are the gap, exigency and catalyst theses. The gap thesis attributes the emergence of development banks of which microcredit institutions constitute a significant part thereof, to lack of appropriate financial institutions in the wake of industrial revolution and emergence of nation states to care for the credit needs of those entrepreneurs with long term fund requirements. The exigency thesis on the other hand, views emergence of development financial institutions as resulting from the need to urgently embrace wide scale national economic development programmes in the less developed economies following achievement of national political independence. Accordingly, it necessitated the establishment of such development-oriented financial institutions as a matter of urgency. Further, the catalyst thesis leverages on the capacity of such development finance institutions to engage in significant level of investment banking activities which provide basis for attraction of large scale international and national investors to participate in funding identified local investment opportunities in the developing economies.

2.1.3: The Supply-Leading Finance Theory:

The Supply-leading Finance Theory originally provides theoretical support for public subsidy of rural farmers in Europe which was later extended to other micro enterprises. The key argument centers on the fact that rural farmers were generally conceived as poor and as such, do not have capacity to save. In that sense, Robinson (2001) asserts that the state felt that since farmers are central to the issue of food production and supply of industrial raw materials, they needed to be availed with subsidized farm inputs which they would repay during the harvest season. In this sense, the study further observed that critics of supply-leading finance theory found that uncontrolled subsidies have the long run effect of distorting credit prices (interest rates). Further, it may also, give way to situations where some local influentials may divert subsidized inputs and sell them eventually at commercial rates at the expense of the farmers and society at large.

2.2 Review of Previous Studies

Scholars have severally evaluated the nature of interrelationships which prevail between various forms of microcredit disbursements and national economic growth, sectoral economic development within a given economy, as well as economic units inclusive of household incomes and poverty reductions. In this light, Seibeil (2000) as well as Ehigiamusoe (2011) contend that although the active poor are generally believed to lack access to financial services provided by conventional (commercial and Merchant) banks, empirical evidences however, confirm that the active poor are significantly bankable.

The study consequently argues that the active poor have in recent periods, acquired appreciable capacity to run deposit accounts, invest in financial securities, borrow and repay loans, as well as patronize micro insurance facilities as a result of expansion and consolidation in micro finance services and products. Resultantly, a significant number of active poor have not only participated in patronage of such services but have experienced accelerated improvements in their income levels, social, economic and financial advancements. These have directly, contributed to improvements in human development index ratings. Further, the evidences provided by Quinones and Remenyi (2000) demonstrate compelling basis to assert that on the average, households with significant access to micro finance facilities and credits realize substantially, higher average incomes relative to those other households without access to microfinance facilities.

In this light, Nnamdi and Nwiyordee (2014) evaluate the influences of private sector microcredit programmes in Nigeria, financial inclusion and sectoral growth of entrepreneurial activities over the period 1992 to 2011. The study employs published data and evaluates the nature of prevailing causal relationships between classified sectoral economic activity contributions to Nigeria's gross domestic product and the quantum of disbursed microcredits to those classified sectors of economic activity. The results provide evidence to confirm that among the classified sectors of economic activity in Nigeria (transport/commerce, real estate/construction, manufacturing/food processing, other mining/quarrying and agriculture/forestry) only microcredit allocations to the other mining/quarrying sector tend to significantly promote (Granger Cause) Nigeria's gross domestic product. The study recommends intensified development of micro deposit and credit products and enforcement of credit contracts to ensure enhanced contribution of microcredits to Nigeria's sectoral economic growth.

Urged by the need to evaluate the extent to which sectoral economic activities in Nigeria propel demands for microcredits, Nnamdi and Akinpelumi (2016) find significant long run relationship between classified sectoral economic activities in Nigeria and demand for microcredits (disbursed). However, the study finds significant prevalence of Schumpeterian independent hypothesis in most of the classified sectors of economic activity. This is because significant causal relationships only prevail between disbursed microcredits and sectoral activities in only one out of the five classified sectors. The study recommends that microcredit institutions should invest more in the development and marketing of more sector-specific micro deposit and credit products to achieve significant level of promotion and/or support between sectoral economic activities and microcredit allocations.

On the Indian economy, Sharma and Puri (2013) evaluate the extent of relationship between microcredits and economic growth in India. The study employs correlation and simple regression analytical techniques and

confirms prevalence of significant measures of association and relationship between disbursed microcredits and economic growth in India over the period 2006 to 2012. The contributions of the variations in microcredits to changes in India's GDP was also very high. In another development, Nnamdi and Torbira (2015) take a multi-sectoral perspective to the relationship between microcredits and Nigeria's economic growth. Employing data over the period 1992 to 2014, ADF, Johansen's Cointegration, Error Correction and Pair-Wise Granger Causality tests were conducted. The study finds prevalence of significant long run relationships among the study variables. However, Nigeria's GDP and sectoral microcredit allocations failed to promote and/or Granger Cause each other. Further, Nnamdi and Torbira (2016) compared the leveraging effects of conventional (commercial bank credits) and microcredits on Nigeria's economy and confirm that microcredits over the period of study (1992 to 2014), promote Nigeria's economic growth more than commercial bank credits. The study recommends establishment of more microcredit institutions as well as intensified research into micro deposit and credit products backed with enforcement of credit contracts in order to promote better and enhanced growth of Nigeria's economy through microcredit operations.

Okpara (2010) evaluates some of the critical poverty-inducing factors in Nigeria and the extent to which disbursed microcredits influence poverty reduction among the active poor in the country. The results show that increased disbursement of microcredits reduced significantly, the level of poverty among the active poor. Consequently, the study calls for significant increases in the quantum of disbursed microcredits as well as expansion in the network of microfinance institutions in Nigeria.

Audu and Achegbulu (2011) evaluate the influence of microfinance operations on poverty reduction in Nigeria. The study finds that irrespective of all investments in Nigeria's microfinance scheme, rural poverty still persists and continues unabated. The study attributes this result to the tendency for Nigerian microfinance institutions to concentrate their investments and lendings in the urban areas with little emphasis on the rural enclaves.

Nwigwe *et al.* (2012) observe that regardless of the intensity of implementation of microfinance policy pursued, its impact on poverty reduction is at best doubtful. Idowu and Oyeleye (2012) study the influence of microfinance operators in selected local government areas in Oyo state, Nigeria. They find compelling reasons to conclude that microfinance operations reduced poverty index from 0.1668 to 0.1551 within a study period of three (3) years. In another development, Idowu and Salami find that among the female hairdressers in Ogbomoso North Local Government in Oyo State, Nigeria, there is a significant relationship between the standard of living of the hairdressers and microfinance facilities they accessed.

Further, Agbaeze and Onwuka (2014) study the relationship between microcredit operations and poverty alleviation in Enugu East Local Government Council, Enugu State, Nigeria. The results provide evidence to assert that while poverty could generally be said to have remained high within the area studied, however, those households with access to microcredits on the average, enjoyed higher standards of living compared to those without access to microcredits.

Nwakanma *et al.*, (2014) study the relationship between microcredit disbursements and economic growth in Nigeria. Employing an Auto-Regressive Distributive Lag Bound (ARDL) and Granger Causality tests, the study finds a valuable long run relationship between Nigeria's economic growth and microcredit operations over the period of study, 1982 to 2011. The Granger Causality results further confirm a significant unidirectional causality which runs from Nigeria's GDP to disbursed microcredits. The study recommends intensified development of micro deposit and credit products as well as improved enforcement of credit contracts in order to deepen the effects of microcredit operations on Nigeria's economic growth.

Okafor *et al* (2016) evaluate the influence of sectoral credits on economic performance in Nigeria over the period of 1981 to 2014. Multiple regression technique was employed. The results provide evidence to suggest that microcredits allocated to various sectors have significant influence on Nigeria's economy.

Nnamdi (2015) evaluates the nexus between bank credits allocated to Nigeria's public and private sectors and the nation's economic growth over the period 1981 to 2011. The results confirm prevalence of significant long-run relationship and causalities among the variables of study. Asikhia (2009) examines micro business owners, their perceived relationships with microfinance organizations and the consequent influences on their income levels and national development. The results indicate that the strength of relationship between micro business operators and microfinance institutions is more of a function of their anticipated benefits from such relationships.

3. MATERIALS AND METHODS

For the purpose of better comprehension, this section is subdivided into the following sub-sections:

3.1 Data and Employed Variables Description:

This study employs annualized data on Nigeria's human development index (HDI) and microcredits disbursed to the following sectors: agriculture & forestry, mining and quarrying, manufacturing and food processing, real estate and construction, transport/commerce, and others in accordance with Central Bank of Nigeria's

classifications of sectoral economic activities in Nigeria as published in its Statistical Bulletins over the period 1992 to 2016 shown in appendix. Further, because human development index (HDI) is expressed as a ratio while microcredit allocations to classified economic activity sectors are presented in billions of Naira (₦b), it is deemed appropriate in this study to express sectoral microcredit allocations as a ratio of total microcredits disbursed annually in Nigeria in order to express the study variables in like terms. These are shown in table I below;

Table I: Human Development Index (HDI), Microcredits Allocated to Agriculture & Forestry Sector as a Ratio of Total Microcredits (MAFG), Microcredits Allocated to Mining & Quarrying Sector as a Ratio of Total Microcredits (MMQG), Microcredits Allocated to Manufacturing & Food Processing Sector as A Ratio of Total Microcredits (MMFP), Microcredits Allocated to Real Estate & Construction Sector as a Ratio of Total Microcredits (MREC), Microcredits Allocated to Transport/Commerce Sector as a Ratio of Total Microcredits (MTCS), Microcredits Allocated to Others Sector as a Ratio of Total Microcredits (MOTS) In Nigeria Over the Period 1992 to 2016.

Year	HDI	MAFG/TM CR	MMQG/TM CR	MMFP/TM CR	MREC/TM CR	MTCS/TM CR	MOTS/TM CR
1992	0.38	0.22	0.13	5.38	0.73	3.12	0.49
1993	0.38	0.19	0.05	22.74	0.37	5.89	0.24
1994	0.39	0.13	0.21	6.24	0.17	14.72	0.55
1995	0.39	0.09	0.18	6.97	0.82	5.61	0.37
1996	0.4	0.16	0.08	8.83	0.60	7.50	0.30
1997	0.4	0.23	0.08	7.02	0.53	6.94	0.26
1998	0.41	0.38	0.03	9.66	0.22	15.54	0.12
1999	0.41	0.34	0.03	10.87	0.24	20.14	0.08
2000	0.42	0.34	0.03	10.87	0.24	20.14	0.08
2001	0.46	0.34	0.03	10.87	0.24	20.14	0.08
2002	0.4	0.34	0.03	10.87	0.24	20.14	0.08
2003	0.4	0.34	0.03	10.87	0.24	20.14	0.08
2004	0.46	0.34	0.03	10.87	0.24	20.14	0.08
2005	0.47	0.34	0.03	10.87	0.24	20.14	0.08
2006	0.48	0.03	0.89	1.09	5.19	1.99	1.45
2007	0.48	0.03	0.89	1.09	5.19	1.99	1.45
2008	0.49	0.08	0.12	4.87	1.07	11.20	0.45
2009	0.49	0.08	0.12	3.99	1.06	11.69	0.70
2010	0.5	0.10	0.10	4.18	1.04	11.51	0.65
2011	0.51	0.09	0.07	5.25	1.00	20.93	0.18
2012	0.51	0.08	0.04	7.62	1.63	14.70	0.40
2013	0.52	0.05	0.13	4.87	0.89	20.42	0.56
2014	0.53	0.07	0.02	16.87	1.74	10.72	0.62
2015	0.53	0.06	0.03	8.63	1.55	22.57	0.41
2016	0.53	0.07	0.02	20.25	1.12	23.39	0.38

Source: Ectract from E-views-10 Output

Human development is captured by employment of human development index (HDI) as calculated by the United Nations in respect of Nigeria over the period of study. Further, the study employs other variables which include microcredit allocations to various classified sectors of economic activity in Nigeria as follows: Agriculture & forestry, Mining & Quarrying, Manufacturing & Food Processing, Real Estate & Construction, Transport/Commerce and Others in accordance with Central Bank of Nigeria's Classifications of same.

3.2. Specification of Analytical Tools and Tests.

The overall objective of this study is to examine the nature of inter-relationships which prevail between sectoral microcredit allocations and human development index in Nigeria. For better appreciation of this sub-section the analytical tools employed are explained as follows;

(i) Stationarity Tests:

The stationarity properties or otherwise of the time series data employed need to be ascertained by utilization of unit root tests. This is to ensure that employment of the data will not lead to spurious estimates. In this perspective, according to Brooks (2009), the Augmented Dickey Fuller (ADF) test is employed. The decision rule is to reject the null hypothesis if the ADF test statistic is absolutely greater than the corresponding Mackinnon's Critical Values at 1%, 5% and 10% levels of significance.

(ii) Multiple Regression Test

The multiple regression test is employed to capture the short-run estimates of the predictive regression equation. The significance of the associated t-statistics of the explanatory variables is expected to be at least 0.05, if the null hypothesis of no significance is to be rejected.

3.2.3 Johansen's Cointegration Test:

Johansen's Co-integration technique is utilized in ascertaining the prevalence of long run equilibrium relationship among the employed set of study variables. The decision rule is based on significance at 0.05 level, of the resulting co-integrating equation.

3.2.4 Error Correction Estimates.

Brooks (2009) asserts that error correction technique tends to evaluate the nature of prevailing long run sensitivities of the explained variable to each of the employed explanatory variables. Moreover, it assists in predicting the speed with which the explained variable adjusts to long run equilibrium after short run distortions in the study's explanatory variables.

3.3 Model Specification:

Changes and/or improvements in the standard of living among Nigerian citizens as reflected by human development index (HDI) can theoretically be influenced by the quantum of sectoral economic activities which are partly financed with microcredits. Consequently, the relationship between human development index and sectoral microcredit disbursements can be functionalized as expressed in equation (i) below;

$$HDI = f(MAFG, MMQG, MMFP, MREC, MTCS, MOTS) \quad (i)$$

Where:

HDI = Human Development Index

MAFG = Microcredits allocated to agriculture/forestry sector as a ratio of total disbursed microcredits in Nigeria.

MMQG = Microcredits allocated to mining/quarrying sector as a ratio of total microcredits disbursed in Nigeria.

MMFP = Microcredits allocated to manufacturing & food processing sector as a ratio of total microcredits disbursed in Nigeria.

MREC = Microcredits allocated to real estate & construction sector as a ratio of total microcredits disbursed in Nigeria.

MTCS = Microcredits allocated to transport/commerce sector as a ratio of total microcredits disbursed in Nigeria.

MOTS = Microcredits allocated to others sector as a ratio of total microcredits disbursed in Nigeria.

For estimation purposes, equation (i) is re-written as shown in equation (2) below;

$$HDI = \beta_0 + \beta_1 MAFG + \beta_2 MMQG + \beta_3 MMFP + \beta_4 MREC + \beta_5 MTCS + \beta_6 MOTS + \mu_1$$

β_0 = Constant Parameter

$\beta_1, - \beta_6$ = Estimation parameters for sectoral microcredits respectively

μ_1 = Error terms

3.4 Apriori Expectations: Provision of microcredits to entrepreneurs in any sector is theoretically expected to increase the tempo of investment, sectoral outputs of goods and services and consequently, the quality of human life in those sectors. It is correspondingly expected that for all sectors, sensitivity of HDI to sectoral microcredits will be higher than zero. Consequently, it is expected that;

$$\beta_1 > 0, \beta_2 > 0, \beta_3 > 0, \beta_4 > 0, \beta_5 > 0 \text{ \& } \beta_6 > 0$$

4. PRESENTATION OF RESULTS

4.1 Presentation of Stationarity (Unit Root) Test Results:

The results of the stationarity tests for all the study variables are presented in table 2 below:

Table 2: Results of Stationarity (Unit Root) tests:

(Differenced) Variable	ADF Test statistic	Mackinnon's Critical Values at 1%, 5% & 10%			Order of Integration	Prob.
		1%	5%	10%		
D(HDI)	-6.087385	-3.769597	-3.004861	-2.642242	I(1)	0.0001
D(MAFG)	-4.319326	-3.752946	-2.998064	-2.638752	I(1)	0.0028
D(MMQG)	-5.209903	-3.769597	-3.004861	-2.642242	I(1)	0.0004
D(MMFP)	-10.39927	-3.752946	-2.998064	-2.638752	I(1)	0.0000
D(MREC)	-5.158944	-3.769597	-3.004861	-2.642242	I(1)	0.0004
D(MTCS)	-6.181553	-3.752946	-2.998064	-2.638752	I(1)	0.0028
D(MOTS)	-5.299411	-3.769597	-3.004861	-2.642242	I(1)	0.0003

D(HDI), D(MAFG), D(MMQG), D(MMFP), D(MREC), D(MTCS) and D(MOTS) denote the differenced variants of Human Development Index, Total Microcredits Disbursed to Agriculture & Forestry Sector, Mining & Quarrying Sector, Manufacturing & Food Processing Sector, Real Estate & Construction Sector, Transport/Commerce Sector and to Others Sector respectively.

Source: Extracts from E-Views 10 Output.

Table 2 presents the stationarity test results for the employed data. Generally, the absolute values of the ADF test statistics for all the employed study variables are higher compared to all their corresponding Mackinnon's critical values at 1%, 5% and 10% respectively. In all, the study variables are integrated of order I(1). As such, they are deemed fit for utilization in subsequent estimations.

a. Presentation of OLS Results

To analyze the short run interrelationships and the variations in HDI accounted for by changes in the variations in the predictor variables in the short run, the ordinary least squares test was implemented. The results are shown in table 3 below:

Table 3: Results of Multiple Regression Test [Ordinary Least Square (OLS) test]

Dependent Variable: D(HDI)

Method: Least Squares

Date: 01/25/18 Time: 23:59

Sample: 1992 2016

Included observations: 25

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.372001	0.030984	12.00626	0.0000
D(MAFG)	-0.094751	0.068905	-1.375097	0.1860
D(MMQG)	-0.305911	0.070932	-4.312758	0.0004
D(MMFP)	-0.001362	0.001119	-1.217719	0.2391
D(MREC)	0.049601	0.011446	4.333466	0.0004
D(MTCS)	0.004734	0.000900	5.262232	0.0001
D(MOTS)	0.080543	0.047213	1.705945	0.1052
R-squared	0.870004	Mean dependent var		0.453600
Adjusted R-squared	0.826673	S.D. dependent var		0.054074
S.E. of regression	0.022512	Akaike info criterion		-4.518003
Sum squared resid	0.009123	Schwarz criterion		-4.176718
Log likelihood	63.47504	Hannan-Quinn criter.		-4.423345
F-statistic	20.07772	Durbin-Watson stat		1.983408
Prob(F-statistic)	0.000000			

Source: Extracts from E-Views 10 Output.

Table 3 above shows a coefficient of determination (R^2) of 0.870004, which implies that variations in all the explanatory variables account for 87% of the variations in Nigeria's human development index, while the rest 12.43% of the variations is attributable to other variables not captured in the study. The results provide evidence that in the short run, the coefficients of microcredits disbursed to mining & quarrying, real estate & construction, as well as transport and commerce sectors are significant in explaining the variations in Nigeria's human development Index. On the other hand, allocated microcredits to agriculture & forestry, manufacturing & food processing, and Others sector failed the significance test. On the whole, the F-statistic is significant at 0.05 level, which implies a good line of fit while the Durbin-Watson statistic value of 1.983408 is within acceptable range and serves as an evidence of absence of significant autocorrelation.

4.3 Presentation of Johansen's Co-integration Test Results:

Table 4 below presents the results of Johansen Cointegration tests for all the variables of this study:

**Table 4: Results of Johansen's Unrestricted Cointegration Rank Test:
 Test (Maximum Eigen Value):**

Date: 01/25/18 Time: 23:01
 Sample (adjusted): 1994 2016
 Included observations: 23 after adjustments
 Trend assumption: Linear deterministic trend
 Series: HDI MAFG MMQG MMFP MREC MTCS MOTS
 Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.996770	306.2341	125.6154	0.0000
At most 1 *	0.967035	174.3242	95.75366	0.0000
At most 2 *	0.821810	95.84096	69.81889	0.0001
At most 3 *	0.712367	56.16810	47.85613	0.0068
At most 4	0.576601	27.50852	29.79707	0.0898
At most 5	0.269847	7.741413	15.49471	0.4935
At most 6	0.021840	0.507877	3.841466	0.4761

Trace test indicates 4 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 *	0.996770	131.9099	46.23142	0.0000
At most 1 *	0.967035	78.48328	40.07757	0.0000
At most 2 *	0.821810	39.67286	33.87687	0.0091
At most 3 *	0.712367	28.65958	27.58434	0.0363
At most 4	0.576601	19.76711	21.13162	0.0767
At most 5	0.269847	7.233537	14.26460	0.4619
At most 6	0.021840	0.507877	3.841466	0.4761

Max-eigenvalue test indicates 4 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Source: Extracts from E-Views 10 Output.

The Johansen's cointegration results shown in table 4 above confirm prevalence of four (4) co-integrating equations, thus indicating the prevalence of a significant long run relationship among the time series variables under study. The trace statistics as well as the Max-Eigen Statistics values are higher than their corresponding critical values for the four (4) significant co-integrating equations in the two approaches.

4.4. Presentation of Error Correction Estimates:

To correct for the errors that prevail between the long and short run dynamics of the variables in the study, the error correction test was employed. The results are shown in table 5 below:

Table 5: Results of Error Correction Model

Dependent Variable: D(HDI)

Method: Least Squares

Date: 01/25/18 Time: 23:02

Sample (adjusted): 1993 2016

Included observations: 24 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.374896	0.032486	11.54029	0.0000
D(MAFG)	-0.075440	0.076633	-0.984440	0.3396
D(MMQG)	-0.326351	0.080124	-4.073082	0.0009
D(MMFP)	-0.001626	0.001271	-1.279546	0.2189
D(MREC)	0.050033	0.012241	4.087385	0.0009
D(MTCS)	0.004392	0.001015	4.325917	0.0005
D(MOTS)	0.090410	0.051018	1.772128	0.0954
ECM(-1)	-0.034815	0.288331	-0.120747	0.9054
R-squared	0.864826	Mean dependent var		0.456667
Adjusted R-squared	0.805687	S.D. dependent var		0.052970
S.E. of regression	0.023350	Akaike info criterion		-4.415274
Sum squared resid	0.008723	Schwarz criterion		-4.022590
Log likelihood	60.98329	Hannan-Quinn criter.		-4.311095
F-statistic	14.62368	Durbin-Watson stat		2.010760
Prob(F-statistic)	0.000007			

Source: Extracts from E-Views 10 Output.

From table 5 above, the ECM coefficient is 0.034815 with the expected negative sign. It implies that approximately 3.48% of the disequilibrium in human development index (HDI) in Nigeria is offset within the year due to distortions in the explanatory variables. On the other hand, the coefficient of determination (R^2) of 0.864826 indicates that about 86.48% of the variations in Nigeria's human development index in the long run is accounted for by variations in the study's explanatory variables. Further, the results show that only microcredits disbursed to mining & quarrying, real estate & construction, and transport/commerce sectors are the significant explanatory variables for prediction of variations in Nigeria's human development index in the long run. In the same direction, other sectoral microcredit disbursements to agriculture & forestry, manufacturing & food processing, and others sector are statistically unimportant in explaining Nigeria's human development index in the long run. On the whole, the F-statistics is significant at 0.05 level, while the Durbin Watson value is within the acceptable range.

5. DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

The results of this study provide evidence of substantial agreement between the estimates of the short and long run analyses. In the short run analysis represented by multiple regression results, microcredits allocated to mining/quarrying, real estate/construction and transport/ general commerce sectors significantly relate with Nigeria's human development index. While the Johansen's cointegration test provides evidence of material long run relationship among the set of study variables, the error correction estimates indicate that microcredits allocated to mining/quarrying, real estate/construction and transport/commerce sectors significantly influence Nigeria's human development index in the long run.

Microcredits allocated to agriculture/forestry, manufacturing/food processing as well as others sector do not significantly influence Nigeria's human development index in the short and long terms.

The above results are in agreement with the fact that microcredit institutions in Nigeria substantially play significant roles in the finance of local mining/quarrying sector through group finance of co-operatives engaged in local mining and extraction of solid minerals in the various geo-political zones in Nigeria.

For the transport/general commerce sector, microcredit institutions actively fund a significant number of mass transit buses and tricycles. Many of them carry large posters on their bodies and screens to that effect until the facility is regularized. In the real estate/construction, while funding artisans like welders, fitters and block industry operators among others, the microcredit institutions have also played significantly in providing bridging facilities for some contractors engaged in constructing private homes in order to address their cash flow problems pending receipt of payments on achievement of the prescribed milestones.

The results of this study provide further support for those of Nnamdi and Nwiyordee (2014), Nnamdi and Torbira (2016), Okpara (2010) as well as Nnamdi and Torbira (2015). On the other hand, the results reveal that Nigerian microcredit institutions still substantially shy away from lending to agriculture and forestry sector probably because of the high risk associated with agricultural lending as well as substantial lack of expertise to play safely in that sector.

On the whole, it is concluded that only microcredits allocated to the mining/quarrying, real estate/construction and transport/general commerce sectors are valuable in predicting variations in Nigeria's human development index within the context of this study. Accordingly, it is recommended that (i) Nigeria's microcredit institutions should increase their lending to mining/quarrying, real estate/construction and transport/general commerce sectors in order to boost Nigeria's human development index. (ii) Nigeria's microfinance institutions should invest more resources in the development of diversified micro deposit and credit products to boost the leverage they provide to these viable sectors in order to boost human development index in Nigeria as a nation.

REFERENCES

- Adeyemi, K. S. (2007). Institutional Reforms for Efficient Micro Finance Operations in Nigeria. *Union Digest*, 11(3&4), 15-36.
- Agbaeze, E. K. & Onwuka, I. O. (2014). Impact of Micro Credit on Poverty Alleviation in Nigeria: The Case of Enugu East Local Council. *International Journal of Business and Management Review*, 2(1), 27-51.
- Agene, C. A. (2011). Microfinance Banking: Principles and Practice. *Abuja: Gene Publications*.
- Asikhia, O. U. (2009). Attitudinal Response of Small and Medium Scale Business Owners to Microfinance Banking in Nigeria. *European Journal of Social Sciences*, 11(4), 599-618.
- Audu, M. L. & Achegbulu, J. O. (2011). Microfinance and Poverty Reduction: The Nigerian Experience. *International Business and Management*, 3(1), 220-227.
- Bencivenga, V. R., & Smith, B. D. (1991). Financial Intermediation and Endogenous Growth. *The Review of Economic Studies*, 58(2), 195-209.
- Brooks, C. (2009). *Introductory Econometrics for Finance*, Cambridge, Cambridge University Press, 337-339.
- Ehigiamusoe, G. (2011). *Issues in Microfinance: Enhancing Financial Inclusion*, Lagos, Mindex Publishing Co.
- Feldman, R. S. (2016). *Development Across The Life Span*. Pearson. 10-13.
- Goldsmith, R. W. (1969). *Financial Structure and Development*, New Haven: Yale University Press.
- Human Development Index (2014). <https://hubpages.com/politics>, retrieved on 24/11/17.
- Idowu, A. & Oyeleye, O. A. (2012). Impact of Microfinance Banks on Poverty Alleviation in Selected Local Government Areas of Oyo State, Nigeria. *European Journal of Business and Management*, 4(21), 125-137.
- Idowu, A. & Salami, A. O. (2010). Impact of Microfinance Banks on Standard of Living of Hairdressers in Ogbomoso North Local Government of Oyo State, Nigeria. *American Journal of Social and Management Sciences*, 2(1), 34-40.
- Maddala, G. S. (2007). *Introduction to Econometrics*, New Delhi, John Willey. 379-380.
- Mastropieri, M. A., & Scruggs, T. E. (2017). *The Inclusive Classroom: Strategies for Effective Differentiated Instruction*. Pearson.
- McKinnon, R. (1973). *Money and Capital in International Development*. Washington, DC: The Brookings Institution.
- Nnamdi, I. S & Nwiyordee, A. N. (2014). Private Sector Microcredit Programmes, Financial Inclusion and Sectoral Entrepreneurship: Evidence and Insights from Nigeria. *European Journal of Business and Management*. 6(35). 204-214.
- Nnamdi, I. S. & Akinpelumi, F. O. (2016). How Far Do Sectoral Entrepreneurship Contributions to Nigeria's Economic Growth Influence Disbursement of Microcredits? An Evaluation, *Hezekiah University Journal of Management and Social Sciences*, 4(1), 13-26.

- Nnamdi, I. S. & Torbira, L. L. (2015). Microcredits in Nigeria's Economic Growth Process: A Multi-Sectoral Analysis, *Nigerian Journal of Financial Research*, 10(1), 1-4.
- Nnamdi, I. S. & Torbira, L.L (2016). Leveraging Nigeria's Economic Growth: Conventional or Microcredits. *African Social and Educational Journal*. 5(1), 284-299.
- Nnamdi, I. S. (2015). Private Vs. Public Sector Bank Credits And Economic Growth Nexus In Nigeria: Where Does Efficacy Rest?. *Research Journal of Finance and Accounting*. 6(3). 26-237.
- Nwakanma, P.C, Nnamdi, I.S. & Omojefe, G.O. (2014). From Rural To Micro Finance Banking: Contributions of Microcredits To Nigeria's Economic Growth – An ARDL Approach, *International Journal of Financial Research*, 5(3), 73-85.
- Nwankwo, G. O. (1985). *The Nigerian Financial System*, London, Macmillan Publishers. 95-98.
- Nwigwe, C. A., Omonona, B. T., & Okoruwa, V. O. (2012). Microfinance and Poverty Reduction in Nigeria; A Critical Assessment. *Australian Journal of Business and Management Research*, 2(4), 33-40.
- Okafor, I.G, Ezeaku, H.C & Ugwuegbe, S. U. (2016). Effect of Private Sector Credit on Economic Growth in Nigeria (1981-2014). *EPRA International Journal of Research and Development (IJRD)*, 1(6).
- Okpara, G. C. (2010). Microfinance Banks and Poverty Alleviation in Nigeria, *Journal of Sustainable development in Africa*, 12(6), 177-191.
- Patrick, H. T. (1976). *Demand Following or Supply Leading Finance*. In Meier, G. M. (ed), *Leading Issues in Economic Development*, New York, Oxford University Press, 296-299.
- Quinones, B., & Remenyi, J. (2000). *Microfinance and Poverty Alleviation: Case Studies from Asia and the Pacific*, New York, Pinter.
- Robinson, J. (1952). *The Generalization of the General Theory*. In J. Robinson (Ed.) *the Rate of Interest and Other Essays*, London, MacMillan, 86-87.
- Robinson, M. (2001). *The Microfinance Revolution: Sustainable Finance for the Poor*. World Bank Publications, 138-149.
- Schumpeter, J.A. (1934). *The Theory of Economic Development*, Cambridge, Mass, Harvard University Press.
- Seibel, H. D. (2000). *Agricultural Development Banks: Close Them or Reform Them*. Working paper/University of Cologne, *Development Research Center*. 37(2).
- Sharma, G. L. & Puri, H. (2013). An Empirical Testing of Relationship Between Microfinance and Economic Growth in India, *Journal of Indian Research*, 1(2), 87-94.
- Shaw, E. S. (1976). *Financial Repression and Liberalization*, In Meier, G. M. (ed), *Leading Issues in Economic Development*, New York, Oxford University Press, 305-310.
- Ul-Haq, M. (1995). *Reflections on Human Development*. Oxford University Press. 12-26.
- Ul-Haq, M. (2003). The Birth of The Human Development Index. *Readings in Human Development*, 127-137.
- Wikipedia (2017). Human Development Index. https://en.wikipedia.org/wiki/Human_Development_Index.
- Yunus, M. (2003). *Jolis A. Banker to the Poor: Micro-lending and the Battle Against World Poverty*. New York, Public Affairs.
- Yunus, M. (2008). *Creating a World Without Poverty: Social Business and the Future of Capitalism*, New York, Public Affairs.

Appendix

Table 1: Human Development Index (HDI), Microcredits to Agriculture & Forestry Sector (MAFG), Microcredits to Mining & Quarrying Sector (MMQG), Microcredits to Manufacturing & Food Processing Sector (MMFP), Microcredits to Real Estate & Construction Sector (MREC), Microcredits to Transport/Commerce Sector (MTCS), Microcredits to Others Sector (MOTS) and Total Microcredits Disbursed in Nigeria over the Period 1992 to 2016.

Year	HDI	Total Microcredit Disbursed (N'b)	Agriculture & forestry (N'b)	Mining & Quarrying (N'b)	Manufacturing & Food Processing (N'b)	Real Estate & Construction (N'b)	Transport/Commerce (N'b)	Others (N'b)
1992	0.38	135.80	29.50	3.70	19.90	14.60	45.60	22.50
1993	0.38	654.50	123.20	5.70	129.60	47.50	280.00	68.50
1994	0.39	1220.60	155.40	32.20	201.00	34.90	513.80	283.30
1995	0.39	1129.80	98.60	17.90	124.80	102.60	575.70	210.20
1996	0.4	1400.20	229.40	17.60	155.40	92.70	695.00	210.10
1997	0.4	1618.80	367.40	28.50	200.00	105.20	729.90	187.80
1998	0.41	2526.80	962.70	31.00	299.40	67.10	1042.70	123.90
1999	0.41	2958.30	1007.20	27.00	293.50	71.90	1447.80	110.90
2000	0.42	3666.60	1248.35	33.46	363.77	89.11	1794.44	137.45
2001	0.46	1314.00	447.37	11.99	130.36	31.94	643.08	49.26
2002	0.4	4310.90	1467.71	39.34	427.69	104.77	2109.77	161.61
2003	0.4	9954.80	3389.27	90.86	987.64	241.95	4871.91	373.18
2004	0.46	11353.80	3865.58	103.62	1126.44	275.95	5556.58	425.63
2005	0.47	28504.80	9704.91	260.16	2828.03	692.79	13950.33	1068.58
2006	0.48	16450.20	505.23	449.33	491.98	2554.43	5078.32	7370.91
2007	0.48	22850.20	701.80	624.14	683.39	3548.24	7054.05	10238.58
2008	0.49	42753.06	3354.30	412.40	2006.33	2139.15	23962.48	10878.40
2009	0.49	58215.66	4736.90	569.70	2275.70	2421.10	28314.20	19898.06
2010	0.5	52867.50	5102.90	520.40	2172.90	2257.40	25975.90	16956.86
2011	0.51	50928.30	4679.20	329.40	1728.85	1725.45	36114.94	6350.46
2012	0.51	90422.25	7407.68	298.73	2275.01	3718.03	54673.01	22049.79
2013	0.52	94055.58	4803.12	603.25	2937.27	2616.01	53409.48	29686.46
2014	0.53	112110.15	7735.68	187.09	3156.49	5486.51	58821.75	36722.62
2015	0.53	187247.34	11761.52	390.88	3372.79	5218.26	117759.41	48744.48
2016	0.53	196194.99	14412.32	234.17	4742.99	5318.10	124412.31	47075.10

Source: Statistical Bulletin of the Central Bank of Nigeria (2016)