ABSTRACT

The microfinance institutions are evident tools for Small Scale Enterprises development due to the roles they perform in the economic advancement. Past studies have shown microfinance serves as a key player in the financial sector that has positively impacted in all works of life through the services it offers. This study is positioned to explore the case of Nigeria by examining the impact of micro-credit lending to Small Scale Enterprises on economic advancement in Nigeria over the period 1992–2019, using the autoregressive distributed lag approach to cointegration analysis. Controlling for the possible effects of crude oil price and trade openness on economic advancement in Nigeria, this study found the relationship between micro-credit lending to Small Scale Enterprises and economic advancement is negative and significant in the long-run and positive but insignificant in the short-run, thus, suggesting the weakness of financial intermediary sector in resource mobilization and allocation in Nigeria. The result, in general, illustrates the vulnerability of the financial sector in stimulating economic advancement by providing micro-credit for small businesses and the unbanked. Hence, this study suggests a well-articulated policy framework that will facilitate access to financial services.
1. INTRODUCTION

Credit is recognized in Nigeria as an important instrument for the promotion of SMEs. Over the years, the Nigerian government has undertaken numerous policy and structural reforms aimed at the flow of finance from the banking sector to small and medium-sized enterprises (SMEs), and in particular, informal sectors possibly the unbanked among the entrepreneurs [1]. The prime goal of boosting the output of SMEs' entrepreneurial activities, however, has not materialized. Traditional banks consider SMEs' activities to be poor and consequently have little interest in funding the sector, coupled with high transaction costs and short payback terms when funding is taken into account. Since robust economic growth cannot take place without the introduction of well-focused programs to alleviate poverty by empowering the unbanked to improve their access to formal financial services, as part of its banking reform agenda, the Central Bank of Nigeria has begun to license microfinance institutions to provide financial services to entrepreneurs that cannot access finance (Ozioko, 2010). The focus has thus shifted from large enterprises to small and medium-sized companies that have the potential to build national ties to rapid and sustainable industrial growth. Yarron (1998) states that Nigeria has outstanding entrepreneurs who need help at all levels, including micro, medium and medium-sized companies and big companies, hence, there is need for good funding is a common feature of these firms.

However as noted by (Hermes & Lensink, 2007), several microfinance issues remain unanswered. More attention should be given explicitly to the following two pressing issues: (1) Does the social and economic situation of the poor affected by the current operations of microfinance in developing countries? This is an important question as much effort and funding has been made available to develop microfinance as a tool for tackling poverty, especially since the beginning of the new millennium. (2) Is there long-term sustainability of microfinance institutions with respect to trade between sustainability and outreach? Fig. 1 revealed the evolutionary movement of loan to SMSEs in Nigeria. There is gradual decline in the amount of credit to SMEs from 1992 up until 2001. After that, the number of credits increases but for a limited number of years (that is between 2001 to 2002). Surprisingly, between 2003 and 2016, the amount of credit falls significantly leading to several questions surrounding the availability of loan to SMEs in Nigeria even though there is a sudden rise in the loan to SMSEs in 2017.

The crucial role of finance in the growth and survival of SMEs and the adoption of microfinance as the main source of financing SMEs in Nigeria remain pivotal. It, therefore, makes it imperative to study the extent to which microfinance can enhance small business performance considering steady the insignificant contributions of credit to SMEs in Nigeria. Besides, the empirical evidence emerging from various studies on the effect of microfinance on entrepreneurial development have so far yielded mixed results that are inconclusive and contradictory. Some studies only looked at microfinance and poverty alleviation [2,3,4], other studies looked at microcredit alone as an intervention tool for entrepreneur development [5] others looked at the presence of microfinance institutions as a catalyst for entrepreneurial development (Ozioko, 2007, Alalade 2013 Ojo, 2009). Question of whether specific microfinance services (micro-credit, micro-savings) improves or worsens SMEs performance leading the social and economic advancement is still worthy of further research. The other parts of this research article are arranged in order of sequence; review of related literature, methods and materials, discussion of results, conclusion, and policy recommendations.

2. THEORETICAL FRAMEWORK

This research is based on the growth theory of Harold (1939) and Dolmar (1946), known as Harold Dolmar growth model. The concept behind this model is that aggregate demand must increase at the same rate as the economic production capacity increases for a steady state of growth. First, we see the need for investment if an entrepreneur has to expand, and this idea corresponds to the loans and savings provided by MFIs to allow more investment by small entrepreneurs. The assumption is that their business prosperity is restricted by the region, in spite of the effort made to offer to entrepreneurs. The SMEs and members also perform well as their national economic output improves because there are more prospects for the industry. Theory suggests that microfinance institutions operate...
such activities as the procurement of loans, mobilization of insurance, training etc. that also serve as a tool that helps to increase production user potential. The literature has widely discussed the role of microfinance banks in creating development. Furthermore, Bencivenga and Smith [6] clarified that the creation of microfinance banks and efficient financial intermediation contribute to the economic growth of rural areas by channeling savings to high-productivity activities and reducing risks that could endanger their productive potential.

On the empirical front, Fant [7] examined micro-credit as a poverty reduction tool in the Savelugu/Nanton district in the northern region of Ghana. The sample comprised of 40 respondents and content analysis was adopted. The study found out that there are a marked improvement in household economic variables such as increased level of incomes, saving, expenditures on consumption and acquisition of assets. However, the study only looked at microcredit as an intervention and didn't consider micro-savings. Consequently, the study was based on a government micro credit scheme (MASLOC scheme) not clients that patronize a microfinance institution.

Ojo (2009) investigated the impact of microfinance on entrepreneurial development of small-scale enterprises that are craving for growth and development in a stiff economy in Nigeria. The sample comprises of 60 entrepreneurs in Lagos State while Chi-square, analysis of variance and simple regression analysis were adopted as tools of analysis. The study found that there is a significant difference in the number of entrepreneurs who use microfinance institutions and those who do not use them while there is a significant effect of microfinance institutions activities in predicting entrepreneurial productivity; and that there is no significant effect of microfinance institutions activities in predicting entrepreneurial development. Consequently, the study only looked at individual lending, not group lending to SMEs.

Babajide [8] investigated the effects of microfinancing on Micro and Small Enterprises (MSEs) in South-west Nigeria. The sample of the study is four hundred and forty three (443) micro-enterprises and one hundred and eighty (180) small enterprises while Survival Analysis and multiple regression analysis were adopted as tools of analysis. The findings revealed that microfinance and micro-financing enhance the survival of Micro and Small Enterprises (MSEs) but not sufficient for the growth and expansion of such Micro and Small Enterprises.

Akingunola, Adekunle, Adegbesan and Aninkan [5] determined the impact of microfinance on entrepreneurship development in Nigeria with a special reference to Ogun State. The sample of the study comprises of 300 entrepreneurs in the state while Ordinary least squares (OLS) regression method was adopted as tool of analysis. The study revealed the existence of the positive relationship between microfinance and entrepreneurship development in Nigeria. It further revealed that microfinance contributes to entrepreneurial activities that can lead to sustainable development in Nigeria.

**Fig. 1. Time evolution bank credit to SMEs**
Zhiri [1] investigated the impact of microfinance services on the performance of small and medium scale enterprises (SMES) in Zaria metropolis using a cross-sectional, descriptive and sample of 300 SMEs operating with Credit Microfinance bank within Zaria Metropolis. The study found that the microfinance services have a significant impact on the level of entrepreneurship activities of SMEs in Zaria metropolis.

Taiwo, Ayodeji and Yusuf [9] investigated Small and Medium Enterprises as a veritable tool in Economic Growth and Development using a survey method. The results of the study, therefore, reveal that the most common constraints hindering small and medium scale business growth in Nigeria are lack of financial support, poor management, corruption, lack of training and experience, poor infrastructure, insufficient profits, and low demand for product and services. The paper recommends that Government should as matter of urgency assist prospective entrepreneurs to have access to finance and necessary information relating to business opportunities, modern technology, raw materials, market, plant and machinery which would enable them to reduce their operating cost and be more efficient to meet the market competitions.

Friday [10] assessed the impact of Microfinance on Small and Medium Enterprises (SMEs) in Nigeria using survey design. The findings of the study reveal that significant number of the SMEs benefitted from the MFIs loans even though only few of them were capable enough to secure the required amount needed. Interestingly, majority of the SMEs acknowledge positive contributions of MFIs loans towards promoting their market share, product innovation achieving market excellence and the overall economic company competitive advantage. The paper recommended that Government should try to provide sufficient infrastructural facilities such as electricity, road network and training institutions to support SMEs in Nigeria.

Oluitan [11] in his work on the relationship between credit and output in Nigeria with time series data spanning 1970 to 2005, used the regression method and found that credit causes output. Also, it was found that inverse association exist between export and credit, and between oil export and credit, while non-oil export, capital inflows and imports have direct association with credit.

Ahlin and Jiang [12] investigated the association between micro-credit and development in an occupational choice model and they observed that microfinance credit has positive impact on development.

Fatoki and Odeyemi, [13] employed logistic regression on survey data derived from 445 respondents in the analysis of the determinants of credit approval for new SMEs South Africa and observed that among the determinant factors are managerial competencies, business information, networking, location, crime, business size and incorporation.

Exploring the influence of microfinance institutions on development in selected African and Asian nations, Brune, [14] employed data of MFIs from 2003 to 2006 and found a direct linkage between microfinance institutions and development. Adopting a cross sectional survey technique and MFI branch location data in determining if MFI aid microenterprises in Nigeria, Babajide, [8] observed that microfinance reduced micro businesses’ financing constraints.

Kamil [15] explored the influence of CPS on the economic growth in Ethiopia with time series data spanning 1989 to 2016. Employing the Johansen co-integration and ECM, the findings showed a direct association between economic growth and credit to private sector. Also, a long run linkage existed between CPS and economic growth. A similar study was carried out in Nigeria by Olowofeso et al, [16]. Using FMOLS technique on quarterly data ranging from 2000:1 -2014:4, they found a direct association between private credit and output while inverse linkage existed between prime lending rate and economic growth. Examining the effect of private sector credit on Nigerian economic growth with quarterly data spanning 1993:1 - 2013:4 and adopting multiple regression method, Amoo et al, [17] found direct and significant relationships among credit to private sector, trade openness, monetary policy and economic growth, while a negative association was seen among domestic investment, electricity consumption and economic growth in Nigeria.

Gözgör and Gözgör [38] investigated the linkage between bank credits and GDP per capita in 20 Latin America nations with panel data spanning 1960-2010. Using cointegration and causality tests in a panel framework, they observed that a long run linkage existed between the variables and causality running from private sector credit to
Osman [39] analyzed the association between private sector credit and Saudi Arabian economic growth with data covering 1974 to 2012. Employing ARDL method, he found that private sector credit had direct impact on RGDP while openness has inverse linkage with RGDP. Using VAR technique on data spanning 1965 to 2010, Arsene and Guy-Paulin, [40] explored the linkage between private sector credit and economic growth in Cameroon and observed that inflation directly affects credit while credit and economic growth were positively related. Investigating the influence of microenterprise loan on entrepreneurship development in Bangladesh from June to December, 2012, Ferdous, [41] adopting regression method found that loan products raises income but do not enhance innovation. Also, MFIs enhances entrepreneurial development with their group lending technique.

**Chart 1. Summary of previous studies**

<table>
<thead>
<tr>
<th>Authors</th>
<th>Sample and period</th>
<th>Methodology</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Donou-Adonsou and Sylvester [19]</td>
<td>71 developing nations (2002–2011)</td>
<td>FE and 2-stage least squares</td>
<td>Bank credits exert inverse influence on poverty while Microfinance institutions had no significant effect on poverty</td>
</tr>
<tr>
<td>Dhrifi [21]</td>
<td>89 nations (1990 to 2011)</td>
<td>Simultaneous equation</td>
<td>Direct association between household consumption expenditure per capita and GDP</td>
</tr>
<tr>
<td></td>
<td>54 developing nations (1980 to 2004)</td>
<td>fixed effect vector decomposition</td>
<td>Poverty falls as the level of financial development enhances</td>
</tr>
<tr>
<td>Umanhonlen et al, [26 a,b]</td>
<td>Nigeria (1992 -2015)</td>
<td>cointegration and ECM</td>
<td>Microfinance bank assets, deposits, and gross earnings have no significant influence on SMEs performance while microfinance loans had inverse significant impact on SMEs performance in Nigeria in both short run and long run.</td>
</tr>
<tr>
<td>Mia and Soltane [27]</td>
<td>50 South Asian MFIs (2007 to 2012)</td>
<td>Malmquist Productivity Index</td>
<td>MFIs is significantly influenced by financial, economic and institutional factors</td>
</tr>
<tr>
<td>Okpara. [28]</td>
<td>Nigeria (1980-2004)</td>
<td>factor analysis</td>
<td>At the initial state increase in MF credit raises poverty while at a later stage persistence rise in microfinance credit reduced poverty to a large extent.</td>
</tr>
<tr>
<td>Belinga et al [29]</td>
<td>Turkey (1969-2013)</td>
<td>VECM and cointegration</td>
<td>Domestic credit and bank deposits cause economic growth</td>
</tr>
<tr>
<td>Akpansung</td>
<td>Nigeria (1970 to 2010)</td>
<td>Two-Stage Least</td>
<td>credit to private sector improves</td>
</tr>
</tbody>
</table>
Authors | Sample and period | Methodology | Results
--- | --- | --- | ---
Nwaogwugwu and Babalola [30] | 2008 | Squares | Growth while lending rate inversely influenced growth
Imougehele [31] | 1986-2012 | Contegration and ECM | Bank credit has direct impact on SMEs
Judith et al [32] | 1986-2012 | Cointegration Approach | Bank credit to private sector has inverse association with GDP while M2 has direct linkage with GDP
Sassi and Gasmi [33] | 1995-2012 | GMM | There is an inverse Relationship between household market credit and GDP while a direct linkage between enterprise credit and GDP.
Ananzeh [34] | 1993-2014 | VAR and VECM | Existence of long run Association between various indicators of bank credit and real GDP
Okafor et al [35] | 1981-2014 | VAR-Causality | one way causal influence from private credit and M2 to RGDP
Ugoani [36] | 1990-2011 | Survey | Bank credit exert significant influence on growth and development
Tawose [37] | 1975-2009 | Cointegration and VECM | Loan and advances and savings have direct impact on RGDP while interest rate exert inverse influence on RGDP

Önder and Özylidirim [42] investigated the linkage between the state- bank’s credit and local economic growth in Turkey with data covering the period of 1992 and 2010. Adopting panel regression they found that state-owned bank’s credit had direct relationship with local growth. In an attempt to determine the effect of commercial bank credit to agriculture on productivity via agricultural scheme fund in Nigeria, Obilor, [43] observed that agricultural scheme fund to agriculture exerts direct and significant influence on productivity.

Leitão [44] employed GMM technique on panel data of 27EU nations from 1990 – 2010 in the exploration of the association between bank lending and economic growth and observed that bank credit and inflation rate reduces GDP while savings and trade increase GDP. Examining the effect of bank credit on Agricultural output in Nigeria, Nnamocha and Eke [45] adopted ECM to data spanning 1970 to 2013 and found that in the short run, only industrial output contribute toe growth. But in the long run, both bank credit and industrial output exert positive and significant impact on agricultural productivity.

In South Africa, Chisasa and Makina, [46] explored the association between bank credit and agricultural output with data spanning 1970 and 2011 and employing cointegration and ECM, they observed that bank credit exert positive and significant influence on agricultural output. Oluymombo (2011) analyzed the relationship between microfinance bank credit and economic growth in an OLS framework and found that a direct linkage Between dependent and independent variables.

### 3. DATA AND METHODOLOGY

#### 3.1 Data Description

The study uses annual data from 1992 through 2019 (28 observations) to analyze the impact of the micro-credit lending on the income level in Nigeria. Data availability defines the sample time. The GDP per capita (constant 2010 US$) represents income in Nigeria. The Commercial banks loans to Small Scale Enterprises as % Total credit reflects the role of micro-credit leaning in enhancing income through economic activities. It is widely believed to generate higher levels of investment and productivity in the economy than loans to the government sector [47]. In the Nigerian macroeconomic system, two control variables are used to capture such components that could have an impact on the economy. The factors include the international price of crude oil (in U.S. dollars a barrel) and the overall trade openness, which accounts for Nigeria's openness to exchange, plus imports to
GDP. This study involves the inclusion of crude oil prices among control variables to determine the impact of the oil industry on economic activity in Nigeria. Given that oil price significantly influenced by several economic and political factors in the international oil market (Alkhathlan, 2013), rather than domestic economic activities and development (Samargandi et al., 2014), a fall in crude oil price will impact negatively on the development of income, making the long run development of income per capita a function of crude oil price. Table 1 summarizes the list of variables:

### 3.2 Descriptive Statistics and Unit Root Tests

Fig. 2 presents the results of the descriptive statistics using simple bar chart. Real GDP per capita shows gradual increase in the economic growth from 2000 to 2014, it remain unchanged from 2016 to date. The volume of micro-credit lending to Small Scale Enterprises gradually decreased from below 4% in 1991 to 1% in 2006. Meanwhile decrease continued into negative up until 2016. The oil price increased from below 4.5% in 2001 to 4.6% in 2006. However, the period from 2007 to date witnessed much fluctuation in oil prices. The period from 1992 to 2019 witnessed much fluctuation in international market (trade openness) in Nigeria with all the indicator fluctuating significantly over the period. A sharp increase is observed in all the indicators from 2007 to 2012 corresponding to the period of the global financial crisis and a sharp decline afterwards.

### 3.3 Results of Unit Root Test

The order in which the variables are incorporated is first examined. Stationary tests are carried out at the first levels, then first in a difference, in order to establish the unit roots and the order in which all the variables are integrated. The findings of the stationary testing for ADF and PP show that variables of one order I (1) are combined.

### 3.4 Empirical Methodology

In order to analyze the effect of micro-credit lending to Small Scale Enterprises on income, this study applies a similar log-linear empirical model (see eq.1) to Samargandi et al. (2014).

\[
\ln R_{gdp} = a_0 + a_1 \ln M_{rcp} + a_2 \ln O_{ilP} + a_3 \ln T_{rdgdp} + e_t
\]

(1)

\( Ln R_{gdp} \) represents the economic advancement as defined in Table 1. \( Ln M_{rcp} \) represents the micro-credit lending to Small Scale Enterprises as % Total credit. \( Ln O_{ilP} \) and \( Ln T_{rdgdp} \) are two control variables representing the international crude oil price and trade openness respectively while \( e_t \) is the error term. The autoregressive distributed lag or Bound testing (ARDL) method proposed by Pesaran et al. (2001) is used in this analysis. Studies showed that the ARDL method offers certain statistical advantages over other co-integration strategies (Samargandi et al., 2014); in recent years, this method have become increasingly becoming popular (Jayaraman and Choong, 2009). While other co-integration techniques require the integration of all variables of the same order, the ARDL testing procedure gives valid results either I (0) or I (1) or co-integrated, permits simultaneous testing of the long- and short-range relationships among the variables within a time series model and delivers very efficient and consistent results for small and large variables. It also provides consistent estimates and the relevant t-statistics of the long-term relationship even though certain regressors are endogenous (see Harris and Sollis 2003). ARDL is the preferred approach to this empiric analysis because of the different order of integration of variables used in this study see Table 2. The ARDL model is available as:

### Table 1. List and definition of variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCRP</td>
<td>Commercial Banks Loans To Small Scale Enterprises as % Total credit</td>
</tr>
<tr>
<td>RGDP</td>
<td>GDP per capita (constant 2010 US$)</td>
</tr>
<tr>
<td>Oilp</td>
<td>Annual average of international crude oil prices (US$).</td>
</tr>
<tr>
<td>Trdgdp</td>
<td>Trade openness: Total trade (exports plus imports) to nominal GDP.</td>
</tr>
</tbody>
</table>

Source: Central Bank of Nigeria (CBN) Statistical Bulletin
### Table 2. ADF and PP Unit root tests

<table>
<thead>
<tr>
<th>Variable</th>
<th>In level I(0)</th>
<th>First difference I(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ADF</td>
<td>PP</td>
</tr>
<tr>
<td>lnRGDP</td>
<td>1.369</td>
<td>1.5384</td>
</tr>
<tr>
<td></td>
<td>[0.953]</td>
<td>[0.966]</td>
</tr>
<tr>
<td>lnMCRP</td>
<td>-1.4186</td>
<td>-1.5609</td>
</tr>
<tr>
<td></td>
<td>[0.1417]</td>
<td>0.1096</td>
</tr>
<tr>
<td>lnOILP</td>
<td>0.6315</td>
<td>0.7198</td>
</tr>
<tr>
<td></td>
<td>[0.8466]</td>
<td>0.8645</td>
</tr>
<tr>
<td>ln TRADE</td>
<td>-0.1387</td>
<td>-0.0709</td>
</tr>
<tr>
<td></td>
<td>[0.6266]</td>
<td>0.6501</td>
</tr>
</tbody>
</table>

[ ] p-values ** Significance at 5%. *** Significance at 1%. The asterisks indicate the rejection of the null hypothesis of unit root. All the variables are in the natural log form.

Fig. 2. Time series plot of the study variables (from 1992 to 2019)

$$
\Delta \ln RGdp_t = \beta_0 + \sum_{i=1}^{n} \beta_{1i} \Delta \ln RGdp_{t-i} + \sum_{i=0}^{n} \beta_{2i} \Delta \ln MCRP_{t-1-i} + \sum_{i=0}^{n} \beta_{3i} \Delta \ln OILP_{t-2-i} + \sum_{i=0}^{n} \beta_{4i} \Delta \ln TRADE_{t-3-i} + \beta_5 \ln RGdp_{t-i} + \beta_6 \ln MCRP_{t-1} + \beta_7 \ln OILP_{t-1} + \beta_8 \ln TRADE_{t-1} + \varepsilon_{tt}
$$

Where $\Delta$ is the difference operator while $\varepsilon_t$ is white noise error term. The test includes the output of F-tests for the coefficients of lagged variables to determine the presence of a longer-term relationship between them. In order to examine the co-integration between variables, the following hypotheses are tested. The following hypotheses are tested to investigate the existence of co-integration among the variables. The null hypothesis of no cointegration among the variables in Eq. (1) is $(H_0: \beta_5 = \beta_6 = \beta_7 = \beta_8 = 0)$ against the alternative hypothesis $(H_1: \beta_5 \neq \beta_6 \neq \beta_7 \neq \beta_8 \neq 0)$. The choice of rejecting or accepting $H_0$ (no co-integration of the
variables) is based on the following conditions: if the F-statistical calculations are greater than the upper critical band then Ho is rejected, and the variables are co-integrated, if the F-statistical calculations are below, Ho is accepted and the variables are not jointly integrated but if the F-statistic calculated. Pesaran et al. (2001) and Narayan (2005) provide critical values for the evaluation of the zero hypothesis. While Pesaran et al. (2001) argues that the critical values for the ARDL-bounds test depend on the number of regressors in the model, Narayan, (2005) shows that the critical values are influenced by the sample size. With 84 observations and 3 regressors in the specified model, the calculated F-statistics is compared to critical values taken from both Pesaran et al. (2001) and Narayan (2005).

The long-term coefficients of variables are then calculated after checking for co-integration among the variables. For selecting the best lag duration, the study uses the Akaike Knowledge Criterion (AIC). The fact that the variables are co-integrated means that causality occurs in at least one direction. The short-term relationship estimation error correction model is defined as:

\[
\Delta \ln RgdP_t = \beta_0 + \sum_{i=1}^{n} \beta _{1i} \Delta \ln RgdP_{t-i} + \sum_{i=0}^{n} \beta _{2i} \Delta \ln Mrcp_{t-i} + \sum_{i=0}^{n} \beta _{3i} \Delta \ln Oilp_{t-i} + \sum_{i=0}^{n} \beta _{4i} \Delta \ln Trdgdp_{t-i} + \lambda _{1} ECM_{t-1} + u_{1t} \tag{3}
\]

A negative and significant ECM_{t-1} coefficient (\lambda _{1}) between the dependent and explanatory variables implies that any short term disorder will be convergent into the longer lasting balancing relationship.

### 3.5 Diagnostic Test

The diagnostic tests that follow ensure the acceptability of empirical models are performed: Breusch – Godfrey serial LM test correlation, ARCH heteroscedasticity test, and Ramsey RESET functionality test. The stability and the short-run dynamics of the long-run Coefficients are tested on the basis that Brown, Durbin and Evans (1975) have cumulative sums and cumulative residual squares (CUSUMSQ) tests. The error-correction model coefficients are assumed to be stable if the plot of statistics CUSUM and CUSUMSQ remain under the 5% range of significance level, but when a plot of statistics from CUSUM and CUSUMSQ crossed the 5% range of significance, then error-correction model coefficients are considered unstable (Bekhet and Matar, 2013).

### 4. RESULTS AND DISCUSSION

#### 4.1 Results of Co-integration Test

The results of the cointegration test, based on the ARDL bounds testing approach, are presented in Table 3. Cointegration is tested on the functional model using each of the indicators of economic advancement as the dependent variable. The results show that the F-statistic is higher than the upper bound critical value from Narayan (2005) at the 5% level of significance using restricted intercept and no trend in the functional Model. The results therefore suggest the presence of cointegration between each of the individual indicators of real gdp per capita, micro-credit lending to Small Scale Enterprises and the control variables. Based on the results, the null hypothesis of no cointegration is rejected in the functional model. This implies that in the long run, it is expected that micro-credit lending to Small Scale Enterprises could have a significant relationship with economic advancement in Nigeria.

#### 4.2 Long-run and Short-run Estimates

The empirical results for long-run impact of micro-credit lending to Small Scale Enterprises as % Total credit (lnMrcp) and the two control variables lnOilp and lnTrdgdp are reported in Table 4. We found that the effect of micro-credit lending to Small Scale Enterprises as % Total credit (lnMrcp) on real gdp per capita is negative and significant. This shows that micro-credit lending to Small Scale Enterprises as % Total credit is declining income per capita. Keeping other factors constant, 1% increase in micro-credit lending to Small Scale Enterprises as % Total credit lowers income per capita by 0.052%. Oil price lnOilp is positively linked at 1% significance level. It implies that a 1% increase in oil price may lead income per capita by 0.1709% keeping all else the same. The effect of trade openness on real gdp per capita is negative and significant. This shows that trade openness is declining income and economic advancement in Nigeria. Keeping other factors constant, 1% increase in trade openness lowers real gdp per capita by 0.16698%.

In the short run, micro-credit lending to Small Scale Enterprises as % Total credit (lnMrcp) has
positive and statistically insignificant effect on real GDP per capita see Table 5. This result highlight the weakness of the Nigerian financial sector in stimulating economic growth through resource mobilisation and allocation in economic activities in Nigeria. Similar result was highlighted by Umanhonlen et al [26 a,b]. Oil price lnOilp significantly contributes to real GDP per capita. The impact of trade openness on real GDP per capita is negative and significant. We further note that coefficient of ECM_t-1 term is negative and statistically significant at 1% level of significance. This significance of ECM_t-1 shows the speed of adjustment from short-run towards long-run equilibrium path for Nigerian economy by employing real GDP per capita function. The estimate of lagged error term is 0.4981 which confirms that changes in short-run are corrected by 49.81% every year. The short-run model contains R^2 equal to 0.9920 and model is overall statistically significant at 1%. The diagnostic analysis reveals the absence of serial correlation and normal distribution is also found for short-run model. The absence of autoregressive conditional heteroscedasticity is confirmed. The linear model is well designed confirmed by Ramsey reset test. The CUSUM and CUSUMsq tests also confirm the reliability of long run results.

Table 3. ARDL bounds cointegration test

<table>
<thead>
<tr>
<th>Model</th>
<th>F-statistic</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>F_RGDP(1, Mcrp, Oilp, Trdgdp)</td>
<td>3.7780**</td>
<td>Cointegration</td>
</tr>
<tr>
<td>Critical Value Bounds Pesaran et al. (2001)(k = 2)</td>
<td>1% 5% 1%</td>
<td></td>
</tr>
<tr>
<td>I0 Bound</td>
<td>3.65</td>
<td>2.79 2.37</td>
</tr>
<tr>
<td>I1 Bound</td>
<td>4.66</td>
<td>3.67 3.2</td>
</tr>
<tr>
<td>ARDL Models selected on Akaike info criterion (AIC). Restricted intercept and no trend</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: *, **, and *** indicate significance at 10%, 5% and 1%, respectively

Table 4. Long-run estimates

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. error</th>
<th>T-statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>lnMCRP</td>
<td>-0.05245</td>
<td>0.013448</td>
<td>-3.900068</td>
<td>0.0012</td>
</tr>
<tr>
<td>lnOILP</td>
<td>0.170929</td>
<td>0.040327</td>
<td>4.238595</td>
<td>0.0006</td>
</tr>
<tr>
<td>lnTRADE</td>
<td>-0.166982</td>
<td>0.04726</td>
<td>-3.533289</td>
<td>0.0026</td>
</tr>
<tr>
<td>C</td>
<td>7.515836</td>
<td>0.203768</td>
<td>36.88423</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Fig. 3. Plot of CUSUM and CUSUMSQ for coefficient stability for ECM
Akaike Information Criteria (top 20 models)

Fig. 4. Akaike information criteria

Table 5. Short-run estimates

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ΔlnRGDP(-1)</td>
<td>0.6982</td>
<td>0.1688</td>
<td>4.1357</td>
<td>0.0007</td>
</tr>
<tr>
<td>ΔlnMCRP</td>
<td>0.0095</td>
<td>0.0092</td>
<td>1.0270</td>
<td>0.3188</td>
</tr>
<tr>
<td>ΔlnMCRP(-1)</td>
<td>0.0200</td>
<td>0.0136</td>
<td>1.4665</td>
<td>0.1608</td>
</tr>
<tr>
<td>ΔlnOILP</td>
<td>0.0596</td>
<td>0.0222</td>
<td>2.6782</td>
<td>0.0019</td>
</tr>
<tr>
<td>ΔlnTRADE</td>
<td>-0.0831</td>
<td>0.0380</td>
<td>-2.1832</td>
<td>0.0333</td>
</tr>
<tr>
<td>ECM(-1)</td>
<td>-0.4981</td>
<td>0.1471</td>
<td>-3.3850</td>
<td>0.0003</td>
</tr>
</tbody>
</table>

Diagnostic tests
Adj. R² | 0.9920 |
D-W stat | 2.6112 |
SC | 3.578(0.5360) |
Het | 0.3243(0.574) |
JB | 6.498(0.3875) |
RESET | 3.047(0.7750) |

Note: Adj R² means Adjusted R-squared; SC means Breusch–Godfrey serial correlation LM test; Het is the ARCH test for heteroscedasticity; JB is the Jarque-Bera Normality test; RESET is the Ramsey RESET test *, **, and *** indicate significance at 10%, 5% and 1%, p-values in ( )

5. CONCLUSION AND POLICY IMPLICATIONS

This study examined the impact of micro-credit lending to Small Scale Enterprises on real GDP per capita in Nigeria using the ARDL approach to cointegration analysis over the period 1992–2019. While controlling for the possible influence of crude oil price and trade openness, we applied unit root tests to examine stationarity properties of the variables and the bounds testing approach to test the presence of cointegration between the variables. Our empirical results indicate the presence of cointegration between economic advancement, micro-credit lending to Small Scale Enterprises, crude oil price and trade openness. Specifically, micro-credit lending to Small Scale Enterprises as % Total credit (lnMrcp) has negative and significant effect on real GDP per capita in long run, but positive and insignificant effect in the short run. In the policy setting, this implies that
the role of finance, particularly the policy and process of credit creation and its consequences for the real economy are not fully harnessed. Perhaps, the credit to private sector has an element of crowding out investor. In terms of crude oil price, our results suggests that it promotes economic advancement in Nigeria. This causal influence is important in the economic context especially in policy formulation, the use of revenue from brent oil can facilitate and promote the allocating resources in the country. This will enhance economic activities that will facilitate access to micro-credit lending to Small Scale Enterprises. The results of this study show that there is every need to enhance resource mobilisation and allocation efficiency in the financial sector in Nigeria. Such objective would require putting in place appropriate policy and institutional frameworks including regulatory, supervisory and legal frameworks. It is concludes that there are urgent need for microfinance banks operations and the relevant regulatory authorities to come up with policy measure that will ensure that microfinance banks assets base, deposits and gross earnings are improved upon in order to effectively support the growth of the SMEs sectors in the country. It recommends that the government should rise to its responsibility to the sector by providing the enabling environment for microfinance bank to strive and effectively supporting SMEs. Hence, there is the need also to spread the loan repayment over a long period or increase the moratorium so as to enable the microfinance clients have a greater use of the loan over a reasonable period for meaningful and profitable investment which ensure easy repayment.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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