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Determinants of loan repayment patterns among Micro Agricultural Financial Institution of South Africa beneficiaries in North West Province, South Africa

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Abstract: This paper examined the determinants of loan repayment patterns among Micro Agricultural Financial Institution of South Africa beneficiaries in North West Province, South Africa. A simple random sampling technique was used to select 273 respondents from a total of 344 beneficiaries. A structured questionnaire was used to collect data which was analysed using the Statistical Package for Social Sciences (SPSS) with frequencies, percentages and probit regression. The results show that respondents were predominantly male (84%); married (95%); Christians (94%); having secondary school education (72%) with a mean age of 55.5 years, mean production expenditure of R1251.43, mean personal expenditure of R 1168.50; mean income from livestock as R 121333.00 and mean income from crops as R 19468.00. In terms of repayment 29.3% did not repay, 44% made partial repayment and 26.7% total repayment. Significant determinants of no repayment pattern were natural capital after (t = 2.08), gender (t = 1.84), marital status (t = -2.26), membership of organisation (t = -2.31) while the significant determinants of partial repayment were farm expense (t = 3.80) gender (t = -2.07) age (t = 2.33), membership of organisation (t = -3.04), frequency of contacts with extension (t = -5.16). The significant determinants of total repayment were human capital after (t = 1.85), gender (t = -2.92), marital status (t = -3.60), dependents (t = -3.78), males in household (t = 2.90), females in household (t = 3.63) and frequency of extension contact (t = -1.75).

Keywords: loan repayment patterns, microfinance, smallholder farmers, North West Province, South Africa

Introduction

In addition to other factors of production credit is considered as more important because it determines access to most of the farm resources required by farmers.

The provision of credit can be regarded as an important mechanism for raising the incomes of rural populations mainly by organizing resources for more productive uses (Kuwornu *et al*., 2012*)*. Farm credit within agricultural households is not only necessitated by the limitations of self-finance, but also by uncertainty pertaining to the level of output and the time lag between inputs and output (Dadson, 2012). To increase agricultural productivity and assist households in maintaining food security, many governments in developing countries initiated credit programmes so that farmers will have access to formal sources of credit without 'bankable' collateral, high administrative costs and perceived high risks associated with agricultural and small scale farmers (Dadson, 2012, Awoke, 2004).

Two major sources of credit to smallholder farmers in South Africa were Land and Agricultural Bank of South Africa and Micro Agricultural Financial Institutions of South Africa (MAFISA). The Land Bank serves as a reliable source of credit to smallholder farmers who do not necessarily have the assets required by credit institutions to serve as collateral since government provides some form of guarantee in terms of loans disbursed by the bank. This act by government saw many farmers acquiring loans to either purchase land, production loans and farm machinery such as tractors, ploughs and harvesters. The Land Bank is also faced with challenges of farmers not honouring their contractual obligations on loan repayments. This negatively affects the bank's loan book since its success is dependent on farmers repaying their loans in accordance with the mutual agreements reached by both parties. There are smallholder farmers who no longer enjoy financial services from the Land Bank because of outstanding amounts from previous years. Such farmers have to look for other sources of credit because the bank is restricted by the National Credit Act (NCA) to disburse loans to borrowers who willingly or unwillingly fail to repay their loans.

Micro Agricultural Finance Institutions of South Africa was established by government in 2004 with a view to facilitate the provision of equitable access to financial services by economically active rural communities (DAFF, 2016), with the objective of providing financial capital to people who cannot access finance from formal financial institutions such as commercial banks. The scheme provides short to medium term production loans to the poorest of the poor in need of such services. MAFISA sources financial resources from the market, although government remains the majority shareholder considering the fact that it contributes the greatest share of the scheme's finances. The Micro Agricultural Financial Institutions of South Africa (MAFISA) is another financial institution designed by government to service smallholder farmers whose credit record does not allow them to eligible to apply and secure loans from commercial banks, co-operatives and even the Land Bank. MAFISA's lending criteria is relaxed in order to give farmers an opportunity to access loans at a cheaper rate and with less collateral requirements. A limiting factor with

MAFISA is that it offers loans only to the tune of R 500 000.00. This leaves those who require more than this amount in difficult situations since they will not easily secure such loans from other institutions, especially those with impaired credit records (DAFF, 2015)

In the past five decades, microfinance has evolved from an innovative idea into an important tool for improving development. The growth of microfinance according to Berg *et al*., (2013) has resulted in competition from microfinance may lead to loss of economies of scale for informal lenders, as fixed costs have to be spread over a smaller volume of lending, causing screening and monitoring costs to rise (scale diseconomies); cream-skimming low risk borrowers, leaving high risk borrowers to be served by informal lenders (cream-skimming); channelling formal credit through informal lenders (collusion) and inflexible and frequent repayment requirements of microfinance loans induce increased borrowings from informal lenders, raising demand on the informal market (crowding in). Chen, Rasmussen, and Reille (2010) found excessive lending due to overconcentration of microfinance contributed to rising delinquencies in Nicaragua, Morocco, Bosnia and Herzegovina, and Pakistan. These scenarios have implications for the repayment ability of the borrowers particularly smallholder farmers whose enterprises are climate dependent. Roslan and Karim (2009) categorized loan repayment behaviours into three namely characteristics of the borrower-specific, farm-specific, and institutional variables. Hietalahti and Linden (2006) analysed the socio-economic impacts of microfinance and repayment performance: a case study of the Small Enterprise Foundation in South Africa and concluded that repayment problems were caused by group heterogeneity.

According to Dadson (2012), the question of repayment of loan by farmers is one of the important issue since it influences access to credit by the farmers. Onyeagocha, Chidebelu and Okorji (2012) stated that one way to tackle the loan repayment challenges is to investigate the factors which affect the loan repayment. Banuri (2006) posits that as the number of loans for the poor increases, there should also be a positive relationship with recipients' income. Meyer (2015) revealed that Access to future loans becomes an important incentive for repayment when obtaining a new loan is perceived as being more beneficial than defaulting Copestake *et al.* (2005) firmly believe that microfinance is just but one of the factors that leads to increased income. In Ogun state Nigeria, factors that improves smallholder cooperative farmers' loan repayment were age, level of education, farming experience, net farm income and loan size obtained, while in Abia state Nigeria, the amount of informal loan repaid was significantly influenced by gender, distance between home and source of credit, household size, interest rate and farm income Isitor *et al*., 2016; Osondu *et al.,* 2015). In Punjab province of Pakistan, Mahmud *et al*. (2007) reported that loan repayment was influenced by inadequate loan, supervision of bank employees, form of loan use, high interest rates, and changes in business and residence of the borrower. Chauke

et al. (2013) found in the Capricorn District of South Africa that factors that loan repayment affect credit access.

In Ghana transitional zone Abankwah *et al.* (2016) found that farmer's age, sex, household membership, income and farming systems significantly influence loan repayment capacity. More so, "relatively low interest rate, post disbursement monitoring, moratorium and repayment schedule were institutional factors" found to influence loan repayment by smallholder farmers. Social capital can facilitate access to credit, but also affect repayment behaviour of borrowers (van Bastelaer, 2000). Yogendrarajah and Semasinghe (2015) found that decision making and control over assets significantly negatively influenced repayment. Loan repayment performance of Farmers groups in Techiman, Ghana were affected by group characteristics such as "polarization of religious background, number of married personalities in a group, size of a group, gender balance of a group and the variety of crops cultivated by the group" (Ayogyam *et al* 2016). Sharma and Zeller (1997) report that credit groups with higher percentages of women had significantly better repayment rates. The ability of women to outperform men in terms of repayment in microfinance led the Grameen Bank in Bangladesh to switch to a nearly entirely female clientele (Armendariz and Morduch 2005) . Hulme (1991) and Gibbons and Kasim (1991) reported that greater proportion of women than men paid on time in Malawi and Malaysia.

Factors such as credit analysis regards leadership and human relations; commitment and confidence; internal locus of control; self-efficacy; calculated risk taking; need for achievement; and opportunity seeking were reported by Henning, and Jordaan (2016) as important indicators of the ability of potential borrows to repay their loans. The comparison of repayment performance of farmers and non-farmers who borrowed credit in individual and group-based schemes from formal banks in the Mekong Delta (MD) in Vietnam using a Tobit model found that repayment in group schemes was positively affected by educational level and by loans to farmers, and negatively by the loan amount, while repayment by independent borrowers is positively affected by the loan amount, farmers as borrowers, and the gender of borrowers (Nam and Duy 2016).

In this paper, repayment patterns were conceptualized as no repayment, partial repayment and total repayment. This was based on the amount of loan repaid less the amount received within the stipulated pay-back period which is the standard recovery period by MAFISA. DAFF (2015) stated that "repayment should be in line with the income cycle of the specific enterprise. Clients may also use income from other sources to repay the loan. Capital and interest must be redeemed within the agreed loan period". For the analytical purposes, no repayment was operationalized as inability to pay within the expected period; partial repayment was depicted as the repayment of certain proportion of the loan within stipulated period while total repayment was the full payment within the cycle of the enterprise. The main

objective of the study was to isolate the determinants of loan repayment patterns among MAFISA beneficiaries and factors that can lead to their categorisation into no repayment, partial repayment and total repayment patterns

Methodology

The study was carried out in all four district municipalities of the North West Province (NWP), namely: Bojanala Platinum District, Ngaka Modiri-Molema (Central) District, Dr Kenneth Kaunda (Southern) District and Dr Ruth Segomotsi Mompati District. The North West is the fourth largest Province in South Africa, with a land size of 104 882 square kilometres representing 8.7 per cent of the country's total surface area. Agriculture is the second biggest contributor to the Provincial Gross Domestic Product (GDP) after mining. Summer temperatures range from 17° C to 31 °C, and the total annual rainfall is about 360 millimetres (mm).

The population of the study consisted of all smallholder farmers supported by MAFISA in the North West Province. Males and females, including the youth who borrowed capital from the institution to establish new enterprises and expand existing ones constituted the population of the study. There are 344 beneficiaries of MAFISA in the province. Simple random sampling was used to select participants for the study. This was done throughout the province and all beneficiaries supported by MAFISA stood equal chances of being selected. A sample size of 273 farmers was randomly selected from the various districts of the Province. The sample size of 273 farmers was arrived at using the Raosoft Sampling Technique. Respondents consented voluntarily to respond to questions posed to them by enumerators. All respondents were advised not to participate in the study if they felt uncomfortable. The purpose of the study and the need to participate in the study was adequately explained to every respondent.

Completed questionnaires were coded, captured and analysed using version 21 of the Statistical Package for Social Sciences (SPSS). Descriptive statistics, frequencies, percentages, graphs and charts were used to summarise the data. The probit model was used to analyse the effect of socio-economic factors on repayment by beneficiaries. The dependent variable Y is dichotomous, thus Y=1 if beneficiary has fully repaid the loan, and Y=0 if beneficiary has not repaid the loan. A probit model highlights the fact that the discrete dependent variable Y is a rough categorisation of a continuous but unobserved variable Y^*. If Y^* could be directly observed, then standard regression methods would be used (with an assumption that Y^* is a linear function of some independent variables, for example):

$$Y^* = \acute{\alpha}+\beta_1 X_1+ \beta_2 X_2+...+ u_j \quad (3)$$

Y^* is a loan repayment ability which is used as a proxy for Y^*.

$$X = (1, X_{2,} X_{3,} X_4, X_5 \ldots\ldots\ldots\ldots X_{12}) \quad (4)$$

$$\beta = (\beta_{1,} \beta_{2,} \beta_{3,} \beta_4, \beta_5 \ldots\ldots\ldots\ldots \beta_{12}) \quad (5)$$

$$Y_i^* = \begin{cases} 1 \, if \, Y_i^* > Y \\ 0 \, if \, Y_i^* \leq 0 \end{cases} \quad (6)$$

$$P\left(Y = \frac{1}{X}\right) = F(XB) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{XB} e^{\frac{-(XB)^2}{2}} dx \quad (7)$$

The model was specified as follows:

$Y^* = X_1 Age + X_2 Gender + X_3 Education + X_4 MAFISA\ loan + X_5 Annual\ farm\ income + X_6 Recordkeeping + X_7 Member\ of\ farmer\ organisation + X_8 Years\ in\ farming + X_9 Engage\ in\ non\text{-}farming\ business + X_{10} Farm\ size + X_{11} Amount\ of\ loan\ received + X_{12} Access\ to\ high\ value\ market + X_{13} Household\ size + X_{14} Number\ of\ years\ received\ financial\ support + u_j$

Where Y^* *and* u_j are the loan repayment patterns and error term respectively.

Results and Discussion

Table 1 shows the demographic profile of respondents. From the table, MAFISA beneficiaries were predominantly male (84%); married (95%); Christians (94%); having secondary school education (72%) with a mean age of 55.5 years, mean production expenditure of R1251.43, mean personal expenditure of R 1168.50; mean income from livestock as R 121333.00 and mean income from crops as R 19468.00. These findings implies that MAFISA beneficiaries are male dominated with low levels of education but generally married and moderately old in age. The study revelead agriculture is practised predominantly by old people. This could be due fact that youth has rellocated from villages to join universities, colleges or to seek employment somwhere else outside their area (Hebinck and Van Averbeke, 2007). Montshwe (2006) maintains that the older the farmer, the lesser the chances of being granted loans by formal credit institutions. The results of the study revealed that the agricultural sector is still dominated by older people compared to other sectors of the economy. This confirms the myth that agriculture is for older people who are already on old-age pension.

Table 1 - Demographic profile of respondents

VARIABLES	DESCRIPTIONS
Gender	Predominantly Male 84%
Age	Mean =55.5 SD= 10
Marital status	Predominantly married 95%
Educational level	Predominantly secondary school 72%
Religion	Predominantly Christians 94%
Production expenditure	Mean = 1251.43 SD =20,000.00
Personal expenditure	Mean = 1168.5 SD= 12,000.00
Income from livestock	Mean = 121333 SD= 5,000.00
Income from crops	Mean = 19468 SD= 3,000.00

Table 2 - Repayment categories among respondents

	FREQUENCY	PERCENTAGE
No repayment	80	29.3
Partial repayment	120	44.0
Total repayment	73	26.7
Total	273	100.0

Table 3 presents the results of the Probit regression analysis of factors affecting repayment patterns. The dependent variable is the proportion of the amount of money repaid (principal plus interest) by borrower. The proportion repaid is expected to be influenced by several factors which is the main objective of this study to identify and explain these variables. Repayment patterns were conceptualized as no repayment, partial repayment and total repayment. The probit model seeks to explain the probability of beneficiaries' repaying patterns the loan obtained from MAFISA. The signs of the coefficients of independent variables and significance of the independent variables were used in largely determining the impact of each variable on the probability of repayment patterns of loans by farmers. the results shows that Significant determinants of no repayment pattern were natural capital after (t = 2.08), gender (t = 1.84), marital status (t = -2.26), membership of organisation (t = -2.31) while the significant determinants of partial repayment were farm expense (t = 3.80) gender (t = -2.07), age (t = 2.33), membership of organisation (t = -3.04), frequency of contacts with extension (t = -5.16). The significant determinants of total repayment were human capital after (t = 1.85) gender (t = -2.92) marital status(t = -3.60), dependents (t = -3.78) males in household (t = 2.90), females in household (t = 3.63) and frequency of extension contact (t = -1.75). The implications of the findings from the probit regression analysis is that the significant variables for each category of the loan repayment patterns influenced respondents to fall into each of the

Table 3 - Probit regression analysis of factors affecting repayment patterns

	No repayment		Partial repayment		Total repayment	
Variables	Estimate (SE)	Z	Estimate (SE)	Z	Estimate (SE)	Z
Crop income	0.00(0.00)	-0.13	0.00(0.00)	1.15	0.00(0.00)	-0.89
Livestock income	0.00(0.00)	-1.45	0.00(0.00)	-0.211	0.00(0.00)	0.33
Other sources income	0.00(0.00)	1.51	0.00(0.00)	0.17	0.00(0.00)	-v.38
Farm expense	0.00(0.00)	1.54	0.00(0.00)	3.81***	0.00(0.00)	1.62
Production expense	0.00(0.00)	-0.18	0.00(0.00)	-0.762	0.00(0.00)	1.21
Personal expenditure	0.00(0.00)	-0.19	0.00(0.00)	1.75*	0.00(0.00)	1.13
Amount spent on diseases	0.00(0.00)	-0.11	0.00(0.00)	-0.17	0.00(0.00)	0.73
Relevance to activities	-0.003(.03)	-0.09	0.003(0.01)	0.23	0.007(.015)	0.49
Financial capital after	0.03(.07)	0.42	0.006(.04)	0.16	0.047(.037)	1.30
Physical capital after	-0.002(.06)	-0.02	-0.05(.03)	-1.60	-0.066(.047)	-1.38
Social capital after	-0.12(.12)	-1.01	-0.03(.04)	-0.82	0.052(.057)	0.91
Human capital after	-0.02(.05)	-0.40	0.016(.019)	0.82	0.042(.023)	1.85*
Natural capital after	0.168(.08)	2.08**	0.029(.03)	0.86	-0.045(.042)	-1.07
Attitude towards services	-0.02(.03)	-0.67	-0.001(0.014)	-0.07	0.008(.018)	0.47
Effectiveness of services	0.045(.03)	1.39	-0.004(.02)	-0.23	-0.030(.019)	-1.59
Production constraints	-0.015(.03)	-0.50	0.010(.012)	0.79	-0.007(.014)	-0.47
Gender	-0.32(.17)	-1.84*	-0.139(.07)	-2.09**	-0.206(.070)	-2.92**
Age	-0.04(.07)	-0.61	0.066(.03)	2.33**	0.023(.034)	0.66
Marital status	-0.49(.21)	-2.26**	0.084(.05)	1.63	-0.356(.099)	-3.60***
Education	0.04(.09)	0.43	0.029(.05)	0.64	-0.008(.045)	-.168
Dependents	0.10(.15)	0.68	0.072(.17)	0.44	-0.245(.065)	-3.78***
Males in household	-0.12(.16)	-0.77	-0.083(.16)	-0.51	0.166(.057)	2.90**
Females in household	-0.13(.16)	-0.80	-0.075(.17)	-0.44	0.234(.064)	3.64
Extension contact	-0.029(.12)	-0.22	-0.006(.05)	-0.14	0.028(.05)	0.562
Membership of organisation	-0.63(.27)	-2.317**	-0.231(.07)	-3.04**	0.011(.26)	0.042
Frequency of extension contact	-0.19(.31)	-0.62	-0.614(.12)	-5.16***	-.213(.12)	-1.750*
No. of workers	-0.05(.05)	-0.99	-0.009(.03)	-0.322	-0.040(.03)	-1.39
Farming experience	0.06(.05)	1.150	-0.001(.01)	-0.110	0.004(.019)	0.23
Intercept	-16.07(7.34)	-2.20	-7.16(2.4)	-2.89	-8.31(2.62)	-3.17
Chi-Square	115.29		459.81		419.96	
df	51		91		44	
Sig.	0.00		0.00		0.00	

categorised loan repayment patterns. the differentials in terms of the marital status, organisational membership, predominant gender, frequency of extension contacts could have accounted for these variables being significant for the three categories of loan repayment patterns. Coker and Audu (2015) asserted that sex (gender), membership of cooperative, loans granted and duration of micro-credit repayment are positive and significantly associated with the classification of the two groups (partial payment and non-payment groups) relative to the reference group. Hermes and Lensink (2011) stated that women are more reliable and have higher pay-back ratios and they use a more substantial part of their income for health and education

of their children, thus, women play a very important role in reducing poverty within households.

Conclusions

This introduction of Micro Agricultural Financial Institution of South Africa was predicated on the fact that microfinance plays an important role in improvement of farming enterprises which is however not readily available in rural areas particularly for previously disadvantaged individuals who struggle to secure credit from formal credit institutions such as banks. Micro Agricultural Financial Institution of South Africa has improved farmers' access to credit but the unintended consequences of the problem of repayment arose. Significant determinants of no repayment pattern were natural capital after, gender, marital status, and membership of organisation while the significant determinants of partial repayment were farm expense, gender, age, membership of organisation, frequency of contacts with extension. The significant determinants of total repayment were human capital after, gender, marital status, dependents, males in household, females in household, frequency of extension contact. The implications of the findings from the probit regression analysis is that the significant variables for each category of the loan repayment patterns influenced respondents to fall into each of the categorised loan repayment patterns.

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