DETERMINANTS OF LOAN REPAYMENT PERFORMANCE OF FISHERMEN: EMPIRICAL EVIDENCE FROM GHANA

H.D. ACQUAH[1]*, J. ADDO[2]

*E-mail: henrydegraftacquah@yahoo.com

ABSTRACT. This study investigated factors influencing loan repayment performance of fishermen. A survey of 67 randomly sampled fishermen was conducted using a standard questionnaire. An interview schedule was the main tool of data collection while descriptive statistics and multiple regression analysis were the main analytical techniques. The study showed that majority of the fishermen interviewed were in the productive age range, had high average annual income and were experienced fishermen. Empirical results indicated that 70.1% of the fishermen interviewed had delayed repayment and this was partly attributed to low catch and high debts from fishmongers. Regression estimation results reveals that loan repayment increased with years of education, fishing income, years of fishing experience and amount of loan whilst the age and investment made negatively influenced the amount of loan repaid. The regression analysis finds the fishing income, loan and amount of investment made as significant predictors of the amount of loan repaid. The covariates in the model explained 77% of the variation in the loan repaid. It is recommended that allocation of loans to fisheries sector be increased to stimulate fishing activities and improve repayment performance of fishermen.

Key words: Determinants; Fishermen; Microcredit; Multiple regression; Loans repayment.

INTRODUCTION

Many financial institutions in developing countries provide financial services such as saving and credit to aid several smallholder enterprises. This is an effort in line with the "Millennium development goals" which seeks to reduce poverty by 50% by the year 2015. However, the sustainability and continuity of the financial institutions to increase the volume of credit to stimulate the poverty reduction goal depends on the

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[1] Department of Agricultural Economics and Extension, University of Cape Coast, Cape Coast, Ghana
[2] Institute for Development Studies, University of Cape Coast, Ghana

repayment rates. High repayment rates allow the institutions to lower the interest rates and processing costs and consequently increase patronage of loans. High repayment rates reduce the subsidy- dependence of the credit institutions to help them reach a better sustainability level. Repayment performance thus serves as a positive signal for increasing the volume of credit availability to various sectors of the economy.

However, the financial institutions continue to decline credit to the agricultural and fisheries sectors. This decline is partly due to poor loan repayment performance from these sectors. Most of the loans default in these sectors could arise from poor management procedures, loans diversion and unwillingness to repay loans as well as other socio economic characteristics. However, despite the importance of repayment rates on the sustainability of financial institutions, and poverty reduction, within the Ghanaian context, very few studies have tried to investigate loan repayment performance among fishermen. This study therefore fills the gap by investigating loan repayment performance of fishermen in the central Ghana. Specifically, the study seeks to: 1) examine the socio-economic characteristics of fishermen; 2) examine the loan processing and disbursement procedures; 3) examine the socio-economic determinants of loan repayment performance of fishermen.

Inability of borrowers to repay amount of loans collected is crucial for the long-term sustenance of the credit institutions. As a result, many studies have tried to examine loan repayment performance of many socio-economic groups. Empirical work by Arene (1993) revealed income, farm size, age of farmers, farming experience and level of education of farmers contributed positively to the credit worthiness of farmers. Oladeebo and Oladeebo (2008) examined the determinants of loan repayment among smallholder farmers in Ogbomoso Agricultural Zone, Nigeria. Results from multiple regression analysis showed that amount of loan obtained by farmers, years of farming experience with credit, level of education, were major factors that positively and significantly influenced loan repayment. Eze and Ibekwe (2007) examined the determinants of loan repayment under the indigenous financial system in Southeast Nigeria. Empirical results from multiple regression analysis revealed amount of loan received, age of beneficiary, household size, and years of formal education and occupation as important predictors of loan repayment under the system. Mashatola and Darroch (2003) analyzed the factors affecting the loan status and repayment scheme of sugarcane farmers who received graduated mortgage loan in Kwazulu-Natal, South Africa. Results identified farm size (proxied by annual gross turnover), access to off-farm income, and average annual gross turnover relative to loan size as criteria in selecting potential farmers for such

scheme as they provided additional liquidity to fund future operations and debt repayment. Okorie (1986) examined the major determinants of agricultural smallholder loan repayment in Ondo State, Nigeria. Results identified the nature and timeliness of loan disbursement, the number of supervisory visits by credit officers, profitability of the enterprise on which the loan funds were invested as significant factors that stimulate loan repayment. Kohansal and Mansoori (2009) investigated the factors affecting loan repayment performance of farmers in Khorasan-Razavi Province of Iran. Results from a logistic model showed that loan interest rate was the most important factor affecting repayment of agricultural loans. Farming experience, and total application cost were the next factors respectively. Chirwa (1997) analyzed the determinants of credit repayment among smallholder farmers in Malawi using a probit model. Results revealed sales of crops, size of group, degree of diversification, income transfer and the quality of information as significant determinants of agricultural credit repayment. Bassem (2008) examined the factors vulnerable to affect the repayment performance of group lending in Tunisia. Empirical results from a logistic regression estimation showed that the repayment is influenced positively by the internal rules of conduct, the same business, and the knowledge of the other members of the group before its formation, the peer pressure, the self-selection, the sex, the education and the non financial services. However, the homogeneity, and the marital status had a negative influence on repayment.

MATERIALS AND METHOD

Study area description. Komenda-Edina-Eguafo-Abirem (KEEA) municipal district is one of the 13 districts in the central region of Ghana. The municipal is bounded on the south by the Atlantic Ocean (Gulf of Guinea), the east by the Cape Coast Metropolis, the north by the Twifo Hemang-Lower Denkyira District and the west by the Mphor-Wassa East District. The KEEA district is located between longitudes 1°20' west and 1°40' west and latitudes 5°05' north and 5°15' north. The district covers an area of 1372.45 km^2 (919.95 square miles).

Elmina is a 700-year- old town located on the coast of the central region of Ghana in West Africa. It is the capital of four distinct traditional areas or states, which have been put together to constitute a political district called KEEA district. Its geographical coordinates are 5°5'0" North, 1°21'0" West and has a population of about 20,000 people. Fishing is the main industry in the area.

Sampling and sample size. The sample for the study consists of 67 fishermen in the Elmina in the central region of Ghana. The target population was fishermen in central region of Ghana. Random sampling technique was used to select the sample.

The Map of Central Region of Ghana
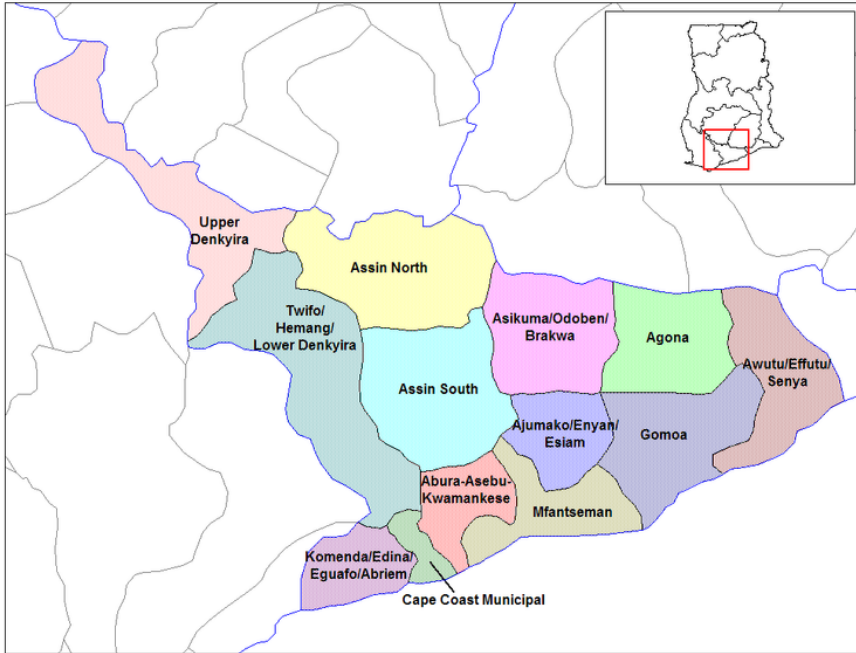
Data analysis. An interview schedule was the main tool of data collection while descriptive statistics and multiple regression analysis were the main analytical techniques. While frequency, percentages and means were used to describe the socio-economic characteristics of respondents. Multiple linear regression model was used to analyze factors affecting the amount of loan repaid by respondents. Specification of multiple linear regression model using matrix notation becomes:

$$Y = \beta X + \varepsilon$$

$$Y = \begin{bmatrix} Y_1 \\ Y_2 \\ Y_n \end{bmatrix} \quad X = \begin{bmatrix} 1 X_{11} X_{21} \\ 1 X_{12} X_{22} \\ 1 X_{1n} X_{2n} \end{bmatrix} \quad b = \begin{bmatrix} b_0 \\ b_1 \\ b_2 \end{bmatrix} \quad \varepsilon = \begin{bmatrix} \varepsilon_1 \\ \varepsilon_2 \\ \varepsilon_n \end{bmatrix} \quad (1)$$

The method of least squares is used to obtain the beta estimates that minimize the sum of the squared deviations as follows:

$$Min(Y - X\hat{\beta})(Y - X\hat{\beta}) \quad (2)$$

$$2X(Y - X\hat{\beta})$$

$$X'Y - X'X\hat{\beta} = 0$$

$$X'X\hat{\beta} = X'Y$$

$$(X'X)^{-1}X'X\hat{\beta} = (X'X)^{-1}X'Y$$

$$I\hat{\beta} = (X'X)^{-1}X'Y$$

$$\hat{\beta} = (X'X)^{-1}X'Y \quad (3)$$

This research uses information criteria as technique for providing the basis for model selection. Most commonly used information criteria such as Akaike Information Criteria (AIC) and the Bayesian Information Criteria are employed. The idea of AIC (Akaike, 1973) is to select the model that minimizes the negative likelihood penalized by the number of parameters as specified in the equation (1).

$$A I C = -2 \log (L) + 2 p \quad (4)$$

Where L refers to the likelihood under the fitted model and p is the number of parameters in the model. Specifically, AIC is aimed at finding the best approximating model to the unknown true data generating process and its applications draws from (Akaike, 1973; Bozdogan, 1987; Zucchini, 2000).

The Bayesian Information Criteria (BIC) is derived within a Bayesian framework as an estimate of the Bayes factor for two competing models (Schwarz, 1978; Kass and Rafftery, 1995). BIC is defined as:

$$B I C = -2 \log (L) + p \log (n) \quad (5)$$

Where L refers to the likelihood under the fitted model, p is the number of parameters in the model and n is the sample size. Models that minimize the Bayesian information criteria are selected. From a Bayesian perspective, BIC is designed to find the most probable model given the data.

RESULTS AND DISCUSSION

Socio-economic profile of fishermen. In an attempt to examine whether the socio-economic characteristics of respondents influence loan repayment performance, the fishermen were asked questions pertaining to that. The fishermen had a mean age of 43.04 years with majority (40.3%) of them in the age range between 41-50 years. 22.4% were between 19-30 years; only 7.5% were between 61-70 years. The results from the distribution of the ages of the fishermen revealed that most of them fall within the productive age. The fishermen interviewed had a mean of 5.79 years of formal education; with majority (43.3%) having obtained basic education. 20.9% had obtained junior high school education; while only 4.5% had obtained senior secondary education. However, 31.3% had no formal education.

The distribution of years of fishing revealed an average of 24.21 years of experience with 35.8% having between 11-20 years of experience; 34.3% having between 21-30 years; 19.4% having between 31-40 years; only 1.5% of the fishermen had between 51-60 years of fishing experience. It must be emphasized that this high average years of experience is expected to positively influence loan repayment of fishermen.

The results from the distribution of incomes of fishermen revealed a mean annual income of GH¢5586.42 with the majority representing 50.7% having an annual income between GH¢1000-GH¢5000; 19.4% earn between the ranges GH¢5001-GH¢10000; only 4.5% had annual income above GH¢25000. However, 17.9% had an annual income below GH¢1000. Given the relatively higher

average income distribution of the fishermen, their repayment performance is expected to improve.

In an attempt to examine whether respondents who had other income generating activities; and those who used other tools alongside their canoe/boats and nets have higher repayment performance, the respondents were asked relevant questions. Of the fishermen interviewed, only 22.4% had other income generating activity which included carpentry, construction work and crop farming. However, 77.6% had no other income generating activity. Of the 67 fishermen interviewed for the study, 68.7% use other machines like outboard motors and generators. However, 31.3% of the fishermen do not use any other machinery in their fishing activities.

Loan processing procedures. In an attempt to examine whether the loan processing procedures affect repayment performance, the fishermen were asked questions relevant to that. Second, they were asked whether collateral security was provided before the loans were given out. Finally, they were asked whether they incur any costs on processing the loans.

59.7% of the fishermen had to wait for about 1-3 months before loans were disbursed; 10.4% waited between 4-6 months; 22.4% waited between 1-3 weeks before receiving the loans; only 7.5% waited for less than a week. Of the 67 fishermen interviewed, 40.3% had to provide collateral substitutes before loans

were given out. Items used as collateral included plots of land, houses, fishing nets, and canoes/boats. However, 59.7% did not provide collateral security before loans were given out to them. The distribution of loan processing costs revealed that 53.1% spent between GH¢15-GH¢50 to process the loans; 34.4% of the fishermen spent between GH¢51-GH¢100. However, only 9.4% spent between GH¢201-GH¢250 to process loans. It must be emphasized that the distribution of loan processing costs is proportional to the size of loans received.

Size of loans borrowed and invested. In an attempt to examine whether the size of loans collected and invested influence loan repayment performance, the fishermen were asked to indicate the amount of loan collected and the amount they invested into their fishing activities. Of the fishermen interviewed, 25.4% borrowed less than GH¢1000; 55.2% obtained between GH¢1000-GH¢4000; 14.9% obtained between GH¢4001-GH¢7000; 3.0% obtained between GH¢7001-GH¢10000. Only 1.5% borrowed more than GH¢10000. The average size of loans borrowed was GH¢2423.13. However, the distribution of the size of loans invested into fishing activity revealed 13.4% of the fishermen investing less than GH¢500; 67.2% invested between GH¢500-GH¢3000; 13.4% invested between GH¢3001-GH¢5600; whilst 4.5% invested between GH¢5601-GH¢8100. Only 1.5% invested an amount more than GH¢8100. The average amount

invested into fishing activity was GH¢2075.37. Comparison of the averages of the amount borrowed (GH¢2423.13) and amount invested (GH¢2075.37) revealed not much difference and as a result, we expect the size of loan invested to influence repayment performance.

Size of loans repaid and repayment structure. The distribution of size of loans repaid was also examined. 32.8% of the fishermen were able to repay less than GH¢1000; 47.8% had repaid between GH¢1000-GH¢5000; 11.9% were able to repay between GH¢5001-GH¢10000; only 1.5% of the fishermen were able to repay more than GH¢10000. However, 6.0% of the fishermen were unable to repay

any amount. Repayment structure was basically two types namely installment or bulk repayments. Majority of the fishermen (92.5%) repaid the loans in installments. Loan repayment periods varied from 1-30 months with majority (28.4%) of the loans repaid between 7-12 months.

Determinants of loan repayment performance. A multiple regression analysis was employed to analyze the socio-economic factors that influence loan size. The Akaike Information Criteria (Akaike, 1973) and the Bayesian Information Criteria (Schwarz, 1976) provided the basis for selecting the model that provided the best fit to the Loan size model detailed in *Table 1*.

Table 1 - Parameter estimates of the Multiple Regression Model

Variables	Estimates	Std. Error	t value	Pr (>I t I)
CONST	644.754	796.588	0.809	0.421
AGE	-45.006	27.843	-1.616	0.111
EDU	11.415	38.888	0.294	0.770
EXP	50.656	30.384	1.667	0.100
FINC	0.059	0.024	2.450	0.017 **
LOAN	1.243	0.093	-13.290	$<2e^{-16}$ ***
INVT	-0.507	0.114	-4.421	$4.2e^{-05}$ ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Note: AGE= Age of respondents; EDU= Years of education; FINC= Fishing Income of respondent; EXP= Experience (measured by years of fishing); LOAN= Amount of loan; INVT= Amount of investment.

The model specification with loan size as the dependent variable and age, years of education, fishing income, years of fishing experience, amount of loan and amount of investment as the covariates provided the best fit with AIC and BIC of

1174.518 and 1192.156 respectively. The model estimation result reveals a positive relationship between amount of loan repaid and years of education, fishing income, years of fishing experience and amount of loan whilst a negative relationship exist between

the amount of loan repaid and the age and investment made. The regression analysis finds the fishing income, amount of loan and amount of investment as significant predictors of the amount of loan repaid. The covariates in the model explained 77% of the variation in the loan repaid.

CONCLUSIONS

Inability of borrowers to repay amount of loans collected is crucial for the long-run sustainability of credit institutions in most developing countries. High repayment rates allow the institutions to lower the interest rates and processing costs, and subsequently increase the volume of credit availability. However, due to the inherent uncertainty resulting from unpredicted changes in the weather patterns and marketing related risks, fishermen are likely to have poor repayment behaviour. The study examined the loan repayment performance of fishermen in the central region of Ghana.

The study showed that majority of the fishermen interviewed were in the productive age range, had high average annual income and years of fishing experience. However, given the low level of education, lack of alternative income generating activity, cumbersome loan processing procedures, they are likely to have high loan default. The study identified fishing income, amount borrowed and size of loan invested into fishing as significant predictors of loan repayment.

It is therefore recommended that easy loan processing and onward disbursement of loans need to be ensured by the credit institutions to improve repayment behaviour. Additionally, allocation of loans to agricultural sector particularly fishing must be increased to stimulate fishing activities and improve fishing incomes and repayment performance of fishermen.

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