



Analysis of Informal Credit Constraints among Farmers in South East, Nigeria

¹Okezie, C. R. and ²Offor, S.O.

¹Dept. of Agribusiness and Management, Michael Okpara University of Agriculture, Umudike

²Dept. of Agricultural Economics and Extension, Akwa Ibom State University,
Oruk Anam, Akwa Ibom State

Corresponding Author's email address: okezie.chidinma@mouau.edu.ng rosynma2003@gmail.com

Abstract

Empirical evidence on determinants of credit constraint types among informal credit users is almost nonexistence in south east, Nigeria. Using a well-structured questionnaire and an extended direct approach, primary data were collected and analysed using seemingly unrelated regression model. The seemingly unrelated regression analysis of factors influencing credit constraint by types showed age ($p < 0.05$) and dependency ratio ($p < 0.05$) positively affect risk constrained households, while non-farm income ($p < 0.05$) and farm size ($p < 0.05$) negatively affect risk constrained farm households. Also, the result showed that quantity constraint positively depends on amount requested ($p < 0.05$) and negatively on household size ($p < 0.01$), education ($p < 0.05$) and interest ($p < 0.05$). Farming experience ($p < 0.05$) and interest rate ($p < 0.05$) were negative, while distance ($p < 0.01$) was positive for transaction cost constrained type. Price constraint positively depends on dependency ratio ($p < 0.05$), non-farm income ($p < 0.05$) and interest rate ($p < 0.01$) and negatively depends on gender ($p < 0.05$) and farm size ($p < 0.05$). Therefore, it is recommended that in order to cushion the effect of informal credit constraint, lenders should train potential borrowers and establish organised informal monitoring team for each state to serve as an insurance against any default. Also, Institution capacity building for both lenders and borrowers should be an integral part of every credit programme that will be provided in order to increase agricultural productivity and the income of farmers, thus policy measures for improving access to credit should be developed based on farmer's needs.

Keywords: Rural credit market, informal credit constraints, farmers, participation and seemingly unrelated regression

Introduction

Credit is one of the components of financial services considered fundamental in all production circuits, networks-material and service products (Dicken, 2007). Credit has a crucial role for elimination of farmers' financial constraints to invest in farm activities, increasing productivity and improving technologies (Kohansal, Ghorbani and Mansoori, 2008). Credit being fundamental to the operation of all production circuits can have direct and indirect effects such as procurement of farm inputs and adoption of technologies (Hussein, 2007). Rweyemamu, Kimaro and Urassa (2003) also pointed that without credit, millions of cash-starved small holders who dominate the rural landscape are unable to adopt most productivity technologies and low return, subsistence-oriented production practices therefore continue to underpin most rural livelihood strategies. The provision of credit also has increasingly been regarded as an important tool for raising incomes

of rural population, mainly mobilizing resources to more productive uses (Atieno, 2001). Farm credit enhances productivity and promotes standard of living by breaking the vicious cycle of poverty of small scale farmers (Muhongayire, Hitayezu, Mbatia and Mukoya-Wangia, 2013). Rural credit markets can be separated into formal and informal markets. Informal rural credit grew very fast in last few decades and became an important part of rural credit. Informal rural credit can take various forms. Interpersonal lending, which includes loans extended among friends, relatives, neighbours, or colleagues, is among the most basic strategies that farmers use to deal with liquidity requirements. Other forms include lending from moneylenders, pawnshops, and private money houses.

Rural credit markets in developing countries are influenced by the peculiar strategies adopted by lenders in response to problems associated with the screening of

loan applicants, credit obligations avoidance, and enforcement of contracts (Binswanger and Rosenzweig, 1986; Siamwalla, *et al.* 1990). The emergence and existence of informal financial markets is a result of excess regulations in the formal financial sector (Adofu, *et al.*, 2010). Services rendered in an informal financial institution include credit or savings and or both. It was found that the major players in the informal financial market are friends, relatives, money lenders and informal institutions (co-operatives, savings and credit society or unions, rotating savings and credit association and non-government organisation). Informal financial markets have been in existence for several years and have grown due to the increasing unwillingness of formal banks to lend to small and medium-scale businesses. Informal finance, although important and has proved successful in meeting the credit needs of farmers, has not attained a scale and coverage to make a significant impact on the credit needs of entrepreneurs probably due to limited resources mobilized which restrict the extent to which they can effectively and sustainably satisfy their credit needs (Schrieder and Gertrud, 2009).

Studies have shown that a large percentage of farmers faced with credit constraints have low production efficiencies (Bravo-Ureta and Pinheiro, 2009). The problem of credit constraint has been shown to be the major cause of low agricultural output which eventually cumulates into low farm income (Obike, Ukoha and Nwajiuba, 2007). Credit constraints have a number of serious consequences for production and consumption in the short run and for asset accumulation, poverty reduction, and the evolution of well-being in the long run. When farmers face a credit constraint, additional credit supply can raise input use, investment and hence output, thus, influence of credit constraints on the production of farmers cannot be overemphasized. For farmers that are fortunate enough to have access to credit, there is still a wide gap between the amount of credit requested and the amount supplied. There is still limited information regarding household and individual characteristics and credit constraint problems of informal financial markets, especially in rural areas. Empirical studies on credit constraint among farm households in south east, Nigeria are very few and far between. Existing studies in this area such as Oyedele, Akintola, Rahji and Omonona (2009); focused on the South western part of the country. Omonona, Lawal and Oyinlana (2010) in their own study focused on formal financial institutions. The focus of the present study is in South east, Nigeria and on informal financial market.

Methodology

The study employed multi-stage simple random sampling technique in selecting 240 respondents. Three out of the five states in the South East geo-political zone were randomly selected viz Abia, Anambra and Ebonyi States. In the second stage, two agricultural zones per state were randomly selected giving a total of six Agricultural zones. In the third stage, two local government areas (LGAs) were randomly selected from

each of the selected agricultural zones giving a total of 12 LGAs. In the fourth stage, two communities were randomly selected from each of the LGAs giving a sample of 24 communities. In the last stage, based on the list of farmers who participated in informal credit markets obtained from resident agricultural development programme (ADP) officers and enumerators, 10 farmers from each community were randomly selected giving a total of 240 farmers. Out of this number, 223 questionnaires were correctly filled (172 constrained and 51 unconstrained farmers). Therefore, 172 credit constrained farmers identified were used for the study.

Sampling Procedure

Primary data were collected using a well-structured questionnaire and oral interviews. The study used cross sectional data from participant farmers of informal credit market of farm households. The target population in the study are the farmers, informal credit sources and credit constrained farmers. The study employed multi-stage simple random sampling techniques in selecting 240 respondents from which 172 constrained respondents were used for seemingly unrelated regression analysis. The data for the study were analysed using both descriptive such as percentages, means, and inferential statistics such as ordinary least square and seemingly unrelated regression models.

Model specification

Credit constraint was identified directly from the farm households and survey by asking whether households consider themselves to be credit constrained by using a carefully designed credit questionnaire (Zeller, 1994; Sawada *et al.*, 2006) and following Ali and Deininger (2014) and Okezie., (2019) credit constraint types were categorized as shown in Figure 1. To identify credit constrained farmers, first households were asked whether they have applied for credit in the last two years. Among those who applied for credit, farmers were identified as unconstrained if they have received as much credit as they have requested and indicated no need for credit. Meanwhile farmers were considered credit constrained if the loan application was rejected or they could not borrow sufficiently. Second, for those who did not try to borrow, respondents were asked why they did not apply in order to further classify them according to types of credit constraint. Farmers were identified as being unconstrained if the answer was no need for credit and received total amount applied for, respondents were identified as credit constrained if:

- They already had a large amount of debt;
- They believe credit application will be refused;
- They do not know anyone who could be a guarantor;
- They do not know how to get credit or do not know any informal financial institution in the area and;
- They are afraid to apply for credit.

To further determine credit constraint by types or categories the seemingly unrelated regression equation was employed as shown below:

In the econometric analysis, credit rationing/constraint is described by a series of dichotomous variables

defining the possible categories of constraint. Typically, farmers' constrained status is characterized by the unobserved latent counterpart of the observed variable captured in the survey following Olomola and Brempong (2014), Korosteleva, Isachenkova and Rodionova (2012) and it can be expressed implicitly as follows:

$$\gamma_i^* = x_i' \beta_i + \varepsilon_i(1)$$

The observed variable is γ_i , which equals 1 if $\gamma_i^* > 0$, in which case a farmer belongs to a particular rationing category, and 0 otherwise. x_i is a vector of explanatory variables, β_i represents coefficients to be estimated in the model, and ε_i represents the error term. Four aspects of credit constraint are modeled in the analysis: quantity constraint, risk constraint, transaction and price constraint following Ali and Deininger (2014) and Okezie (2019) as shown in Figure 1.

The equations for the four models are expressed as follows.

$$\gamma_{1i} = \alpha_i x_i + \varepsilon_i; \dots (2)$$

$$\gamma_{2i} = \beta_i x_i + \mu_i; \dots (3)$$

$$\gamma_{3i} = \gamma_i x_i + v_i; \dots (4) \text{ and}$$

$$\gamma_{4i} = z_i x_i + \varepsilon_j; \dots (5)$$

Where; γ_{1i} is a dichotomous variable with a value of unity for a quantity-constrained farmer i and 0 otherwise. In the same vein, γ_{2i} has a value of unity for a risk--constrained farmer i and 0 otherwise, γ_{3i} has a value of unity for a transaction--constrained farmer i and 0 otherwise, while γ_{4i} has a value of unity for a price--constrained farmer i and 0 otherwise. x_i represents a vector of explanatory variables; α_i , β_i , γ_i and z_i are coefficients to be estimated; and ε_i , μ_i , v_i and ε_j are random error terms. The explanatory variables included in the model were as stated in equation below:

Y = Credit constrained (insufficient supply, rejected, fear of losing collateral etc, otherwise unconstrained)

X_1 = Age of the household head (years)

X_2 = Marital Status (1 = married, 0 = otherwise)

X_3 = Gender of farmer (1 = male, 0 = female)

X_4 = Farming experience (number of years in farming)

X_5 = Household size (number of household members)

X_6 = Amount requested (total amount of credit applied in the last two years in #)

X_7 = Dependent Relatives (children under 18 years and adults above 65 years)

X_8 = Non-Farm Income (money received from off farm work, including money received from relatives working in other towns or cities in #)

X_9 = Farm Income = receipts of the farm sales in the last one year (#)

X_{10} = Farm size (Total household farm size in hectares)

X_{11} = Education (Years of formal education)

X_{12} = Interest rate (total amount paid as interest charges on money borrowed in #)

X_{13} = Distance to Source of informal Credit (km)

U = Error terms

All the explanatory variables are assumed to be exogenous or predetermined at the time of credit application.

Results and Discussion

Credit constraint status of respondents

Following the approach in Figure 1, Table 1, summarized the extent of credit constraints among farm household in the study area. The result indicated that majority (76.68%) of the respondents were constrained. Among the constrained farmers, higher proportion of the farm household (27.80%) were quantity constrained followed by credit constrained due to risk constrained factors (26.91%), transaction cost constrained (12.11%) and price constrained (9.86%).

Credit constraint conditions by types among farmers

The seemingly unrelated regression model was employed to ascertain the determinants of credit constraints among farmers by types of credit constraints. Table 2 shows a Breusch-Pagan test of the independence of the error terms of the four seemingly unrelated regression equations implying that the credit constraint models are not independent, evidenced by the non-zero cross correlation coefficients of the error terms, thus supporting the use of seemingly unrelated regression as a more appropriate estimation technique than estimating each of the equations independently. The estimated coefficients of credit constraints models are presented in Table 3. A positive sign of the correlation coefficient is consistent with the unobserved heterogeneity in the discriminatory (constrained) tendency against the farmer while a negative value for the coefficient is consistent with the interpretation that factors that cause farmers to be placed in a particular constrained category may make them less likely to be placed in another category. The results showed that quantity constrained significantly depends on household size, educational attainment of household head and interest rate. Risk constrained significantly depends on age of household head, dependency ratio, non-farm income and farm size. Transaction constrained statistically depends on farming experience, household size, educational level of the household head and interest rate charged while price constrained significantly depend on gender, dependency ratio, non-farm income, farm size and interest rate at different levels of significances with negative and positive coefficients as the case may be.

Factors affecting credit constrained farmers by types of credit constraint

The age of household head was statistically significant at $P < 0.05$ and positive only in risk constrained category. The result indicates that the higher the age of the farmer or the older they become, the greater the likelihood of being risk constrained. Adamon, Anthony and Adeleke (2017) in their study on credit constraints and farm productivity in Ethiopia reported that risk constrained households were relatively older than their unconstrained counterparts. This might be because the younger farmers are still agile and might be more risk taking than older farmers. Also younger farmers are more inclined to take chances by applying for loans even at high interest rate in spite of the risk of being turned down, losing their collateral or defaulting unlike their

older counterparts (farmers) who are more risk averse. Gender of household head was statistically significant at $P < 0.05$ level and had a negative coefficient in the price constrained category. This implies that male respondents had a lower probability of being price constrained than female farmers. In other words, female headed respondents will not apply for credit due to high interest rate leading to higher probability of being price constrained than their male counterparts. This result corroborates the findings of Olomola and Brempong (2014). They reported that female headed households were less likely to apply for credit because of high interest rates charged by potential lenders and the fear of losing their collateral should they be unable to repay the loan. The findings of Lawal *et al.*, (2009) and Booth and Nolen (2009) also shared similar view.

Farming experience was statistically significant at $P < 0.05$ and negatively related to transaction cost constrained. Its negative coefficient implies that the higher the number of years of experience, the lower the probability that the farmer will be transaction cost constrained. This is *a priori* expected. Being into farming for years, the farmer is expected to have better information with regards to nearby lenders to reduce transportation cost. Olomola and Brempong (2014) reported a negative significant relationship between farming experience and transaction cost constraint indicating that experienced farmers are less likely to be transaction cost constrained. They asserted that an experienced farmer is expected to have a good record or credible evidence of operation, which can be shown to the lender to demonstrate that the loan is genuinely required and thus the lender may not want to reject his application outrightly.

Household size was statistically significant at $p < 0.01$ and negatively related to quantity constrained. The negative coefficient implies that, increase in household size will reduce the probability of being quantity constrained. The implication of this result is that, informal lenders will disburse more funds to larger farm household than their counterparts as large household could represent better ability for income generation and debt repayment. This finding agrees with the empirical research report of Olomola and Brempong (2014) that households with large number of members were significantly less likely to be constrained

Farm size was significant at $P < 0.05$ and negatively related to both risk constrained and price constrained. The result implies that farmers with larger farms are less likely to be risk constrained compared to their counterparts with smaller farms and also less likely to be price constrained. In other words, increase in agricultural land size decreases farmers' propensity of having his loan application rejected. This may be explained by the fact that large farms are viewed by prospective lenders as more capable of repaying their loans without default because of their high income generation potential. This finding supports Reyes (2011) study, who revealed that households possessing more

land are evaluated to be more credit worthy. Thus the impact of farm size on the propensity of the household to be credit constrained is determined by the magnitude effect on the demand side and supply side. The effect of education on the probability of the household to be quantity constrained is significant at $P < 0.05$ with negative sign and also negative and highly significant at $p < 0.01$ for transaction cost constrained category. The result implies that the probability of being quantity constrained and transaction cost constrained tend to decrease with higher education. This might arise from the fact that educated farmers would have a better financial literacy and first-hand information with regard to credit availability. This may thus boost their confidence not only in participating but also in their ability to repay credit. From the lender's side, education is a signal that prospective borrowers are financially mature, credit /trustworthy, and capable of better credit management. Similar results were obtained by Ali and Deininger (2014) and Jia *et al.* (2010) in a related study reported that households with more education are capable of making better investment decision, trusted by the society, and can be an indicator of household human capital which plays an important role in relaxing quantity constraints, thus they are less likely to be quantity constrained.

Interest rate is a major determinant of credit constraint condition especially price constrained. The result shows that interest rate is positive and statistically significant at $P < 0.01$ for price constrained while negatively and statistically significant at $P < 0.05$ for quantity constrained condition. It implies that high interest rate increases the probability of being price constrained. Quantity constraint was negative which implies that from the point of view of the lender, at high interest rate, the lender is expected to approve the application and also lend substantial amount of credit applied for by the farmer, if not all the amount applied for. Distance to source of credit was positive and significant at $p < 0.01$ for transaction cost constrain. This implies that the farther the distance to the source of credit, the higher the probability of being transaction cost constrained. This could be because transportation cost increases with lender- borrower distance which increases the effective cost of borrowing. Accordingly, the farther away the farmer with respect to source of credit, the more difficult the access to credit information, and therefore the higher the likelihood of being credit constrained. This result is in corroboration with the findings of Adamon *et al.* (2017).

Conclusion

Informal credit market plays important role in alleviating problems of poor farm households' regarding credit constraints. Given the evidence that majority (76.68%) of farm households in southeast, Nigeria were credit constrained, the findings suggests that farm households in the study area cannot expect informal credit market to come to their rescue if they find access to formal credit difficult, as they are liable to be excluded from all the credit markets at the same time. Also,

regarding the sign and significance of the variable linked to education, it is reductive simply to consider informal financial institution alternative solutions for poor households dealing with credit constraints. In order to cushion the effect of informal credit constraint, lenders should train potential borrowers and establish organised informal monitoring team for each state to serve as an insurance against any default. Also, Institution capacity building for both lenders and borrowers should be an integral part of every credit programme that will be provided in order to increase agricultural productivity and the income of farmers, thus policy measures for improving access to credit should be developed based on farmer's needs.

References

- Adamon, N.M., Anthony, M.S. and Adeleke, O.S. (2017). Credit constraints and farm productivity-Micro-level evidence from smallholder farmers in Ethiopia. Working paper series. No 247, January 2017. Pp. 1-40.
- Adofu, I., Antai, E. and Alabi, O. (2010). Informal savings mobilization and investment: A case study of rotating savings and credit association (ROSCA) in Kogi State, Nigeria. *Continental J. Social Sciences*, 3, 7-17.
- Ali, D. A. and Deininger. K. (2014). Causes and Implications of Credit Rationing in Rural Ethiopia: The Importance of Spatial Variation. *Policy Research Working Paper WPS6096*. Washington, DC: World Bank.
- Atieno R. (2001). Formal and Informal institutions lending policies and access to Credit by small-scale enterprises in Kenya: An Empirical Assessment, *AERC Research paper* No. III.
- Barslund, M. and Tarp, F. (2008). Formal and informal rural credit in four provinces of Vietnam. *Journal of Development Studies*, 44(4), 485-503.
- Binswanger, H. P. and Rosenzweig, M. R. (1986). Behavioural and material determinants of production relations in agriculture. *Journal of Development Studies*, 22(3), 503-539.
- Booth, A. and Nolen, P. (2009). Gender differences in risk behaviour: Does Nurture matter. *IZA Discussion Paper* (4026).
- Bravo-Ureta, B.E. and Pinheiro, A.E. (2007). Technical, Economic and Allocative Efficiency in Peasant Farming: Evidence from the Dominican Republic. *Developing Economies*, 35, 48-67.
- Dicken, P. (2007). *Global Shift: Mapping the Changing Contours of the World Economy*. 5th Edition, SAGE Publications Inc. London, California, New Delhi.
- Hussien, H. (2007). Farm household economic behaviour in imperfect financial markets. Doctorial Unpublished thesis Swedish University of Agricultural Sciences, Uppsala.
- Izumida, Y. (2008). *The Kou in Japan: A Precursor of Modern Finance*. Seminar On Informal Financial Markets in Development, Washington, D.C., October 1989.
- Jia, X., Heidhues, F. and Zeller, M. (2010). Credit rationing of rural households in China. *Agricultural Finance Review*, 70(1), 37-54.
- Kohansal, M., Ghorbani, M. and Mansoori, H. (2008). Effect of Credit Accessibility of farmers on Agricultural Investment and Investigation of Policy Options in Khorasan Razavi Province. Retrieved on 13th of January, 2009 from <http://www.scialert.net/pdfs/jas/2008>.
- Korosteleva, K., Isachenkova, N. and Rodionova, Y. (2012). The Impact of Credit Crunch On Enterprise Financing in Emerging Markets: Does Firm Size Matter? Draft paper, School of Slavonic and East European Studies, University College London, London, U K . www.slideshare.net/NewEconomicSchool/paperthe-impact-of-credit-crunch-on-Enterprise-financing-in-emerging-marketsdoes-firm-size-matter.
- Lawal, J. O., Omonona, B. T., Ajani O. I. and Oni, A. O. (2009). Effects of Social Capital on Credit Access among Cocoa Farming Households in Osun State. *Nigeria, Agricultural Journal*, 4, 184-191.
- Muhongayire, W., Hitayezu, P., Mbatia, O.L. and Mukoya-Wangia, S.M. (2013). Determinants of farmers' participation in formal credit markets in rural Rwanda. *Journal of Agricultural Science*, 4 (2), 87-94.
- Obike, K.C., Ukoha, O.O. and Nwajiuba, C.U. (2007). Poverty Reduction among Farmers in Nigeria: The Role of the National Directorate of Employment. *Medwell Agricultural Journal*, 2(4), 530-534.
- Okezie, C.R. (2019). Determinants of Farm Households Participation in Informal Financial Markets in South East, Nigeria. *Unpublished Ph.D Thesis*. Department of Agricultural Economics, University of Nigeria, Nsukka.
- Olomola, A.S. (2014). Interlinked Transactions in Nigerian Rural Credit System NISER Monograph Series.No. 10. Ibadan, Nigeria: *Nigerian Institute of Social and Economic Research*, 12(5), 202-207.
- Omonona, B.T., Lawal, J.O. and Oyinlana, A.O. (2010). Determinants of credit constraints conditions and production efficiency among farming households in Southwestern Nigeria. *Journal of Social Sciences*, 5(4), 326-331.
- Oyedele, G.A, Akintola J.O., Rahji, MAY. and Omonona, B.T. (2009). Credit constrained condition of farm households and profitability of agricultural production in Nigeria Agriculture. Department of Agricultural Economics, University of Ibadan. *Nigeria Agric. Journal*, 4(4), 192-201. Issn: 1816-9155.
- Reyes, D. A. (2011). Credit constraints in rural financial markets in Chile: determinants and consequences. s.n.], [S.I. Retrieved September 17, 2013, from <http://edepot.wur.nl/182837>.
- Rweyemamu, D., Kimaro, P. and Urassa, O. (2003). Assessing Micro-Finance Services in Agricultural Sector Development. A case study of Semi-formal financial Institutions in Tanzania. <http://www.ifpri.org/2020/nw/nwpapers/tanzbr200308.pdf>
- Sawada, Y., Akoten, J.E. and Otsoka, K. (2006). The

Determinants of Credit Access and Its Impacts on Micro and Small Enterprises: The Case of Garment Producers in Kenya. *Economic Development and Cultural Change*, 54, 927-944.

Schrieder, H. and Gertrud, R. (2009). *Informal Financial Groups in Cameroon: Motivation, Organization and Linkages*. M.S. Thesis, Ohio State University, 2009.

Siamwalla, A., Pinthong, C., Poapongsakorn, N., Satsanguan, P. Nettayarak, P., Mingmaneeakin, W. and Tubpun, Y. (1990). The Thai rural credit scheme: Public subsidies, private information and segmented markets. *World Bank Economic Review*, 4(3):271-295.

Zeller, M. (1994). Determinants of Credit Rationing: A Study Of Informal Lenders And Formal Credit Groups In Madagascar. FCND Discussion Paper NO. 2. Food Consumption and Nutrition Division. *International Food Policy Research Institute* 1200 Seventeenth Street, N.W. Washington, D.C.20036-3006 U.S.A. *World Development*, 22(12),1895-1907.

Retrieved from <http://www.ifpri.org/sites/default/files/pubs/divs/fcnd/dp/papers/dp02.pdf> on June 10, 2013.

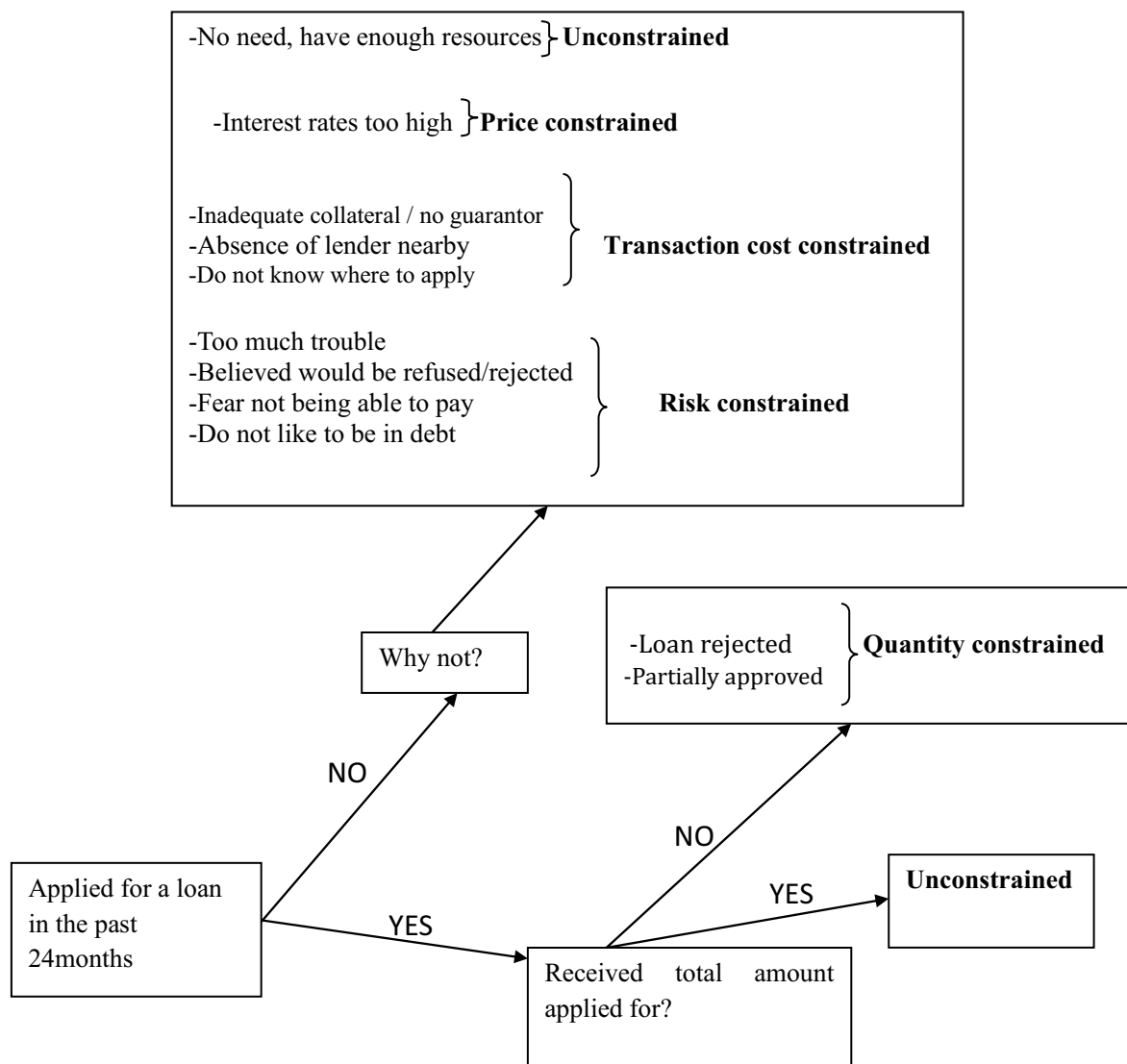


Figure 1: Definition of credit constraint status – Direct elicitation approach
 Source: Adapted from Ali, Deininger and Duponchel (2014) and Okezie, 2019

Table 1: Credit constraint status of respondents

Credit Status	Frequency	Percentage
Constrained	171	76.68
Unconstrained	52	23.32
Quantity Constrained	62	27.80
Risk Constrained	60	26.91
Transaction Constrained	27	12.11
Price Constrained	22	9.86
Total	223	100

Source: Field Survey, 2018

Table 2: Correlation matrix of residuals

Variables	Quantity Constrained	Risk Constrained	Transaction cost Constrained	Price Constrained
Quantity Constrained	1.000			
Risk Constrained	-0.1676	1.0000		
Transaction cost Constrained	0.9391	-0.2024	1.0000	
Price Constrained	0.6589	-0.1258	0.6932	1.0000

Breusch-Pagan test of Independence: $Chi^2(6) = 323.629, Pr = 0.0000$

Table 3: Seemingly unrelated regression estimates for credit constrained farmers by types of credit constraints

Variables	Quantity Constrained	Standard Error	Risk Constrained	Standard Error	Transaction cost Constrained	Standard Error	Price Constrained	Standard Error
Constant	0.4351 (1.55)	0.4351247	0.4095 (1.87)**	0.2185378	0.3104 (1.08)	0.2873861	0.6880 (2.46)**	0.2800841
Age	0.1214 (1.50)	0.0809364	0.1234 (1.96)**	0.0629881	0.1092 (1.32)	0.0828319	0.0046 (0.06)	0.0807273
Marital Status	0.0011 (0.21)	0.0054005	-0.0059 (-1.39)	0.0042029	0.0061 (1.11)	0.005527	0.0030 (0.55)	0.0053865
Gender	-0.0116 (-1.31)	0.0088209	0.0005 (0.07)	0.0068648	-0.0101 (-1.12)	0.0090275	-0.0194 (-2.20)**	0.0087982
Farming Experience	-0.1351 (-0.90)	0.1498553	0.0565 (0.48)	0.1166237	-0.2609 (-1.98)**	0.1533649	-0.0136 (-0.09)	0.1494681
Household Size	-0.0609 (-2.92)***	0.0208115	-0.0059 (-0.37)	0.0161964	0.0041 (0.54)	0.0077244	0.0243 (1.17)	0.0207577
Amount requested	7.67e-07 (2.28)**	3.36e-07	1.95e-07 (0.19)	1.04e-07	3.32e-07 (0.24)	1.37e-06	-9.07e-07 (-0.68)	1.34e-06
Dependency Ratio	0.0024 (0.27)	0.008843	0.0118 (1.99)**	0.006882	0.0003 (0.03)	0.0090501	0.0148 (1.98)**	0.0088201
Non-Farm Income	-1.24e-06 (-1.33)	9.36e-07	-1.25e-06 (-1.99)**	7.29e-07	4.94e-07 (0.52)	9.58e-07	1.85e-06 (1.98)**	9.34e-07
Farm Income	-2.60e-07 (-0.77)	3.37e-07	1.19e-07 (0.27)	4.49e-07	-1.07e-07 (-0.31)	3.45e-07	-8.91e-08 (-0.25)	3.51e-07
Farm Size	-0.0007 (-0.15)	0.0042899	-0.0187 (-2.22)**	0.0084026	-0.0046 (-1.04)	0.0043904	-0.0194 (-2.20)**	0.0087982
Education	-0.130305 (-2.55)**	0.0511	-0.0013 (-0.31)	0.0042788	-0.0310 (-3.13)***	0.0098999	0.0032 (0.97)	0.0033386
Interest rate	-5.14e-07 (-1.96)**	2.62e-07	6.14e-08 (0.23)	2.67e-07	1.79e-06 (1.34)	1.34e-06	1.28e-06 (2.77)***	4.61e-07
Distance to Source of Credit	0.0018 (0.26)	0.0070101	-0.0152 (-1.68)	0.0091188	0.0670 (3.14)***	0.0212989	0.0082 (0.96)	0.0086007
Chi ²	69.00***		35.63***		60.78***		55.10***	
R ²	0.4863		0.3116		0.3611		0.4426	
No of observations	172		172		172		172	

** , *** indicates significant at 5% and 1% respectively. Values in paranthesis are Z Values

Source: Field survey, 2018