
Does gender affect loan default?

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Abstract: We examine the effects of gender on loan default in an emerging market context. Specifically, we investigate whether female borrowers are less risky to loan default than male counterparts. Using logit and 3,717 loan clients' dataset from a big financial institution in Sierra Leone over the period 2007 to 2014, we find that female is positively related to loan default but not statistically significant. This finding has implication on theory, practice and policy on loan default in emerging market context. This study's finding does not only contribute to an important but neglected area of research, but also practice and policy, due to the size, growth and impact of loan default in emerging markets.

Keywords: loan repayment; behavioural banking; emerging market; logistic regression; Sierra Leone.

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1 Introduction

Does gender affects loan default? World Bank (2007) suggests gender is one of the factors affecting loan repayment. Prior studies' finding on the gender-loan default nexus, however, is unclear. Lower loan default rate, for example, is associated with female loan officers and borrowers (see Beck et al., 2012). Others suggest lower loan default is a function of the female group, due to their cooperation, but not the individual (Anthony and Horne, 2003). Empirical studies on the gender-loan repayment nexus in emerging market context, where loan default impact is very high (Adusei and Appiah, 2011), remain scant. Accordingly, scholars are calling for more research on the extent to which gender and other demographic characteristics of customer's influence loan repayment.

This study attempts to contribute to this gap. Specifically, in the context of emerging markets, we examine whether gender is related to loan default, while controlling for marital status, loan frequency, loan type, and loan amount. Using a sample of 3,717 loan clients' dataset, consisting of 425 defaulters and 3,292 non-defaulters, drawn from a big financial institution in Sierra Leone, from 2007 to 2014, we find that loan default is positively and significantly related to loan amount, type and frequency but not marital status. Contrary to our expectation, gender is positively and insignificantly related to loan default.

Our contributions are threefold. First, we examine whether gender is related to loan default, in the context of Sierra Leone. To the best of our knowledge, there is no study on the gender-loan default nexus in the Sierra Leone context. In this respect, the findings of prior studies may not be applicable in Sierra Leone, due to sharp contrast in economic indicators. Here, Sierra Leone, with GDP per capital of \$1,651, is ranked in the top 14 poorest countries. From this point, second, we argue that our findings are relevant to regulators, boards and gender advocates in the banking industry. Understanding the factors that affect loan repayment in the industry can strengthen financial firms and regulatory bodies (such as Bank of Sierra Leone) to develop policies that can lead to effective and efficient management of loan repayment. In other words, the findings of the study can aid authorities of financial institutions to understand the gender's influence in non-repayment of loans. Finally, credit risk officers can use our findings as reference point in assessing loan applications in the context of emerging markets.

The rest of the paper proceeds as follows. Section 2 reviews literature. Section 3 present the method and the results are discussed in Section 4. Section 5 concludes.

2 Literature review

Gender is one of the major factors that determine the extent of payment of loans (World Bank, 2007), however empirical studies have not explored exhaustively on how gender affect loan or credit payment (Adusei and Appiah, 2011). The results on the few studies conducted are inconsistent and premature to conclude on the nexus between gender-loan defaults. This is because while others assert female as a high defaulters of loans, others postulate otherwise. Godquin's (2004) study, for example, asserts that there is no significant evidence to suggest that female borrowers perform better than male counterparts when it comes to loan repayment. Also, Bhatt and Tang (2002) and Anthony and Horne (2003) argue that there is no evidence that female loan clients are better than male loan clients in terms of payment of micro loans. Similarly, Adusei and Appiah (2011) conclude that female borrowers are not better than their male counterparts.

Contrary to the above empirical studies reveal that females are less likely to default loan repayment compare to male counterparts (e.g., Hulme, 1991; Kevane and Bruce, 2001; Khandker et al., 1995; Cheston and Kuhn, 2002; D'Espallier et al., 2009). For this reason, females are often targeted by financial institutions when offering loans (see Dyar et al., 2006). In all, there is near consensus in the literature that the percentages of males who have repayment problems are more than that of the females. The reasons why women are superior to men when it comes to loan repayment are not far-fetched (see Todd, 1996; Goetz and Gupta, 1996; Aghion and Morduch, 2000; Morduch and Aghion, 2005; Garikipati, 2008). For instance, scholars suggest females compared to their male counterparts, are not only sensitive to peer-pressure and interventions of loan managers (Goetz and Gupta, 1996), but also make prudent investment decisions (Todd, 1996; Aghion and Morduch, 2000). Likewise, financial institutions prefer to lend credit to females (Morduch and Aghion, 2005), for three main reasons. First, females are less likely to misappropriate loans. Second, females due to reputational risk are also less likely to default on loan repayment, and finally, they are arguably more responsible to pay loans when they are due (see Garikipati, 2008). In sum, female clients are more conservative when it comes to their investment choices and therefore do not take high level of risks that could affect their loan repayments. These reasons in part explain why female borrowers are good clients when it comes to loan repayment over the last decade (World Bank, 2007). Empirical studies, however, is not conclusive on this point. Our study adds to literature on whether or not females are less risky to loan default than males in an emerging market, Sierra Leone where there is no prior research.

3 Method

This study uses secondary data of records of 3,717 loan clients from financial institutions in Sierra Leone, over a period of eight years (2007–2014). Data on gender, marital status, loan type, loan frequency and loan amount are used in our model for data analysis. We use binary logistic regression to examine how gender and other related variables influence loan repayment rate among loan clients in Sierra Leone. Repayment rate is operationalised through two different measures: portfolio-at risk and write-offs. This study employs portfolio-at-risk as the dependent variable. Portfolio-at-risk represents the percentage of loans that are overdue at least 30 days. It is a dummy variable, loan

overdue for at least 30 days is classify as default (1), whilst client who pay loan on time is classify as not default (0). The logistic regression model is:

$$\text{Loan default}_{it} = \beta_0 + \beta_1 \text{Gender}_{it} + \beta_2 \text{Marital status}_{it} + \beta_3 \text{Frequency of loan} \\ + \beta_4 \text{Type of loan}_{it} + \beta_5 \text{Loan amount}_{it} + \varepsilon_{it} \quad (1)$$

where

Loan default is clients' loan default (1), non-default (0)

Gender is female borrower (1), otherwise (0)

Marital status is marital status; married (1), otherwise (0)

Frequency of loan is the number of times clients receive loan facility

Type of loan is individual loan (1), otherwise (0)

Loan amount is equals the logarithm of loan amount.

4 Results

4.1 Descriptive and testing of assumptions

The descriptive statistics and frequency of loan receipts of the data used are presented in Tables 1 and 2, respectively. The result shows that 2,690 representing 72.4% are males while 1,027 representing 27.6% are females. For marital status, majority of 91.2% have married but not 8.8%. Also, 11.4% of the clients have defaulted loan. On type of loan, 85.8% and 14.2% of the clients took salary and individual loans, respectively; implying that salary loan is dominant in our sample. Interestingly, the result in Table 2 shows that majority of the clients (37.8%) have received credit facility just once, while 0.3% of the respondents have applied and received credit eight times.

Table 1 Demographic characteristics

<i>Variable</i>	<i>Classification</i>	<i>Frequency</i>	<i>Percentages</i>
Loan default	Defaulters	425	11.4
	Non-defaulters	3,292	88.6
Gender	Male	2,690	72.4
	Female	1,027	27.6
Marital status	Married	3,390	91.2
	Single	327	8.8
Type of loan	Salary loan	3,191	85.8
	Individual loan	526	14.2

The multicollinearity of the independent variables is tested using of variance inflation factor (VIF) and tolerance statistics. Table 3 displays the results of the test of multicollinearity. It is observed that all the variables have tolerance values far greater than 0.1, indicating that there is no problem of multicollinearity (see Pallant, 2011).

Table 2 Frequency of loan receipt

<i>Number of times</i>	<i>Frequency</i>	<i>Percentage</i>
Once	1,405	37.8
Twice	911	24.5
Three times	641	17.2
Four times	392	10.5
Five times	225	6.1
Six times	94	2.5
Seven times	37	1.0
Eight times	12	0.3
Total	3,717	100

Table 3 Test of multicollinearity

<i>Independent variable</i>	<i>Tolerance</i>	<i>VIF</i>
Gender	0.922	1.037
Marital status	0.946	1.011
Frequency of loan	0.923	1.037
Type of loan	0.914	1.046
Loan amount	0.925	1.034

4.2 *Logistic results and discussion*

We use omnibus tests of model coefficients and Hosmer-Lemeshow to test the overall performance of model. The result on omnibus tests of model coefficients shows a chi-square value of 330.423 with five degrees significant at 1% ($p = 0.000$) (see Table 4), implying that the relationship between the combination of the independent variables and the dependent variable is verified and significant. Similarly, result of the Hosmer-Lemeshow goodness-of-fit test registers chi-square value of 12.470 with a significant level of 0.310. Thus, the variables used support the gender-loan default model estimation.¹ Our model, with 41.8% of pseudo Cox and Snell R-squared, registers 52.2% for Nagelkerke R-squared, suggesting that our do not only fit well but also the independent variables have good predictor power.

Table 4 Omnibus tests of model coefficients

		<i>Chi-square</i>	<i>Df</i>	<i>Sig.</i>
Step 1	Step	330.423	5	.000
	Block	330.423	5	.000
	Model	330.423	5	.000

Table 5 presents results of the study. Wald test is employed to examine the contribution of each predictor variable in the model, whilst the odd ratios represent the change in odds of being in one of the categories of outcome when the value of a predictor increases by one unit (see Tabachnick and Fidell, 2007). Our result shows that the type of loan has significant effect on loan default. This means that, an increase in individual loan

increases the likelihood of default ($\beta = 1.178$; p -value = 0.000). Frequency of loan and loan amount are also statistically significant with p -values less than 0.01. Gender of the clients is positive ($\beta = 0.162$; p -value = 0.215), but has no significant impact on the likelihood of default by loan clients. The implication of this finding is that, females borrowers are not better clients than male borrowers when it comes to loan repayment. Our finding is in agreement with the findings of Adusei and Appiah (2011), Bhatt and Tang (2002), Anthony and Horne (2003) and Godquin (2004) that found no relationship between gender and loan repayment.

Table 5 Logistic results

<i>Variables</i>	<i>Beta</i>	<i>Standard error</i>	<i>Wald</i>	<i>Df</i>	<i>Sig (P-value)</i>	<i>Odd ratio</i>
Gender	0.162	0.130	1.537	1	0.215	1.176
Marital status	0.133	0.222	0.361	1	0.548	1.143
Type of loan	1.178	0.138	74.513	1	0.000	3.248
Frequency of loan	0.421	0.035	148.430	1	0.000	1.523
Amount of loan	0.804	0.127	40.431	1	0.000	2.235
Constant	-8.822	0.823	114.921	1	0.000	0.000

Again, marital status does not influence the likelihood of default ($\beta = -0.133$; p -value = 0.222). This implies a person's marital status is not related to the likelihood of loan default. The amount of loan received by the loan customer is positively related to default ($\beta = 0.804$; p -value = 0.000). The implication of this result is that the bigger the amount of loan borrowed, the more likely the borrower can default. Finally, our study finds that the number of times a borrower receives loan is significantly associated with default ($\beta = 0.421$; p -value = 0.000). This suggests the more access a client gets loan facility, the higher the likelihood of default.

5 Concluding remarks

The question of the relationship between gender and loan repayment have not been explored exhaustively. Given the importance of loan repayment to the health of financial institutions, the focus of the study was to examine the nexus of gender-loan repayment of clients in Sierra Leone. We employ logistic regression model to analyse 3,717 clients from financial institutions in Sierra Leone. The parameter estimates for the model were evaluated at 5% significant level.

Overall, there is a positive but statistically insignificant relationship between gender (that is proxy as female) and loan repayment of loan clients in Sierra Leone. We thus conclude that female is not a significant predictor of loan default among credit clients in Sierra Leone. The policy implication of the findings is that finance institutions should focus on tightening their monitoring regime instead of depending on gender to minimise loan default.

This study, however, has several limitations. First, the variables used are not exhaustive. For instance, the researcher did not obtain data regarding the educational level and age of clients. Accordingly, the study recommends that these variables among others should be tested in future studies to ascertain how they affect loan default. Finally,

the current study mostly focused on socio-demographic factors that influence loan default in the financial sector using logistic regression analysis. Future studies should also focus on internal and macro-economic factors that can also affect credit risk or loan default in the financial sector in emerging markets. The final word on the gender-loan repayment is not yet said, future research is welcomed.

References

- Adusei, M. and Appiah, S. (2011) 'The gender side of lending: are females better borrowers?', *Economic and Finance Review*, Vol. 1, No. 3, pp.46–50.
- Aghion, D.B.A. and Morduch, J. (2000) 'Microfinance beyond group lending', *Economics of Transitions*, Vol. 8, No. 2, pp.401–420.
- Anthony, D. and Horne, C. (2003) 'Gender and cooperation: explaining loan repayment in micro-credit groups', *Social Psychology Quarterly*, Vol. 3, No. 4, pp.293–302.
- Beck, T., Behr, P. and Guettler, A. (2012) 'Gender and banking: Are women better loan officers?', *Review of Finance*, Vol. 17, No. 4, pp.1279–1321.
- Bhatt, N. and Tang, S.Y. (2002) 'Determinants of repayment in microcredit: evidence from programs in the United States', *International Journal of Urban and Regional Research*, Vol. 26, No. 2, pp.211–218.
- Cheston, S. and Kuhn, L. (2002) 'Empowering women through microfinance', in Daley-Harris S. (Ed.): *Pathways out of Poverty: Innovations in Microfinance for the Poorest Families*, pp.167–228, Kumarian Press, Bloomfield Connecticut.
- D'Espallier, B. Guerin, I. and Mersland, R. (2009) *Women and Repayment in Microfinance*, pp.1–37, Working Paper Series No. 4, Rural Microfinance and Employment Project, Marseille, France.
- Dyar, C., Harduar, P., Koenig, C. and Reyes, G. (2006) 'Microfinance and gender inequality in China', a paper prepared for the *International Economic Development Program*, Ford School of Public Policy, University of Michigan, USA.
- Garikipati, S. (2008) 'The impact of lending to women on household vulnerability and women's empowerment: evidence from India', *World Development*, Vol. 36, No. 12, pp.2620–2642.
- Godquin, M. (2004) 'Microfinance repayment performance in Bangladesh: how to improve the allocation of loans by MFIs', *World Development*, Vol. 32, No. 11, pp.1909–1926.
- Goetz A. and Gupta, R.S. (1996) 'Who takes the credit? Gender, power and control over loan use in rural credit programs in Bangladesh', *World Development*, Vol. 24, No. 1, pp.45–63.
- Hulme, D. (1991) 'The Malawi Mudzi fund: daughter of Grameen', *Journal of International Development*, Vol. 3, No. 3, pp.427–431.
- Kevane, M. and Bruce, W. (2001) 'Social norms and the time allocation of women's labour in Burkina Faso', *Review of Development Economics*, Vol. 5, No. 4, pp.119–129.
- Khandker, S.R., Halily, B.K. and Han, Z.K. (1995) *Performance and Sustainability*, Vol. 306, No. 24, pp.178–209, World Bank discussion paper, Washington DC.
- Morduch, J. and Aghion, B.A. (2005) *The Economics of Micro Finance*, Themti Press Cambridge, England.
- Pallant, J. (2011) *SPSS Survival Manual; A Step by Step Guide to Data Analysis using SPSS*, 4th ed., Everbest, China.
- Tabachnick, B.G. and Fidell, L.S. (2007) *Using Multivariate Statistics*, 5th ed., Pearson Education, Boston.
- Todd, H. (1996) *Women at the Centre: Grameen Bank Borrowers after One Decade*, Dhaka University Press Limited, Dhaka.
- World Bank (2007) *Finance for All? Policies and Pitfalls in Expanding Access*, Vol. 3, No. 13, pp.147–198, A World Bank Policy Research Report, Washington DC.

Notes

- 1 A high significant value of omnibus tests of model coefficients should be less than 0.05, whereas a value larger than 0.05 requires for Hosmer-Lemeshow goodness-of-fit test (Pallant, 2011).