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Article

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GENERAL & APPLIED ECONOMICS | RESEARCH ARTICLE

Improving loan repayment in Ghana: Does financial literacy matter?

Samuel Tawiah Baidoo^{1*}, Hadrat Yusif¹ and Enock Kojo Ayesu¹

Abstract: Loan defaults continue to be a major challenge that confronts financial institutions in developing countries and this impedes their potential role in sustainable development. Given the enormity of loan defaults, policymakers have devoted much attention to the phenomenon by implementing strategies and policies aimed at improving loan repayment to avert the situation. To complement the effort of policymakers, several empirical studies have also been conducted regarding loan repayment determinants; but what is worrying is that none of these studies emphasises the role of financial literacy, especially in the Ghanaian context. This study therefore examines the potential effect of financial literacy on loan repayment. We rely on primary data and employ the binary probit regression for the analysis. The results reveal a positive and significant relationship between financial literacy and loan repayment. This means that enhancing financial literacy improves loan repayment significantly which will in turn ensure sustainability of the financial institutions. The level of education of borrowers is also revealed to play a key role in loan repayment. Given the findings, the study sheds new lights on how loan repayment can be improved to ensure a vibrant banking sector.

Subjects: Economics; Finance; Banking; Credit & Credit Institutions

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PUBLIC INTEREST STATEMENT

Loan defaults continue to be a major challenge that confronts financial institutions, especially those in the developing world and Ghana is no exception. Given the enormity of loan defaults: potential of collapsing financial institutions, reducing investment and retarding economic growth among others, several strategies and policies have been implemented to improve the situation but the results seem not to be satisfactory. This study therefore seeks to examine the role financial literacy play in loan repayment which has not been given much attention in past studies on Ghana. Indeed, the study has revealed that enhancing financial literacy improves loan repayment significantly, and this is likely to ensure the sustainability of the financial institutions. This is so because, if individuals are financially literate, they will be able to manage their financial resources efficiently and the implication is that loans received from the financial institutions will be repaid and hence possible collapse will be avoided.

Keywords: loan repayment; financial literacy; financial institutions; loan default; Ghana
JEL classification: C25; D14; G20; G21

1. Introduction

The role played by financial institutions in economic growth and development of economies is widely acknowledged and cannot be overemphasised. Financial institutions contribute significantly to employment and poverty alleviation through job creation and ultimately economic growth (see Amuakwa-Mensah et al., 2017; Baidoo & Akoto, 2019; Baidoo et al., 2018; Haile, 2015; Nukpezah & Blankson, 2017; Oteng-Abayie, 2017; Rastogi & Ragabiruntha, 2018; Sakyi et al., 2019; Salifu et al., 2018; Sethi & Sethy, 2019; Walle, 2014). The financial sector is also noted for its potential role in sustainable development through provision of credit to individuals and firms for investment and corporate social responsibilities (see García-Pérez et al., 2018; Lopatta et al., 2017; Mezher et al., 2002; Pucheta-Martínez et al., 2019; Weber et al., 2014). Notwithstanding the important contribution of financial institutions, the sector is confronted with several challenges which hinder its contribution to economic growth and sustainable development. Among these challenges, the most crucial among them that has been given more prominence in policy discourse and attracted attention of researchers is loan default (see Asiama & Amoah, 2019). Loan default continues to pose threat to financial institutions and the industry at large across the world (Abor & Quartey, 2010; Amuakwa-Mensah et al., 2017; Bank of Ghana, 2016, 2017; Marouli et al., 2015; Mokhtar et al., 2012; Munene & Guyo, 2013) and Ghana is no exception to the phenomenon.

Loan default which is attributed to non-repayment of loans approved and disbursed to borrowers (Enimu et al., 2017; Yibrie & Ramakrishna, 2017) raises concerns not only because of the effect it has on financial institutions but also on individuals, entrepreneurs and the economy as a whole. There are several negative consequences that arise due to incidence of loan default. Researchers (see Abor & Quartey, 2010; Amuakwa-Mensah et al., 2017; Munene & Guyo, 2013) report that loan default which emanates from non-performing loans (NPLs)¹ has the tendency of retarding economic growth, private investment and increasing unemployment, because there will be inadequate funds for entrepreneurs with viable investment ambitions to execute the envisioned projects.

NPLs which eventually lead to loan default (due to consistent non-repayment of loan) are endemic in most developing countries and therefore call for urgent attention given its negative consequences. For instance, the financial stability report of Bank of Ghana covering financial institutions' operations for the first seven months of 2016 reveals that NPLs is on the ascendency. NPLs reached an amount of GHS6.1 billion (US\$1.45 billion) with the equivalent NPL ratio of 19.1% (Bank of Ghana, 2016). This value according to the report shows an increase of about 70% from an amount of GHS3.6 billion (US\$0.97 billion) in the year 2015 with NPL ratio of 13.1%. In the year 2017, NPLs soared to an amount of GHS7.96 billion (US\$1.81 billion) from amount of GHS6.1 billion recorded in 2016. As a result, the NPL ratio also increased to 21.2% from the 19.1% recorded in 2016 (Bank of Ghana, 2017). Further, the banking sector report from January to April 2018 indicates that the stock of NPLs increased from GHS7.96 billion in 2017 to GHS8.63 billion (US \$1.84 billion) in April 2018 with a NPL ratio of 20.8% (Bank of Ghana, 2018a). This clearly indicates that NPLs in Ghana has been persistently increasing and this certainly gives cause to worry.

The persistent rise in the NPLs in Ghana is indeed an issue of concern given that these NPLs eventually result in loan default and in turn affect the sustainability and profitability of financial institutions negatively (Abor & Quartey, 2010; Amuakwa-Mensah et al., 2017; Asiama & Amoah, 2019; Wangai et al., 2014). Wangai et al. (2014) and Asiama and Amoah (2019) report that NPLs often cause distress to financial institutions and even lead to their collapse. For instance, in Ghana, seven banks² have had their licenses revoked by the Central Bank of Ghana between August 2017 and August 2018 as a result of insolvency which emanates from high levels of NPLs (Bank of Ghana, 2018b). It is worth noting that Royal Bank has its NPLs constituting as high as 78.8% of the

total loans granted. Out of these seven banks that had their licenses revoked, five of them have been consolidated into Consolidated Bank Ghana Limited (a state bank) whilst the other two are handed over to GCB Bank Limited (which is also a state bank). These takeovers resulting from abysmal performance by these financial institutions has subsequently had devastating effect on the lives of employees as many have become unemployed.

Given the enormity of loan default as expounded above, it is therefore necessary for policy-makers and players in the financial industry to implement strategies and policies to improve loan repayment. Several studies (see, for instance, Abu et al., 2017; Acquah & Addo, 2011; Awunyo-Vitor, 2012; Enimu et al., 2017; Haile, 2015; Kiliswa & Bayat, 2014; Salifu et al., 2018; Wongnaa & Awunyo-Vitor, 2013; Yibrie & Ramakrishna, 2017) which seek to unearth factors to be tackled in order to avert the situation have been conducted. A number of determinants including individuals' demographic and socioeconomic characteristics (such as age, education income, marital status and employment status), loan size, interest rate and supervision by financial institutions have been revealed by these studies as the factors that significantly affect successful loan repayment, yet the problem still persist and getting worse. The question, therefore is, are there other important variables that are not considered by these numerous studies but have the potential of improving loan repayment to ensure a vibrant financial sector?

The answer may be yes. This is so because none of these studies especially on Ghana emphasise the potential role financial literacy can play in improving loan repayment. Financial literacy is defined by researchers as the general understanding and knowledge that allows consumers or individuals to effectively and efficiently manage and make sound financial decisions regarding their financial resources (see Atkinson & Messy, 2012; Fernandes et al., 2014; Lusardi & Mitchell, 2011a, 2011b, 2014; OECD, 2005; PACFL, 2008). According to these authors (e.g., Atkinson & Messy, 2012; Fernandes et al., 2014; Lusardi & Mitchell, 2011a, 2011b, 2014; Mouna & Anis, 2015), financial literacy plays a key role in the lives of individuals when it comes to the management of financial resources. Relating this to the current issue under consideration, it can therefore be construed that individuals or borrowers who are more financially literate are more likely to manage their financial resources effectively and hence more likely to successfully repay loans received relative to their less financially literate counterparts. What is worrying is lack of empirical finding to support this claim as well as the absence of this important variable in existing studies especially those on Ghana.

Therefore, the present study revisits loan repayment determinants with much emphasis on financial literacy. Specifically, the study examines the potential effect of financial literacy on loan repayment in the Ghanaian context.

The study makes important contributions to knowledge and literature as far as loan default continues to remain a major challenge for financial institutions in Ghana and also the need to implement strategies and policies to improve loan repayment. The current study is the first to examine the relationship between financial literacy and loan repayment especially in Ghana to the authors' best knowledge. Again, this study sheds lights on the important variables to be given the utmost attention by financial institutions when it comes to the approval and disbursement of loans to prospective borrowers. Finally, the current study uses a relatively larger sample size (none of the papers reviewed uses a sample of more than 400 respondents for analyses) compared with existing studies and this enhances the generalisation of the present results to a greater extent.

The remaining of the study is organised as follows. The next section focuses on literature review whilst section three discusses the methodology of the study. What follows is the results and discussion and the final section presents the conclusions and policy implications of the study.

2. Review of related literature

Empirically, several studies have been conducted on loan repayment in Ghana and other parts of the world. These studies have identified different factors that affect loan repayment. It must,

however, be stated that none of the studies on Ghana included financial literacy as a potential variable that can affect loan repayment. The ensuing paragraphs present a brief review of past studies.

With regard to financial literacy, studies by Nyamboga et al. (2014) on Nigeria, Mutegi et al. (2015) on Kenya, Tuyisenge et al. (2015) on Rwanda, Wanjiku and Muturi (2015) on Kenya and Musabwasoni et al. (2018) on Rwanda reveal that individuals who are more financially literate are more likely to repay their loans successfully as being financially literate reduces delays in loan repayment. Also, Haile (2015) and Abu et al. (2017) reveal a positive relationship between household size and loan repayment. The authors add that having larger household size improves loan repayment because other members of the household who are gainfully employed will earn income to support loan repayment. In contrary, Pasha and Negese (2014) and Enimu et al. (2017) find a negative relationship between household size and loan repayment. This negative relationship is attributed to the higher responsibilities (due to larger household size) which increase household expenses and hence retard loan repayment.

Again, a positive relationship between income, higher profit and loan repayment has been revealed (see, for instance, Abu et al., 2017; Acquah & Addo, 2011; Awunyo-Vitor, 2012; Enimu et al., 2017; Haile, 2015; Wongnaa & Awunyo-Vitor, 2013). These authors indicate that higher income is associated with successful loan repayment because individuals who earn relatively higher income are able to meet all repayment obligations. Studies by Abu et al. (2017) and Enimu et al. (2017) have also reported a negative relationship between being a male and successfully repay loan. Loan amount is also reported to have a positive relationship with successful loan repayment (see Abu et al., 2017; Acquah & Addo, 2011; Awunyo-Vitor, 2012; Enimu et al., 2017). For instance, Acquah and Addo (2011) explain that individuals who receive larger loan amount are able to undertake the planned investment which in turn helps them to fulfil repayment obligations. Studies by Pasha and Negese (2014) and Salifu et al. (2018) have, however, reported a negative relationship between loan amount and successful loan repayment.

Education is also reported to be successful loan repayment enhancing (see Abu et al., 2017; Angaine & Waari, 2014; Anigbogu et al., 2014; Pasha & Negese, 2014; Salifu et al., 2018; Wongnaa & Awunyo-Vitor, 2013). For instance, Salifu et al. (2018) indicate that highly educated employees of enterprises are likely to be more productive (which will lead to more output and profit) and manage business resources properly which will in turn facilitate loan repayment. A study by Angaine and Waari (2014) also shows a positive relationship between age and loan repayment whilst that of Pasha and Negese (2014) reveals a negative relationship between age and loan repayment. Pasha and Negese (2014) also indicate that longer repayment schedules are associated with unsuccessful loan repayment.

It is also reported that borrowers who receive training organised by lenders as well as regular visit from lenders are more likely to successfully repay their loans (see Awunyo-Vitor, 2012; Haile, 2015; Wongnaa & Awunyo-Vitor, 2013). Awunyo-Vitor (2012) indicates that individuals who receive training from lenders before the loan is disbursed are able to effectively manage their projects and therefore obtain more output and enough income which help them to meet all repayment obligations. Again, a study by Angaine and Waari (2014) shows that married individuals are more likely to successfully repay loans received. Contrary to this finding, Wongnaa and Awunyo-Vitor (2013) report that more responsibilities arising from marriage lead to diversion of incomes meant for loan repayment to provision of social and economic needs of family members thereby hindering successful loan repayment. Pasha and Negese (2014) confirm the finding by Wongnaa and Awunyo-Vitor (2013) by reporting that individuals who divert loans received for other purposes are less likely to successfully repay their loans.

One thing is evident from the empirical studies reviewed. It is observed that none of the studies (those on Ghana) includes financial literacy in the analysis and this raises concerns to be worried

about given the potential role of financial literacy in improving loan repayment. This is so because, considering the fact that financial literacy enables individuals to effectively manage their financial resources, there is the likelihood of improving loan repayment through improvement in financial literacy. Therefore, it will be prudent to incorporate financial literacy in loan repayment studies and the present study seeks to fill this gap in the literature, especially in the Ghanaian context.

3. Methodology

This section presents the methodology the study employs and is divided into three sub-sections; data and estimation strategy, model specification and data description.

3.1. Data and estimation strategy

The study uses primary data and the binary probit regression model is employed as the analytical tool. Demographic and socioeconomic information on Ghanaians who have ever received loan (within the past 12 months prior to the data collection) from any formal financial institution³ are elicited with the use of structured questionnaire (see Appendix B). The information elicited include age, gender, marital status, educational level, income level, household size, financial literacy level and employment status. Information related to loan activities such as loan repayment status and repayment mode are also elicited from the respondents. It must be emphasised that only individuals who are 18 years and above in Ghana are considered in the study. This is because they are the individuals who are classified as adults by the constitution of Ghana and can therefore engage in meaningful economic activities. Again, they are the individuals who can independently open formal bank account and also apply for loan from the formal financial institutions.

The population which falls within the category of 18 years and above in Ghana are estimated to be 13,632,299 according to the 2010 Population and Housing Census (PHC) report (Ghana Statistical Service, 2013). Given this population, we use random sampling technique to select our respondents from the two most densely populated regions in Ghana, namely, the Greater Accra and Ashanti regions. Out of the 13,632,299 individuals who are 18 years and above, Greater Accra region has a population of 4,780,380 whereas Ashanti region has 4,010,054 making them the first and second densely populated areas, respectively. According to the PHC 2010 report, these two regions have attracted a lot of individuals from all other parts of Ghana due to the economic opportunities in these areas. The report further indicates that diverse people with different background and characteristics are found in these two regions. Therefore, focusing on these two regions for our study is worthwhile because the results can be generalised to a greater extent.

With respect to the study sample size, 800 questionnaires⁴ are printed and administered in these two regions. Specifically, 400 questionnaires are administered in each region. Both assisted and self-administered approaches to questionnaire administration are employed. This is done in order not to ignore individuals who cannot read, understand and write in the language (English) used in designing the questionnaire. To this end, individuals who can read, understand and write in English are given the questionnaire to fill by themselves whereas those who cannot read, understand and write in English are interviewed and their responses are used to fill the questionnaire accordingly. However, after data cleaning and management, a sample of 600 individuals representing a response rate of 75% are finally used for the analysis.

A frequency table is used to represent the individuals' demographic and socioeconomic characteristics whilst the binary probit regression model is employed to examine the relationship between financial literacy and successful loan repayment. The binary probit regression model is deemed appropriate given the dichotomous nature of the dependent variable (Asteriou & Hall, 2011; Greene, 2012). The dependent variable is successful loan repayment and takes the value 1 if a respondent successfully repaid the loan within the stipulated loan period and 0 if the respondent defaulted repayment.

Finally, to ensure the results are reliable and robust, diagnostic tests such as test-retest reliability and multicollinearity tests are conducted. The test-retest is conducted using the

Cronbach's alpha value proposed by Cronbach (1951) whilst the multicollinearity test is done using the pairwise correlation test. According to Field (2009), Cronbach's alpha value of 0.7 and above is ideal for a reliable questionnaire for data elicitation. A higher Cronbach's alpha value means the questionnaire used for data collection is reliable and hence similar results can be produced when it is administered the second time. Also, according to Greene (2012), a correlation coefficient (between two independent variables) of not more than 0.5 is asserted not to pose multicollinearity threat. Robust standard errors for all the independent variables are also estimated to address any potential heteroscedasticity issue in the study.

3.2. Model specification

The study follows authors such as Asteriou and Hall (2011), Greene (2012), Wongnaa and Awunyo-Vitor (2013) and Abu et al. (2017) and specifies the following probit regression model.

$$SLR = \beta_i + \delta FL_i + \gamma Y_i + \mu_i \quad (1)$$

where SLR is the dependent variable and represents successful loan repayment and FL is the independent variable of interest and represents financial literacy. Y denotes vector of control variables and they are income, household size, age, education, marital status, employment status, gender and repayment mode and are represented by Inc , Hhs , Age , $Educ$, $Mast$, $Empst$, Gen and $Repmode$, respectively. δ is the coefficient of financial literacy whereas γ represents the coefficients of the control variables. β and μ are the intercept and the stochastic error term, respectively.

The expanded probit regression model to be estimated is specified in Equation (2).

$$SLR = \beta_i + \delta FL_i + \gamma_1 Inc_i + \gamma_2 Hhs_i + \gamma_3 Age_i + \gamma_4 Educ_i + \gamma_5 Mast_i + \gamma_6 Empst_i + \gamma_7 Gen_i + \gamma_8 Repmode_i + \mu_i \quad (2)$$

where the variables and the parameters are as explained earlier in Equation (1). According to Greene (2012) and Asteriou and Hall (2011), the coefficients of probit models do not have direct economic meaning and also do not reveal the magnitude of the effect of the change in the independent variables on the dependent variable. To this end, the study further estimates the marginal effect at the means for financial literacy and all the control variables and interprets them accordingly. Further, Equation (1) is re-estimated using the logistic regression model to establish the robustness of the results obtained from the probit regression model.

3.3. Data description

The dependent variable is successful loan repayment and it is defined in this study as the ability to repay loan⁵ received within the agreed loan period between the lender and the borrower. It is therefore measured as a binary dummy and takes a value of 1 if a borrower is able to repay the loan within the agreed loan period and 0 if a borrower is unable to repay the loan within the stipulated loan period. Specifically, this variable is obtained by asking the question "were you able to successfully repay the loan you received from your bank within the agreed loan period?" and the response is either "yes" or "no". Past studies such as Acquah and Addo (2011), Mokhtar et al. (2012), and Wongnaa and Awunyo-Vitor (2013) have also used similar approach to obtain loan repayment variable in their studies.

With respect to financial literacy which is the independent variable of interest, it is defined as the general understanding and knowledge that allows consumers or individuals to effectively manage and make sound financial decisions regarding their financial resources. The study adopts this definition following the ideas and concepts of the OECD (2005), PACFL (2008), Atkinson and Messy (2012), Lusardi and Mitchell (2011a, 2011b, 2014) and Fernandes et al. (2014). We do so in order to have a consistent measure for the variable. These authors have asked financial literacy questions which are essential in any contemporary setting and the questions are related to

interest rate, inflation and risk diversification. Following this, we also ask the respondents to provide responses to four financial literacy statements⁶ which are related to interest rate, inflation and risk diversification with binary (yes or no) responses. Further, the study follows the studies by Klapper et al. (2012) and Baidoo et al. (2018) and creates a financial literacy score based on the responses (number of correct responses) obtained from the respondents and the scores are then used for the analysis.

Following the assertions by authors such as Atkinson and Messy (2012), Lusardi and Mitchell (2011a, 2011b, 2014) and Fernandes et al. (2014), the financial literacy variable is hypothesised to have a positive relationship with successful loan repayment, thus, $\delta > 0$. This is so because, being financially literate is expected to enhance decision making by individuals regarding their financial resources. Therefore, financial literacy is expected to equip individuals to manage their financial resources effectively and efficiently which will in turn help them to meet their loan repayment obligations. Meeting all loan repayment obligations will then ensure that loan received are repaid successfully and within the agreed loan period.

Description and the *a priori* expectation of the remaining independent variables are presented in Table 1.

4. Results and discussion

This section of the study focuses on the descriptive analysis and estimation of Equation (2) as well as the discussion of the results.

4.1. Descriptive analysis

The demographic and socioeconomic characteristics of the respondents are analysed and the summary of the descriptive statistics is reported in Table 2.

From Table 2, individuals who successfully repaid their loan are 360 and those who defaulted are 240 and these represent 60 and 40%, respectively. Regarding financial literacy score, the analysis

Table 1. Description of variables

Variable	Measurement	A priori expectation
Marital status	Married = 1; Single (comprising never married, divorce and widowed) = 0	Positive
Employment status	Employed = 1; Unemployed = 0	Positive
Gender	Male = 1; Female = 0	Positive
Monthly income (GHS) ⁷	GHS400.00 and below (R); GHS401.00–GHS600.00; GHS601.00–GHS800.00; GHS801.00–GHS1,000.00; Above GHS1,000.00	Positive
Household size ⁸	1–2 dependents (R); 3–4 dependents; 5 or more dependents	Negative
Age	18–24 years; 25–39 years; 40–54 years; 55–60 years; Above 60 years (R)	Positive
Education	None; Primary; Junior High School/ Middle School Leaving Certificate (JHS/MSLC); Senior High School/ Ordinary Level (SHS/O'Level); Tertiary education (R)	Negative
Repayment mode ⁹	Daily; Weekly; Monthly (R)	Positive

(R) denotes reference category.

Source: Authors' compilation.

Table 2. Summary of descriptive statistics

Variable	Freq.	Percent	Variable	Freq.	Percent
Age (in years)			Income (GHS)		
18–24	100	16.70	GHS400.00 and below	176	29.30
25–39	278	46.30	GHS401.00–GHS600.00	88	14.70
49–54	171	28.50	GHS601.00–GHS800.00	108	18.00
55–60	42	7.00	GHS801.00–GHS1,000.00	118	19.70
Above 60	9	1.50	Above GHS1,000.00	110	18.30
Gender			Marital status		
Male	372	62.00	Married	359	59.80
Female	228	38.00	Single	241	40.20
Education level			Financial literacy score		
None	19	3.20	1 correct response	40	6.67
Primary	27	4.50	2 correct response	20	3.33
JHS/MSLC	152	25.30	3 correct response	32	5.33
SHS/O'Level	185	30.80	4 correct response	508	84.67
Tertiary	217	36.20			
Household size			Repayment mode		
1–2	246	41.00	Daily	99	16.50
3–4	200	33.30	Weekly	53	8.83
5 or more	154	25.70	Monthly	448	74.67
Employment status			Loan repayment status		
Employed	589	98.20	Successful loan repayment	360	60.00
Unemployed	11	1.80	Defaulted	240	40.00

Source: Authors' estimation.

reveals that 40 and 20 respondents have 1 and 2 correct responses and these represent 6.67 and 3.33%, respectively. Respondents who have 3 and 4 correct responses are 32 and 508 representing 5.33 and 84.67%, respectively. Further, the study reveals that majority of the respondents are between the ages of 18 and 54 years. The results also indicate that greater proportion of the respondents earn income of above GHS600.00.

4.2. Regression results and discussion

Equation (2) is estimated and the results are reported in Table 3. Consistent with our *a priori* expectation, the results indicate that there is a positive and significant relationship between financial literacy and successful loan repayment. Individuals who are more financially literate are more likely to repay loan received relative to their less financially literate counterparts. The marginal effect shows that answering one additional financial literacy question correctly increases the probability of successfully repaying loan received by 13 percentage points at 1% significance level. This implies that individuals who are more financially literate are able to manage their financial resources effectively and therefore are able to meet all their repayment obligations which facilitate successful loan repayment all other things being equal. This result agrees with the assertions by Atkinson and Messy (2012), Lusardi and Mitchell (2011a, 2011b, 2014), Fernandes et al. (2014), and Baidoo et al. (2018) that financial literacy indeed enables individuals to manage their financial resources efficiently. This finding also confirms similar studies in other countries (see Musabwasoni et al., 2018 on Rwanda; Mutegi et al., 2015 on Kenya; Nyamboga et al., 2014 on Nigeria; Tuyisenge et al., 2015 on Rwanda; Wanjiku & Muturi, 2015 on Kenya).

Table 3. Binary probit regression results

Variable	Coefficient	Robust standard error	Marginal effect
Financial literacy score	0.3275***	0.0875	0.1251
Income (GHS400.00 and below)			
GHS401.00–GHS600.00	0.7065***	0.1903	0.2396
GHS601.00–GHS800.00	0.5905***	0.1848	0.2074
GHS801.00–GHS1,000.00	0.1938	0.1971	0.0725
Above GHS1,000.00	0.2477	0.2069	0.0920
Household size (1–2 dependents)			
3–4 dependents	–0.1854	0.1652	–0.0713
5 or more dependents	–0.2053	0.1908	–0.0794
Age (Above 60 years)			
18–24 years	0.8196	0.6127	0.2732
25–39 years	1.1746**	0.5946	0.4212
40–54 years	1.4437***	0.6005	0.4545
55–60 years	1.7332***	0.6376	0.4032
Education (tertiary)			
None	–1.0240***	0.3971	–0.3852
Primary	–1.3608***	0.3250	–0.4814
JHS/MSLC	–1.2839***	0.1997	–0.4789
SHS/O’Level	–0.9148***	0.1610	–0.3503
Marital Status (single)			
Married	0.6789***	0.1471	0.2592
Employment status (unemployed)			
Employed	0.6873	0.6039	0.2687
Gender (female)			
Male	0.1475	0.1250	0.0566
Repayment mode (monthly basis)			
Daily basis	1.4298***	0.2107	0.4085
Weekly basis	0.8122***	0.2439	0.2616
Constant	–3.0835	0.9170	–

Number of observation = 600 Prob > χ^2 = 0.0000
Wald $\chi^2(20)$ = 183.78, pseudo R^2 = 0.3162

Reference categories are in parenthesis; *** and ** denote 1 and 5% significance level, respectively.

Source: Authors’ estimation.

The results further show a positive relationship between income categorical variables and successful loan repayment. Individuals who earn substantial income of above GHS400.00 are more likely to successfully repay loan received compared with individuals who earn income of GHS400.00 and below. Specifically, the marginal effect figures indicate that earning income of GHS401.00–GHS600.00 and GHS601.00–GHS800.00 increase the likelihood of successfully repaying loan received by 24 percentage points and 21 percentage points at 1% level of significance, respectively. Income categories of GHS801.00–GHS1,000.00 and above GHS1,000.00 are however insignificant. By implication, individuals who earn relatively higher income are likely to meet all loan repayment obligations and hence more

likely to successfully repay loan received. This outcome is consistent with the finding by Acquah and Addo (2011) and Wongnaa and Awunyo-Vitor (2013).

The results in Table 3 further show that a positive and significance relationship exists between age categorical variables and successful loan repayment. This means that individuals who are relatively younger (below 60 years) are more likely to successfully repay loan received relative to their counterparts who are relatively older (above 60 years). The marginal effect shows that being in the age category of 25–39 years, 40–54 years and 55–60 years increase the probability of successfully repaying loan received by 42 percentage points, 45 percentage points and 40 percentage points and are significant at 5, 1 and 1% levels, respectively. It can be observed from the marginal effect values that though the effects are positive indicating more likelihood of loan repayment, the magnitude of the effects reduces as individuals approach 60 years and above. This further confirms that individuals who are relatively older are less likely to successfully repay loan received. Kiliswa and Bayat (2014), Pasha and Negese (2014), and Enimu et al. (2017) have reported similar finding whereas Wongnaa and Awunyo-Vitor (2013) report contrary result.

Education categorical variables are revealed to have a negative and significant relationship with successful loan repayment. Precisely, individuals who have SHS/O'Level education and below are less likely to successfully repay loan received compared with their counterparts who have obtained tertiary education. The marginal effect indicates that having no formal education, Primary, JHS/MSLC and SHS/O'Level education reduce the probability of successfully repaying loan received by 39 percentage points, 48 percentage points, 48 percentage points and 35 percentage points, respectively at 1% significance level. This finding can be attributed to the fact that individuals who have lower level of education may lack financial resources management skills and are also likely to be less financially literate. Therefore, these categories of individuals are less likely to manage their financial resources effectively to facilitate successful loan repayment relative to tertiary education counterparts. This outcome agrees with the results by Anigbogu et al. (2014), Abu et al. (2017) and Salifu et al. (2018).

The results again show that there is a positive and significant relationship between marital status and successful loan repayment. Individuals who are married are more likely to successfully repay loan received as compared to single counterparts. The marginal effect reveals that being married increases the likelihood of successfully repaying loan received by 26 percentage points at 1% significance level. This outcome can be explained by the fact that married individuals may receive support from each other and therefore there will be lower burden in terms of providing for family needs and hence all repayment obligations can be met to ensure successful loan repayment. Similar result has been found by Angaine and Waari (2014) whereas the study by Wongnaa and Awunyo-Vitor (2013) reports contrary result.

With regard to repayment mode and successful loan repayment, a positive and significant relationship is revealed. Individuals who have daily and weekly loan repayment schedules are more likely to successfully repay loan received relative to their counterparts who repay loan on monthly basis. Specifically, having daily and weekly repayment schedules increase the probability of successfully repaying loan received by 41 percentage points and 26 percentage points at 1% significance level. Again, it is observed that as the repayment schedule increases the magnitude of the effect on the successful loan repayment reduces confirming that relatively longer repayment schedule is associated with less likelihood of successful loan repayment. Studies by Awunyo-Vitor (2012) and Abu et al. (2017) also show that borrowers who have shorter repayment schedules are more likely to successfully repay their loan.

However, the study does not show evidence of significance relationship between household size, employment status, gender and successful loan repayment. Though insignificant, the signs are as expected. A negative relationship is revealed between household size categorical variables and successful loan repayment whereas those of gender, employment status and successful loan

repayment are positive. Past studies (see Abu et al., 2017; Angaine & Waari, 2014; Awunyo-Vitor, 2012; Enimu et al., 2017; Salifu et al., 2018) have also reported insignificant relationship for gender and household size. This notwithstanding, studies by Wongnaa and Awunyo-Vitor (2013) and Abu et al. (2017) have found significant relationship between gender, household size and loan repayment.

To ascertain the robustness of the results in Table 3, Equation (2) is estimated again using binary logistic regression model which is also appropriate for our binary dependent variable. The results are reported in Table A1 (see Appendix A). It is observed from Table A1 that the results are similar to those reported in Table 3. The results show a positive and significant relationship between financial literacy and successful loan repayment implying that enhancing financial literacy is key to successful loan repayment. The results reveal that answering one additional financial literacy question correctly increases the probability of successfully repaying loan received by 13 percentage points. The remaining variables maintain their signs and significance levels. This further indicates that the estimated results are robust and reliable for policy purposes.

Again, the soundness and reliability of the results obtained is dependent on the notion that the questionnaire used for data elicitation is good and reliable and the estimated results are free from any econometric problem. To this end, test-retest reliability and multicollinearity tests are conducted and the results are reported in Tables A2 and A3, respectively (see Appendix A). The reliability test indicates that the overall Cronbach's alpha value is 0.73 which is higher than the 0.7 proposed by Field (2009); the minimum and maximum alpha Cronbach's alpha values are 0.70 and 0.74, respectively. This means that the questionnaire used for data elicitation is reliable and hence similar results can be obtained when administered the second time. With regard to the multicollinearity test, it is observed that multicollinearity is not an issue in the study because all the correlation coefficients are less than 0.5 with the exception of age and marital status variable which is 0.52 and this does not pose multicollinearity threat.

5. Conclusions and policy implications

This study has investigated whether financial literacy is really important in improving loan repayment with evidence from Ghana. In doing so, we rely on primary data and the binary probit regression model is applied to the dataset. The study reveals a positive and significant relationship between financial literacy and successful loan repayment. With regard to the control variables, the study shows that there is a positive and significant relationship between income, age, marital status, repayment mode and successful loan repayment. A negative relationship is also found between lower level of education and successful loan repayment. Indeed, based on the study results, it is concluded that enhancing financial literacy among individuals or borrowers improves successful loan repayment. Shorter repayment schedule also improves successful loan repayment. Finally, other important variables that affect successful loan repayment are income, education, age and marital status.

The outcome of the study is therefore crucial for policy purposes especially for Ghana. First, given the positive relationship between financial literacy and successful loan repayment, the study recommends that policymakers, stakeholders and all players in the financial industry should create awareness on financial education. This is so because, improving financial education and knowledge of individuals will enable them to manage their financial resources efficiently and this is likely to equip them repay loans received within the agreed loan period to avoid loan default. Second, the study has revealed that individuals who repay their loans on daily and weekly basis are more likely to successfully repay loans received. It is therefore recommended that managers and credit officers of financial institutions who approve and disburse loans should consider shorter loan repayment schedules such as daily and weekly. The shorter repayment schedule will facilitate successful loan repayment because borrowers may not get the opportunity to divert income meant for repayment obligations for other purposes which will eventually lead to loan default. Third, based on the negative relationship between lower education level and successful loan

repayment, the study recommends that education level of prospective borrowers should be given attention before approval and disbursement of loans. Alternatively, individuals who have lower level of education (Senior High School and below) should be given intensive training on financial resources management before loans can be approved and subsequently disbursed. Finally, the study recommends that managers and credit officers of financial institutions should pay meticulous attention to the age of prospective borrowers. This is because, this study has shown that Ghanaians who are relatively younger are more likely to successfully repay loans received relative to their older counterparts who are above 60 years. Specifically, loan should be approved and disbursed to younger and active individuals who can really undertake economic activities with the funds received so as to be able to repay loans received out of the proceeds.

In all, ensuring vibrant financial industry through implementation of strategies and policies aimed at improving successful loan repayment will mean that financial institutions can survive and continue to play their role of funds mobilisation and provision of loans to individuals with viable investment ambitions. This will then also mean that more employment will be created through job creation to facilitate economic growth and sustainable development of Ghana in the long run.

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Notes

1. Non-performing loans are loans on which a borrower is neither paying the interest nor the principal amount for at least 90 days.
2. The banks are UT Bank, Capital Bank, UniBank, Royal Bank, Sovereign Bank, Beige Bank and Construction Bank.
3. Formal financial institution refers to any financial institution that has been given license to operate by Bank of Ghana and also has the permission to accept deposits and grant loans to customers.
4. We administer 800 questionnaires in this study due to limited financial resources.
5. Notwithstanding this definition, we acknowledge the fact that some individuals may have the ability to repay the loan received but may not do so and hence being part of those who did not successfully repay their loans.
6. The statements are (1) When I borrow money from the formal financial institution, I will pay an interest in addition to the principal amount; (2) When there is inflation, the value of my money reduces; (3) I can earn interest on my money when I save portion(s) of my income with a formal financial institution; and (4) I do financial planning for the future (e.g., in order to successfully repay loan received).

7. For individuals in the formal employment, it is their monthly disposable income whereas for those in the informal employment, it is the average income they receive (including monies received from economic activities, friends and family members) within a month.
8. In this study, household size is used to represent respondents' dependents instead of number of children and the motivation is that there are respondents who do not have children but live with relatives and other people they cater for.
9. Repayment mode represents the agreed payment schedule with respect to the loan received.

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Appendix A

Table A1. Binary logistic regression results

Variable	Coefficient	Robust standard error	Marginal effect
Financial literacy score	0.5498***	0.1607	0.1288
Income (GHS400.00 and below)			
GHS401.00–GHS600.00	1.1942***	0.3256	0.2387
GHS601.00–GHS800.00	1.0003***	0.3191	0.2090
GHS801.00–GHS1,000.00	0.3099	0.3421	0.0707
Above GHS1,000.00	0.4622	0.3622	0.1036
Household size (1–2 dependents)			
3–4 dependents	–0.3630	0.2923	–0.0861
5 or more dependents	–0.3685	0.3370	–0.0879
Age (above 60 years)			
18–24 years	1.4541	1.1035	0.2816
25–39 years	2.0434**	1.0735	0.4403
40–54 years	2.5487**	1.0870	0.4651
55–60 years	3.0366***	1.1600	0.3914
Education (tertiary)			
None	–1.8115***	0.6940	–0.4145
Primary	–2.3823***	0.5685	–0.5036
JHS/MSLC	–2.2228***	0.3568	–0.5046
SHS/O’Level	–1.5604***	0.2803	–0.3678
Marital Status (single)			
Married	1.1602***	0.2555	0.2721
Employment status (unemployed)			
Employed	1.1922	1.1247	0.2893
Gender (female)			
Male	0.2869	0.2180	0.0677
Repayment mode (monthly basis)			
Daily basis	2.4672***	0.3773	0.4029
Weekly basis	1.3807***	0.4413	0.2583
Constant	–5.2876	1.6665	–

Number of observation = 600 Prob > χ^2 = 0.0000
Wald $\chi^2(20)$ = 150.62, pseudo R^2 = 0.3171

Reference categories are in parenthesis; *** and ** denote 1 and 5% significance level, respectively.

Source: Authors’ compilation.

Table A2. Reliability test results

Item	Cronbach's alpha
Financial literacy	0.725
Income – GHS400 and below	0.733
Income – GHS401.00–GHS600.00	0.739
Income – GHS601.00–GHS800.00	0.737
Income – GHS801.00–GHS1,000.00	0.725
Income – above GHS1,000.00	0.707
Household size – 1-2	0.729
Household size – 3-4	0.724
Household size – 5 or more	0.703
Number of children	0.710
Age – 18-24 years	0.737
Age – 25-39 years	0.716
Age – 40-54 years	0.732
Age – 55-60 years	0.739
Age – above 60 years	0.742
Education – None	0.742
Education – Primary	0.744
Education – JHS/MSLC	0.722
Education – SHS/O'Level	0.730
Education – Tertiary	0.712
Repayment mode	0.719
Sector of employment	0.720
Marital status – Single	0.701
Marital status – Married	0.704
Employed	0.720
Unemployed	0.720
Male	0.728
Female	0.728
Test scale	0.734

Source: Authors' compilation.

Table A3. Multicollinearity test results

Variable	Correlation coefficients								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
FL (1)	1.000								
Inc (2)	-0.059	1.000							
Hhs (3)	0.119	-0.052	1.000						
Age (4)	0.186	-0.084	0.498	1.000					
Educ (5)	0.177	-0.046	-0.102	-0.077	1.000				
Mast (6)	0.145	-0.076	0.463	0.529	-0.188	1.000			
Empst (7)	-0.097	0.032	-0.067	-0.118	-0.002	-0.105	1.000		
Gen (8)	-0.125	-0.001	-0.043	-0.083	-0.204	0.014	0.210	1.000	
Repmode (9)	-0.273	0.121	-0.206	-0.256	-0.118	-0.361	0.167	0.099	1.000

Source: Authors' compilation.

Questionnaire

This questionnaire is to assist us examine the role financial literacy play in loan repayment. Therefore, we will be grateful if you could provide responses to the following questions to enable us complete the research successfully. This research is solely for academic and policy purposes and hence the information you will provide will be treated as such. The information provided will also be treated with utmost confidentiality.

Personal characteristics of respondent

1. Age (years): 18–24 25–39 40–54 55–60 Above 60
2. Sex: Male Female
3. Ethnicity: Asante Ga Kwahu Ewe Fante Other (specify).....
4. Religion: Christianity Islam Traditional Other (specify).....
5. Nationality: Ghanaian Non-Ghanaian
6. Educational Level: None Primary JHS/MSLC SHS/O'Level Tertiary
7. Employment Status: Employed Unemployed
If Employed: Public sector Private sector Self-employed
8. Occupation: Farming Trading Teaching Banking Civil Servant
Vocational (Hairdressing, carpentry, repairer, etc.) Other (specify).....
9. Marital Status: Single Married Divorced Other (specify).....
10. Number of Children: None 1–2 3–4 5 or more
11. Household size (wife, husband, children, other dependants): 1–2 3–4
5 or more
12. Do you own a House?: Yes No
13. Do you own a Business/Firm?: Yes No
14. Do you own any other Property? (e.g. Land, car, farm): Yes No
15. How often do you visit health facility with health complication(s)? None Daily
Weekly Monthly Quarterly Semi-annually Annually
Other (specify).....
16. How often do you send your dependant(s) to health facility with health complications?
None Daily Weekly Monthly Quarterly
Semi-annually Annually Other (specify).....
17. Are you directly responsible for the payment of the hospital bills? Yes No

Financial characteristics of respondent

18. Do you have relative (s)/friend (s) outside Ghana?: Yes No
If Yes, do you receive remittance from them? Yes No

19. Do you earn income?: Yes No
If Yes, please indicate monthly income: Less than GH¢ 200 GH¢ 201–400
GH¢ 401–600 GH¢ 601–800 GH¢ 801–1,000 GH¢ 1,001 and above
20. Do you save?: Yes No
If Yes, with which financial institution?: Commercial Bank (GCB, Barclays, ADB)
Savings and Loans (First Allied, Multicredit, Utrak) Rural Bank Credit Union
Mutual Fund Other (specify).....
21. Have you ever demanded loan from formal financial institution? Yes No
22. If **No**, what is/are reason (s) for not applying for loan? No need for loan
Unfavourable terms and conditions Not be able to repay Avoid seizure of properties in
case of default Other (please specify).
If **Yes**:
23. How many times have you applied for Loan? (from any financial institution)
1 2 3 4 or more
24. How much did you apply for?: GH¢ Less than GH¢ 500 GH¢ 501–1,000
GH¢ 1,001–5,000 GH¢ 5,001–10,000 Above GH¢ 10,000
25. Purpose of Loan: Finance my education Finance education of my dependants Farming
 Business (starting) Business (expansion) Debt Settlement
Vehicle Housing Other (specify).
26. How often did you repay your loan?: Daily Weekly Monthly
Other (specify).....
27. Have you defaulted in repayment before?: Yes No
If Yes, what was/were the reason (s)?: (Please tick as many as possible)
Decline in sales/profits Non supervision by the Bank Diversion of Funds
Loan used for household expenses (fees, feeding, utility bills, etc.)

Unfavourable repayment conditions (duration, interest rate, monthly instalment, etc.)
Untimely disbursement of loan (late loan approval) Collapse of Business/Firm
Other (specify).....
28. Please provide responses to the following statements based on your understanding:
- (a). When I borrow money from the formal financial institution, I will pay an interest in addition
to the principal amount. Yes No
- (b). When there is inflation, the value of my money reduces. Yes No
- (c). I can earn interest on my money when I save portion(s) of my income with a formal financial
institution. Yes No
- (d). I do financial planning for the future (For example, in order to successfully repay loan
received). Yes No

Thank you very much for your time



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