

Modelling Choice of Credit by Small Scale Entrepreneures' in Oyo State, Nigeria: An Application of Multinomial Logit Model

Ajagbe, F. A.

Department of Entrepreneurial Studies
Federal University of Agriculture Abeokuta, P. M. B. 2240, Ogun state, Nigeria
E - mail; ajagbefriday@yahoo.co.uk

Abstract

Study on Small Scale Enterprises (SSEs) has been recognized as one of the means by which accelerated economic growth and rapid industrialization can be achieved (Sausser, 2005). In view of this, the study examined determinants of source of credit by small scale entrepreneurs in Oyo state, Nigeria. Questionnaire was adopted for the collection of data from 350 respondents through stratified sampling techniques, while multinomial model was used to analyze the data. The results of the estimated multinomial logit model with personal savings as chosen base are that: entrepreneurial choice of credit from various sources revealed that, education and value of assets were positively correlated to banks, while education was positively significant to relatives/friends and profit plough back had positive sign to multiple sources. It was concluded that, the use of specific credit sources, either formal or informal, was justified as the only source available. It was against this background that small-scale enterprises must be profitable in order to grow and be able to attract more external finance. It is therefore necessary to provide a policy environment that affords the necessary incentives for enterprise growth.

Keywords: Multinomial analysis, Entrepreneurs choice of credit, Small scale enterprises, Nigeria.

1. INTRODUCTION

Study on Small Scale Enterprises (SSEs) has been recognized as one of the means by which accelerated economic growth and rapid industrialization can be achieved (Sausser, 2005). The small scale enterprise sector are reputed to be behind most of the socio-economic transformation of many economies. They become a focal concern today due to their significant roles in development especially in the developing countries and generate wide-spread economic benefits which eventually leads to reduction of poverty among low income earners. Small scale enterprises have become important contributor to the national economy because it has been recognized as feeder services to large-scale industries (Fabayo, 2009)

In general, small scale enterprises whether set up by an individual, group of people or society has economic contribution to the Nigerian economy as a result of its indispensable role towards the economic growth and social development of the nation which also include; mobilization of untapped financial resources, conservation of foreign exchange, utilization of local resource inputs, as well as avenues for economic integration. Others are transformation of the traditional sector into modern form, creation of employment opportunity, providing training ground for managerial skill acquisition and affording a source of livelihood for the majority of low income earners nationwide (Owualah, 1999).

However, several studies on the SSEs have focused their attention on financing aspects as the main issue (Terpstra and Osilon, 1993) particularly, in the subject of entrepreneurs choice of credit structures of the SSEs (Coleman, 2000; Van Auken and Neeley, 1996). In Nigeria, in order to boost the enormous role played by the sectors the government issues programs to achieve its objectives, a lot of policies and programmes had been put in place by the Federal Government. These include among others the establishment of Nigeria Industrial Development Bank (NIDB), Small Scale Industrial Schemes (SSIS), and Nigeria Bank for Commerce and Industry (NBCI), Central Bank of Nigeria Special Credit Programme (CBNSCP), National Economic Reconstruction Fund (NERFUND), Peoples' Bank of Nigeria (PBN) Community Bank and Industrial Development Centres. Despite these, the execution of these schemes had not been able to achieve the desired results of improving the lots of these entrepreneurs (Adeleke, 2001). This is due to the fact that, it is faced with many challenges and constraints that inhibit the realization of its full potential such as economic, institutional and legal. Others are increased cost emanating from lack of power supply coupled with limited access to working capital and long - term credit, regulatory restriction, inadequate infrastructure, limited managerial and technical expertise are key factors that make the sector players confirm themselves to narrow markets where intense competition reduce prices thereby generating low profit margin. This eventually lead to either early deaths of their business (closure) or retardation of the enterprises, while very few manage to graduate to medium and large-scale enterprises (Ajayi, 2001). Nevertheless, the activities of both formal and informal credit institutions have not proved relatively successful in meeting the credit need of small scale enterprises in some countries (Napon and Haddleston, 1993). The reason behind this is that as micro - enterprises grow in size, the nature of loan required become increasingly difficult for informal credit source to satisfy, yet they still remain too small for the formal lenders, who consider them as uncredit - worthy. In view of inadequate credit

persistence and the co-existence of formal and informal credit source in Oyo state, it is therefore, pertinent to examine constraints of entrepreneurs choice of credit for small scale enterprises in Oyo state, Nigeria.

2. Literature Review

Different people choose to use the available sources of credit to suit their personal and economic features. These features have been found to determine the decision to apply for credit at all, and whether to apply from either formal or informal lenders. However, their effects on the lenders decision to ration applicants differ between the two market segments (Zeller, 1994). Myers (1984) with adoption of *Pecking Order* model suggested that different choices of capital structures emanates as a result of a limited access to get external capital resources, for example stock markets. This model ascertained that a limited access to external markets stimulates a dominant choice to use internal capital resources. This model has been selected by many SSEs to choose their choice of capital resources.

Berger and Udell (1998), provided empirical support for the strong dependence of SSEs on the use of internal capital resources. In their research, it was discovered that SSEs in America dominantly made use of capital resources from commercial banks and private financial institutions. These banks and the institutions use family ties (close relationship) and confidants to develop business contracts with the SSEs. This type of relationship also assists these financial institutions to obtain SSEs financial report easily. (Azariadis, 2001). stressed the role of credit market imperfections as an obstacle to rapid economic growth. The message from this entire strand of literature is that financial deepening in the form of smoothly functioning insurance and credit markets is a prerequisite for economic development.

3. Materials and Methods

The study was carried out in 4 geo-political zones of Oyo State, Nigeria (Ibadan/Ibarapa, Ogbomoso, Oyo and Oke-ogun). Population of small scale enterprises in the aforementioned areas constitutes the population of the study. A well structured questionnaire was designed to obtain relevant information from 350 respondents chosen through stratified sampling techniques. In analyzing the data, multinomial logit was used.

In order to establish the demand for credit and the relative importance of the different sources available to the rural households, we formulate and estimate a multinomial logit model. We then postulate that the dependent variable D_i can take on one of j categories 1, 2, ..., k (the different alternative choices/sources of credit). Let $\Pr(D_i = M/X)$ be the probability of observing outcome M given X , the probability model for D_i can be constructed thus:

$$\Pr(D_i = M/X) = \frac{\exp(\beta_0 + \beta_1 X_{2i} + \dots + \beta_k X_{ni})}{\sum_{j=1}^k \exp(\beta_{0j} + \beta_{1j} X_{2i} + \dots + \beta_{kj} X_{ni})} \dots \dots \dots (1)$$

For $j = 1, 2, \dots, k$. The parameters are not all identified since more than one set of parameters generates the same probabilities of the observed outcomes unless we impose constraints on the model (e.g. see Greene, 1997; Long, 1997; McFadden, 1973), which is achieved by setting parameters, for example, those of the first choice category $j = 1$ to be all zero: $\beta_{01} = \beta_{11} = \beta_{k1} = 0$. In other words, parameters of the first choice category are used as the base against which the other choices are compared. The choice can be arbitrary and this opportunity can be used to make comparison between any groups of the alternative categories. The log likelihood function for the multinomial logit can be written thus:

$$\ell = \sum_{i=1}^n \sum_{j=1}^k d_{ij} \log(p_{ij}) \dots \dots \dots (2)$$

where d_{ij} is a dummy variable that takes the value 1 if observation i has chosen alternative j ; 0 otherwise. The first-order conditions are:

$$\frac{\partial \ell}{\partial \beta_{kj}} = \sum_{i=1}^n (d_{ij} - P_{ij}) X_{kj} \dots \dots \dots (3)$$

The multinomial logit model can also be expressed and interpreted in terms of the odds, i.e the odds of outcome m versus outcome n given x , indicated by $\omega_{m/n}(x)$, equal to

$$\omega_{m/n}(x_i) = \frac{\Pr(y_i = m / x_i)}{\Pr(y_i = n / x_i)} = \frac{\exp(x_i \beta_m) / \sum_{j=1}^j \exp(x_i \beta_j)}{\exp(x_i \beta_n) / \sum_{j=1}^j \exp(x_i \beta_j)} = \frac{\exp(x_i \beta_m)}{\exp(x_i \beta_n)} \dots (4)$$

Combining the exponents leads to the odds equation:

$$\omega_{m/n}(x_i) = \exp[x_i (\beta_m - \beta_n)] \dots (5)$$

Taking logs shows that the multinomial logit model is linear in the logit:

$$\ln \omega_{m/n}(x_i) = x_i (\beta_m - \beta_n) \dots (6)$$

The difference $\beta_m - \beta_n$, called the contrast, is the effect of x on the logit of outcome m versus outcome n. since the model is linear in the logit, it is fairly simple to compute the partial derivative:

$$\frac{\partial \ln \omega_{m/n}(x)}{\partial x_k} = \frac{\partial x (\beta_m - \beta_n)}{\partial x_k} = \frac{\partial x \beta_m}{\partial x_k} - \frac{\partial x \beta_n}{\partial x_k} = \beta_{km} - \beta_{kn} \dots (7)$$

Which allows us to interpret $\beta_{km} - \beta_{kn}$ thus: for a unit change in x_k , the logit of outcome m versus outcome n is expected to change by $\beta_{km} - \beta_{kn}$ units, holding all other variables constant.

In our case, the choice of financial institution is then modelled as a function of both personal and household/dwelling characteristics as already defined. This can be presented as a general form equation:

$$D_i = f(AG_i, ED_i, SX_i, MT_i, HS_i, DS_i, AC_i, AS_i, DW_i, RR_i, RG_i) \dots (8)$$

Where D_i takes on values 1, 2 ...k if individual i chooses alternative j (including no credit and the particular source of credit to those who applied). The rest of the explanatory variables are as defined.

However, multinomial logit models give us potentially large amounts of information on the relative importance of the different sources of credit demanded by individuals, given their characteristics. The coefficient $\alpha_1 \dots \alpha_{11}$ provide an appropriate adjustment to obtain consistent estimates of the effects of changes in the explanatory variables on Y_i for those who demand credit and also indicate the proportion of the total effect due to induced changes in behaviour of those who demand for credit (Berndt, 1991).

The model is in explicit form:

$$Y = f(X_1 X_2 X_3 \dots X_n) + e \dots (9)$$

where Y = Sources of revenue

X_1 = Age (years of existence)

X_2 = Level of Education (formal (1) informal (0))

X_3 = Gender (Dummy variable, male (1) female (0))

X_4 = Family size (Number of people)

X_5 = Membership composition (Dummy Yes (1) No (0))

X_6 = Value assets (Naira)

X_7 = Period of obtaining credit (Month)

X_8 = Profit plough back (Dummy Yes (1) No (0))

X_9 = Business situation before credit (Dummy, Favourable (1) otherwise (0))

U_i = error term

4. RESULTS AND DISCUSSION

4.1 Socio-Demography Characteristics of Respondents

A summary of the distribution of these variables that are expected to have important implications for choice of credit among the beneficiaries is presented in Table 4.1. About 64.9% of the respondents were male while 35.1% were female. This shows that female entrepreneurs were generally less likely to be founders of new small scale business than male while the males had significantly higher entrepreneurial intention than females. Similarly female entrepreneurs mostly engage on farm activities and household chores, while males concentrate on income earning activities. Therefore the need to encourage women to seek credit facilities to still very expedient in the study area, because females have little or no control of assets such as land and buildings that could be used as collateral. So, demand for credit is expected to differ by gender.

Table 4.1, also shows that 0.3% of the respondents were less than age of 30years. 28.3% were within 31 – 40 age group, while 40.6% were between 41 – 50 years age cohort, 17.4% were between 51 – 60 years of age, and just about 13.4% were more than 60 years old. This revealed that the population sampled was predominantly middle aged. This age – groups are known to be energetic and therefore expected to be entrepreneurial and economically active in exploring avenue for business opportunities. More so, the middle-aged groups with an ambition to earn higher incomes are expected to be up and doing in terms of savings to accumulate wealth. Therefore, the young are expected to save and/or borrow for investment than the old. While the old depend mostly on their past savings and accumulated wealth, to smooth their consumption. In view of

this, demand for credit is expected to vary positively with age.

Table 4.1. also reveals that twenty percent had primary education, 56.3% had post primary education, 17.4% had vocational/Technical education while the remaining 6.3% had attended either polytechnics or University. The distribution clearly reveals that, all the respondents (100%) had acquired one level of education or the other. This presupposes that they were generally able to appreciate the need to make use of both formal and informal credit institutions as well as to evaluate information for business improvement and productivity. The predominance of educated respondents shows that the policy of encouraging self employment in actually yielding fruit, it may also be said that the probability of self employment is expected to rise with increase in the level of education, so also the demand for credit increases with the level of education.

In respect of their marital status, about 71.7% were married while 28.3% were single. This implies that, the married are more likely to be relatively stable, making financial institutions to view them as more reliable and makes them more likely to demand for credit compared to the unmarried. Also, Reynolds (1999) and Headol (2003) cited by Adegbite (2006) established a positive relationship between marital status and business performance. In their study of small scale entrepreneurs in the United States of America (USA), married men and women performed better in managing a business than single, divorce or widowed individuals.

4.2 Interpretation and Discussion of Regression Results

The results of the estimated multinomial logit model are discussed in terms of the significance and signs of the parameters. Evidence from the model as contained in table 4.2. shows that the set of significant explanatory variables varied across the sources of credit in terms of the levels of significance and signs. However, the base chosen is personal savings. The software used is STATA 11.0.

4.2.1 Relatives / Friends:

The result shows that education with t value of (2.75) is positive and significantly associated with the relatives and friends, relative to the reference group. The positive signs implied that the probability of an individual accessibility to credit from relatives / friends, relative to the reference group increases as this explanatory variable increase. The reason might be because the more an individual attain higher educational status, the more likely an individual depends on his / her friends / relatives that can assist him / her in terms of financial needs without any serious problems. Okurut, Andrie and Servaas (2004), in their research study confirmed it that the higher the educational status of an individual, the higher the credit worthiness of such an individual and this is in line with the finding.

On the contrary, age has t value of (-1.84), membership of SSES ownership with t value of (-3.17), value of assets with a t value of (-2.09) and period of obtaining credit has t value of (-1.68) they were negative but significant at 10%, 5% and 1% level of significance respectively. This shows that the negative and significant parameters mean that the probability of an individual choosing credit facilities from friends / relatives is lower relative to the probability of individual seeking credit facilities from the reference group. This is in consonant with the study of Ajagbe (2012).

4.2.2 Bank Loan:

It is important to note that, models of choice between different institutions, with the observed socio-economic variables pertaining to individuals and households are thus likely to reflect only a small part of the borrowers' choice. However, Bank loan has 4 variables that were statistically significant at 5% and 10% probability levels. The variables include education, assets, age and membership of SSES ownership.

Education with t value of (1.69) is positively significant at 5% level of significant. This shows that the probability of an individual to borrow from bank source of credit increases than the probability of choosing from the base category (personal savings). This means that the educated are likely to have incomes and more likely to have assets that can act as collateral. Hence, education increases the chances of obtaining credit facilities from bank relative to personal savings. This is in conformity with the study of Onstenk (2003) who has it that educated individuals are more likely to be involved in entrepreneurial activity and that they are able to appreciate the need to make use of banks.

Asset with a t value of (2.02) is positively correlated with bank loan at 5% level of significant. The positive effect observed means the probability to choose the bank is greater than the probability of choosing personal savings. This is because the more the assets of an individual for example, an individual with certificate of occupancy or title deeds on a particular property, the higher the propensity of such an individual to seek credit facility easily from the bank relative to the base category. This is in line with Gibb (1998) who opined that asset level of a firm is an important indicator of performance because if the asset and capital fall short of the liabilities when these two are compared, then the firm is not solvent and can no longer continue in business and the access to bank credit will be restricted.

Besides this, age with t value of (-1.78) is negatively significant to bank loan. This reveals that the probability of an individuals seeking credit facilities from the bank is lower relative to the reference group. Meaning that the more the number of years of an individual, the lesser the willingness of the bank to give out

loan to such an individual because the old people are dependant, less active and less productive. Hence are less inclined to demand for credit, particularly from the bank whose interest rate may often be high. This concise with Mpuga (2008) who reported that at intermediate age demand for bank loan increases with age because the middle aged groups possesses entrepreneurial skill and are more economically active in exploring avenues for business opportunities.

The membership of the enterprise ownership has a t value of (-1.87) with a negative impact on access to bank loan. This implies that the probability to choose credit from the bank is lower than the probability of choosing personal savings, the reason is that the entrepreneurs were not credit worthiness, have no total control over their business and lack the collateral to secure credit from bank. Hence, the knowledge of this will made the people prefer personal savings source. This confirmed the observation by Ajagbe, Adewoye, and Ajetomobi (2007) that no businessman or woman will like to use the business as collateral security to secure loans from the bank for fear of loosing the business and the right of ownership to the bank.

Another variable of interest is profit ploughed back that affect loan negatively but significant with a t value of (-5.52). This shows that profit ploughed back of most of the small scale enterprise was small, which invariably end up to low profit margin on the part of small scale entrepreneurs. Consequently, personal savings source is more adequate for satisfying this need. This is in line with Usman and Adewoye (2006) they postulated that, with low profit margin, there will be low propensity to save, and hence inability to secure the required credit facilities from the bank as a result of low capital build - up which eventually affects capital accumulation and investment.

4.2.3 Various sources of credit:

The only socio-economic variable that is significantly affecting is profit ploughed back, positive with a t value of (7.94). The profit ploughed back is a major profit index for small-scale enterprise, hence the more the contribution, the higher the profit margin, the higher the propensity to save, and hence the higher the probability of obtaining loan from several sources relative to personal savings source. This is in consonant with Ajagbe (2012). He discovered that positive relationship exist between various sources of credit and profit ploughed back probably because of personal relationship with many individuals involved in the loan disbursement process.

5. Conclusion

This study dealt with policy options for growth and development of small scale enterprises, through the examination of availability of different sources of credit, their accessibility and some of the constraints. The result showed that the major reasons for not seeking credit by the respondents were lack of information, lack of required collateral and terms and conditions for accessing bank loan. The use of specific credit sources, either formal or informal, was justified as the only source available. It is against this background that these recommendations were made that, credit policy for small - scale lending terms and conditions need to be formulated in order to mobilize savings and maximize availability of credit to the informal sector of Oyo state economy. Also, given the multi - functionality of profit ploughed back and other resources, policy environment that promotes incentive for enterprise growth should be encouraged. Besides, the formal financial institutions should also be encouraged to diversify their loan portfolios so as to be able to cater for the different financial needs to small-scale enterprises.

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Table 4.1: Socio-demography characteristics of the Respondents.
 N = 350

Socio-Demography characteristics	Frequency	Percentage %	Cumulative
Gender			
Male	227	64.9	64.9
Female	123	35.1	100.0
Age			
Less than 30	1	0.3	0.3
31 – 40	99	28.3	28.6
41 – 50	142	40.6	69.2
51 – 60	61	17.4	86.6
61 above	47	13.4	100.0
Educational Status			
Primary	70	20.0	20.0
Post primary	197	56.3	76.3
Vocational/Technical	61	17.4	93.7
Tertiary	22	6.3	100.0
Marital status			
Single	99	28.3	28.3
Married	251	71.7	100.0

Source: Field Survey, 2012

Table 4.2: Multinomial Regression of access to credit. Dependable variable: Sources of Revenue

Explanatory variable	Relatives/friends (t)	Money Lender (t)	Bank Loan (t)	Multiple Sources (t)
Gender	0.295 (0.73)	0.362 (0.29)	-0.131 (-0.25)	0.117 (0.18)
Age	-0.456 (-1.84)**	-0.386 (0.58)	-0.638 (-1.78)*	0.213 (0.62)
Family size	0.166 (0.81)	0.258 (0.45)	0.109 (0.36)	0.196 (0.64)
Membership Composition	-1.361(-3.17)***	-0.338 (0.26)	-1.108 (-1.87)**	0.823 (1.27)
Value of Assets	-0.427 (-2.09)**	0.539 (1.36)	0.491 (2.02)**	-0.027 (0.11)
Education	0.672 (2.75)**	0.506 (0.74)	0.565 (1.69)*	-0.300 (0.74)
Period of obtaining credit	-0.359 (-1.68)*	-0.103 (-0.22)	-0.413 (-1.20)	-0.447 (1.15)
Profit plough back	0.194 (0.71)	0.171 (-0.26)	-2.890 (-5.52)***	2.633 (7.94)***
Business. situation before credit	0.160 (0.51)	-0.095 (-0.12)	0.386 (0.98)	0.356 (0.80)
Constant	-0.852 (-0.45)	-6.288 (-135)	1.525 (0.58)	-10.763(-3.82)***
Log Likelihood	-227.91886			
Number of Observations	350			
LR chi ² (36)	293.16			
Prob. > chi ²	0.0000			
Pseudo R ²	0.3914			

Source: Field Survey, 2012

* Significant at 10% ** Significant at 5% *** Significant at 1%

√ The Reference / Base category is Personal Savings. (t) t - statistics

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