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Firm Characteristics and Access to Bank Financing: Evidence from SMEs in North Central Nigeria

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Abstract

The paucity of finance to SMEs, widely reported in the literature has continued to undermine the potential of the sector as a driver of economic growth. This scourge has partly been blamed on the SMEs' observable characteristics. However, the dearth of comprehensive research in this area portends the need for further studies especially in the North Central Nigeria where the problem is reportedly endemic. Against this backdrop, the study examines, from both SMEs and banks' viewpoints, the impact of firm characteristics on access to bank financing in the North Central Nigeria. The study drew data from the primary source through the adaption of World Bank and OECD Financial literacy questionnaires. A sample of 280 SMEs and 207 loan officers were drawn from the population of 1030 SMEs and 448 banks respectively. Descriptive statistics, binary logit regression model with Marginal effect and Kruskal Wallis H were employed in analyzing the data. From SMEs' perspective, the results revealed that firm age, incorporation status and industry which are significant at 0.05, 0.01 and 0.1 respectively, are the firm specific characteristics impacting access to bank finance among SMEs whereas firm size is insignificant. From banks' perspective, all the selected firm characteristics, which are all significant at 0.01, are the factors influencing banks' credit approval for SMEs in the North Central Nigeria. The study concluded that SMEs in the North Central Nigeria encounter serious paucity of finance as they are virtually oblivious of, or not fully exploring all firm related factors influencing their access to facilities especially from banking institutions. The study, therefore, recommended that SMEs should fully explore all firm factors, at individual level, for improved access to financial market. Also, they should synergise by forming strong alliance and solicit credits as a consortium rather than as individual units to facilitate better access and at relatively cheaper costs.

Key words: Firm Size, Bank Financing, Nigeria, SMEs, Binary Logit

JEL Classification: G3, G21, C2, L11

Paper Classification: Research Type

Introduction

Background of Study

Small and Medium Enterprises' (SMEs) active participation in the financial market, via affordable and convenient access to financial facilities, does not only propel their growth but also results into financial development which is globally acknowledged as an essential stimulus for economic growth.

The prominence of SMEs role in the transformation of several economies, developed and developing, cannot be downplayed. The subsector is convincingly essential catalyst for poverty reduction, employment generation, and economic growth and development. It is on record that private businesses, majority of which are SMEs, have been exerting substantial dominance over the economy of Europe prior to nineteenth century Akogu (2003). More than 90 per cent of African enterprises operate as SMEs and they contribute 50 to 60 percent to employment generation in most African economies (Ahiawodzi & Adade 2012).

Specifically, in Nigeria, (Lawal and Ijaiya, 2007) noted that Nigerian SME subsector employs about 80 percent of the country's labour force. It is equally on record that SMEs account for a chunk of the industrial and agricultural sector employment.

Nonetheless, the economic potential of SME subsector depends largely on how well it performs in an economy (Olutunla & Obamuyi, 2008). However, SMEs performance is a function of their ability to easily access finance to support ample investment opportunities. It thus implies that, for subsector to level up to huge performance and growth expectation, there is necessity for greater financial access.

Acknowledging the fact, SMEs financing has been receiving considerable attention in the Nigerian development agenda (Mordi, Anyanwu, Adebusuyi, Odey, Amoo, Mbutor, Adebayo, Akpan, Igue, Ibeagha, Belonwu & Zimboh, 2014). These efforts become necessary given the limitations of informal finance such as money lenders and rotating credit and savings association, and semi-formal finance (cooperative societies, credit unions and so on), in providing external finance for business expansion (Ayyagari, Demirguc-Kunt, & Maskimovic, 2012; Solari, Morini-Marrero & Hernández- Estárico, 2014).

Accordingly, the Nigerian banking sector underwent tremendous reforms including consolidation in December 2005. One of cardinal rationales for bank consolidation is the need to promote credit delivery to the SMEs so that they can generate economic activities for the national economic growth (Mordi et al., 2014). Yet, SMEs are still plagued with myriads of problems, the major of which is finance.

Notwithstanding the Nigerian banking sector reforms including consolidation since the year 2006, which implies that banks in Nigeria are now more financially formidable, available evidence shows that credit delivery to SMEs has continued to plummet significantly. In spite of the supposed positive effect of bank consolidation, the loan portfolio of the Nigerian banks is more channeled to large companies and multinational institutions than the SME subsector Ekpu (2015).

The situation is more worrisome in the North Central Nigeria where the World Bank survey (2014) reveals serious paucity of finance to SMEs in the region. For instance, the statistics of firms with a bank finance stand at 4.5 per cent and 1.6 per cent for Kwara state and Niger state respectively. Also, the proportion of investment finance by banks stands at 7.0 per cent and 1.6 percent for Kwara state and Niger state respectively. In terms of working capital financing, only

6.7 percent and 4.2 per cent of the firms in those two states have bank financing.

According to Mordi et al. (2014), the credit rationing situation can be blamed on a range of factors notable among which is the SME- firm specific characteristics. Generally, most SMEs lack attractive firm characteristics in terms of age, size, incorporation, industry among others, to resolve the problem of information asymmetry which generates adverse selection and moral hazard which thus constitutes impediment for availability of credits to SMEs even in liberalized financial markets.

Consequently, failure of the sector to grow occasioned by limited access to formal external finance has been leading to collapse and massive exodus of many SMEs in Nigeria just a few years of their start-up. The multiplier effect is that, this could spell doom on the national economy as the volume of economic activities being generated by this vibrant sector via financial development may be on the continuous decrease and its quota contribution to the GDP might be drastically undermined.

Although plethora of studies (Abor & Biekpe, 2007; Chandler, 2009; Dun &Girma, 2012; Fatoki & Asah, 2011; Ghimire & Abor, 2013; Kira, 2013; Kira & He, 2012; Le & Nguyen, 2009; Musamali& Tarus, 2013 among others) have delved into the linkage between firm characteristics and access to bank finance, it appears there is a paucity of empirical evidence in this regard from Nigeria, especially in North Central region where the problem of access to finance for SMEs is relatively endemic.

More so, the available empirical studies have been one sided (considering only the demand side that is SMEs) lacking corroboration with the evidence from the supply side (banks). It is therefore glaring that the available evidence on the impact of firm characteristics on access to bank finance do not provide a comprehensive and clear-cut results about the impact. This scenario portends the need for further studies on the subject matter especially in the North Central Nigeria where there is reportedly dearth of comprehensive studies in this regard. Hence, this gap is filled by extensively examining and synthesizing the extent to which SMEs' firm specific characteristics (in terms of firm age, firm size, incorporation status and industry) explain access to bank finance in the North Central Nigeria from both demand side (SMEs) and supply side (banks) perspectives. In view of the research objectives, the following hypotheses stated in null forms, were tested;

H_{01}: Firm age has no significant impact on access to bank finance among SMEs in the North Central Nigeria

H_{02}: Firm size has no significant impact on access to bank finance among SMEs in the North Central Nigeria

H_{03}: Firm incorporation has no significant influence on access to bank finance among SMEs in the North Central Nigeria

H_{04}: Firm's industry has no significant impact on access to bank finance among SMEs in the North Central Nigeria

H_{05}: There is no significant difference in banks' credit approval for SMEs with respect to firm age, size, incorporation and industry in the North Central Nigeria.

Literature Review

Conceptualization of Firm Characteristics, Access to Bank Finance and SMEs

According to Musamali and Tarus (2013), firm characteristics can be described as the firm specific factors which include its size, age, form of ownership and the industry to which it belongs.

Also, in line with the above definition, firm characteristics have been viewed as enterprise traits which have bearing on its performance. Firm characteristics include factors such as firm's size, age, collateral availability and business information Fatoki & Asah (2011).

To further elaborate these definitions and make them more all-encompassing, Kira and He (2012) defined it as traits of the firm which has positive or negative bearing on firm's operation. They further explained the traits of the firm to include its attributes such as firm's legal status (that is ownership or incorporation status), age, industry, size, collateral and business information. However, some studies have collapsed collateral and business information into size and industry. This is premised upon the argument that the bigger the size of the firms and the more capital intensive the firms' industry, the greater their investment in non-current asset that can be pledged as collateral. Above all, the identified firm characteristics have wider application in the literature.

Ahiawodzi and Adade (2012) defines access to finance as the ability of individual or business to obtain credits from formal and informal sectors which include financial institutions, personal savings and family assistance. Based on this definition access to finance is limited to credit availability and is construed as ability of an enterprise to access it from formal and informal institutions for the acquisition of productive assets that translate to firm performance through efficient utilization.

Kira and He (2012) also defined access to finance as "the availability of financing from all sources which may be internally generated funds including own capital or retained earnings; facilities from Rotating Savings and Credit associations (ROSCAs); Micro Finance Institutions (MFI); Deposit Money Banks and Non-financial Institutions including Non-Governmental Organizations (NGOs). The duo incorporates external funding though restricted to loan from informal channels, Deposit Money banks and assistance in form of grants or aid from the NGOs. Claessens (2006) perceives access to finance as the degree of affordability and usability of financial products to meet financial needs.

The study defines access to external finance as the availability and utilization of financial products and/or services from formal, semiformal and informal credit institutions, and trade credit. Since bank finance has been reported as the most patronized formal external finance option by the SMEs, the study will focus only on the SMEs access to bank financing including DMBs and MFIs.

Small and Medium Enterprises Development Agency of Nigeria (SMEDAN) (2015) defines Small Enterprise as one whose total assets (excluding land and building) is more than 10 million naira but less than 100 million naira with total workforce of more than 10 employees but less than 50. Whereas a firm with total workforce of 50 and 199 employees with total assets (excluding land and building) of more than 100 million but not exceeding 1 billion is categorized as a medium enterprise.

Theory of credit rationing has its origin deeply rooted to the work of Stiglitz and Weiss (1981). They employed a model based on the credit markets imperfection characterized by asymmetric information, which makes the costs of garnering accurate information on the borrowers and that of monitoring them highly prohibitive. According to Stiglitz and Weiss (1981), the widespread information asymmetry in the financial markets generates agency problems of adverse selection and moral hazard which affect credit availability as well as the capital structure of SMEs. This phenomenon is what they referred to as credit rationing. The assumption of the model is existence of several finance providers, for instance banks, whose interest is the profit maximization via their interest choice and collateral, and sizeable number of potential deficit units (that is borrowers) whose interest is equality of profit maximization vis-a-vis the investible projects alternatives. The idea here is that there is probabilistic distribution of the returns and associated risk from each

investible project to be undertaken by the potential borrower. This probability distribution is known to the borrower but remained unknown to the finance provider.

The existence of information asymmetry in market equilibrium results into credit rationing situation among potential deficit units (borrowers) (Mordi et al, 2014; Stiglitz & Weiss, 1981). In other words, credit is said to be rationed if among the potential borrowers with seemingly similar features, some access credit while others do not, or certain pocket of borrowers are not able to access credit or can only access at a much prohibitive price. However, interest rates, collateral requisition and other loan terms offered by the suppliers of finance might leave a chunk of potential borrowers without access to credit (that is adverse selection) (Fatoki & Odeyemi, 2010). On the other hand, these lending terms including interest rates and others might affect the action of the borrower ex-post. This behavioral change in the borrowers occasioned by the change in the loan contract terms is known as moral hazard (Stiglitz & Weiss, 1981). The suggestion of the Stiglitz& Weiss' theory of credit rationing is that reasonable numbers of SMEs that can utilize fund productively have difficulty of accessing formal financial system.

According to Mordi et al (2014) borrowers' observable peculiarities, firms' characteristics and loan features can influence credit rationing. Hence, the theory underscores the significance of firm characteristics such as size, age, industry, collateral and incorporation that can be used to gauge credit worthiness of SMEs with a view to resolving information asymmetry and facilitate access to finance for SMEs.

Kumar and Fransisco (2005) explored the nexus between some firm related factors and credit access among Brazilian firms. Based on the data drawn from Investment Climate Survey of 2003 on 1642 Brazilian firms, the study used maximum likelihood pro bit model and found that principally that size of the firm has significantly strong influence on their credit constrained status, relative to firm performance and other firm related factors. However, the effect of size is stronger for investment financing than working capital financing. The implication of their findings is that formal credit institutions are much more likely to lend to large firms majorly for investment financing than their small counterparts.

In a related study, Beck and Demirguc-Kunt (2006) also found an empirically significant linkage between firm age, firm size and ownership status, and access to credit market. The study showed that older, larger and internationally owned firms are less likely to encounter credit constraint than the SME counterparts especially in the absence of well-developed credit institutions. In line with the study, a more competitive banking structure, sound systems of credit information sharing as well as specific financing channels such as debt factoring and lease financing become imperative for greater access to external financing for SMEs.

Abor and Biekpe (2007) explored the factors which influence bank financing among Ghanaian SMEs. The study employed secondary data obtained during a six-year financial period (1998 to 2003) of the selected 105 SMEs. The study used panel regression estimation model for the analysis and found that age, size and tangibility of the assets had significant positive association with the bank loan access which though according to the study accounted for a very minute percentage of the total debt financing. However, profitability of the firm was found to be negatively related to the bank debt ratio. In line with the findings, the study suggested development and improvement of SMEs' information management practices vis-a-vis proper maintenance of operational records with a view to reduce information opaqueness that constitutes hindrance of access to finance.

Chandler (2009) conducted a study on the selected South African small firms to examine the nexus between age as a firm characteristic and capital access using structured interview. The

study found age of the firm as crucial to ease of finance access as it signals to the fund providers, ability of the firm to withstand business challenges and provides a synopsis with which its credit wherewithal can be assessed. The study thus, sensitize the small firms to remain in business in spite of any challenge as their longer stay builds their credentials in the face of the lenders by signaling that they can weather tough economic conditions and that they do not adopt opportunistic behavior. Laying credence to firm age as essential determinant of finance access, Le and Nguyen (2009) also found that young Vietnam SMEs encounter relatively expensive credit largely due to information asymmetry; hence older Vietnam firms tend to be more favored for bank facilities than their counterparts.

Similarly, Musamali and Tarus (2012) explored the firm-specific determinants of SMEs' finance accessibility using Ordinary Least Square regression estimation technique. They found that firm profile indeed influences Kenyan SMEs' access to finance. The study further revealed that size affects access to finance as larger firms would probably have adequate collaterals to pledge and their size informs the lenders that they are able to meet their obligations and thus are able to grow in size. In terms of age, the study opined that older firms have more access owing to the fact that the lenders are in possession of their credit history which they employ in assessing their credit worthiness. Also, with respect to industry the study concluded that manufacturing firms are less volatile given the tangible nature of their assets, which serve as collaterals hence their relative ease of access to finance.

Recognizing shortage of finance as the main challenge limiting the SME sector to contribute fully to the economy, Kira and He (2012) examined the impact of firm factors on debt financing access by SME in Tanzania. The study was conducted via the self-administered questionnaires on 163 Tanzanians firms. The study employed Maximum Likelihood estimation techniques and found that firm specific characteristics in terms of firm's location, size, business information, age, incorporation status and collateral influenced access to debt finance from Tanzanian banks.

Balogun, Agumba and Ansary (2016) explored the factors predicting access to bank credit by SMEs in South African construction sector. Using binary logistic regression, study revealed that size, incorporation status, collateral, bank relationship and managerial competency are significant predictors of bank credit accessibility. Thus, incorporated and larger construction firms with viable collateral and good track record with banks are likely to be successful in their bank credit applications.

Magembe (2017) investigated the determinants of credit access by SMEs in Tanzania. Using logistic regression, the study found that business information is a critical factor determining credit access of SMEs in the region covered in the study. The study also showed that high interest charge and collateral requirement constitute decisive factors for loan approval for SMEs in Tanzania.

Ngunli and Odunga (2019) examined the effect of firm age and firm size on financial inclusion of women owned SMEs in Kenya. The results of the OLS multiple regression employed revealed a significant negative effect of firm age on financial inclusion while firm size was found to significantly and positively affect financial inclusion. This implies that younger firms may have unrestricted access to finance provided they are larger enterprises with higher tendency of meeting up the collateral requisition for credit facilities.

In a related study, Kivunzi, Wepukhulu and Opiyo (2019) also showed that firm's economic condition requirement, firm's capacity requirement and firm's collateral requirements in addition to firm's size requirements are the major credit scoring practices that influence credit access for Kenyan SMEs.

Chandrayanti, Nidar, Mulyana and Anwar (2019) empirically employed Structural Equation Model (SEM) to examine the influence of firm characteristics and business performance on credit accessibility by small businesses in West Sumatera of Indonesia. Using business performance as a mediating variable, the study showed that firm characteristics exert significant influence on credit access through improved business performance.

Methodology

Cross sectional survey design was adopted in the study. This design is usually adopted when there is no intent of controlling any of the study samples Asika (2006). For the purpose of this study, the demand side population of interest consists of all SMEs operating in Benue State, Kogi State, Kwara State, Nassarawa State and Niger State of the North Central region of Nigeria who are members of Nigerian Association of Chambers of Commerce, Industry, Mines and Agriculture (NACCIMA).Strict compliance with the business operation standards of the Nigerian Corporate Affairs Commission and SMEs Development Agency of Nigeria guides the study population. As of 31st December 2017, 1030 firms belonging to SMEs category had followed the registration requirement of NACCIMA and they form the demand side population. The target population for the supply side consists of all loan officers of the various branches of Deposit Money Banks (DMBs) and Microfinance banks (MFBs) in the region. According to CBN Statistical Bulletin (2017), the total number of DMBs' branches in the five states currently stand at three hundred and fifty-three (353) whereas that of Microfinance counterparts, based on Nigerian Deposit Insurance Corporation reports of 2017, stands at ninety- five (95). This brings the number of all DMBs and MFBs' branches to four hundred and forty-eight (448).A sample size of 280 SMEs and 207 bank loan officers were selected based on the scientific sampling determination of Krejcie and Morgan (1970) using stratified and multistage sampling techniques respectively.

The study adapted the World Bank Survey questionnaire to obtain opinions directly from respondents, that is, selected SME owners or managers and loan officers of the Deposit Money Banks and Microfinance Banks in the North central Nigeria. The study adopted both descriptive and inferential statistics. The descriptive analysis made use of such tools as; tables, frequency distributions and percentages, and measures of central tendency and variability including mean and standard deviation. Binary choice model with marginal effects and Kruskal Wallis H tests (as the data violated the normal distribution assumptions) were adopted for inferential statistical analysis.

Model Specification

Following Musamali and Tarus (2013) (with modification) who investigated the influence of firm profile on access to finance among SMEs, this study models firm characteristics as a function of access to bank finance as follows:

$$ACCESS_i = f(FC_i) \quad \text{(1)}$$

Where

$ACCESS_i$ = access to bank finance of individual SME

FC_i = Firm Specific Characteristics of individual SME

It also follows that,

$$FC_i \equiv (AGEF_i, SIZE_i, INC_i, IND_i) \quad \text{(2)}$$

Where:

$SIZE_i$= size of individual SME business

$AGEF_i$= age of individual SME business

IND_i= Industry of individual SME business, and

INC_i= Incorporation status of individual SME business.

Equation (2) is therefore transformed into a multiple linear relationship specification as:

$$ACCESS_i=\beta_0+\beta_1 AGEF_i+ \beta_2 SIZE_i+\beta_3 INC_i+\beta_4 IND_i+\varepsilon_i \quad (3)$$

Equation 3 is the multiple linear relationships showing the impact of firm characteristics on access to bank finance.

$$ACCESS_i=\beta_0+\beta_1 AGEF_i+\beta_2 SIZE_i+\beta_3 INC_i+\beta_4 IND_i+\varepsilon_i \quad (4)$$

Equation 4 relates to the impact of firm characteristics on access to bank finance.

β_0 = constant parameter

β_1, β_2, β_3 andβ_4= other unknown parameters and ε_i = disturbance term

The a-priori expectation of the model is a positive relationship between the dependent variable and all the independent variables. That is AGEFi>0; SIZEi>0; INCi>0; INDi>0 or <0;

Results and Discussion

Demand Side Analysis (SMEs)

The section presents and analyses the Binary logit and marginal effects results of the demand side analysis (SMEs).

Impact of firm Characteristics on access to Bank Finance among SMEs

In the model for access to bank finance, the dependent variable is dichotomous, taking the value of 1 if the enterprise accessed a loan in the last financial year which forms part of their capital structure, (comprising of borrowing only from bank) and 0 if otherwise. The independent variables comprise of a set of identified firm related factors (that is firm age, firm size, incorporation and industry).

Table 1: Binary Logit Regression Model of Firm Characteristic Effects on Access to Bank Finance

VARIABLES	Coefficients	p-value
Firm age	0.331** (0.153)	0.032
Firm size	0.402 (1.648)	0.808
Incorporations	3.695*** (1.396)	0.009
Industry (manufacturing)	-5.472*** (0.946)	0.000
Constant	-6.626* (3.372)	0.050
Observations	280	
F-statistic	5.82***	
Pseudo R-squared	0.6826	
Wald (Firm Characteristics)	2.52**	

Jackknife Robust Standard errors in parentheses
*** significant at 1%, ** significant at 5%, * significant at 10%
Source: Authors' Computations, 2019.

The model was estimated with Jackknife robust estimates of standard errors to account for likely heteroskedasticity. The results show that the model is statistically significant with F-statistic values of 5.82 indicating that the overall model significantly explains the probability of access to bank finance. Reported pseudo R-squared (0.6826) also shows that the dependent variables are well explained by the independent variables. The Wald test of joint significance for all firm's characteristics shows values of 2.52 which is statistically significant at 0.05. Therefore, all firm's characteristics are jointly significant in influencing bank financing access for SMEs.

From the estimation results of the binary logit regression of the first model (model with only firm's characteristics) in Table 1, firm age, incorporation status, type of industry, are statistically significant firm's characteristics affecting the probability of access to bank finance, evident from each of their low probability values, while firm size is statistically insignificant factor determining the probability of access to bank finance (with higher probability values than conventional significance levels). More specifically, older and incorporated (relative to non-incorporated) enterprises have increased probability of access to formal finance. However, enterprises in the manufacturing industry have lower probability of access to formal finance compare to enterprises in other industries.

The increase or decrease in probability of access to bank finance in response to the change in each of the factors considered is presented in Table 2. The table shows the marginal effects of firm's characteristics on the probability of access to bank finance. In the model, since firm age and incorporation status are positive significant factors, their respective marginal effects indicate that a year increase in the firm's age will increase the probability of access to bank finance by 0.079 while incorporated enterprises have greater likelihood of access to bank finance than their counterparts by 0.613 probabilities.

Table 2: Marginal Effects of Firm Characteristic Effects on Access to bank Finance

	(1)	
VARIABLES	Coefficients	p-value
Firm age	0.079**	0.036
	(0.038)	
Firm size	0.096	0.808
	(0.394)	
Incorporations	0.613***	0.000
	(0.096)	
Industry (manufacturing)	-0.794***	0.000
	(0.054)	

Jackknife Robust Standard errors in parentheses
*** significant at 1%, ** significant at 5%, * significant at 10%
Source: Authors' Computations, 2019.

On the other hand, since type of industry is a negative significant factor, its marginal effect indicates that enterprises in the manufacturing industry are less likely to access bank finance than their counterparts by 0.794 probabilities.

Diagnostic Tests

Specification Tests

Table 3 presents the test for model specification for access to bank finance model to ascertain if the model is correctly or wrongly specified that is, to detect if there is specification error in the model or not.

Table 3: Model Specification Test – Access to Bank Finance Model

	Firms' characteristics	
	Coefficient	p-value
_hat	1.058	0.000
_hatsq	0.104	0.055
Constant	0.222	0.295

Source: Authors' Computations, 2019.

The specification test (referred to as linktest) makes use of (_hat) and (_hatsq) which are the linear predicted value and linear predicted value squared respectively, as the predictors of good model. The threshold is that since the variable _hat represents the model predicted value; it must be statistically significant for the model to be well specified. On the other hand, for proper model specification the variable _hatsq must not have much predictive power except by chance. Thus, statistical significance of the _hatsq connotes the statistical significance of the linktest. This usually indicates either omission of relevant variable(s) or inappropriate specification of the link function.

The result shows that variable _hat is statistically significant even at 1% level of significance in the model (with p-values of 0.000 each) while variable _hatsq is not statistically significant at 5% level of significant. _hatsq is only significant at 10% level of significant which indicates a weak

importance (with p-values of 0.055). This can be concluded upon that the models are correctly specified.

Multicollinearity Test

Two tests of multicollinearity were conducted for the models of this study. A pairwise correlation analysis was conducted to assess the relationships that exist among the variables of the model. The variance inflation factor was also conducted as a further verification to the presence of multicollinearity in the models. The result of the pairwise correlation analysis presented in Table 4 indicates that none of the relationships among the explanatory variables have correlation coefficient even up to 0.6. A general rule of thumb is that correlation coefficient of 0.8 and above is a signal of the presence of multicollinearity.

Table 4: Pair wise Correlation

	Firm age	Firm size	Incorporations	Industry
Firm age	1			
Firm size	0.0666	1		
Incorporations	-0.065	0.2067	1	
Industry	0.0618	0.0846	-0.0637	1

Source: Authors' Computations, 2019.

Since, none of these relationships have high correlation coefficient it can be safely concluded that there is no existence of multicollinearity in the model.

Table 5: Variance Inflation Factor – Firm Characteristics

Variable	VIF	1/VIF
Firm age	3.94	0.253624
Industry (manufacturing)	1.75	0.57127
Incorporations	1.12	0.889324
Mean VIF	2.27	

Source: Authors' Computations, 2019.

The variance inflation factor also validates the correlation results further by indicating that there is absence of problematic multicollinearity in the models. This is evident from the average VIF of the result presented in Table 5 being less than 10. According to Asteriou and Hall (2016), VIF values exceeding 10 are generally viewed as evidence of the existence of problematic multicollinearity. This usually occurs when R-squared of the model is greater than 0.

Supply Side analysis (Loan Officers of Banks)

This section discusses the descriptive statistics and analyses the data relating to the importance of firm characteristics in banks' credit approval for SMEs in the North central Nigeria. Important firms and owners' Characteristics for Loan Approval Decisions of Banks

The summary statistics of the level of importance of firm and owner characteristics to the bank loan approval process is depicted in Table 6. The results reveal that virtually all the firm characteristics including the size, firm age, incorporation status and industry are important

considerations in loan approval of banks. This is evident in their mean values of approximately 3. Overall, vast majority of banks consider all the firm characteristics as important or moderately important in their credit approval to SMEs.

Table 6: Summary of loan officers' perceptions of the Importance of Firm Characteristics in loan approval decisions of banks

	Mean	Standard deviation
Firm size	2.64	0.675
Firm age	3.07	0.429
Firm incorporation status	2.66	1.044
Firm industry	3.43	0.746

Source: Authors' Computations, 2019.

Test of Normality

Prior to the test of hypothesis, the data were subjected to diagnostic test of normality to determine appropriate statistical tests (parametric or non-parametric) to be conducted. The study used both Kolmogorov-Smirnov and Shapiro-Wilk to assess the normality of the distribution of the data set.

Table 7: Tests of Normality using Kolmogorov-Smirnov and Shapiro-Wilk

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
Statistic	df	Sig.	Statistic	df	Sig.	
Firm age	0.456***	207	0.000	0.440***	207	0.000
Firm size	0.301***	207	0.000	0.761***	207	0.000
Firm incorporation status	0.199***	207	0.000	0.865***	207	0.000
Firm industry	0.362***	207	0.000	0.711***	207	0.000

a. Lilliefors Significance Correction
*** significant at 1%, ** significant at 5%, * significant at 10%

Source: Authors' Computations, 2019.

As shown in Table 7, the Kolmogorov-Smirnov tests produced relatively small Kolmogorov-Smirnov values of 0.456, 0.301, 0.199 and 0.362 for size, firm age, incorporation status and industry respectively which were all significant at 0.01.

Similarly, the Shapiro-Wilk test of normality obtained relatively small coefficients of 0.440, 0.761, 0.865 and 0.711for size, firm age, incorporation status and industry which were all significant at 0.01. Both tests indicated that the distribution of the data departed from the normal distribution. This implies that the data is not normally distributed to carry out a parametric statistical analysis (ANOVA), hence non-parametric statistical test of difference (Kruskal-Wallis H test) was employed.

Analysis of differences in banks' credit approval for SMEs with respect to firm and owner characteristics

In order to determine the differences in banks' credit approval for SMEs with respect to firm characteristics in the study area as contained in the fifth objective of the study and test the related

hypothesis accordingly, the Kruskal-Wallis H non-parametric test was explored. To achieve this, banks were grouped into five based on oftenness of their loan approvals namely, very seldom, seldom, neither often nor seldom, often and very often. The differences among these groups w tested across all the firm characteristics using Kruskal-Wallis H as an alternative to one-way ANOVA test. Table 8 shows the results of the Kruskal-Wallis H statistics for all variable of interest.

For firm age and firm size, the tests resulted in very large chi-square values of 182.594 and 105.943 respectively which were all significant at 0.01. Thus, banks differ significantly in their credit approvals with respect to age and size of the firm. Thus, firm age and firm size exert very large influence on banks credit approvals. As regards incorporation status and industry, the test resulted in large chi-square values of 54.262 and 49.559 respectively, which were all significant at 0.01. Thus, banks differ significantly in their credit approvals with respect to incorporation status and industry. As such, incorporation status and industry largely influence banks credit approvals.

Table 8: Results of Kruskal-Wallis Statistics

Variables	Loan Approval	N	Mean Rank	Chi-square	p value
Firm age	VERY SELDOM	26	80.35		
	SELDOM	6	94.50		
	NEITHER OFTEN NOR SELDOM	152	94.50	182.594***	.000
	OFTEN	19	196.00		
	VERY OFTEN	4	196.00		
Firm size	VERY SELDOM	26	191.00		
	SELDOM	6	141.50		
	NEITHER OFTEN NOR SELDOM	152	82.18	105.943***	.000
	OFTEN	19	196.00		
	VERY OFTEN	4	196.00		
Incorporation status	VERY SELDOM	26	64.50		
	SELDOM	6	64.50		
	NEITHER OFTEN NOR SELDOM	152	100.97	54.262***	.000
	OFTEN	19	179.00		
	VERY OFTEN	4	179.00		
Industry	VERY SELDOM	26	147.00		
	SELDOM	6	147.00		
	NEITHER OFTEN NOR SELDOM	152	88.44	49.559***	.000
	OFTEN	19	147.00		
	VERY OFTEN	4	147.00		

*** significant at 1%, ** significant at 5%, * significant at 10%

Source: Authors' Computations, 2019.

Table 9 depicts the summary of all hypotheses tested in the study. It shows the rejection and non-rejection of the null hypotheses for both demand side (SMEs) and supply side (loan officers) analyses.

Table 9: Summary of the Research Hypotheses Testing

	Variables	Remarks on Hypotheses Tests	
		Demand side – Access to Bank Finance	Supply side Credit Approval
Firm Characteristics (Joint Hypothesis Rejected)	Firm age	Significant (+ve); Rejected	Rejected
	Firm size	Not significant; Not rejected	Rejected
	Firm incorporation status	Significant (+ve); Rejected	Rejected
	Firm industry	Significant (-ve); Rejected	Rejected

Source: Authors' Compilations, 2019.

Discussions of Findings

Firm age has a significant positive impact on access to bank finance. This indicates that older SMEs have higher probability of accessing bank finance. The result of the supply side also shows that firm age influences bank credit approval for SMEs. The result is in line with the findings of Chandler (2009) and Le and Nguyen (2009) who argued that the longer the firm stays in operation, the more persistent it is to unpleasant economic circumstances thus, older businesses usually possess the requires synopsis with which their credit wherewithal can be appraised. More often than not, younger firms are viewed as lacking required credentials in terms of their credit history hence they are denied access or even subjected to prohibitive loan cost for them to access finance from most financial institutions Klapper, Laeven & Rajan (2010). In line with the credit rationing theory, information such as years of operation could perhaps resolve information asymmetry for firms and thus facilitate access to finance.

With regard to firm size the results show that size is not statistically significant for access to bank finance. By implication, size does not influence the probability of access to bank finance. The result contrasts with the findings of Cassar (2004), Fatoki and Asah (2011) and Dun and Girma (2012) who found that bigger firms easily access external finance and trade credits whereas smaller firms majorly rely on self-raised finance. However, the result of the supply side shows firm size influences the credit decisions of banks. The inconsistency of SMEs results and the bank results justify the fact that the latter attach importance to firm size which the former perhaps are not exploring.

Regarding incorporation status and access to bank finance, the result shows that incorporation status of SMEs influences their access to bank finance in such a way that firms that are incorporated are more likely to access bank finance than their counterparts. This is also corroborated with the results of the supply side which reveals that the banks' credit approval for SMEs depends on their incorporation status. The study agrees with earlier studies such as Coleman and Cohn (2000), Musamali and Tarus (2013) and Balogun et al., (2016) who also reported a statistically significant positive impact of ownership structure on access to finance.

With respect to industry of operation (making manufacturing a reference category), the results reveal a statistically significant negative impact of industry on access to bank finance. This denotes SMEs in manufacturing industry have lower probability of access to formal finance relative to their counterparts. The result of the supply side also confirms that there is a significant difference in banks' credit approvals with respect to industry of SMEs in North central Nigeria. This study conforms to Barbosa and Moraes (2004) and Solari et al. (2014) who also reported similar findings.

Theoretically, the nexus between industry categorization and the firm gearing is premised upon the supposition that industry categorization is a substitute for risk inherent in the individual industries. Consequently, if the risk degree is the yardstick for accessing external finance, firms in the high-risk industry such as manufacturing and agriculture with frequent demand for credit are less likely to access much finance relative to other less risky industry perhaps due to the risk averse behavior of banks especially for SMEs. This contrasts the findings in Abor (2008) who reported that SMEs in the industry characterized with huge asset structure, such as agriculture and manufacturing sectors, tend to have highest debt ratio while reverse is the case for SMEs in the trading sector.

Conclusion and Recommendation

Improved financial access is desirous to sustain SME subsector for better contribution to economic growth and development. This is so because SMEs' active involvement in the financial market vis a vis easy access to financial products and services culminates into financial development that is globally believed to be an important indicator of economic growth and development. Yet, paucity of finance, widely reported in the literature, deters the performance of SMEs. This scenario has been blamed primarily on their characteristics as firms. Against this backdrop, the study examined, from SMEs and banks perspectives, the impact of firm characteristics, in terms of firm age, size, incorporation status and industry, on access to bank finance in the North Central Nigeria where the scourge is reportedly endemic. From SMEs' viewpoint, the study found that firm age, incorporation status and industry impacted access to bank finance, whereas all the variables are found to influence the credit approval for SMEs from bank perspectives. Overall, the study concluded that all the identified firm characteristics including firm age, firm size, incorporation status and industry are important determinants of access to bank finance for SMEs in the North Central Nigeria. This is predicated upon the fact that increased access to bank finance implies that SMEs possess attractive characteristics that help resolve asymmetric information which culminates into adverse selection and moral hazards.

Therefore, in line with the findings that firm size and firm age usually work to the disadvantage of most SMEs in such a way that younger and smaller firms frequently encounter a great deal of challenges accessing external finance, it is recommended that SMEs should synergize and form strong alliance, and borrow as a consortium rather than individual units. This will facilitate improved access to formal external financing and enjoyment of economies of scale in terms of relatively reduced loan costs. In addition, individual SMEs should have reasonable number of years in operation before opting for bank finance.

Furthermore, in view of the findings, banks often lend credence to incorporation as a sign of credibility and formality of operation. This tends to hedge out the financial challenges ignited by information asymmetry and fear of imminent bankruptcy of SMEs. Therefore, SME businesses should, as soon as they are able to capture satisfactory portion of the market, take advantage of incorporating their business for better access to finance. Finally, the huge lending risks involved in manufacturing sector perhaps cause banks to favor large firms, SMEs should operate in other industries with shorter cash operating cycle than manufacturing for improved financial access.

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