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Impact of cash flow on banks' lending to SMEs in Nigeria: An empirical analysis

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Abstract
This study examined the effect of cash flow on banks' lending to SMEs in Nigeria. Although, cash flow lending is getting recognition nowadays, little is known about its impact on banks' lending to SMEs particularly in Nigeria. Studies in the past dwelled much on the assessment of government programmes to support the creation of SMEs, but grossly overlooked the analytical impact of such policies on efficient allocation of credit to SMEs. As an attempt to fill this gap, this study answered the following questions; what factors determine cash flow lending to SMEs in Nigeria? To answer the question we used a data consisting of 49 non-financial firms listed in the Nigerian stock exchange for the period 2005 to 2018 and employed both pooled and random effect estimation techniques. The result from the study shows that both current and previous cash flow positively and significantly affect the amount of credit granted to firms by the banks. Additionally, deterioration of firms' net situations reduces the amount of credit granted by banks to firms. The study thus, recommends that Government should remove all unnecessary bureaucratic hurdles and discrimination, establish strategic and robust venture capital sector, crowd funding and other forms of financial institutions such as micro finance institutions to make funds available at affordable rate to critical sectors such as agriculture and manufacturing.

Keywords: Cash flow, information asymmetry, credit, SMEs

1. Introduction

There is an increasing recognition of the significant contribution of Small and Medium Enterprises (SMEs) in economic development. The sector plays a pivotal role through several pathways that go beyond creation of jobs. They are growth-supporting sector that contributes significantly not only in the improvement of living standard, but also brings substantial local capital accumulation and are responsible for driving innovation and competition in the emerging economies. Government in Nigeria, like in other emerging countries, undertakes plan to encourage the establishment and growth of SMEs. The general idea is the view that SMEs would accelerate the attainment of broad socio-economic objectives, including poverty reduction, employment generation and wealth creation, among others.

Traditionally, creation, survival and growth of these SMEs requires financing. However, obstacle to finance affects the creation, efficient operation and growth of this business segment. For instance, the survey conducted by the small and medium enterprise development agency in Nigeria (SMEDAN, 2017) [11] shows that access to finance is the most challenging problem confronting the operations of both micro and SMEs in the country. Nationally, only 49.5 percent of SMEs access credit from the banks in Nigeria (SMEDAN, 2017) [11].

The survey further noticed that 65 percent of these SMEs do not have business plan. This contributes to their frequent failure and reluctant from investors and lenders in providing capital to them because of inadequate information, pointing to the informational asymmetry problem, a condition in which economic agents and stakeholders have access to different information. This can create profound financing obstacles to SMEs (Abdelhafid and Mohammed, 2019) [1]. Information asymmetry can distort prices and can hamper optimal allocation of resources. Incomplete information about the type and quality of the agent before entering into contract agreement can lead to equilibria with adverse selection or equilibria with moral hazards if it occurred after the transaction. This leads to credit rationing, a situation in which among observationally identical loan applicants, some get loans whereas others denied.

Hence, those that do not have access to credit will not be able to borrow even if they are willing to offer higher interest rate, to the extent that no matter how adequate the supply of loan, there would always be some borrowers who cannot get access to credit at any given interest rate. Small economic agents such as SMEs suffered most, from credit rationing.

In an attempt to address the problem associated with information asymmetry, governments, through various agencies and in collaboration with other international financial and non-governmental organizations come up with the concept of cash flow lending[1] to support credit delivery to these SMEs. This idea of cash flow lending systematically deviated from the traditional collateral-based lending that cause greater challenge to SMEs. Most SMEs do not have collateral to present. Moreover, where the collateral is available it fails to meet the required standard of the banks. As such, many SMEs missed important projects that consequently affect the growth and development of the nations as a whole.

Although, cash flow lending is getting recognition nowadays, little is known about its impact on banks' lending to SMEs particularly in Nigeria. Studies in the past dwelled much on assessing the government programmes to support the creation of SMEs (Oyefuga *et al*., 2008; Peter *et al*., 2018) [4, 10] but grossly overlooked the analytical impact of such policies on efficient allocation of credit to SMEs.

As an attempt to fill this gap, this study raised the following questions; what factors determine cash flow lending to SMEs? To answer this question, we used a data consisting of 49 non-financial firms listed in the Nigerian stock exchange for the period 2005 to 2018. The main objective of the study is to investigate the impact of cash flow on banks' lending to SMEs in Nigeria. The result from the study shows that both current and previous cash flow positively and significantly affect the amount of credit granted to firms by the banks. Additionally, deterioration of firms' net situations reduces the amount of credit granted by banks to firms.

The structure of the study is as follows: after the introduction in section one, section two presents the literature review on asymmetric information and SMEs financing obstacles. Section three presents the methodology while section four covers analysis and discussion of the result. Section five summaries and concludes.

2. Literature Review

2.1 The Theory of Information Asymmetry

According to the neoclassical assumptions, all goods are identical, information flows in the market perfectly and that prices are determined according to forces of demand and supply. However, this analysis is not always the case. Sometimes, one of the parties in transaction may not know the quality of the product, thus creating information gap. George Akerlof contributed through his famous article in the clarification of the impact of quality on price by the prominent example about the used car market. Akerlof (1970) [2] shows that in a used car market consisting of good and bad cars, only sellers know the quality of their cars. A buyer would like to acquire a car, but keen in paying a reasonable price that is consistent with the price of the car.

As the buyer cannot observe quality, owners of low quality cars will always claim they are selling a high-quality product. A reasonable price will then reflect the average quality of the market. However, under such circumstances, sellers whose cars are worth more than the average price find such price too low, hence exiting the market. The average price must then drop further, inducing more exits. Consequently, at the exception of worst quality cars, no seller is willing to sell a car that a buyer is willing to buy. The distortion that led to this situation refers to asymmetric information under. This problem is particularly prominent in the field of insurance economics (the contract between securer and secured), financial markets (through nominal value and real value of securities), banking economics (the relationship between lender and borrower). Two major problems arise from the situation of information asymmetry: adverse selection and moral hazards.

2.1.1 Adverse Selection

Inefficient availability of credit, often known in economic literature as credit rationing, is a form of market failure caused by adverse selection problem. According to Akerlof's conclusion on the used car market, bad goods eliminate good ones because of the high cost of owning the information. Relating this example to the case of bank financing of small and medium enterprises, it may take the form in which banks offer the same interest rate for investments with varying degrees of risk. Firms facing financial constraints are more likely to accept the credit offer no matter how high the interest rate would be. While good firms would likely decline the loans offer with higher interest rates.

2.1.2 Moral Hazards

Moral hazard on the other hand, is information asymmetry arising after the contractual agreement between individuals. The most common form of moral hazard is the principal-agent problem, whereby one individual (the principal) wants to hire another individual (the agent) to perform a given task. However, once the contract has been signed, the agent can either take an action that is non-observable for the principal (hidden action), or obtain information about some characteristics of the environment that the principal cannot acquire (hidden information). Contrary to the case of adverse selection where a menu of contracts are offered to agent, moral hazard situations implies that every agent is given the same contract; the contract must therefore take into account future information asymmetries, and hence address the incentives problem. Mirrlees (1999) [12], Holmström (1979) [5] and Grossman and Hart (1983) [9] were key contributions to this literature. Moral hazards in the financial markets usually featured through the inability of managers of companies as agents of shareholders to maximize the wealth of these individuals. Bondholders also exposed to this type of problems.

The reason for the exposure of lender or investor to the risk of moral hazard remains the inability of the lender to; consistently monitor the activities of the borrower or issuer, as this process requires the costs of time and effort that the lender cannot afford. Even if the lender insists that the borrowing contract should limits the borrower's ability to

[1] For example, the OECD Working Party on SMEs and Entrepreneurship (WPSMEE) project on "New approaches to SME and entrepreneurship finance: provide a broad range of instruments" aims to help broaden the finance options available to SMEs and entrepreneurs. It contributes to the OECD-wide project on New Approaches to Economic Challenges (NAEC). For more detail, see Cusmano, L., & Koreen, M. (2015) [3].

undertake risky projects, still the lender would be exposed to these risk if he does not consistently monitor the activities of the borrower to determine compliance with the terms of the contract. To sum up, moral hazard problem is the behavior of the borrower that lender cannot predicts. It is more likely present in financing of small and medium-sized enterprises compared to financing big enterprises because of their lack of financial transparency, ownership structure and their owners' concealment of the real purpose of the project.

2.2 Information Asymmetry and Bank Financing of the SMEs

Empirical evidence established conflicting interest between banks and SMEs because of the divergence of objectives. Some economists (Mayer, 1988) [8] see that the long-term relationships between them as an indicator of economic growth and prosperity. They support their views with the case of both the German and Japanese economies. Others in particular like Hellwig (1991) [7] sees the relationship as a source of problems to banks. This is because banks were forced, through various policies, to bear bad customers for too long and, this is in the interest of small and medium enterprises, whose behavior becomes opportunistic and exploitative, which leads to inefficient allocation of loans at the macroeconomic level. According to this view, this is detrimental on the level of economic growth. The analysis of the status of bank loans for small and medium enterprises is not a microeconomic concern, but rather an examination of ways of promoting and improving the relations between small and medium enterprises in order to promote economic growth.

Despite this, banks and other lending institutions consider number of factors when granting loan to firms. Banks consider these factors as an attempt to estimate the likelihood of a credit default. The technique of assessing the borrower takes into account both qualitative and quantitative measures. This literature reviews some basic factors that determines the behavior of banks to grant loans to firms. Generally, these are age of the firm in business, cash flow or liquidity, size, firm's previous performance, net situation of the firms and other macroeconomic conditions such as aggregate level of economic performance as well as other monetary variables like interest and inflation rates. In other words, these factors affect the extent to which SMEs can take loan from the commercial banks.

One of these factors is cash flow. Cash flow shows how much of the money that firm makes remains after settlement of all financial obligation. Cash Flow Projection demonstrates firm's income and expenditure looking forward into the future. Thus, cash flow eventually defines firm's capacity to repay a loan. Consequently, banks look at the cash flow of a borrower to determine their capability to pay back the loan. Cassano, Jõeveer and Svejnar (2013) [17] examined the factors affecting micro, small and medium enterprises access to bank credit and the effect of these loans on their performances. The study utilized data from Bulgaria, Georgia, Russia and Ukraine for the period 2001 to 2004. The regression analysis shows that MSMEs that received loans in the past based on their cash flow and collateral are more like receiving additional loans in the future. This means that both cash flows and collateral based lending exert positive and significant impact on firms' ability to access bank loans in the future.

Furthermore, banks consider the net situation of the firms to gauge whether or not a firm is capable enough to meet the regular debt servicing. In respect to this, Abdelhafid and Mohammed (2019) [1] susing data from Algeria find a negative and statistically significant relationship between firms' net situation and access to bank loan. In addition, they also discovered that firm size positively and significantly influences firms' bank financing. In other words, the lager the firm in size, the higher the chance of accessing banks' loan. Hence, collateral or assets give the lender assurance that they can repossess the collateral in case the borrower defaults on the debt. Hence, banks take into account the loan-to-value ratio.

Tunde *et al*., (2017) [16] examined the financing constraints of SMEs in six southwestern states in Nigeria. The result indicates that high cost of borrowing constitutes financing constraints for SMEs, whereas collateral requirement exhibit positive but weak relationship with SMEs financing constraints. While Obokoh and Asaolu (2012) [14] on the other hand focused on 50 SMEs in Lagos area, and observed that financial reform does not relaxed SMEs financing constraints. Lack of information in the SME loan market only leads to more banks' problems in knowing the quality of borrowers. Many studies of bank financing for small and medium enterprises indicate that the overall trend of bank behavior in case of information asymmetry is either rationing of the loans or grant them at an additional cost.

3.1 Methodology

The dataset of this research comprises of various firm level and macroeconomic variables. The firm level data include total debt of the firm, size, age, cash flow, past investment and net situation. While the macroeconomic variables are GDP per capita, inflation rate and lending rate. The sample period is from 2005 to 2018. The choice of the sample period was informed partly due to availability of data and partly due to the fact that the Nigerian financial market witnessed significant reforms in 2005. It is expected that this reform will have significant impact on banks' lending to SMEs in Nigeria.

3.2 Sources of Data and Measurement

The firm level data come from annual financial reports of the firms published in the Nigerian Stock and Exchange Commission annual statistical bulletins and African Financial. The variable size is a dummy. It takes the value 0 if the firm is small, 1 medium and 2 large. The variable age is also a dummy taking the value 0 if the firm is young and 1 if otherwise. These two variables measure the existence of asymmetric information. Net situation is measured as a ratio of firm's total assets to total indebtedness and it captured the potentialities of bank recovery of the loan. We also included the cash flow or liquidity variable. The cash flow variable measured as gross operating surplus of the firm captures the degree of firms' financial constraints. While past investment measured as a natural log of firm fixed asset captures the growth opportunities of the firm that is whether the firm grows or not.

The macro level data were included to provide a comprehensive description of Nigeria's economy. We extracted the data from World Bank Development Indicators (WDI) and Central Bank of Nigeria Statistical Bulletins. The per capita GDP used is based on the constant market price of 2010 and is measured in millions of US dollars. We included the per capita GDP in the model to capture the

effect of inflation and Lending rate.

3.3 Empirical Framework

Given that variables related to asymmetric information are difficult to obtain, this research opt to adopt a model similar to Abdelhafid and Mohammed (2019) [1] however with modification. We test the effect of asymmetric information on firms' external financing decision using the variables discussed earlier. We specified the empirical model as follows:

$$D_{it} = \beta_0 + \beta_1 liq_{it} + \beta_2 liq_{it-1} + \beta_3 nets_{it} + \beta_4 PI_{it} + \beta_5 siz_{it} + \beta_6 age_{it} + \beta_7 X + \gamma_i + \tau_t + \varepsilon_{it}$$

Where D measures the amount of credit granted by the bank to firm i at time t while ε_{it} is an error term of zero mean and constant variance; model parameters measure the variables sensitivity to granting credit. The coefficient of main variables of interest β_1 and β_2 are expected to be positive and significant indicating that firms with higher cash flow both in current and previous periods receive more loan from bank. While the coefficient β_3 can be either positive or negative. That is to say, bank grant or denied loan depending on the net situation of the firms. We also expect increase in debt due to growth opportunities of the firms; hence, we expect β_4 to be positive. The sign of β_5 and β_6 are expected to be positive and significant. Meaning that large and older firms are more likely to receive credit from banks than small or young firms are.

The model estimated is panel in nature because of the advantages associated with using panel regression. Hsiao (1985) [6] listed several benefits from using panel data that include; identifying an economic models and discriminating between competing economic hypotheses; eliminating or reducing of estimation bias and reducing problems associated with data multicollinearity.

In addition, panel regression also gives data that are more informative, more variability, less collinearity among the variables, and more degrees of freedom. Hence, more efficiency is expected from the result. We employed two types of panel analytic models: pooled regression model and random effect model. Pooled regression model is one type of model that has constant coefficients, referring to both intercepts and slopes. For this model, researchers can pool all of the data and run an ordinary least squares regression model. In the random effect model, the individual effects are distributed randomly across the cross-sectional units and in order to capture the individual effects, the regression model is specified with an intercept term representing an overall constant term (Seddighi, 2000). Because the Hausman test failed to support the use of fixed effect model, hence, we do not considered it here.

3.4 Descriptive Statistics

Table 1 shows the summary statistics of the key variables used in the regression. For the sample period, loan granted to firms grow by approximately 21 percent with the highest growth of 27 percent. The average age of the firms is 46 years. In terms debt recovery, potentially 68 percent have good enterprise outlook based on their net situation. Only 15 percent of the firms have worsening condition. Past investment also grow by 21 percent. The economy suffers from inflation of about 11.5 percent while average GDP per capita stood at 2259 USD. Real interest rate goes as high as 18 percent during the period under review.

Table 1: Summary Statistics of Key Variables

Variables	Mean	Std. Dev	Min	Max
Loan granted	20.69	2.87	11.64	26.92
Age	0.47	0.50	0	1
Size	1.73	0.56	0	2
Liquidity	19.71	3.06	7.22	26.07
Net Situation	0.68	3.40	-15.05	8.54
Past Investment	21.50	2.58	12.22	26.84
Real interest rate	6.77	5.86	-5.63	18.18
Per capita GDP	2259.35	519.00	1268.38	3222.69
Inflation rate	11.51	3.44	5.38	17.86

4. Finding of the study

This section presents the empirical result and the results are presented in two parts. In the first place, we present and discussed the results related to the effect of cash flow on the amount of loan received by a firm. Secondly, we examine the effects of the presence of cash flow loans on SME performance, irrespective of the size of these loans. We carry out this estimation for all firms together and separately by firm size, using the three size categories of firms corresponding to small, medium-sized and large firms.

4.1 Impact of Cash Flow on Bank Loan to SMEs

Based on the results from Table 2, both current and the lagged cash flow variables have a strong explanatory power. In other words, current loan is dependent on both current and previous cash flow. Specifically, the result shows that increase in previous cash flow by 1 percent is associated with increase in amount of current loan given to firms by approximately 11 percent. On the other hand, deterioration of firm's current net situation has a negative repercussion on firm's amount of current loan. Meaning that if banks perceived that firm's ability to repay loan is worsening or in other words, the chance of default goes up, they may equally reduce the amount of loan to firm. There is also a positive relationship between past investment and the amount of loan to firms. This is because increase in growth opportunities of the firm give banks confidence in in anticipation of future streams of cash flow as well as ability to repay.

Additionally, firm age and size that are important indicators of information asymmetry have different level of significant in our regression. Age, in particular is not statistically significant. This is might be due to the current government policy that encourages the establishment of new businesses. Under this circumstance, age may not significantly matters because of the government interventions for the star-up businesses. The negative sign associated with age of the firms is an indication that older firms substitute costlier external funding with cheap internal funds.

However, size is statistically significant especially with respect to medium and large size firms showing that volume of loans increase with size. This is logical. Although, age does not matters, but size significantly determines the volume of the credit that goes to firm, indicating that one aspect of asymmetric information still prevails in the Nigerian financial market. Other control variables do not

show significant impact on the amount of credit to firms during the period under review. The 2007 to 2008 Global Financial Crises as well as 2016 economic recession that hit the economy may explain the reason why the variables were not statistically significant.

Table 2: Impact of cash flow on bank financing

Variables	OLS	REM
Cash flow	0.438***	0.381***
	(0.0619)	(0.0584)
Previous cash flow	0.129**	0.105*
	(0.0646)	(0.0568)
Net Situation	-0.317***	-0.314***
	(0.0342)	(0.0330)
Past investment	0.288***	0.212***
	(0.0547)	(0.0586)
Medium	1.231**	2.309***
	(0.497)	(0.894)
Large	0.848**	1.831**
	(0.427)	(0.769)
Age	-0.278	-0.423
	(0.193)	(0.345)
Per capita GDP	0.00251	0.000490
	(0.00512)	(0.00438)
Inflation	0.0485	0.0244
	(0.0772)	(0.0653)
Interest rate	0.000186	0.0728
	(0.159)	(0.137)
Constant	-1.816	4.339
	(9.468)	(8.205)
Number of observations	250	250
Year dummy	Yes	Yes
R square	0.77	0.58

Significant at: * $p<0.10$, ** $p<0.05$, *** $p<0.01$

5. Conclusion and Recommendation

The study of the impact of cash flow on lending to firms in Nigeria permits us to draw number of interesting conclusions. The first relates to the allocation of credit and the other with respect to information asymmetry. With regard to the allocation of credit, we discovered that firms that received loans based on cash flow in the past, equally stand a chance of receiving loan in the present time. This finding is similar to Cassano, Jõeveer and Svejnar (2013) [17] and may reflect the fact that firms that received a given loan in the past are more likely to apply to the same lender and/or that the lender is more likely to lend to firms to which he/she lent in the past. With respect to information asymmetry, lack of full information about the firms by the commercial banks hiders channeling of credit to, particularly SMEs. This indicates that government policies to revive the SMEs sector remains weak in Nigeria, perhaps due to stringent and unrealistic bureaucratic channels.

Hence, this study recommends that Government should intensifies effort in designing and implementing policies that can facilitates SMEs access to credit. Government should remove all unnecessary bureaucratic hurdles and discrimination, establish strategic and robust venture capital sector, crowd funding and other forms of financial institutions such as micro finance institutions to make funds available at affordable rate to critical sectors such as agriculture and manufacturing. This is essential, considering the fact that it will assist in the creation of new businesses and allows existing firms to leverage on so many opportunities to expand and create job opportunities.

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