

## Evaluation of Factors Affecting Credit Flow from Banks to SMEs in Uganda

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### Abstract

We contribute to the existing literature on SMEs credit conditions in developing countries by investigating the structure of the SMEs lending market in Uganda with the aim of understanding the factors that influence the main aspects of credit demand and supply. The study makes use of SMEs micro data from the World Bank Enterprise Survey. We conclude that credit demand and supply are positively affected by the level of capital financed by internal funds or banks. Firms that report falls in sales may find it harder to apply for loans, and they are also more likely to be charged higher interest rates on loans. Banks' profitability affects their decision to supply credit and their lending terms and conditions. GDP growth rate positively affect credit demand but it tends to have a negative effect on aspects of credit access and its terms and conditions. The findings of this study could be linked to a significant number of similar African countries as well as provide an opportunity to compare and contrast with the other studies from developed countries.

**Keywords** Credit, Supply and demand, Bank market power, Bank profitability, Uganda

### 1. Introduction

Small and Medium Enterprises (SMEs) are at the heart of Uganda's economy because of the role they play in the emerging economic structure in terms of job creation, GDP growth and above all poverty alleviation. Kuntchev *et al.* (2014) cite Ayyagari *et al.* (2007) indicating that SMEs employ more than 50% of the formal workforce. This implies that they have the highest rates of job creation in the whole world. The Organisation for Economic Co-operation and Development (OECD) reported that more than 95% of business firms in developing countries are SMEs which account for 60% of private sector employment and contributes a large percentage to GDP growth. The World Bank Enterprise Survey also shows that about 800,000 SMEs in Uganda are sources of employment opportunities; the firms also have tremendous potential for reducing poverty levels in the population as noted by the Ministry of Finance Planning and Economic Development (MFPED).

This is not surprising as it is observed to be the case in most of the African countries and other developing economies and therefore they may be recognised as a fundamental part of a dynamic and healthy economy. In fact, according to recent research conducted by UK-based business-networking group, Approved Index, Uganda ranks first in the world for having the most entrepreneurs per capita that is, 28.1% of the population are entrepreneurs. This number is those of followed by Thailand, Brazil and Cameroon. It also notes that in the UK and the US, entrepreneurs are associated with start-ups but in some countries, becoming self-employed is a necessity rather than a dream, "You have to make your own opportunities when there are not many jobs available." The latter is certainly the case on the African continent.

Despite the contribution that SMEs make to economic growth, they are faced with limited access to finances which makes it hard for them to grow in both size and profits and this also leads to most of them shutting down after one year in operation (Okurut and Bategeka, 2006; Kappel *et al.*, 2004; Uganda Microfinance Outreach Plan 2001; Obwona and Mugume, 2001). Although many SMEs in Uganda mainly rely on internal forms of financing but as they grow, the need for external credit is inevitable and therefore they turn to banks as the primary source of external credit. The Global Entrepreneurship Monitor (2014) shows that only 6% of young entrepreneurs cite financial institutions as the source of their capital and banks are referred to as the primary source of external credit. A vast majority of new SMEs depend on internal finance or internal equity but as the firms grow, it is increasingly difficult to keep the costs within the constraints of self-finance and therefore they need capital from external sources such as banks (Fatokil and Smit, 2011; Beck *et al.*, 2006; Berger and Udell, 2006). However,

these SMEs tend to be more credit constrained than large firms and they find it difficult to access bank credit due to a variety of factors which may have either firm-related factors, bank-related or even may be related to the economy at large.

This study is concerned with the aspects of bank credit demand and supply to Small and Medium Enterprises (SMEs) in Uganda. The aim of the study is to provide further insight into the firm, bank and macroeconomic factors that influence the flow of credit from banks to SMEs in Uganda. It is intended to examine how these factors determine the decisions that the firms and banks make and how these decisions affect credit demand and supply. The study focuses on the factors that affect banks' decision to supply credit to SMEs in Uganda. It also investigates the factors faced by SMEs that affect their decision to apply for bank credit as well as the effect of macroeconomic activities on both credit demand and supply.

There are several sources of external finance from which SMEs could benefit and they are classified into four categories: equity finance and three options for debt finance: formal debt finance including banks and non-banking financial institutions, trade finance including credit from suppliers and customers and finally informal sources of finance such as moneylenders, friends and relatives (Kuntchev *et al.*, 2014). Commercial banks are a principal source of external debt for SMEs but they also offer a wide range of services other than loans and this may be termed as cross-selling to take advantage of the opportunity which SME banking provides (Coleman and Cohn, 2000). These banks perceive SMEs as a core and strategic business and seem well-positioned to expand their links with them through diversification of products and services they provide to these firms (Beck *et al.*, 2008; Augusto *et al.*, 2010). Such services include deposit accounts, cheque transactions, trade bill financing, overdraft facilities to name a few.

The World Bank (2014) reported that Uganda had only 10% of small and medium firms with a bank loan, a proportion less than half the average for developing countries. Tushabomwe-Kazooba (2006) in a survey conducted in Western Uganda finds that out of 48 percent of the firms had their growth ambitions adversely affected by lack of sufficient funds for working capital and long-term investment purposes. Furthermore, in a survey conducted by MFPED in 2006, most SMEs find it difficult to grow due to insufficient capital since they are not able to obtain finance from banks. Although Coleman and Cohn (2000) assume that banks recognise the SME fragment to be highly profitable, some researchers also point out that banks may not have the incentive to lend to these firms due to the high risk embedded in their operations (Nanyonjo and Nsubuga, 2004). These firms may also fail to meet the bank requirements due to certain firm characteristics which discourage banks to supply them with credit. Such attributes may include size of the firm, its performance and capital structure (Hussain *et al.*, 2006).

Banks may also set tough lending conditions such as high interest rates, short-term loans, and collateral requirements which discourage firms to apply for loans. For example, in an interview held by the Independent magazine (2015), most businessmen raised the issue of banks charging them high lending rates among other strict lending conditions which make it hard for their firms to grow. The central bank responded by explaining that lending rates have been slow to fall because banks are granting loans only to their most creditworthy clients.

To summarize, fully constrained firms have no external debt because loan applications were rejected due to the failure of meeting bank requirements or the firm did not even bother to apply due to strict lending conditions even though they needed additional capital. Consequently, these findings alone provide the rationale for investigating the structure of the SME lending market in Uganda with the aim of understanding the factors that influence the main aspects of credit demand and supply to SMEs in Uganda.

Using firms' micro data obtained from WBES, this study finds that firms' decisions on loan applications, level of credit demand and level of access to credit are positively affected by the level of capital financed by internal funds or banks and firm revenues/profitability and size. For bank-related factors, the study finds that banks' profitability also affects their decision to supply credit and its terms and conditions further discouraging firms to apply for loans and thus leads to a decline in credit demand. Also, focusing mainly on GDP growth rate, the study identifies that macroeconomic activities positively affect credit demand but they tend to have a negative effect on aspects of credit access and its terms and conditions.

## 2. Factors affecting demand and supply of credit - literature review

The aim of this section is to review some of the relevant studies and theories to identify significant factors which may be responsible for the external credit conditions faced by SMEs in Uganda. The section discusses previous literature on bank-related factors which may have influenced their decision to supply credit to SMEs. Also it includes the relevant theories and firm-specific factors which influence their decision to apply for bank credit and lastly it reviews previous literature on the effect of macroeconomic activities on both credit supply and demand.

### *Credit supply factors*

*Bank performance/profitability:* In a survey conducted by the African Development Bank, most Ugandan banks mentioned that profitability was the main driver for them to participate in the SME market. Calice *et al.* (2012) also add that the banks' interest towards dealing with SMEs is largely driven by the business objective of profit pursuit. This may not only imply that profits in the SME sector are attractive, but importantly that they are attractive relative to the alternatives after controlling the risk. For instance, De la Torre *et al.* (2010) show an array of factors driving banks' desire to become involved with SMEs and the most relevant aspect mentioned by banks is the perception of high risk-adjusted profitability of the sector. The bank profits may be gained through a diversification strategy which involves increasing the deposit base that generates higher income from fees and commission as well as providing loans to the firms. However, due to the high risks associated with SMEs operations, it may affect the banks' decision to supply credit in terms of setting strict lending conditions whereby banks charge customers according to their risk, i.e., the higher the risk, the higher the interest rate charged and the higher the fees for additional services (Fredriksson and Moro, 2014).

In 2012, Uganda reported the highest contribution of interest income on SME loans to banks at 62% compared to other East African countries implying that SMEs are charged high interest rates to guard against credit default. As Stiglitz and Weiss (1981) explain that banks are concerned about the interest rate they receive on the loan and the riskiness of the loan. Due to information asymmetries, the interest rate a bank charges may itself affect the riskiness of the pool of loans and the actions of borrowers. Hence, as the interest rate rises, the average riskiness of those who borrow increases leading to lower bank profits. This may imply that raising the interest rate or value of collateral may not be profitable to banks. Analysts suggest that banks need to strike a balance between making huge profits and encouraging businesses to flourish by subsidising the bank charges and lending rates and encouraging relationship lending which will benefit both the banks and borrowers (The Ugandan Independent Magazine, 2013).

*Bank concentration and competition:* The Structure-Conduct-Performance (SCP) paradigm suggest that formal measures of market structure are strong predictors of firms' competitive behaviour and this may have an influence on credit demand and supply to SMEs (Berger and Udell, 2006). Although researchers such as Petersen and Rajan (1995) argue that less competitive markets may be associated with more credit availability, a financial system with high bank concentration may lead to hiked prices and encourage monopolistic strategies such as high interest rates on loans, price discrimination and short-term loans which further discourages SMEs to apply for external debt from banks (Leon, 2015). Carbo-Valverde *et al.* (2009) show that the issue of bank competition and credit availability may matter most for small and mid-sized enterprises since SMEs are more vulnerable to information problems and they are much more bank-dependent than large enterprises. This is also confirmed by Ryan, O'Toole and McCann (2014) who suggest that the effect of bank market power on financing constraints increases in financial systems that are more bank-dependent and since most of the SMEs in Uganda rely on banks as the primary source of external credit, this market power hypothesis may in fact hold.

### *Credit demand factors*

Although bank-specific factors are important, SME-specific factors are the most serious obstacle to the development of SME lending because they also affect the banks' decision to participate in SME financing.

*Capital structure:* Aside the Pecking Order Theory (POT) and Modigliani and Miller (1958) theories which explain firms' capital structure, other scholars show that small firms, especially new firms, finance a smaller share of their investment with formal sources of external finance i.e., bank credit, since they prefer to use their retained earnings. This could be due to them being risk averse or not being in a position to meet banks' lending requirements such as their collateral requirements or insufficient information on credit history being available amongst other things (Berger and Udell, 1998; Beck *et al.*, 2004).

It may be suggested that the perception of SME borrowers concerning bank credit, affects their decision to apply for this credit. Moreover due to credit rationing, SME owners prefer to retain control by not applying for external capital since they are not inherently riskier in terms of their propensity to fail. This is especially so for the more educated SME owners (Cressy and Olofsson, 1997; Headd, 2003). In fact, previous studies show that small firms finance, on average, 13% points less of investment with bank debt compared to large firms. For example, Vos *et al.* (2007) cite Berger and Udell (1998) who study SMEs' capital structure decisions within a financial growth cycle paradigm find that most SMEs rely on internal sources of funds in their early years of operation due to information asymmetries and moral hazard problems and as they grow in size and age, these firms need to have better access to external funds.

*Size of the firm:* Apart from being viewed as a determinant of firms' capital structure, size is referred to as a significant obstacle to bank credit (Beck *et al.*, 2000; Kuntchev *et al.*, 2014). Beck *et al.* (2000) shows that the probability that a small firm lists financing as a major obstacle is 39% compared to 32% for large firms. Larger firms tend to be more diversified and hence have lower variance of earnings, making them able to tolerate high debt ratios compared to smaller firms which find it difficult and more costly to resolve information asymmetries with lenders (Wald, 1999; Abor and Biekpe, 2009).

It is observed from previous studies that a positive correlation exists between the size of SME and its willingness to seek credit from banks (Kakuru, 2008). Therefore, large firms are more likely to seek credit as they are more growth-oriented than small firms and they tend to meet the lending requirements compared to SMEs. In fact, the probability of being credit constrained decreases with firm size and that is why smaller firms may find it more difficult to access external debt than large firms since SMEs lack sufficient and accurate information on their credit history and as earlier noted, this may affect the bank's decision to provide credit due to fear of credit default.

*Performance of the firm:* Turyahebwa *et al.* (2013) cite Jaggi and Considine (1990) showing that profitability is a crucial indicator for determining the financial position of the firm, whereby a firm with weak profitability compared to others in the industry is considered financially weak and this affects their eligibility to access bank credit, the latter considering firms' performance as one of the requirements for loan approval. According to the Ugandan Ministry of Finance, Planning and Economic Development (2004), bank credit for growth purposes is primarily crucial for those SMEs that seek growth and usually include most of those that have reached the threshold of employing around 50 people with value of assets and annual turnover in the range of 50 Million Ugandan Shillings (UGX). This is what the loan officers pay attention to when screening to ensure that their records meet the selection criteria. This may be because SMEs tend to have a high risk profile which leads to high administrative costs in relation to the financing amounts involved hence, making SME lending unattractive to banks. Based on the POT, firms which are more profitable or with higher level of working capital tend to prefer internal sources of finance to external sources which explains why SMEs choose internal equity at least for the first year of operation (Frank and Goyal, 2003). Further, this may mean that the use of external funds is very much related to profitability on the basis that SMEs, particularly if they are not listed, will make use of internally generated funds as a first resort (Abor and Biekpe, 2009).

*Macroeconomic factor:* Apart from Holton *et al.* (2014), Beck *et al.* (2006) were the only researchers to consider the role of macroeconomic factors in influencing firms' access to finance. Both these studies show that positive and negative changes in economic growth can affect firms' output expectations and their expected returns on investment which alters their demand for credit and this can also affect the supply side, especially for banks which are risk-averse, thus raising the loan rejection rate. For instance, at the time of conducting this study, Uganda is going through a period of economic turmoil with high interest rates and depreciation of the Ugandan shilling against major currencies. This may greatly affect the supply and demand for credit in a way that adversely affects firms' asset values, income and prospects thus leading to economic instability. It may also influence the banks' performance and their involvement with SMEs (Lown and Morgan, 2006). Olawale and Garwe (2010) in a study conducted in South Africa, also propose that economic factors have a direct impact on the potential attractiveness of various strategies and consumption patterns in the economy and have significant and unequal effects on growth of small and medium firms. In this case, we focus mainly on GDP growth as it may have a stronger effect on SME financing.

Overall, the above review of literature shows that there exists various determinants of credit availability to SMEs but there are three major categories which determine credit supply and demand. The first category of bank-related factors includes the profitability of banks and their market structure. The second category is made up of firm-specific factors such as firm size, profitability and capital structure. Lastly, the third category consists of macroeconomic factors, specifically GDP growth. It is important to evaluate these supply and demand factors and identify to what extent they influence credit availability to SMEs. For example, banks' profitability is an important determinant of their ability to supply credit to SMEs in such a way that profit oriented and risk taking banks may find it easier to supply credit to SMEs compared to those that are risk averse. This is also the same with competitive banks. The financing decisions of the firm, their size and performance, may also affect their decision to ask for bank credit. Although there is limited research on the effect of the macroeconomic factors, it is important to include it in this study to provide further insight of the phenomenon of credit flow to SMEs.

### 3. Data and sources

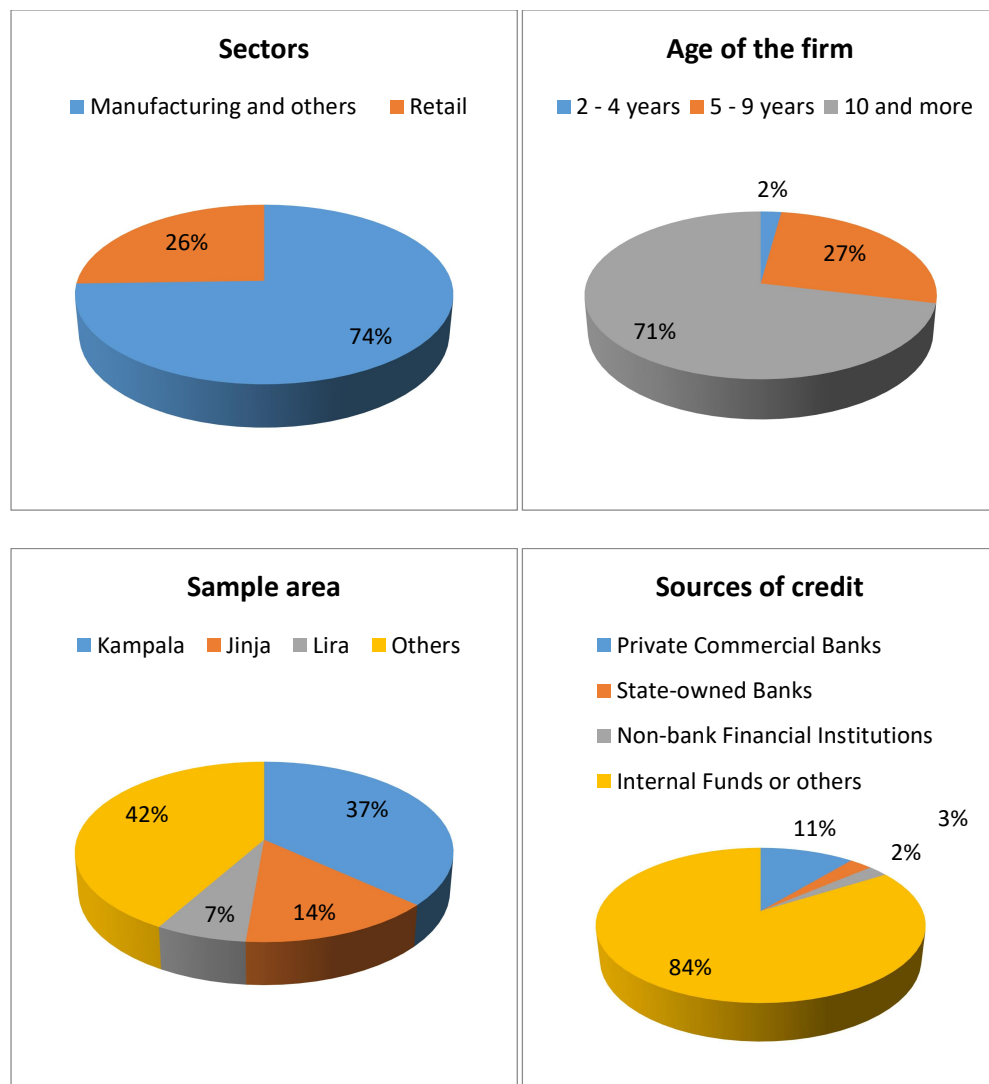
This section presents the data and methodology used to address the objectives of the study. The general purpose of the study is to evaluate the factors that influence the supply and demand for bank credit by SMEs in Uganda by conducting an empirical methodology using firm-specific micro data from WBES and bank data from Bankscope as well as an indicator of the macroeconomic environment.

In the US, SMEs are defined as firms with less than 500 employees and less than 250 employees in the European Union. Whereas the Ugandan Ministry of Finance, Planning and Economic Development (MFPED) defines both small and medium enterprises as firms that employ up to 50 people with value of assets, excluding land and buildings of not more than 50 million Uganda Shillings (UGX) and an annual turnover of between 10 million UGX and 50 million UGX. According to the World Bank Enterprise Survey (WBES), small-sized firms are those with less than 20 employees while medium-sized firms are those with less than 100 employees. Since the data used for this research was obtained from WBES, their definition of SMEs is the operational definition used to identify SMEs and therefore it is the basis on which the study is conducted. These firms are spread across most sectors of Uganda's economy such as food and beverages, carpentry, textiles in the manufacturing sector and retail sector and majority of these firms are located in the urban areas with more than half of them in Kampala which is the capital city (WBES, 2012).

As recommended by many authors who have conducted studies on SMEs, the World Bank Enterprise Surveys (WBES) cover a broad range of business environment topics including access to finance, competition and performance measures. Beck *et al.* (2006) add that all the surveys have country specific questions; they include information on a large section of various types of firms in the country. Furthermore, they provide information on the financing needs of SMEs, their experience in attempting to ask for credit, along with information on their perceptions of the external credit conditions. Hence, all the questions regarding the firms' financial status, sector of activity, employment, ownership type, among others were extracted and used to conduct the study. Other sources such as Global Entrepreneurship Monitor (GEM), and Bankscope were also used to obtain information relevant to the study.

The study used firm micro data for the period which includes 907 observations from different regions of the country. Figure 1 gives a breakdown of the sample data by sector, age, sample area and main source of credit as of 2013. It is observed that only 26% of the firms are involved in the retail sector while the rest of the firms specialise in manufacturing such as recycling, furniture, food and beverages, and textiles. Other services include hotels and restaurants, transport section, and construction.

**Figure 1: Breakdown of data sample by sector, age, sample area and capital structure**



In terms of age, it is shown that 71% of the firms have been in existence for over 10 years while the youngest firms take up just 2% of the entire sample. The figure also shows that majority of the sample is located in the central region and most specifically in Kampala which is the capital city. This may suggest that the proximity to external sources of credit especially banks should not be a challenge since most of the banks are located in urban areas which also encourages relationship lending. Figure 1 also illustrates the percentage of credit provided by different sources and it is seen that although most of the firms are financed by internal funds, private commercial banks are the primary source of external credit providing credit to about 11% of the sample size compared to other financial institutions and state-owned banks. The study further includes a sample of data on the top ten banks involved in SME banking as listed in the Ugandan Independent Magazine. The banks are also highly ranked in terms of total assets and therefore they were the best choice for this study.

Table 1 shows the level of concentration of the Ugandan banking system in 2006 and 2013 using the k-bank Concentration Ratio (as explained by Dickson (1981)). In 2006, there was a high concentration among the five top banks in the market, implying that the top five banks held 84.43% of the total market share. But by 2013, due to entry of new firms and foreign bank participation, the level of bank concentration was slightly reduced to an average of 79.3% and hence, making the bank market structure monopolistically competitive. This implies that the level of competition amongst banks is expected to be high although there is a possibility of imperfect

information which further encourages monopolistic strategies explained by the Structure-Conduct-Performance (SCP) approach (Scherer and Ross, 1990). This banking market structure could be used to explain the behaviour of banks and their decision to set strict lending conditions which discourage SMEs from demanding credit.

**Table 1: Banks concentration ratios**

Year	CR <sub>2</sub> (%)	CR <sub>5</sub> (%)
2006	56.68	84.43
2013	48.88	79.3

*Dependent variables*

Table 2 gives details of the survey questions which are used as dependent variables in the analysis. First, to evaluate the aspect of credit demand focusing mainly on the factors which influence the firms' decision to apply for bank credit; we use a dummy variable for those who did not apply for loans and another one for those who applied for loans. For the latter, the dummy variable equals to '1' if the firm applied for a loan and '0' if it did not apply for a loan and vice versa for the former. Furthermore, to investigate the credit demand, a dummy variable was used, taking the value equals to '1' if the demand for loans has decreased and '0' if the demand has increased or remained unchanged. Firms were also asked of their perception of access to credit had proved a major obstacle. We use a dummy variable equal to '1' if firms reported access to finance as a major/severe obstacle and '0' if it was reported as a no/minor/moderate obstacle. This allows us to identify firms' opinion as to the external credit availability and it captures the opinion of those who were discouraged to apply. For the aspect of obtaining credit supply, to identify banks' interaction with firms and the level of credit supplied to firms, firms are asked if they have a line of credit. The dummy variable is coded '1' if the answer is 'no' and '0' if 'yes'. Finally, to measure the banks' financing terms and conditions a level of annual interest rate is used as a dependent variable.

**Table 2: Dependent variables**

Dummy dependent variables	Survey questions	Dummy coding
No loan application	Did the firm apply for loans in the recent fiscal year? 1. Yes 2. No	Binary variable: 0 = if applied (1) 1 = if did not apply (2)
Applied for Loan	Did the firm apply for loans in the recent fiscal year? 1. Yes 2. No	Binary variable: 0 = if did not apply (2) 1 = if applied (1)
Credit demand decrease	Did your level of debt/ loan demand: 1. Increase 2. Decrease 3. Remain the same	Binary variable: 0 = increased (1), remained the same (3) 1 = decreased (2)
Loan rejection	What was the outcome of the most recent loan application? Was it: 1. Approved 2. Rejected	Binary variable: 0 = if applied and loan or line of credit was approved (1) 1 = loan or line of credit was rejected (2)
Perceived credit availability	To what degree is access to finance an obstacle to the current operations of this establishment? 1. No obstacle 2. Minor obstacle 3. Moderate obstacle 4. Major obstacle 5. Very severe obstacle	Binary variable: 0 = if no obstacle (0), minor (1) or moderate (2) 1 = if major (3) or very severe (4)
No line of credit or loan	Does this establishment have a line of credit or loan? 1. Yes 2. No	0 = if yes (1) 1 = if no (2)
Interest rate	What was the average nominal annual interest rate on this most recent loan?	

### Explanatory variables

The explanatory variables used to capture the effect of firm-level characteristics on credit demand and supply include the firms' change in capital structure (if bank financing or internal financing increased). Also, indicators of the size of the firm, measured by the number of employees and an indicator of revenues (which depends on domestic demand for product) were also taken into account. Table 3 shows these variables in detail. The bank-related factors used as explanatory variables include banks' performance approximated by the profitability ratios which include the return on assets (ROA), the return on equity (ROE) and the net non-interest margin (NNIM). Finally, we also include the macroeconomic variable (GDP annual growth rate) which is used to capture the extent to which the economic activity may affect access to credit from banks.

**Table 3: Explanatory variables: firm and bank level characteristics**

Variables	Explanation
<b>Firm level characteristics</b>	
Firm size: small	How many employees does your company have? 1. small: from 5 – 19 2. medium: from 20 – 99 3. large: more than 100
Firm size: medium	How many employees does your company have? 1. small: from 5 – 19 2. medium: from 20 – 99 3. large: more than 100
Revenues (annual sales)	In the last complete fiscal year, what were this establishment's total annual sales for all products and services?
Capital structure (internal funds)	Percentage of working capital financed by internal funds or retained earnings
Capital structure (bank financing)	Percentage of working capital borrowed from banks
<b>Bank level characteristics</b>	
Return on assets (ROA)	Ratio of net income to total assets
Return on equity (ROE)	Ratio of net income to total equity
Net non-interest margin (NNIM)	Net fees and commissions and remaining operating income to total assets

Table 4 shows summary statistics for the dependent variables along with the bank-related and macroeconomic variables. It is observed that the firms without loan applications have the highest mean value implying that the majority of the SMEs prefer not to apply for loans due to the factors yet to be discussed in the following section. This situation is followed by firms without a line of credit and level of decline in credit demand. The GDP growth rate seems to have a high standard deviation (SD) and the min-max spread, signify that the estimated values deviate away from the mean value.

**Table 4: Summary statistics for dependent and macroeconomic variables**

Variable	Mean	SD	Minimum	Maximum
Applied for loan	0.12	0.32	0.00	1.00
No loan application	0.81	0.39	0.00	1.00
Credit demand decrease	0.29	0.45	0.00	1.00
Perception of credit access	0.40	0.49	0.00	1.00
Loan rejection	0.003	0.05	0.00	1.00
Average annual interest	0.0135	0.056	0.00	0.50
No line of credit	0.765	0.4	0.00	1.00
GDP growth rate	6.22	3.66	3.30	10.80



#### 4. Methodology

Using quantitative research methodology, the empirical strategy of this study is to evaluate external credit conditions of SMEs in Uganda by providing further insight on the likely outcome of the dependent variables given the different explanatory variables mentioned above together with the extent that these variables influence the aspects of credit demand and supply. It may be noted that for all the binary dependent variables, since the questions are qualitative in nature, the following probit specification for the bank credit flow to SME with error term is used:

$$\theta + \beta * \text{firm characteristics} + \gamma * \text{bank level factors} + \alpha * \text{macroeconomic condition} + \varepsilon (1)$$

Equation 1 illustrates the relationship between the variables whereby bank credit flow represents the various aspects of credit supply and demand from banks to SMEs which include loan application decisions, level of credit demand, credit perception, and access to a line of credit. Then, firm-level explanatory variables represent firm-specific factors outlined in Table 3 including firm size, profitability and capital structure. In the case of a regression model, where continuous variable, interest rate on loans, is used as a dependent variable, we ran OLS regression on the same set of firm and bank specific variables alongside GDP growth rate.

As Flamini *et al.* (2009) indicate that bank-specific and macroeconomic factors are the most important explanatory variables for high returns in the banking industry. Hence, they play a big role in identifying how banks make decisions to supply credit to SMEs. Since the main measures of banks' profitability include net-non interest margin, return on assets and return on equity, the bank-level factors used as explanatory variables include NNIM, ROA and ROE. Also, a macroeconomic variable is added to account for the effect of economic activity on credit conditions and this variable is the GDP annual growth rate obtained from World Bank data. In order to avoid issues of perfect collinearity, the bank-level and macroeconomic explanatory variables were regressed on the dependent variables, one at a time, to ensure they were independent representatives of the variables under study. This is also because the values for the explanatory variables were repeated more than once which could have led to singular matrix errors. All the regressions were run using Eviews software to generate conclusions about the relationships between demand and supply factors and credit flow from banks to SMEs.

It is expected that the capital structure of the firm has a great influence on their decision to apply for bank credit and this may also affect the banks' interaction with these firms. It could also be the case that the size of the firm affects the decision of banks to supply credit to these firms due to the high risks involved in their daily operations as earlier noted in the literature. Although data on loan rejection rate could have been relevant to the credit supply aspect of this study, it was not included due to insufficient responses from the survey questions. Instead the study focused on the access to the line of credit or loans to firms to determine the level of credit supply to SMEs. It may be the case that very few small and medium-sized firms have a line of credit which may be due to their financing decisions and the behaviour of profit-oriented banks.

#### 5. Empirical analysis

This section presents the results of the analysis of the firm-specific, bank-specific and macroeconomic factors that affect the decisions of SMEs to apply for credit and also the decisions of loan officers to extend credit to these firms. The results attained explain the relationship which exists between the different aspects of credit demand and supply and the explanatory variables. Hence this section begins by explaining the effects of firm-level characteristics on the flow of bank credit to SMEs, followed by the effects of bank-related factors and lastly it shows the role of the real economy in credit supply and demand.

##### Effect of firm-level characteristics

Table 5 shows results of the regressions for all the binary dependent variables on the firm-level explanatory variables using probit model. Column (1) represents the firms that decided not to apply for loans and it is observed that SMEs are more likely not to apply for loans because the largest percentage of working capital is financed by internal funds or retained earnings while those whose working capital is financed by banks are more likely to apply for loans (Berger and Udell, 1998). Therefore it may be suggested that a positive relationship exists between a firms' capital structure and their loan application decisions. This further explains why most of the firms prefer not to apply for loans because they do not see the need for these loans and this was evident in Table 4 which shows that the majority of the firms have no loan applications. An alternative explanation is, that based on their previous experiences of rejection, these SMEs in fact prefer not to apply. This takes us to the next

point that may further explain why firms do not apply for loans which is revenue for the firm.

As seen in the table, a decline in firms' sales revenues also makes loan applications less likely since the firms cannot meet bank requirements which may include high profits and collateral value which discourages them from applying. Therefore, firms may decide to close operation if they realise that they are not making enough profits or they may apply for loans from friends and family which do not entail specific requirements. The size of the firm may also have an effect on the firms' decision not to apply for loans and this is observed with small-sized firms which are more likely not to apply for loans compared to medium-sized firms. This could also be due to a fear of being rejected based on previous rejections from earlier applications.

Column (2) of Table 5 presents the firms which do apply for loans and how their decision is determined by the firm's characteristics. The results show that the firm's capital structure has a significant effect on their decision in a way that firms, whose working capital is mainly financed by banks, are more likely to apply for loans as mentioned earlier and also firms with decreasing internal funds are more likely to go for bank credit, this decision may be explained by the pecking order theory (Frank and Goyal, 2003). But the firm's decision to apply for loans does not seem to be associated with its size and revenues. It could be explained that firms that rely on banks as their primary source of credit may have a stronger relationship with these banks than other SMEs hence their decision to apply for loans irrespective of revenues and size.

**Table 5: Explanatory variables: firm-level factors**

Variables	No loan application	Applied for loan	Credit demand decrease	Perception of credit availability (major obstacle)	No line of credit	Interest rate
	(1)	(2)	(3)	(4)	(5)	(6)
WC finance by bank	-1.6199***	2.1163***	2.0034***	0.3794	-2.7507***	0.0901***
WC finance by internal	0.9071***	-1.0701***	-0.4412***	-0.1682	1.2691***	-0.0213***
Sale falls	0.3050**	0.0417	0.7737***	0.0451	0.1258	0.0125***
Small sized firms	0.1497*	-0.1067	-0.1812**	0.2006**	0.2112**	-0.0029
Medium sized firms	-0.0430	0.4326	0.1540*	-0.0609	0.0816	-0.0008

Notes: WC stands for working capital. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

In relation to credit demand decline in column (3), there seems to be a contradiction with regards to the capital structure of the firm and how it affects credit demand. It is shown that an increase in working capital, financed by banks, is more likely to reduce the demand for bank credit while a reduction of internal funds also increases the likelihood of credit demand decline. This may be due to credit rationing and it is seen to be common with larger firms since the table shows that smaller firms are less likely to reduce credit demand while medium-sized firms are more likely to decrease the level of credit demand (see Stiglitz and Weiss, 1981).

Column (4) reports the perceptions of firms to credit availability as an obstacle. The former includes firms that applied and those which did not apply for loans and it is shown that the firms' capital structure and revenues do not associate with firms' perceptions. The size of the firm is the only significant factor that influences firms' perceptions of access to credit. Hence it may be concluded that small sized firms are more likely to perceive access to credit as a major obstacle compared to other firms. This may be due to their experience when applying for loans and noting the bank requirements, information asymmetry, among others. Schiffer and Weder (2001) explain that as firms grow in size and revenues (profits), they are able to access more loans than new and small firms that consistently report higher financial obstacles.

Column (5) represents the firms that do not have a line of credit or loan which means that they could have applied for credit and it was rejected or they do not interact with banks and have no access to bank credit. The table shows that firms that rely more on internal funds than bank finances as their main source of credit are less likely to have access to bank credit. This may be due to lack of interaction with these banks which affects the relationship they have and also makes it harder for the banks to trust these firms due to asymmetric information (see Berger and Udell, 2006). It is also shown that the size of the firm is more likely to affect the firm's access to

line of credit, this seemingly being the case, especially for small-sized firms.

Turning briefly to column (6), we see that bank lending conditions in terms of interest rates charged are influenced by the capital structure of the firm and its level of revenues. The table shows that firms whose capital structure is financed by banks are charged high interest rates and this could be due to the high risks involved in the lending to these firms. Furthermore, firms with decreasing internal funds may decide to apply for bank credit which in turn is likely to be charged at a high interest rate. The results also show that a reduction in the revenues of the firm may also lead to the likelihood of high interest being charged on this firm's loans. However the size of the firm does not seem to be associated with this dependent variable.

#### Effect of bank-level characteristics

In Table 6, the results presented show how bank level characteristics are associated with the aspects of credit demand and supply. As seen in column (1), there is no relationship between firms' decision not to apply for loans and the performance of profit-oriented banks. In column (2) however, firms that apply for them seem to be influenced by banks' profitability. For instance, these firms are more likely to apply for loans if NNIM is low than when it is high. Ugo and Gambacorta (2006) explain that banks charge their customers fees in exchange for a variety of traditional financial services such as checking and cash management and investment banking activities. Hence if NNIM is low, it signifies that firms are not charged highly for the services they receive from banks and this may encourage them to apply for loans.

It has been suggested by previous studies that due to asymmetric information and related adverse selection issues, banks take risks with the hope of acquiring higher financial leverage and this act of risk taking may involve the giving of loans to some risky firms with the hope of attracting more borrowers and hence getting higher returns on assets and equity. Therefore due to the occurrence of adverse selection problems, small and medium firms may make use of this opportunity by applying for loans with some confidence knowing that they will not be rejected by those struggling banks in particular.

Looking briefly at column (3), it shows that the level of demand for credit is associated with the banks' profitability ratios as earlier noted. As NNIM increases, firms are more likely to reduce the demand for credit due to high prices being charged on fees and commissions. While a reduction in ROA and ROE may also lead to the likelihood of a reduction of firms demand for credit.

In column (4), it is observed that the firms' perception of credit availability as a major obstacle is associated with bank-related factors in a sense that as NNIM decreases, it makes firms' perception of credit access being an obstacle, more likely. This could be explained by referring to a situation where firms are dealing with profit-oriented or risk taking banks whose main aim is to acquire financial leverage. If the banks' NNIM is low, then it could imply that they are not earning as much from non-interest income as expected and this could result in the charging of higher interest rates to compensate for losses which further affect their customers i.e., the smaller and medium-sized firms thus changing their opinion on credit availability.

**Table 6: Explanatory variables: bank-level factors**

Variables	No loan application (1)	Applied for loan (2)	Credit demand decrease (3)	Access to credit perception (major obstacle) (4)	No line of credit (5)	Interest rate (6)
NNIM	0.0459	-0.5427***	0.3706***	-0.5052***	-0.3044***	0.0167***
ROA	-0.0712	1.0043***	-0.7549***	1.0401***	0.6001***	-0.0340***
ROE	-0.0051	0.0625***	-0.0481***	0.0662***	0.0388***	-0.0024***

Notes: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

On the other hand, it would be expected that an increase in ROA and ROE makes the perception of access to credit being an obstacle, less likely but the results show that there is a probability that an increase in ROA and ROE may also affect firms' perception of credit access. This may be attributed to the lending conditions such as collateral requirements, maturity of loan and loan size which may discourage firms', especially small-sized firms to acquire bank credit (Beck *et al.*, 2006).

Column (5) shows the level of access to a line of credit or loan from banks and it is observed that all the profitability ratios are significant factors that influence the banks' decision to supply credit to firms. It is seen that a low NNIM makes access to a line of credit or loan less likely. Surprisingly, high ROA and ROE also lead to the likelihood of limited access to credit as shown in the table. This may be due to the behavior of banks in a monopolistically competitive market structure (see Scherer and Ross, 1990) which influences their decision to supply credit to SMEs.

Lastly, column (6) shows that the lending terms and conditions i.e., interest rates charged on loans appear to be significantly influenced by the banks' profitability ratios. As seen in the table, an increase in NNIM is more likely to affect the amount of interest charged on loans. Moreover, a reduction in banks' profitability (ROA and ROE) is less likely to influence the rate of interests charged on loans while increasing the banks' profitability, however this also increases the likelihood of higher interest rates. Since SMEs are well known for having high-risk profitability, Fredriksson and Moro (2014) suggest that it is extremely important for a bank to price customers according to their risk i.e., the higher the risk, the higher the interest rate charged and the higher the fees for additional services.

#### Macroeconomic conditions effect

As an indicator of the economic health of a country, the GDP annual growth rate was included in the regression to evaluate the influence of the country's economy in terms of both private and public consumption, investments and government outlays on credit flow from banks to SMEs' in Uganda. column (1), column (2) of Table 7 show that for firms applying for loans, there is a probability that their decision is more likely to be affected by the growth rate of GDP implying that a higher GDP may make firms' loan applications more likely since it signifies a high income generated from the different economic activities which strengthen their eligibility when applying for loans. Similarly, the level of credit demand is also influenced by the level of GDP growth in such a way that a decline in GDP growth makes credit demand decrease more likely as shown in column (3).

Column (4) shows that GDP growth has a positive coefficient which implies that it is more likely to affect firms' perception of credit access being seen as a major obstacle. This is not what one would expect but it may be due to contributions of other macroeconomic factors such as inflation rates and monetary policies which are not the focus of this study but may be recommended for further research. As Flamini *et al.* (2009) suggests that weak economic performance exposes banks to risk and low economic growth promotes the deterioration of liquidity and credit quality thus increasing the probability of limited access to bank credit. Meanwhile column (5) also shows that the level of GDP growth is more likely to influence banks' decision to supply credit to these firms. Similarly, in column (6), a reduction in GDP growth is more likely to affect the level of interest rates charged on loans.

**Table 7: Explanatory variables: macroeconomic factors**

Variables	No loan application	Applied for loan	Credit demand decrease	Access to credit perception (major obstacle)	No line of credit	Interest rate
	(1)	(2)	(3)	(4)	(5)	(6)
GDP	-0.0135	0.1199***	-0.0641***	0.0921***	0.0265*	-0.0029***

Notes: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

## 6. Conclusion

The objective of this study was to evaluate the key factors affecting the flow of credit from banks to SMEs in Uganda. In line with previous studies, the study found that the capital structure of the firm plays a big role in influencing the aspects of credit demand and supply. Firms that have more access to internal funds to finance their working capital are faced with an increase in the probability of not applying for loans compared to firms whose working capital is mainly financed by banks but as noted in the literature, these firms may later require bank finances as they grow in size with increased profits. It was also found that the level of demand for bank credit reduces with an increase in internal funding or retained earnings. The level of access to a line of credit is

also more likely to be affected by the level of capital financed by banks.

Those firms that report falls in sale revenues are more likely not to apply for loans and they demand less bank credit. These firms are also likely to be charged higher interest rates since the banks may view them as risky hence they use this strategy to guard against credit default. The size of the firm also influences firms' decision not to apply for loans, level of credit demand decrease, interest rates charged on loans as well as access to line of credit or loan. As in previous literature, our study identified that access to finance is a major obstacle for small and medium firms.

From the supply side, one can conclude that the level of banks' profitability significantly affects credit supply and demand. It is observed that the NNIM has a negative impact on credit demand while it is seen to have a positive influence on credit supply. ROA and ROE are positively associated with firms' decision to apply for loans and the level of credit demand. As the literature already identified, banks' market structure also plays a big role in their decision to supply credit. Uganda's banking industry is generally monopolistically competitive as of 2013 hence this gives them higher market power to impose strict credit conditions on borrowers that may discourage them from applying for credit.

Lastly the study focused on GDP growth as a measure of the economic health of the country and how changes in the economy may influence credit flow. It was found that GDP growth is positively associated with firms' decisions to apply for loans and the level of credit demand shows that an increase in GDP growth may lead to a high probability that firms might apply for loans whereas a reduction in the level of credit demand shows a decrease. But it was also observed that a decrease in GDP growth also increases the interest rate paid on loans and affects firms' perception of credit access.

We recommend stronger bank-SMEs relationships be formed so as to solve the issue of asymmetric information. This can be done through SME banking innovations such as the creation a department solely for the handling of the SMEs' needs. Also the conducting of intensive training and sensitisation programmes which would keep SMEs well informed of bank lending policies and procedures, packages of SME lending, would be useful. These would improve the level of trust among firms and banks and improve credit flow. The future study results could be improved if the survey data had a longer series of survey data on SMEs firm-specific factors. The bank data would also be improved by using a longer period of time but it was restricted by the firm data and so the values had to be repeated more than once so as to be in line with the firm-specific data.

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