

DETERMINANTS OF THE PROBABILITY OF OBTAINING FORMAL FINANCIAL SERVICES IN TANZANIA

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ABSTRACT

Tanzania is among the poorest countries in the world. Like many other developing countries, the individual households' access to formal financial services is very limited. The government has adopted series of economic reform measures since mid-1980s that include financial liberalization. The present study analyzed the determinants of individual access to formal financial services for livelihood sustainability in Tanzania. Data for the study were collected from various sources – both primary and secondary. Primary data were collected from the three districts whereby two wards were selected from each district. Secondary information was gathered from documentary sources as in the form of reports, records and review of literature. Results show that education, income and distance to formal financial service were significant and positive correlated to access of formal financial institutions in Tanzania as far as sustainable development is concerned. The study recommended the government and other stakeholders including individuals to provide education both formal and informal, improve the individuals' income security through investing (micro enterprises) and opening more formal financial services nearby the community in order to enhance sustainable development.

Keywords: Formal financial services, Financial institutions, Logistic regression, sustainability, Tanzania

INTRODUCTION

The term access to financial services can be defined as the ease with which an individual can use financial services if they want to. It is thus distinct from usage; an individual may have access to financial services but choose not to use them. It is also possible for an individual to face access constraints even if they are using a financial service. For example, an individual may have a bank account, but may face constraints to using it actively because the nearest bank branch or Automated Teller Machine (ATM) is so far from their home (Ellis, 2010).

More recently, access to financial services has been recognized as an important aspect of sustainable development and more emphasis is being given to extending financial services to low income individuals and households (Anne *et al.*, 2005). Yet, access to finance is limited in many developing countries like Tanzania and it reaches only a few individuals and firms (Katz, 2000). Access to financial services has received more attention lately and has become the most important part of the overall development agenda, for a number of reasons: for one, evidence that “finance” as in financial development matters for growth has been accumulating over the last decade. Second, based on changes in economies and economic production, finance may have moved up in the ranking of barriers to economic growth. Third, there is an increasing perception that access to financial services has been skewed for household and enterprises.

According to Ellis *et al.* (2010) Tanzania is characterized by three major types of financial services, namely: Formal financial services are services offered by institutions recognized as fully operational banking structures or equivalent (Personal loan from a Bank, Loan from a government institution, Loan from an employer, Education loan, Car purchase loan, Business loan, Loan to buy a house from a bank, Loan to buy land from a bank, Loan to buy a house from a financial institution, Employer saving schemes, Savings through insurance schemes, Compulsory savings e.g. National Social Security Fund/Zanzibar Social Security Fund, Automated Teller Machine card, Debit card, Post Bank account, Current account, Savings account and Fixed deposit). Semi-formal financial services are those provided by organizations not fitting into any of those categories, or organized groups (Loan from a SACCO, Loan from a microfinance institution, Loan from an ASCA, Hire Purchase, Credit from a kiosk, Credit from a hospital or school, Saving account at a SACCO (Savings and Credit Cooperatives), Savings at a microfinance institution, Savings with an ASCA (Accumulating Savings and Credit Association) and Savings with a merry-go-round). Meanwhile, informal financial services are services offered by institutions operating on a banking framework or offering select banking services but not recognized as official banks as well as services offered at a completely ad hoc level with no formal government regulation (Loan from family or from a friend, Loan from an informal money lender, Loan in kind, Savings with a group at ones workplace, Savings given to family or friends, Savings kept in a secret hiding place and Savings in kind).

To understand better issues surrounding access to financial services, it is important to keep in mind what access to finance refers to. Access to finance refers to the availability of the supply of financial services at “reasonable cost”. Access thus only refers to the presence of financial services (United Nations, 2005). For the majority of Tanzanians, whose income are very low, access to financial services offers the possibility of managing scarce resources more efficiently, protection against risks, provision for the future and taking advantage of investment opportunities. For economic returns for individuals and

households, financial services allow higher standards of living to be achieved with the same resource base while for enterprises and farmers, financial services can facilitate the pursuit of income growth (URT, 2000).

In Tanzania, despite all policy efforts that have been undertaken during the last decade and increase in the number of financial institutions, access has remained limited. According to the national survey on demand for and barriers to accessing financial services data shows that 90% of the people in Tanzania did not have a formal bank account that means only 10% of the population in Tanzania has access to formal financial institutions. This rate is very small and cannot speed up the growth of Tanzanians economy towards meeting the Millennium Development Goals (FSDT, 2006).

Therefore majority of Tanzanians are still unable to use financial services. Many are forced to rely instead on a narrow range of informal financial services providers, which are often very expensive and risky. This constrains the ability of the people to participate fully in financial markets to increase their income and to contribute to economic growth. Stand alone micro finance institutions cannot by themselves fill the gap in financial services provision due to frequent difficulties with mobilizing funds on a large scale and pooling risks over large number (Anne *et al.*, 2005). The purpose of this paper was to identify the determinants of access to formal financial services at individual level in Tanzania.

Access to finance has been investigated by a number of studies. But the empirical studies of these studies are mixed. Anjali (2005) used regression analysis in an evaluation of the relative importance of socio economic factors affecting financial access in Brazil, claimed that geographical location (distance), income and education level were significantly influencing access to financial services. Bosch and Collins (2003) on their study of financial sector development and sustainable growth did not found a statistically significant relationship between these two aspects. Studies on the link between finance and poverty include Levine (2004) who found that financial access development causes less income inequality, also found that inequality decreases as finance developed and since the more concentrated income to higher poverty finance thus helps reduce poverty.

There are studies that show the importance of access to finance. Using household data from Peru, Jacoby (1994) found that lack of access to finance reduce the likelihood that poor household send their children to school. Similarly Jacoby and Skoufias (1997) show that household from India villages without access to finance such as credit market tend to reduce their children's schooling when they suffer transitory shocks than households with greater access to financial services. Temu (1994) used Discriminant analysis to discriminate between users and non users of financial institutions. The author found that family size, distance to local commercial centers were not different between account and non account holders. Financial Sector Deepening Trust FSDT, (2006) through its survey on demand for financial services and barriers to access found that only 10 percent of 38 million people of Tanzania have access to formal financial services.

METHODOLOGY

The study area

The study was conducted in Morogoro region, Tanzania. A multistage random sampling technique was employed to select the study area as it covers large area. Three districts out of six were selected from the region namely, Morogoro Municipality, Morogoro rural and Kilosa (Figure 1). The divisions of Morogoro Municipality, Mikese and Kilosa town were selected from each district respectively. From each division two wards were selected as follows, for Morogoro Municipality the wards were Kihonda and Sabasaba while for Mikese division the selected wards were Mikese and Fulwe. From Kilosa district, Town division, Kasiki and Mbumi wards were selected. Simple random sampling was used to select respondents for interview from the selected village/ streets in each ward depending on the location.

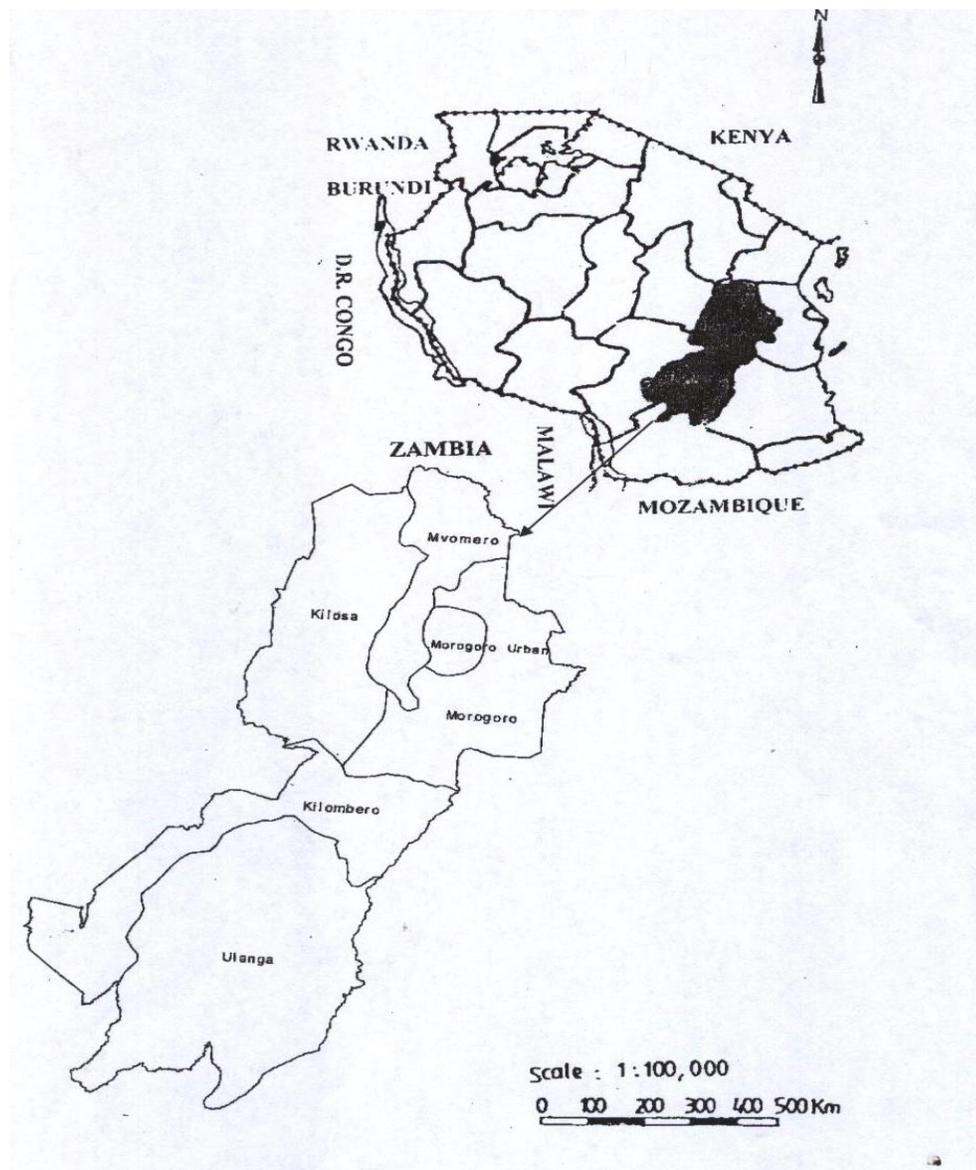


Figure 1: Map of Morogoro region - Tanzania

Instrumentation and the data collection process

The major survey instrument used in the collection of primary information was a structured questionnaire. The questionnaire was designed to collect sufficient data intended to address the objectives of the study. In this regard, the questionnaire included questions properly set to collect information required in running all the anticipated statistical and econometric analyses for testing hypotheses and answering research questions. The actual process of data collection was preceded by two weeks of pre- survey and adjustments of the questionnaire. Data collection exercise was done by the researcher assisted by two enumerators on December 2011. Prior to their active involvement in data collection the enumerators received thorough training on how to administer the questionnaire.

Data analysis

Logistic Regression Analysis

The study employed a logistic regression model to examine the influence of socio-economic factors on access to formal financial services. Individuals with access were the only category of respondents used in this analysis.

The binary logistic regression model using maximum likelihood methods was used to estimate the probability of having access to formal financial services. The purpose of qualitative choice model is to determine the probability and individual with a given attribute will make one choice rather than one or more alternative choices (Gujarati, 1995). Choice models predict the likelihood that an individual will choose an option that will have some relationship to their attributes of socio-economic factors. The binary logit qualitative choice model is based on the cumulative distribution and is specified as

$$P_i = E(Y_i = 1 / X_i) = \frac{1}{1 + e^{-z_i}} \dots\dots\dots(i)$$

Where

e is the base of nature logarithm ms, for choice 1 (success and Y= 0 (otherwise) P is the probability that an individual will make a certain choice when faced with two choices: given x; individual characteristics (Brown, 1991)

$$1 - P_i = \frac{1}{1 + e^{z_i}} \dots\dots\dots(ii)$$

The probability of making one choice relative to the other is calculated by;

$$\frac{P_i}{1 - P_i} = \frac{1 + e^{-z_i}}{1 + e^{z_i}} = e^{-z_i} \dots\dots\dots(iii)$$

Taking the natural log of Eq (iii) will give the values of the logistic (*Ld*) as illustrated in the equation used in this study as follows;

$$\ln \frac{P}{1-P} = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 \dots\dots\dots(iv)$$

Where;

$\ln \frac{P}{1-P}$ = Is the dependent variable which is the natural logarithm of the
 $\frac{P}{1-P}$

Probability of having access to formal financial services (P) divided by the probability of not having access to those services ($1-P$). It takes the values of 1 for access and 0 for no access

X_1 = Age of respondents in years

X_2 = Dummy of sex ($X_2 = 1$ if male and 0 otherwise)

X_3 = School age in years

X_4 = Occupation of respondent

X_5 = Dummy of income ($X_5 = 1$ if high and 0 if low)

X_6 = Dummy of distance measured in km ($X_6 = 1$ if closer to 21km, and 0 if longer than 21km)

α = Intercept (constant)

β_1 = Parameters to be estimated using maximum likelihood techniques

μ_i = is the stochastic disturbance term $\mu \sim N (0, P_i (1-P_i))$

Problems of parameter estimation often emanate from violation of the assumption of the linear regression model. The common problems encountered in the regression analysis include multicollinearity, heteroskedasticity, and autocorrelation. However the commonest problem in the logistic regression models is heteroskedasticity (Gujarat 1995). Heteroskedasticity occurs when variance of the error term is not constant and in turn results into large standard errors of parameter estimates, depressed t – value and hence rejection of many hypothesis unnecessary. Glaser test was conducted to test for heteroskedasticity by regression of absolute of the residual on the explanatory variable and the testing the significance of t-test suggests heteroskedasticity. The model was found to suffer from heteroskedasticity.

Gujarat (1995) suggested solution to heteroskedasticity problem in a logistic model. The solutions involve estimation of a transformed logistic regression model. This was done by transformation of all variables followed by re-estimation of the model by using maximum likelihood estimation of the coefficients. The interpretation of the coefficients is not as straight forward as in ordinary least square regression analysis. The coefficients on their own do not tell much but the coefficients can be used to compute marginal effects, which are useful in interpreting the effect of predictors on the change of probability. Also the signs of coefficients can be used to indicate the direction of the change of the predicated probability arising from a change in the predictor, (Mukherjee, *et al.*, 1998).

The estimated logistic model is expressed as follows

$$\sqrt{w}L_i = \beta_1 \sqrt{w} + \beta_2 \sqrt{w} X_i + \sqrt{w} \mu \dots\dots\dots (v)$$

The equation can be written as

$$L_i^* = \beta_1 \sqrt{w} + \beta_2 X_i^* + v_i \dots\dots\dots (vi)$$

Where

$$L_i^* = \text{Transformed or weighted } L_i$$

The equation can be written as

$$L_i^* = \beta_1 \sqrt{w_i} + \beta_2 x_i^* + v_i \dots\dots\dots (vii)$$

Where

$$L_i^* = \text{Transformed or weighted } L_i$$

$$X_i^* = \text{Transformed or weighted } X_i$$

$$w_i = P_i (1 - P_i)$$

$$v_i = \text{Transformed error term}$$

RESULTS AND DISCUSSION

Socio –economic characteristics of respondents

Socio-economic characteristics have important implications on access to financial services. They have important attributes to any society as they reflect its behavior in decision making and its probable expected responses to many stimuli exposed to it. Socio-economic characteristics of sampled respondents are summarized in Table 1.

Sex of respondents

The results summarized in Table 1 above show that males dominated access to formal financial services than females. Males account for 53.3% of respondents while females form only 46.7%. Males’ dominance in access to formal financial services is an indication that females have no power and decisions on most issues pertaining to financial matters. Therefore a challenge ahead is in female focus in order to omit gender disparity in the access to formal financial services. The results are in line to the findings of Anjali (2005) which showed that half of the men had access to financial services compared to a third of women.

Table 1 Distribution of respondents by socio-economic characteristics (%)

| Variable measured | Morogoro (U) n = 40 | Morogoro (R) n = 40 | Kilosa n = 40 | Total N = 120 |
|-------------------------|------------------------|------------------------|------------------|------------------|
| Age | | | | |
| 15 – 29 | 3.3 | 7.5 | 4.2 | 15.0 |
| 30 – 44 | 18.3 | 11.7 | 19.2 | 49.2 |
| 45 – 64 | 10.8 | 14.2 | 9.2 | 34.2 |
| 65 + | 0.8 | 0 | 0.8 | 1.7 |
| Gender | | | | |
| Male | 15.8 | 18.3 | 19.2 | 53.3 |
| Female | 17.5 | 15 | 14.2 | 46.7 |
| Education levels | | | | |
| Primary education | 15.8 | 21.7 | 21.7 | 59.2 |
| Secondary education | 12.5 | 10.8 | 10.0 | 33.3 |
| College | 2.5 | 0 | 0 | 2.5 |
| University | 1.7 | 0.8 | 0.8 | 3.3 |
| None | 0.8 | 0 | 0.8 | 1.7 |
| Married status | | | | |
| Single | 10.0 | 14.2 | 10.0 | 34.2 |
| Married | 20.8 | 17.5 | 21.7 | 60.0 |
| Widowed | 0 | 1.7 | 0 | 1.7 |
| Occupation | | | | |
| Farming | 9.2 | 14.2 | 12.5 | 35.8 |
| Business | 17.5 | 14.2 | 12.5 | 44.2 |
| Locally employed | 1.7 | 1.7 | 3.3 | 6.7 |
| Civil servant | 5.0 | 3.3 | 5.0 | 13.3 |

Age of respondent

Table 1 above shows that most of the sampled respondents were between 15-64 years, implying that the majority of them were within the active working age. The cohort of 30-44 years, which was about 49.2%, indicates the most active category in production activities and hence their level of access to financial services is high compared to other groups. Further the results reveal to insist income general skills especially for younger people.

Education of respondents

Education is one of the long term strategies that may be used to improve access to financial services. Among the significance difference the findings in Table 1 show that, majority of the sampled individuals have attained primary education (59.2%). About 33.3% attained secondary education and only 2.5% attained higher learning education. This indicates that access to

formal financial services is high to knowledgeable persons, good at following financial matters thereby improving their access. In addition education should be considered as an important tool in contributing towards financial literacy.

Marital status

In this study respondents were also requested to state their marital status. Results in Table 1 show that 60% of respondents are married, 34.2% are single while divorced and widowed are 1.7% and 4.2% respectively. Marriage increases household's size and therefore venture in increased production as a way of finding means of solving financial problems, rising income and increasing the possibility of financial access.

Primary occupation of respondents

Survey results further indicate that majority of respondents 44.2% rely on agriculture as their primary source of income generation. Amani (1992) reported that about 85% of people in Tanzania depend on agriculture as their source of income. The findings suggest that improving farming activities, means helping more to raise their income hence accelerating access to formal financial services. Small business ranked as second major primary occupation in the study area (35.8%) as compared to only 13.3% employed as civil servants and 6.7% employed locally. These findings also imply that people have interest and readiness in entrepreneurship activities through taking initiatives and accepting risks of failure in their small businesses Furthermore improvement of business skills to people, accessing relevant business information and management practices through advisory and business tracking is of great importance.

Income of respondents

Table 2, shows the patterns of income level categories. According to this study 55 % of the respondents fall under the category of those earning an income between Tshs 0-50 000 per month, whereas 36.7% of people earn an income between Tshs 5001-200 000 per month. Only 8.3% fall in the category of those earning more than Tshs 200 000 per month. These results suggest that majority of people have low income. In this situation people cannot have effective participation to access and use formal financial services as they cannot meet bank regulations or cannot open bank accounts because they cannot meet minimum balance requirement, service fees and interest rates. According to World Bank (2005) access to financial services rises with per capita income. The relatively poor, low and irregular income people have limited ability to afford bank charges.

Table 2 Distribution of respondents by income level (%)

| Income | Morogoro (U) | Morogoro (R) | Kilosa | Total |
|------------------|--------------|--------------|--------|-------|
| | n = 40 | n = 40 | n = 40 | |
| 0 – 50,000 | 16.7 | 23.3 | 15 | 55.0 |
| 51,000 – 200,000 | 13.3 | 7.5 | 15.8 | 36.7 |
| > 200,000 | 3.3 | 2.5 | 2.5 | 8.3 |

h) Access to formal financial Services

According to survey results Table 3 shows that 63.3% of respondents never had an access, while 36.7% currently have access to formal financial services. These results are in conformity with that of Financial Sector Deepening Trust (2006) which shows that majority of people in Tanzania have no access to formal financial services.

Table 3: Distribution of respondents by access to formal financial services (%)

| Access to formal financial services | Morogoro (U) | Morogoro (R) | Kilosa | Total |
|-------------------------------------|--------------|--------------|--------|-------|
| | n = 40 | n = 40 | n = 40 | |
| Yes | 15.0 | 10.0 | 11.7 | 36.7 |
| No | 18.3 | 23.3 | 21.7 | 63.3 |

Logistic regression results

A binary logistic analysis was undertaken to determine qualitatively how the relevant factors interact to influence individuals in accessing formal financial services in the study are. Access to formal financial services was thus the dependent variable and the regressors were income, age, sex, education level, primary occupation, income, distance to financial institutions and interest in financial matters. After several running of the model, independent variable such as interest was dropped. This factor was dropped because its inclusion was rendering the model insignificant.

The results show that the model was significant as indicated by the significance of F Value ($P < 0.05$). Moreover, adjusted R^2 -Value of 0.667 indicates that the model explained about 66.7% of the variation in the odds ratio. The higher R^2 values suggest that the Model fitted well to the data, that is have high explanation power of the joint association of the factors influencing access to formal financial services. According to these results only 33.3% of variations are attributed to other factors that are not included in the Model. Final results of parameters are summarized in Table 4.

Table 4: Logistic regression results

| Variables | Coefficients | Std error | T- value | Significance |
|---------------------|--------------|-----------|----------|--------------|
| Constant | 5.334 | 3.548 | 1.503 | 0.133 |
| Age in years | 0.044 | 0.29 | 1.517 | 0.129 |
| Sex | 0.160 | 0.606 | 0.264 | 0.792 |
| School age in years | 14.653 | 4.377 | 3.347** | 0.001 |
| Primary occupation | 0.932 | 1.860 | 0.501 | 0.616 |
| Income | 3.333 | 0.692 | 4.816** | 0.000 |
| Distance | 4.946 | 2.179 | 2.269* | 0.023 |

* Means significant at 5% Level

** Means significant at 1% Level

- 2 log likelihood = 73.511

Adjusted R² = 0.667

F – Value = 38.31

Results from Table 4 show that all six coefficients were positively related to access to formal financial services for sustainable development. Although all parameters were found to be positive there are some, which were found to be statistically insignificant. The positive relationship between age and access to formal financial services can be attributed to the fact that demand for access depends on age, that is younger persons will have a lower demand of financial access than adult individuals in the population. School age in years was expected to have positive effect to access to formal financial services. This is in agreement with a *priori* sign implying that educated individuals are much familiar and interested in issues pertaining to access to financial services than illiterate individuals.

The coefficient for distance has exhibited a *priori* sign and is statically significant ($P < 0.05$), this can be attributed to the fact that individuals dwelling closer to formal financial institutions may have greater chance of accessing to those institutions. This implies that distance to the financial institution points hinder sustainable development to rural areas where 70% of Tanzanians reside (Financial Sector Deepening Trust, 2006). The parameter attached to primary occupation of respondents was expected to have a positive effect. This was in agreement with the *priori* expectations indicating that individuals with more productive occupations have more chance of increasing income, high rate of saving and borrowing from formal financial services. However, the insignificance of this parameter can be attributed to the fact that majority of the interviewed individuals were farmers practicing small scale arable farming producing little for their consumption therefore saving very small amount unable to meet the requirements of formal financial services.

Sex was expected to have a positive effect on access to formal financial services. As expected the results showed a positive effect. This may be caused by males being the head of most of the household in the study area have more power and chance of access to formal financial services than females. The insignificance of parameter attached to sex can be attributed to the reason that females have more alternative chance of accessing to informal financial institutions. The coefficient for income

was expected to have a positive effect on access to formal financial services. The earlier expectation is in agreement with the expected results and statistically significant ($P < 0.01$). This means that individuals with high income are more intense in opening a bank account thereby increasing their access and usage of formal financial services.

CONCLUSION

The purpose of the paper was to determine the probability of obtaining sustainable financial services. This is due to the fact that majority of Tanzanians especially in rural areas, are still unable to use financial services. They are forced to rely instead on a narrow range of informal financial services providers, which are often very expensive and risky. This constrains the ability of the people to participate fully in sustainable financial markets to increase their income and to contribute to sustainable development. Hence the paper was to scrutinize the determinants of access to formal financial services at individual level in Tanzania. Previous studies showed that family size, distance to local commercial centers were not different between account and non account holders. The results of the paper indicated that age, sex, years in schooling, occupation, income of respondents and distance affect positively on sustainability of individual level access to formal financial services. However in low income populations, these results are quite natural given that access to financial services is normally influenced by education, income and distance to the financial institutions. These variables were significant and positively influencing the access of formal financial services. Therefore the study suggests that education, income and distance to formal financial services are important variables in accessing formal financial services. Therefore the government and other have to invest more in such variables so as to reduce poverty at household level.

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