European Journal of Accounting, Auditing and Finance Research
Vol.5 No.3, pp.1- 20, March 2017
Published by European Centre for Research Training and Development UK (www.eajournals.org)

DETERMINANTS OF AGRIBUSINESS ENTITIES LOAN DEFAULT IN THE TAMALE METROPOLIS OF GHANA

♣Charles Adusei

Department of Accounting, Finance and Banking,
Faculty of Business Studies, Garden City University College
Kumasi, Ghana

ABSTRACT: *This paper explores determinants of loan default by Agribusiness entities in the Tamale Metropolis of Ghana. Data to examine the causes of loan default was obtained from owners through structured questionnaire and descriptive statistics, Kendall coefficient of concordance and logistic binary regression was used to analyse the data. Financial variables were more significant than demographic characteristics of agribusiness entities to cause loan default. This suggests financial institutions must apply appropriate adjustments to financial variables in order to minimize loan default risk considering the agricultural sector.*

KEYWORDS: Loan Default, Credit Constraints, Agribusiness, Logit Model, Tamale, Ghana.

INTRODUCTION

In most developing countries with Ghana inclusive agricultural development has been as a result of the borrowing and using of funds for agricultural development as indicated by Awunyo-Vitor and Abankwa (2012). The money borrowed for agricultural purposes is often referred to as agricultural credit which is one of the key inputs needed in agriculture that is in the form of capital to enable farmers increase their farm outputs to increase agriculture production. Agricultural credit does not only involve the credit given to farmers but also credit that have been extended to other entities and firms along the value chain of agriculture and involved in agriculture either directly or indirectly as asserted by (Oladeebo and Oladeebo, 2008). There is no doubt that credit has played a pivotal role in the development of not just the agricultural sector but almost every sector of most nations if not all. The increasing interest in improving agriculture production through credit extension has given birth to a new challenge or problem; that is its repayment. The given of credit often involves the payment of interest and other implications.

Awunyo-Vitor and Abankwa (2012) noted that in developing countries, improvement in productivity through investment in productive ventures, especially in the agricultural sector where majority of the population derive their livelihood is necessary for accelerated economic growth. At low levels of income, the accumulation of savings may be difficult. Under such circumstances, access to loans can help poor farmers and other agribusiness entities in the supply chain of various agricultural products to undertake investment and increase productivity. Thus, in order to increase agricultural productivity especially among the rural poor and to assist rural

♣ Corresponding Author : sircharly2002@gmail.com

ISSN 2053-4086(Print), ISSN 2053-4094(Online)

households in maintaining food security, many governments in developing countries initiated credit programmes with the idea that rural smallholder farmers will have access to formal sources of credit according to (Dong *et. al.* (2010); Awunyo-Vitor and Abankwa, 2012).

According to Saleem *et. al*. (2011) various researchers have put forward the benefits, problems, access and role of credit for increased productivity. But prompt repayment of credit is necessary for good credit worthiness. In the era of very harsh economic environment banks and other financial institutions and even the government rarely give loans of agricultural credit schemes. As banks and other financial institutions charge higher interest rates and borrowers find it difficult to repay loans on time due to the harsh economic conditions. The high default rate amongst borrowers has led to banks even reducing their lending. There is therefore the need for a study to determine the causes of loan default amongst borrowers using agribusiness entities in the Tamale Metropolis as a case study to help nib the issue of loan default in the bud. As there have been several studies on loan default in literature even on famers but very little has been done in relation to agribusiness entities.

EMPIRICAL LITERATURE

Challenges of Loan Acquisition by Agribusiness Entities

Okojie *et. al.,* (2010) enumerated the reasons why some rural women were denied access to credit by financial institutions; they mentioned that lack of collateral, bank accounts and even the procedures and other requirements demanded by financial institutions hindered their access to credit. According to Adejobi and Atobatele (2008) one of the main challenges to accessing or acquiring a credit facility was loan default itself as it discourages the lender from given further loans as they are unable to even recover the principal they give out. Guirkinger and Boucher. (2008) also added that for formal financial institutions the processes and procedures involved in accessing a loan were so complex and not friendly at all especially to small scale farmers who were mostly illiterates and found it very difficult following such processes. Also Rahji and Fakayode (2009) stated that the challenge of acquiring a credit facility was from the many limitations in the flow of information on the financial market; formal financial institutions having the perception that agriculture is a high risk business and the unfriendly credit policies posed by the financial institutions. Nkonya *et. al.,* (2010) equally added that the duration for loan repayment being short and the high interest rates charged were a challenge to accessing credit as this did not go well for small scale farmers. Adegbite (2009) made known that the financial institutions are not just reluctant at offering loans to farmers in Ghana but also Nigeria. This the financial institutions attributed to the high operational cost involved in given small holder farmers credit and their presumed high rate of default amongst them. Most of the farmers also fail to provide the needed collateral demanded by these financial institutions to take care of their loan and the interest in case they default as indicated by Kohansal and Mansoori (2009).

ISSN 2053-4086(Print), ISSN 2053-4094(Online)

Causes of Loan Default

There are four main factors affecting loan default from literature these include; the factors pertaining to the firm, factors pertaining to the borrower, factors pertaining to the lender or lending institutions and factors pertaining to the loan itself. Foltz, (2004) and Ozdemir and Boran (2004) all indicated in their studies that the repayment of a loan depends not just on the willingness of the borrower to pay but also on his or her ability to repay the loan taken. According to DeYoung *et. al.* (2008) the credit assessment of firms and individuals who apply for loans should take into consideration the character of the applicant, their capacity to repay, collateral, capital and even the economic conditions surrounding the applicant. These factors they said had a toll on the borrowers' ability to repay and therefore had to be considered very carefully before disbursing the loan facility. Weinberg (2006) in his study also found out that the loan amount and interest rates charged had a negative correlation with loan repayment as when these two were on the high side they affected the borrowers' ability to repay as things might not be going on well for them. The need for morally upright traits or values is very necessary for progress as these would automatically help prevent the borrower from defaulting such as one belonging to a strong religious group with such high sense of commitment is most likely not to default compare a borrower who is not. There are also borrowers who belong to clubs and societies where other members would be looking after one another and therefore causing them not to default easily.

Diverted funds are also a contributor to loan delinquency. The loans that are not used for the purpose of which they were taken are termed as diverted funds. Warue (2012) reports evidence that; performance of loan delinquency is dependent on borrowers utilizing the borrowed funds for reason intended for and prevention of funds being used for unplanned activities. Warue (2012) also discovered from her research that any negative development of tenancy variable increase the level of loan delinquency. The study showed that, tenancy problems arise when borrowers frequently change their places of residence making it difficult for loan officers to follow up loan repayment. Default rates rise when loan officers fail to perform their roles of screening, encouraging clients and giving them the proper education and training on financial discipline as suggested by (Dixion *et al.,* 2007). According to Field and Pande (2008) frequent repayment of loans provides clients with a commitment device that encourages them to form a savings habit and develops their trust in loan officers as well as their willingness to stay on track with repayment. However, frequent repayments can also result in default risks if clients are given larger loans than before which increase the amount of their cash outlay. Frequent repayment also increases transaction cost.

Omojola and Ugwumba (2013) indicated that correct information given or gotten from livestock farmers is very critical to identifying the determinants of loan default. Their study was conducted in the Etche local government area of Rivers State of Nigeria on the determinants of loan repayment of livestock farmers under agricultural credit guarantee scheme. Their result indicated that loan repayment by the livestock farmers was statistically and significantly influenced by age, farming experience, delay in disbursement and interest rate. There are however several causes of loan default especially when it comes to firms as their financial vulnerability has to be determined first as a successful firm would end up paying more from the profits it declares to the

ISSN 2053-4086(Print), ISSN 2053-4094(Online)

bank while less profits would imply that they would pay less. This further goes on to have an effect on the borrower using the loan for the intended purpose which increases the probability of loan default (Hainz, 2003). According to Altman and Suggitt (2000), aside the economic conditions that could affect borrowers repayment ability their own conditions such as their health and the conditions of their family could also affect their repayment ability as a borrower in ill health might turn to use the money to treat him or herself or possibly use the money to solve family issues rather than repaying the loan. In addition to this Ganbold (2008) stated that the loan amount affect the borrowers repayment ability as large loan amounts hindered the repayment ability of borrowers.

A study conducted by Oladeebo and Oladeebo (2008) in the Oyo state of Nigeria on the socio-economic characteristics of small holder farmers that affected their ability to repay their loans revealed that; years of experience, loan amount and level of education were the factors that had a positive significant impact on their ability to repay their loans. As a study by Waweru and Kalani (2009) in Kenya indicated that the economic downturn was a very significant factor that contributed to loan default. In a study conducted by Fofack (2005) on the effect of the macro economy on loan default; Fofack findings indicated that a stable macro economy implied that businesses were going on well and borrowers would be able to get enough money to repay the loan as the loan to value ratio within those periods were usually high and interest rates were also relatively low. The vice versa was however what would happen if there was an unstable macroeconomic environment. Koopahi and Bakshi, (2002) indicated that some other factors that negatively affected the ability of respondents to repay their loans included; level of education of the borrowers, the length of time of disbursement of the loan and natural disasters negatively affected the ability of the respondents to repay their loans in study conducted in Iran using the Agricultural Bank.

Some researchers such as Roslan and Mohd-Zaini (2009); and Ugbomeh *et. al.* (2008) agreed that the loan characteristics are a major determinant of loan default. According to Copisarow (2000) the loan process and procedure including the monitoring and supervision of the borrower after the loan has been disbursed. He went on to affirm that the diversion of loans is due to poor or no supervision. Bichanga and Aseya (2013), in their study conclude that shrinking economic growth has an effect on loan default. In their work in Kenya, they realized that defaults in loan repayment was as a result of clients not having enough asset value which led them to spend on more household consumption than on loan repayment. Moreover, poor repayments were due to the fact that those paying the loans were the greatest bearers of household expenditure. According to Tedeschi, (2008) the poor appraisal of loans by credit officers and the credit department of financial institutions contribute significantly to loan default.

STUDY AREA AND METHODOLOGY

Study Area

The Tamale Metropolis is one of the twenty-six (26) districts in the Northern Region. It is located in the central part of the Region and shares boundaries with the Sagnarigu District to the west and north, Mion District to the east, East Gonja to the south and Central Gonja to the south-west. The Metropolis has a total estimated land size of 646.90180sqkm as indicated by Ghana

Statistical Services, (2013). Geographically, the Metropolis lies between latitude 9º16 and 9º 34 North and longitudes 0º 36 and 0º 57 West.

Tamale is strategically located in the Northern Region and by this strategic location, the Metropolis has a market potential for local goods from the agricultural and commerce sectors from the other districts in the region. Besides the comparative location of the Metropolis within the region, the area stands to gain from markets within the West African region from countries such as Burkina Faso, Niger, Mali and the northern part of Togo and also en-route through the area to the southern part of Ghana.

There are one-hundred and fifteen (115) communities in the Metropolis. Most of the rural communities have a large expanse of land for agricultural activities and serve as the food basket for the Metropolis. However, these communities still lack basic social and economic infrastructure such as good road networks, school blocks, hospitals, markets and recreational centres, thereby hindering socio-economic development, poverty reduction and reducing the general phenomenon of rural-urban migration.

METHODOLOGY

Design of the Study

Research design is an important component of any research study as it drives the subsequent stage of the study. The study design was strictly quantitative using survey and a case study approach. According to DeVaus (2001), he indicated that within the context of research design, two major fundamental questions must be asked such as: what is going on (descriptive research)? and why is it going on (explanatory research)?

When the unit of analysis is a quantitative data type, the research methods are usually experimental, survey, or case study as suggested by Strang (2015). Abbot and McKinney (2013) indicated that surveys collect information from people using interviews or questionnaires composed of written questions. Surveys are arguably the most used tool for social scientists, market researchers, and a variety of others looking for information regarding people's attitudes, behaviors, and experiences. Surveys are useful for studying the world as it is—not as we think it is, not as we think it should be, but how it actually is. The survey design solicited information from the respondents as the agribusiness entities to find out the causes of loan default in their repayment plan for loans.

Case study research designs or approaches can be based on their function, characteristics, or disciplinary perspective. One's selection of a research design is determined by how well it allows full investigation of a particular research question as indicated by Hancock and Algozzine (2006). Case studies focus on one (or just a few) instances of a particular phenomenon with a view to providing an in-depth account of events, relationships, experiences or processes occurring in that particular instance as suggested by Denscombe (2007). This study adopted the case study method but used a single case study approach but its focus was discovery led where the study described and discusses the causes and determinants of loan default by agribusiness entities with reference to Tamale Metropolis in the Northern Region of Ghana.

ISSN 2053-4086(Print), ISSN 2053-4094(Online)

Respondents for the study

A cross sectional study was conducted between August and December 2016. The study was carried out in Tamale Metropolis of Northern Region of Ghana which is the Regional capital town. The list of the registered agribusiness entities in the Tamale Metropolis was obtained from the Registrar Generals Department in Tamale, while not randomly selected; a quota of ninety-five (95) agribusiness entities was targeted for the study. The ninety-five (95) agribusiness entities selected are representative of the Metropolis in terms of market size, how long they have been in operation; and goods and services offering to the public. Given the nature of the business entities all of them have access credit facility in terms of loans from the financial institutions before. The owners of the agribusiness entities are the respondents for the study who have the knowledge and working experience of the issues are discussions. After meeting sample selection criteria, the respondents were reminded about the purpose of the study and those who accepted to participate voluntarily were included in the sample, this was done during a field visit to confirm the list from the Registrar Generals Department.

Sampling Approach

A Multiple stage sampling procedure was used to sample the respondents. At the first stage, purposive sampling procedure was used to sample the Tamale Metropolis among several Metropolises within Ghana while the second stage of the sampling process involved quota sampling in which set target numbers guided the sampling of agribusiness entities in the Metropolis. In all ninety-five (95) agribusiness entities were sampled for the study. The third stage was purposively selecting the owners of the agribusiness entities as the respondents for the study.

Data Collection

This study made use of primary source of information through questionnaires. Questionnaires have been successfully used for a number of years in many studies and recent advances in knowledge about questionnaire methods and data entry technology have made them even more effective. Questionnaires can be administered in person, both individually or in groups, or mailed out. They are most often associated with survey research. The primary data was collected from the agribusiness entities owners as the respondents through self-administered questionnaire and guided form of questionnaire administration in face-to-face interview for those whose educational level is low as indicated in the demographic profile of the respondents. According to Anasta (1999) a self-administered questionnaire can be used only when the phenomena of interest can be conceptually and operationally defined in a way that permits a written self-report to be given and the phenomena are in fact available to the respondent for self-report. The justification of using self-administered questionnaire was to protect the anonymity of the respondents and it is also a less reactive method of collecting data than others and finally the majority of the respondents are literate and have a fair understanding on the topic under discussion.

ISSN 2053-4086(Print), ISSN 2053-4094(Online)

The questionnaires were administered in the form of a face-to-face interview. The interview proved essential because of the low literacy level of some of the respondents and the sensitivity of the subject matter under study. A structured questionnaire was employed as the data gathering technique. The questionnaire consisted of three sections. Section A contains the respondent's profile which had nine (9) items, Section B and Section C contained nineteen (19) items on sectional themes such loans and institutional characteristics and challenges in loan acquisition. A five Likert Scale was used to measure these pertinent constructs of the questionnaire.

Statistical Analysis

Descriptive statistics such as frequency tables and percentages were employed to analyse data used to present the socio –economic characteristics of respondents. Kendall's coefficient of concordance was used to rank the challenges of loan acquisition by Agribusiness entities.

Logit regression model was used to examine the causes of loan default of agribusiness entities in Tamale Metropolis. A decision by an agribusiness entity to pay their loan is assumed to be influence by the socio-economic characteristics of the clients and institutional factors. Let us represent the agribusiness entity's decision to pay loan by (Y_i) which is assumed to be dependent on a vector of explanatory variables, individual socio-economic characteristics as well as institutional factors (X_i). Therefore the relationship between the dependent variable and independent variables can be formulated as follows;

$$Y_i = \alpha + \beta' X_i + \mu_i \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 1$$

The client's decision to pay his or her loan Y_i is assumed to be dependent on his assessment of the marginal cost and benefits associated with the payment of loans and based on this he or she may decide to pay or default. In reality we do not observe this marginal cost and benefit, thus Equation 1 cannot be estimated. We only notice whether respondents pay their loans or not through the survey questionnaire. Hence we define another variable Y^* such that;

Y_i^*= 1 if respondent does not default in the payment of his loan.

Y_i^*= 0 if respondent defaults in the payment of his loan.

Y_i^* is identified as equal to 1 if respondent pays his loan and therefore does not default; and Y_i^* equal to 0 if the respondent does not pay for his loan and thus default. This will result in the dependent variable having a binary outcome. There are several methods that can be used to analyse data involving qualitative and quantitative dependent variables with binary outcomes. Binary choice models such as linear probability model (LPM), probit and logit models can be used.

As a result of the short comings of the OLS and LPM, we are now left with the choice between the logit and probit models for our analysis. According to Gaur and Gaur (2009),"due to the statistical similarities between the logit and probit models, either of them can be used for analysing binary choice model and therefore the logit model is selected for this study and its specified as follows;

$$P_i = Y_i^* = F(\alpha + \sum \beta_i X_i) = F(Z_i) = \frac{1}{1+e^{-Z_i}} \quad \ldots\ldots 2$$

Where P_i, is the probability that a client will pay for his loan or not. e denote the base logarithm which is approximately equal to 2.718; X_i represents the i^{th} explanatory variables; and α and β_i are parameters to be estimated".

Variable Description

Dependent variable

Based on the questionnaire, respondents would be categorized into clients who pay for their loans and those who do not. With clients who pay their loans taking the value of 1 and those who default in their payment taking the value of 0.

Independent variables

Monitoring and supervision: respondents who are monitored or supervised are given the value 1 and those who are not monitored or supervised the value of 0. It is assumed that respondents who are monitored as to how they use the loan have a greater chance of repayment as compared to their counterparts who are not.

Gender: the gender of respondents that is the owners or managers of the agribusiness entities is being captured as a dummy variable that assumes a value of 1 if the respondent is a male and 0 if otherwise. Females who are better off in terms of managing their businesses are expected to pay their loans.

Income level: the level of income after the loan was collected is captured as an estimate of the value of the agribusiness entity's sales per month or salaries per month in Ghana cedis this is used here as a proxy for the agribusiness entities wealth status. It is expected that agribusiness entities with higher income levels will pay their loans as compared to their counterparts with lower income levels.

Other sources of income: the value of 1 is given to respondents with other sources of income and 0 to respondents who are otherwise. It is assumed that respondents with other sources of income will stand a greater chance of paying their loans compared to their counterparts who do not.

Education (number of years of schooling): level of education is measured in number of years of schooling, that is the higher the level of education the more the respondents will have a better technical knowhow, skills, management and a better understanding of the market.

The size of the agribusiness entity: the size of the agribusiness entity is defined as the number of people working for the entity. There are mixed findings on the effect of size on loan default; one school of thought is of the view that the more the workers the higher the probability of them defaulting whiles another school of thought was of the view that the more the workers an entity has the more they would work better to repay their loan.

ISSN 2053-4086(Print), ISSN 2053-4094(Online)

Years of experience: this is defined as the number of years respondents have been in business and it's measured in years. The higher the number of years of experience a respondent has, the more skilled they will be to better manage the business and therefore we expect it to have a positive correlation with payment of loans.

Interest rate: this is recorded as a dummy, with respondents who perceive that the interest rate is high given the value of 1 and zero (0) for respondents who perceive otherwise. It is expected that respondents who perceive interest rate to be high would have a lower loan repayment rate as compared to their counterparts who think otherwise. It is therefore expected that interest rate would negatively correlate to the rate of loan repayment.

RESULTS AND DISCUSSION

Demographic Characteristics of Respondents

The demographic characteristics of respondents such as their gender, years of education, other sources of income, years of experience and number of employees were presented as follows to give an overview of the respondents the study dealt with which would also help in the running of the logit model.

Table 1: Socio-economic demographics of Agribusiness Entities

Respondents		
(a)	(b)	(c)
Variable	Frequency	Percentage
Gender		
Male	70	74
Female	25	26
Total	**95**	**100**
Age		
20-29 years	10	11
30-39 years	59	62
40-49 years	21	22
50-59 years	4	4
60-69 years	1	1
Total	**95**	**100**
Monthly income level (¢)		
Less than 500	24	26
501-1000	60	63
1001-1500	6	6
1501-2000	3	3
2001-2500	2	2
Total	**95**	**100**
Number of employees		
Non	4	4

ISSN 2053-4086(Print), ISSN 2053-4094(Online)

1-3	51	54
4-6	35	37
7-9	5	5
Total	**95**	**100**
Level of education		
No formal education	29	31
Basic level	21	22
Secondary level	37	39
Tertiary level	8	8
Total	**95**	**100**
Years of experience		
1-5 years	33	35
6-10 years	35	37
11-15 years	15	16
16-20 years	10	10
Above 20 years	2	2
Total	**95**	**100**

Source: Fieldwork data, 2016

The columns (a), (b) and (c) in Table 1 are information on the Agribusiness Entities respondents. The female representation of the respondents was (26%; n = 25) as compared to (74%; n = 70) for males as depicted in Table 1. The skewed resulted in favour of males may be attributed to the nature of the job and the cultural setting where males to some extent have funds to start their business and in terms of inheritance it mostly goes to them. This further contribute to the belief that males are seen as the heads of the family hence he must provide for the family thereby leading to more men participation in small and medium enterprises to feed their families and contribute to the economy. This implies that the agribusiness industry is dominated by males.

The respondents were grouped into five different age categories. Table 1 represents the age distribution of the respondents. The age group 20 to 29 years represents (11%; n = 10) of the respondents, 30 to 39 years represent (62%; n = 59) and 40-49 years represent (22%; n = 21) of the respondents. The other age brackets were 50-59 years and 60-69 years respectively with n =4 and n=1. The age group of 30 to 39 years recorded a high percentage of over half of the sample. This information implies that agribusiness entities have relatively young owners who are likely to be ambitious and passionate about the success of their businesses. They should be able to repay the loan they have taken. The results indicate the youth are more involved in small and medium enterprises as such if all the necessary support is given to facilitate the establishment and management of agribusiness, it will go a long way to reduce the rate of the youth unemployment and poverty in the near future.

In all (8%; n = 8) respondents had tertiary level of education while (39%; n = 37) had secondary level. Basic level was (22%; n = 21) and no formal education was (31%; n = 29). The above data indicated that about 53% have lower than secondary level education which implies very low

ISSN 2053-4086(Print), ISSN 2053-4094(Online)

formal managerial skill to operate and run a business that modern business demands. Therefore with or without education one can operate some form of agribusiness but the literates stand at a comparative advantage. The level of education of the respondents is believed that it will enhance their decision making processes to help them make the most out of their businesses to earn enough profits to repay their loans.

Years of experience of any business owner is said to influence his/her skill and knowledge in managing that business. It is believed that one's experience on the job has a positive effect on skill and competence. The respondents were grouped into five different business experience categories. As shown in Table 1, (35%; n=33) have had business experience ranging from 1-5 years whilst (37%; n = 35) had 6 to 10 years business experience. The other business experiences brackets were 11-15 years (16%; n = 15), 16-20 years (10%; n = 10) and above 20 years (2%; n = 2). The mean years of experience of respondents was 8.4 years of which implies that after doing the same thing over and over again for about 8.4 years one would have gain enough experience and skills needed to succeed in that trade or business to be able to make profits. It is therefore believed that the respondents with that level of experience would be able to work to repay their loans.

Those who work without employees was (4%; n = 4), employee category with 1-3 employees had (54%; n = 51) and 4-6 years of (37%; n = 35). The other category of 7-9 employees was (5%; n = 5) of the respondents. The mean number of employees for the study was 3 but all in all most of the respondents had employees to assist in carrying out the various business activities. This is believed to enhance the performance of the business as competent hands are brought on deck to help the business succeed as they would help in carrying out what ever activity the loan was collected for efficiently and effectively to enable them pay back the loan. When the entity has a good number of employees and the business environment is not so favourable the entity might end up paying employees for no job done and therefore have to be more cautious with the number of employees they employ at particular periods.

The monthly income earned by respondents with less than ¢500 had (26%; n = 24), ¢501- ¢1000 monthly income had (63%; n = 60) of the respondents, ¢1001- ¢1500 of monthly income had (6%; n = 6), ¢1501- ¢2000 of monthly income had (3%; n = 3) and ¢2001- ¢2500 of monthly income represented (2%; n = 2) of the respondents. The mean monthly income earned was ¢718.9 which indicates that most of the respondents earned enough monthly income to enable them take a loan of ¢5,000 and will be comfortable to repay their loans without much difficulties. A business ability to be profitable cannot be compromise as the sustainability of a business depends on its cash inflows and cash outflows to meet its operational activities.

Loan acquisition process

The lending of loans and advances to the customers of banks goes through a rigorous events. Such events or procedures are normally initiated by both the bank and the customers who are seeking for credits with which to run their business operations. The process involves contact between the bank and the applicant for loan, during which the bank would initiate necessary actions to conduct a thorough investigation on the loan applicant and his business or the project

ISSN 2053-4086(Print), ISSN 2053-4094(Online)

for which the funds would be utilised. This section considers the loan acquisition process as perceived by the agribusiness entities.

Table 2: Respondent's views on loan acquisition process

	Yes		**No**	
Loan acquisition issues	N	%	N	%
Monitoring and supervision of loan collected	12	13	83	87
Other sources of income	15	16	80	84
Demand for collateral	89	94	6	6
Bank grant the full amount requested	44	46	51	54
Timely disbursement of loan	28	30	67	70
Was the Length of Time for loan Repayment Sufficient	77	81	18	19
Were you able to repay your loan?	41	43	54	57

Source: Fieldwork data, 2016

Table 2 indicates that (87%, n = 83) of the respondents said they were not monitored or supervised by the financial institution they collected the loan from while (13%, n =12) of the respondents indicated that they were monitored by the financial institution they collected the loan from. This result aligned with the study conducted by Copisarow (2000) where he affirm that the diversion of loans is due to poor or no supervision which is a possible cause of loan default. Poor monitoring and supervision on the use of the loan for the intended purpose could lead to loan default as the money is not being used for what was agreed on to generate income that would enable respondents to pay back their loans without defaulting. It is strange as it is very important for the financial institutions to set policies on loan supervision and make sure that it is adhered to by credit staffs. Warue (2012) reports evidence that; performance of loan delinquency is dependent on borrowers utilising the borrowed funds for reason intended for and prevention of funds being used for unplanned activities. This is an additional confirmation on the importance of the need for effective monitoring and supervision on loan performance and the need to report to superior on that.

The other sources of income of respondents as shown in Table 2 it shows that (84%, n = 80) of the respondents said they had no other source of income aside the one they are currently engaged in while (16%, n = 15) of the respondents indicated that they had other sources of income aside the agribusiness they are currently into. Majority of the respondents had no other source of income which was an indication that there was no other alternative to turn to in case this particular business fails to enable them repay their loans which means they could easily default. Foltz, (2004) and Ozdemir and Boran (2004) all indicated in their studies that the repayment of a loan depends not just on the willingness of the borrower to pay but also on his or her ability to repay the loan taken. This also shows that demographical profile such as the financial position of the borrower to a certain extent helps in loan repayment even if the current business is having operational challenges.

ISSN 2053-4086(Print), ISSN 2053-4094(Online)

Basically, collateral is a security proposed by the financial institution which must be in line with the Banks list on acceptable form of security. In terms of financial institutions demanding collateral from the agribusiness as a condition to accessing the loan showed that (94%, n = 89) of the respondents said that their financial institutions demanded collateral while (6%, n = 6) indicated that they were not asked to provide any collateral as a condition to accessing the loan. Most of the respondents agreed that their creditors demand some form of collateral from them which implied that most of the financial institutions are comfortable with secured loans as they could easily lay their hands on the collateral to offset the loan debt and therefore reduce the level of loan default among respondents. There is however no doubt that the requirement of a collateral would be a challenge to assessing the loan. This result supports the study of DeYoung *et. al.* (2008) where it was stated that in the credit assessment of firms and individuals who apply for loans should take into consideration their ability to provide collateral when the need arises.

Lending of funds to bank customers involves the use of the depositors' money. The implication is that the recoveries of funds from loans and advances granted out to customers must be managed in such manner that the bank would not run into liquidity problems. In essence, recoveries of funds under loans and advances should be managed effectively in order to secure the interest of the depositors in terms of meeting their periodic demands without hitches. (70%, n = 67) of the respondents said their loans were not disbursed on time while (30%, n = 28) indicated that their loans were disbursed on time. Majority of respondents said their loans were not disbursed on time which could probably hinder or defeat the purpose for which the loan was acquired which would affect the respondent's ability to repay the loan. On the concerns of the respondents on timely disbursement of loans, it has to be stated that loan disbursement is not about speed. Preparation of the loan agreement and loan committees of the financial institutions for its authorisation as it can slow down the process as all the necessary documents must be provided and signed by the parties involved in the loan agreement. The loan committees must ensure compliance of the established lending policy and ensure full documentation of loans before disbursement.

In essence, the banks lend funds to the customers based on the financial standing of their business in terms of regularity of cash inflows with which to repay the loans. The banks also take into consideration a less risky business for loans to ensure the safety of the funds and their prompt recovery from the borrowers. The repayment of loans by the beneficiaries depends on their capacity to generate enough funds from their projects, besides the fact that their character which are normally evaluated before loan approval. The responses on whether respondents were able to repay their loans showed that (43%, n = 41) of the respondents were able to repay their loan; and (57%, n = 54) of the respondents said they were unable to repay their loan. Majority of the respondents were unable to repay their loans which might have been due to several reasons. The loan default by the some of the agribusiness entities affects the banks operations in terms of liquidity. Many researchers through their studies have reported on several reasons why loan beneficiaries failed to adhere to the repayment plan. Oladeebo and Oladeebo (2008) indicated that socio-economic characteristics of small holder farmers affect their ability to repay their loans. Waweru and Kalani (2009) in Kenya indicated that the economic downturn was a very significant factor that contributed to loan default. Koopahi and Bakshi, (2002) indicated that some other factors that negatively affected the ability of respondents to repay their loans

ISSN 2053-4086(Print), ISSN 2053-4094(Online)

included; level of education of the borrowers, the length of time of disbursement of the loan and natural disasters negatively affected the ability of the respondents to repay their loans in study conducted in Iran using the Agricultural Bank. Roslan and Mohd-Zaini (2009); and Ugbomeh *et. al.* (2008) agreed that the loan characteristics are a major determinant of loan default. Tedeschi, (2008) was concerned that the poor appraisal of loans by credit officers and the credit department of financial institutions contribute significantly to loan default.

A logit Estimate of the Causes of Loan Default among Respondents

Table 3: A logit Estimate of the Causes of Loan Default among Respondents

Independent Variable	Coefficient	P-values	Marginal Effect
Gender	0.31567	0.28	0.782
Age	0.09586	0.82	0.412
Number of employees	3.53989*	1.74	0.081
Interest rate	-0.64135*	-1.81	0.070
Monthly income	-0.00086	-0.49	0.623
Other sources of income	3.66241**	2.41	0.016
Level of education	0.32136	1.48	0.138
Years of experience	6.89297***	2.67	0.008
_Constant	-13.96716**	-2.10	0.036
Number of observations = 95	**LR Chi^2 = 79.24**	**Pro> Chi^2=0.0000**	
Log likelihood = -12.17574	**Pseudo R^2 =0.7649**		

Source: Author Computation, 2016

Where * = significant at 10% ** = significant at 5% *** = significant at 10%

The causes of loan default among respondents were done with the help of the logit model and the result of the logit estimate presented in table 3. The Pro>Chi^2 was significant at 1% which was an indication that the logit model used was significant and a Pseudo R^2 of 0.7649 showed that the independent variable used are good predictors of the dependent variables. The logit model had the coefficient of four of the independents variables being significant and having a relationship with loan default. The interest rate charged by the financial institutions on the loan disbursed to respondents had its coefficient being significant at 10% and had a negative correlation with loan repayment. The coefficient of the number of employees was also significant at 10% with a positive correlation with loan repayment. The other sources of income had its coefficient being significant at 5% with a positive correlation with loan repayment. The coefficient of the years of experience of the respondents was significant at 1% as it also had a positive correlation with loan repayment.

The years of experience being significant and having a positive correlation with loan repayment meant that the more experienced respondents were at what they used the loan for the better their ability to repay the loan as they would have gathered enough experience to be able to use the loan profitably in their business. This is being supported by the findings of Oladeebo and Oladeebo (2008) who conducted the study in the Oyo state of Nigeria on the socio-economic characteristics of small holder farmers that affected their ability to repay their loans. This

ISSN 2053-4086(Print), ISSN 2053-4094(Online)

revealed that; years of experience had significant effect on respondent's ability to repay their loan and also a positive correlation at that.

The number of employees was also significant and had a positive correlation with respondent's ability to repay their loan. This implied that the more employees a firm had the greater their ability to repay their loan; as they have enough capable hands to work to meet their targets to be able to deliver and make the firm profitable to be able to repay their loan. This is being buttressed by Ganbold (2008) who stated that the more employees a firm had the greater its chance of repayment as they were able to work and repay which ever loan amount they collected.

Other source of income being significant and positively correlated with loan repayment must have been because of the fact that the borrower would be able to gather money from a different source other than the business for which he borrowed the loan for. This is similar to the findings of Panda (2009) who conducted their study in Uttar Predesh State of India showed that socio-economic characteristics of borrowers could be used to distinguish between defaulters and non-defaulters. They found out that some socio-economic characteristics such as other sources of income had a positive and significant influence on loan repayment.

The interest rate has been a very strong influence on loan repayment and it is therefore no wonder that this study found it as a factor that significantly affected loan repayment but rather has a negative correlation with loan repayment. The interest rate adds on to the difficulty borrowers have in paying back the loan they collected as it increases the loan amount sometimes to about twice the amount collected or more. This is similar to the findings of Weinberg (2006) who found out that the loan amount and interest rates charged had a negative correlation with loan repayment as when these two were on the high side they affected the borrowers' ability to repay as things might not be going on well for them. Nkonya *et. al.,* (2010) equally added that the high interest rates charged was a challenge to loan repayment and did not go well for small scale farmers.

Challenges of Loan Acquisition by Agribusiness Entities

Table 4: Coefficient of Concordance (W) on the challenges of loan acquisition by Agribusiness entities

Factors	**Ranking**
High interest rates charged by financial institutions	1
Demand for collateral by financial institution	2
Poor records keeping on the part of agribusiness entity	3
High risk nature of the agricultural sector	4
Seasonality of the agriculture sector	5
Number of respondents	95
Coefficient of concordance (W)	0.448 (44.8%)
Cronbach's Alpha	0.954 (95.4%)
Number of items	5

Source: Author's computation, 2016

ISSN 2053-4086(Print), ISSN 2053-4094(Online)

The study identified five main challenges of loan acquisition by agribusiness entities within Tamale Metropolis of Ghana. These are: high interest charged by the financial institutions, demand for collateral by financial institution, poor records keeping on the part of agribusiness entity, high risk nature of the agricultural sector and seasonality of the agricultural sector. The respondents were asked to rank these challenges as indicated in Table 4. The *F* test for concordance (W) between the rankings of the challenges of loan acquisition is (44.8 %) which is acceptable. It was shown that the most important challenging factor of loan acquisition was high interest rates charged by financial institutions The higher the default probability a lender estimates a borrower to have, the higher the interest rate the lender will charge the borrower as compensation for bearing the higher default risk. This result aligned with Philip *et. al.,* (2009) where their study indicated that the duration for loan repayment being short and the high interest rates charged were a challenge to accessing credit as this did not go well for small scale farmers.

Demand for collateral by financial institution was ranked second as respondents believe that it is a constraint for the agribusiness entities as most of them cannot provide the collateral needed by the financial institutions. This is similar to the findings of Okojie *et. al.,* (2010) who enumerated the reasons why some rural women were denied access to credit by financial institutions; they mentioned that lack of collateral, bank accounts and even the procedures and other requirements demanded by financial institutions hindered their access to credit. This was affirmed by Kohansal and Mansoori (2009) where their study indicated that most of the farmers also fail to provide the needed collateral demanded by these financial institutions to take care of their loan and the interest in case they default.

The third ranked challenge on loan acquisition was poor records keeping on the part of agribusiness entities. Small businesses have the challenge of providing records when the need arises due to poor records keeping but the agribusiness by its nature is worst off considering the fact that majority of them are not literate which will affect the running of the business entity. Studies conducted by Guirkinger and Boucher. (2008) and Rahji and Fakayode (2009) all indicated that the formal financial institutions processes and procedures involved in accessing a loan were so complex and not friendly at all especially to small scale farmers who were mostly illiterates and found it very difficult following those processes.

High risk nature of the agricultural sector was ranked fourth as respondents indicated that it can solely determine whether the loan will be granted or not. The agricultural loans are fraught with some problems which make it to be relegated to the backstage in the scheme of lending portfolio of the commercial banks. The riskiness of agricultural loans is inherent in the precarious nature of agricultural undertakings. The inability of farmers to control supply of goods, no control of the effects of weather conditions and fluctuating income from agriculture compounded with diversion of agricultural loans and difficulty in assessing farmer's creditworthiness all make lending to the agricultural sector riskier. Adegbite (2009) revealed that the financial institutions are not just reluctant at offering loans to farmers in Ghana but also Nigeria. This the financial institutions attributed to the high operational cost involved in given small holder farmers credit and their presumed high rate of default amongst them.

ISSN 2053-4086(Print), ISSN 2053-4094(Online)

European Journal of Accounting, Auditing and Finance Research
Vol.5 No.3, pp.1- 20, March 2017
Published by European Centre for Research Training and Development UK (www.eajournals.org)

It is clear that the overall result of Table 4 gives a mixed reaction on loan acquisition and very insightful from the sample of the agribusiness entities in Tamale Metropolis of Ghana. The Coefficient of Concordance *(W)* 44.80% is an indication that a little below the average of the respondents agreed on the ranking in relation to loan acquisition. This can be inferred as mixed reaction as majority of the respondents opined that the challenges of loan acquisition though ranked can have more weight depending where the loan is to be acquired. This is also an indication the agribusiness entities must put their business operations in order to be able to meet the demands by the banks.

CONCLUSION AND RECOMMENDATION

Credit facility in whatever form improves the liquidity status of a business in the short term thereby enhancing the working capital for running the business. Access to credit in terms of loan comes with consequences in terms of repayment of the principal and the interest. If business is good it makes it a bit easier to pay than when it is going through difficult moments. Cash flow analysis may well be the most important tool used by commercial bankers to evaluate loans. Lenders rely on cash flow statements because cash flows reveal both the degree by which historical and future cash flows cover debt service and borrowers' chances for survival. Cash flow is the firm's lifeblood. The greater and more certain the cash flows, the lower the default probabilities. There really is no substitute for in-depth knowledge of the firm, the industry in which the borrower operates, and the quality of management. In the final analysis, historical cash flows are simply offerings set by accounting information and guidelines, and they come to life only through the diligence, alertness, and the creativity of the minds that perceive them.

Banks can utilise collateral and guarantees to help mitigate risks inherent in individual credits, but transactions should be entered into primarily on the strength of the borrower's repayment capacity. Collateral cannot be a substitute for a comprehensive assessment of the borrower or can it compensate for insufficient information. It should be recognised that any credit enforcement actions (e.g., foreclosure proceedings) typically eliminate the profit margin on the transaction. In addition, banks need to be mindful that the value of collateral may well be impaired by the same factors that have led to the diminished recoverability of the credit. Banks should have policies covering the acceptability of various forms of collateral, procedures for the ongoing valuation of such collateral, and a process to ensure that collateral is, and continues to be, enforceable and realisable. With regard to guarantees, banks should evaluate the level of coverage being provided in relation to the credit quality and legal capacity of the guarantor. Banks should only factor explicit guarantees into the credit decision and not those that might be considered implicit, such as anticipated support from the government.

The aim of the study is to assess causes of loan default by agribusiness entities in Tamale Metropolis in Ghana. The results of the study suggest that majority of the respondents were males in their youthful age with secondary level of education. The agribusiness firms had at least three employees and were experience in their trade. Most of the respondents were not having other sources of income aside but they did complain of the high interest rate charged while the financial institutions from which they took the loans from did very little supervision. Even though respondents did not receive the full amount of the loan they applied for the financial

ISSN 2053-4086(Print), ISSN 2053-4094(Online)

institutions that they applied for the loan from demanded collateral while most of the respondents applied for business loans. The interest rate charged by the financial institutions on the loan disbursed, the number of employees, the other sources of income and the years of experience of the respondents were found to be the determinants of loan repayment among respondents. The high interest rates, demand for collateral and poor records keeping by agribusiness firms were the challenges to accessing loans by respondents.

The paper recommends that agribusiness firms should employ enough capable hands to help make them productive to enable them make profits to repay their loan. Financial institutions should pay due diligence to the credit appraisal assessment of loan applicants paying particular attention to the years of experience of applicants, the number of employees and other sources of income. Finally suggests financial institutions must apply appropriate adjustments to financial variables in order to minimise loan default risk considering the agricultural sector

REFERENCES

Abbot, M. L. and McKinney, J. (2013), Understanding and Applying Research Design. Hoboken. John Wiley & Sons Inc.

Adegbite, D. A. (2009), Repayment performance of beneficiaries of Ogun State Agricultural and Multipurpose Credit Agency (OSAMCA) in Ogun State, (2004-2007). American-Eurasian Journal of Sustainable Agriculture 3 (1), pp. 117–125.

Adejobi, O. and Atobatele, J.T. (2008), Analysis of loan delinquency among small-scale farmers in south western Nigeria: Application of logit and loan performance indices. East Africa Agricultural and Forestry Journal. 74 (3),pp. 149-15

Altman, E.I and Suggitt, H.I. (2000), Default Rates in the Syndicated Bank Loan Market: A Mortlity Analysis. Journal of Banking and Finance. 24, pp. 229-253.

Anastas, J. W. (1999). Research Design for Social Work and the Human Services. 2nd Edition. New York. Columbia University Press.

Awunyo-Vitor, D. and Abankwa V. (2012). Substitutes or Complements? Formal and Informal Credit Demand by Maize Farmers in Ashanti and Brong-Ahafo Regions of Ghana. International Journal of Agriculture and Forestry. Vol. 2(3), pp. 105-112. doi:10.5923/j.ijaf.20120203.05

Bichanga, W. O. and Aseya, L. (2013). Causes of loan default within Microfinance institutions in Kenya. Interdisciplianary Journal of Contemporary Research in Business. Vol 4, No. 12. pp. 316-335

Copisarow, R. (2000). The application of micro credit technology to the UK: key commercial and policy issues. Journal of Microfinance. Volume 2, Number 1. pp. 13-42.

De Vaus, D.A., 2002. Surveys in Social Research. 5th Edition. Crows Nest. Allen & Unwin.

Descombe, M. (2007), The Good Research Guide for small-scale social research projects. 3rd Edition. Maidenhead. Open University Press.

DeYoung, R., Glennon, D. and Nigro, P. (2008), “Borrower - Lender Distance, Credit Scoring and Loan Performance: Evidence from Informational - Opaque Small Business Borrowers”, Journal of Financial Intermediation, 17(1), pp. 113- 143. doi:10.1016/j.jfi.2007.07.002

ISSN 2053-4086(Print), ISSN 2053-4094(Online)

Dixon, R., Ritchie, J., and Siwale, J. (2007, March). Loan officers and loan 'delinquency' in Microfinance: A Zambian case. Accounting Forum, Vol. 31, Issue. 1, pp. 47-71. doi:10.1016/j.accfor.2006.11.005

Dong F, Liu J. and, Feathersone, A. (2010). Effects of Credit Constraint on Productivity and Rural Household Income in China. CARD Working Papers. Paper 507.

Field, E., and Pande, R. (2008). Repayment frequency and default in microfinance: Evidence from India. Journal of the European Economic Association, 6(2-3), pp. 501-509. DOI:10.1162/JEEA.2008.6.2-3.501

Fofack, H. (2005), Non-Performing Loans in Sub-Saharan Africa: Causal Analysis and Macroeconomic Implications, World Bank Policy Research Working Paper No. WP 3769.

Foltz, J. (2004), "Credit Market Access and Profitability in Tunisian Agriculture." Agricultural Economics. Volume 30, Issue 3. pp. 229-240. DOI: 10.1111/j.1574-0862.2004.tb00191.x

Gaur, A. J. and Gaur, S. S. (2009), Statistical Methods for Practice and Research. A Guide to Data Analysis Using SPSS. 2nd Edition. Response Books. New Delhi.

Ghana Statistical Services, 2013. 2010 Population & Housing Census. National Analytical Report. Accra. Ghana Statistical Service.

Ganbold, B. (2008). Improving Access to Finance for SME: International Good Experiences and Lessons for Mongolia. IDE-JETRO Working paper no. 438.

Guirkinger, C. and Boucher, S. (2008). Credit Constraints and Productivity in Peruvian Agriculture. Agricultural Economics. Volume 39, Issue 3. pp. 295-308. DOI: 10.1111/j.1574-0862.2008.00334.x

Hainz, C. (2003). Bank Competition and Credit Markets in Transition Economics. Journal of Comparative Economics, 31 (2), pp. 223-245. doi:10.1016/S0147-5967(03)00021-0

Hancock, D.R. and Algozzine, B., (2006). Doing Case Study Research: A Practical Guide for Beginning Researchers. New York. Teachers College Press.

Kohansal M. R, Mansoori H. (2009). Factors affecting on loan Repayment Performance of Farmers in Khorasan-Razavi Province of Iran: Paper presented at Conference on International Research on Food Security, Natural Resource Management and Rural Development Tropentag 2009, University of Hamburg.

Koopahi, M. and Bakhshi, M.R. (2002). Factors affecting agricultural credit repayment performance: (case study in Birjand district). Iranian journal of agricultural sciences, 33 (1), pp. 11-19.

Nkonya, E., Pender, J., Kato, E., Omobowale, O., Philip, D., and Ehui, S. (2010). Options for enhancing agricultural productivity in Nigeria. International Food Policy Research Institute (IFPRI). Nigeria Strategy Support Program (NSSP) Background Paper No. 11.

Okojie, C.A., Monye-Emina, K., Eghafona, G., Osaghae, O. and Ehiakhamen, J.O. (2010). Institutional and environmental access to micro finance by self-employed women in rural areas of Edo State. International Food Policy Research Institute (IFPRI). Nigeria Strategy Support Program (NSSP) Brief No. 14.

Oladeebo, J.O. and Oladeebo O.E. (2008). Determinants of Loan Repayment among Smallholder Farmers in Ogbomoso Agricultural Zone of Oyo State, Nigeria. Journal of Soc. Sci, 17(1), pp. 59-62.

ISSN 2053-4086(Print), ISSN 2053-4094(Online)

Omojola, J. T. and Ugwumba, C. O. A. (2013). Determinants of Loan Repayment of livestock farmers under agricultural credit guarantee scheme (A.C.G.S) in Etche local government area of river state, Nigeria. Agricultural Advances. 2(6), pp. 165-172.

Ozdemir, O. and Boran, L. (2004). An empirical investigation on consumer credit default risk. Discussion Paper. 2004/20. Turkish Economic Association.

Panda K. D. (2009). Participation in the Group Based Microfinance and its Impact on Rural Households: A Quasi experimental Evidence from an Indian State, Global Journal of Finance and Management, Vol: 1, No: 2, pp. 171-183.

Rahji, M.A.Y. and Fakayode, S. A. (2009). A multinomial logit analysis of agricultural credit rationing. International Research Journal of Finance and Economics. Issues 24. pp.90-100

Roslan, A.H., and Mohd-Zaini, A. K. (2009). Determinants of microcredit repayment in Malaysia: the case of Agrobank. Humanity and Social Sciences Journal, 4(1), pp. 45-52.

Saleem A., Ali F. Khattak R. M., and Qurraishi M. I. (2011). Impact of Farm and Farmer Characteristics on Repayment of Agricultural Credit (A Case Study of D. I. Khan, Khyber Pakhtoonkhawa). Abasyn Journal of Social Sciences; Vol. 4(1). pp. 23-35

Strang, K. D. (2015). The Palgrave Handbook of Research Design in Business and Management. New York. Palgrave Macmillan.

Tedeschi, G. A. (2008). Overcoming selection bias in microcredit impact assessments: a case study in Peru. Journal of Development Studies, Volume 44, Issue 4. pp. 504-518. doi.10.1080/00220380801980822

Ugbomeh, G.M.M., Achoja, F.O., Ideh, V., and Ofuoku, A.U. (2008). Determinants of loan repayment performance among women self-help groups in Bayelsa State, Nigeria. Agriculturae Conspectus Scientificus, 73(3), pp. 189-195.

Warue, B. N. (2012). Factors Affecting Loan Delinquency in Microfinance Institutions in Kenya. International Journal of Management Sciences and Business Research, 1(12), pp. 27-48.

Waweru, N. M. and Kalani, V. M. (2009), Commercial Banking Crises in Kenya: Causes and Remedies. African Journal of Accounting, Economics, Finance and Banking. Vol. 4. No. 4. pp. 12-33

Weinberg, J. A. (2006), Borrowing by U.S. Households. Federal Reserve Bank of Richmond Economic Quarterly, vol. 92, no. 3, pp. 177-194.

ISSN 2053-4086(Print), ISSN 2053-4094(Online)