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Gender-Based Statistical Assessment of Loan Repayment Patterns: Evidence from Guaranty Trust Bank, Maiduguri

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Abstract

Loan repayment defaults pose significant risks to banks, the economy, and customers. This study investigates gender differences in loan repayment defaults, focusing on Guaranty Trust Bank, Maiduguri, Borno State, Nigeria. Specifically, it examines the prevalence of defaults between male and female borrowers and evaluates trends over the period 2021–2023. Data were analyzed using descriptive statistics (bar charts) and inferential statistics (t-tests) with SPSS version 21, after testing the assumptions of normality and homoscedasticity. The results revealed a statistically significant difference between male and female loan defaulters, with male customers recording higher default rates. Moreover, an upward trend in defaults was observed across the three years. The study recommends that commercial banks strengthen loan recovery strategies, particularly in sectors with high default risks, and enforce stricter guarantor requirements to ensure compliance with repayment obligations.

Keywords

Loan Repayment Default; Gender Analysis; Guaranty Trust Bank; Banking Sector; Nigeria

Introduction

The concept of debt implies something that is due. It emerges from a financing option in the business world, and influences a company's business strategies significantly. There are various kinds of debts and time limits for payment. There are short-term debts and long-term debts. The short-term debts are those debts which have to be repaid within a year of procuring them. The current liabilities of various business entities are largely short-term debts. The current liabilities creditors and suppliers within a short span have to be paid to the of time

The failure by customers to make prompt and timely repayment of principal and payment of interest on a debt security or comply with the provisions of a bond indenture indicates a default According to Agada et al (2018) default is the failure to live up to the terms of a contract. Default is a very serious matter and may entitle the lender or bondholder to take possession of debtor’s assets in order to recover the amount lost in principal and interest payments. Default

also has a negative impact on a debtor's creditworthiness in the future. Generally, default is used to indicate the inability of a borrower to pay the interest or principal on a debt when it is due.

Cooperative societies have from the days of old to the present time have consistently encouraged development across the globe especially in emerging economies providing its members with the economic aids in the form of loan in the bid to cause improved standards and business prosperity for its members (Ajayi, Dada & Folorunso, 2021) posits that cooperative society describes a set of people with the same mind sets and drive, whose passion is to cause the availability of the financial provisions that their members would find helpful. Contemporary researchers posited that it is an independent set of individuals who willingly joined force with other persons with similar interest to reach ordinary economic and social benefits through an organization jointly owned and managed democratically by a set organized member (Oluwakayode, 2020).

The usual failure of banks with regard to provision of loan to individuals either with or without adequate collateral security necessitated the need for social enterprise that ensures complete support for individuals with urgent economic and social needs; the basic intention was to amass economic resources of members and redistribute appropriately to members with extreme needs improving access of needy individuals to socioeconomic resources especially financial resources (Ajayi et al., 2021). Notwithstanding these challenges and the adverse effect that it exerts on the operational performance and consequent prosperity of these organizations, the growth of cooperative society ‘s remains measured with savings mobilization of the cooperative society (Abdullahi, 2018). Although, the issues of loan default are not solely caused by borrowers, lenders of financial resources play a crucial role in indulging borrowers as a result of not keeping proper records of loan disbursement and repayments. Bad loan management system has contributed significantly to the default issues thus making loan default unending with formal and most importantly informal financial institution (Garandi and Hassan, 2020).

Nigeria has remained a low-income country where a good number of its citizens feed on less than US$1 per day with the generality of the populace living below the poverty line. In fact, formal financial service providers have habitually shown preference to large and medium size businesses to the neglect of the teeming population of artisans, market men and women and small business operators. This has necessitated the need for the creation of cooperative societies that targets individuals with the same peculiarities and providing them with loans, which has become a viable option for aforementioned informal sector operators and salary earners (Ajayi et al., 2021). The causal factor has been attributed to several issues which have been affirmed severally in literature; managerial capacity of most cooperative societies remains a weakness that has marred its operations, this is evident in the poor loan processing and collection procedure that has contributed critically to loan default of cooperative members. Again, members in their bid to fulfil other commitments different from the basic essence of obtaining the loan tend to use the loan obtained for another purpose which often include business opportunities that does not guarantee the realization of the principal amount invested or return on investment at least in the short term thus making default in repayment of the loan inevitable (Oluwakayode, et al, 2020). Similarly, cooperative society indulge in multiple borrowing, that is, providing inadequate loan size to members giving less consideration to their prospect of paying back; consequently, this shoots up the number of loan defaulters which looking forward constrain the organization from achieving its basic objectives effectively which ultimately threatening its growth and survival.

Literature Review

The stability of the banking industry depends largely on the ability of banks to collect their loans effectively and deficiently. Loan defaults come with dire consequences for banks, the economy and the defaulting customers. For the banks there is a positive correlation between the constructs of loan default rate and the profitability of banks (Maduka and Onwuka, 2013). Banks suffer losses due to loan defaults and this impairs their ability to create further credits. Inability to create further credit wills affects their financial intermediation role and exposes banks to risk of failure. There is no part of the world that is completely free from banking crisis. It is a global problem. Several factors have been posited to have been the triggers of loan defaults.

(Kassegn and Endris, 2020) also conducted research on the determinants of loan default and delinquency in rural credit programs in Ghana using a logistic regression. Their study revealed that, a person who is married is less likely to default than one who is separated or divorced. A male is more likely to default than a female. Holding everything else constant, the larger the loan, the less likely a person is to default. Borrowers with an elementary or secondary education are more likely to default compared to those with no formal schooling. (Kassegn and Endris, 2020) used linear regression model to analyze determinants of loan repayment in smallholder agriculture in the southern highlands of Tanzania. The study showed that education, attitude towards repayment, farm income and off-farm income positively affect loan repayment with farm income being significant, while age, household expenditure and household size have negative influence on loan repayment performance with household expenditure being significant.

Research conducted by (Zohair, 2023) on the determinants of microcredit repayment in Malaysia the case of Agro bank by taking a sample of 630 and employing profit and logistic models indicated that the factors that influence loan repayment are gender of the borrower, type of business activity, amount of loan and training. According to their result, the probability of loan default is higher if the borrower is a male, if the borrower is engaged in the production activity, if the amount of loan is higher and if the borrower did not take any training. Similarly, (Zohair, 2023) studied the determinants of small holder loan repayment performance evidence from Nigerian micro-finance system and found out that the proportion of borrowers with secondary education, number of times borrowers were visited by loan officials and the loan size were the major factors that cause the loan default by the borrower

(Ade, 1999) studied determinants of loan repayment in Nigeria by employing multiple regression models based on 300 samples beneficiaries. The study revealed that poor loan repayment performance was as a result of late release of loan funds, cumbersome loan application and disbursement procedures and emphasis on political considerations in loan approvals

Methodology

This study utilizes secondary data extracted from the commercial bank specifically Guaranty Trust Bank (GTB) Maiduguri. With the secondary data collected, loan defaulters by men and women for the years 2021, 2022 and 2023 were computed. The secondary source used in conducting this research was based extensively on the record of the bank various analytical tools and soft wares such as bar charts, tables, and Statistical Package for Social Science (SPSS) were used in analyzing data for this study. Data collected will be analyzed descriptively using multiple bar charts and inferentially using independent two sample t-test. These enable the researcher to clearly represent true data characteristics and findings with a great deal of accuracy. Interpretation and analysis of data will also be used to describe items in tables used for this study.

Testing Difference between Two Means

If samples of sizes of n_1 and n_2 are drawn from two independent populations whose variances are$\sigma_1^2 and\ \sigma_2^2$known, this study will test whether significant differences exist in the two population means, i.e.

H_0: $\mu_1 = \mu_2$ vs $H_1: \mu_1 \neq \mu_2$, $H_1: \mu_1 > \mu_2\ or H_1: \mu_1 < \mu_2$,

$$Z = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}} \sim N(0,1)$$

Again, this more realistic situation than the case discussed earlier. If there exist two independent samples, in this case,

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{s_p^2\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}} \sim t_{n_1+n_2-2}$$

$$s_p^2 = \frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}$$

$$s_1^2 = \sum_{i=1}^{n} \frac{(x_{1i} - \bar{x}_1)^2}{n_1}$$

$$s_2^2 = \sum_{i=1}^{n} \frac{(x_{2i} - \bar{x}_2)^2}{n_2}$$

$$\bar{x}_1 = \frac{1}{n_1} \sum_{i=1}^{n} x_{ii}$$

$$\bar{x}_2 = \frac{1}{n_2} \sum_{i=1}^{n} x_{2i}$$

Degree of freedom (DF) = $n_1 + n_2 - 2$

Decision rule: Reject H_o, if$t > t_{\propto, n_1} + n_2 - 2$, otherwise do not reject it. In other word, Reject H_op<α

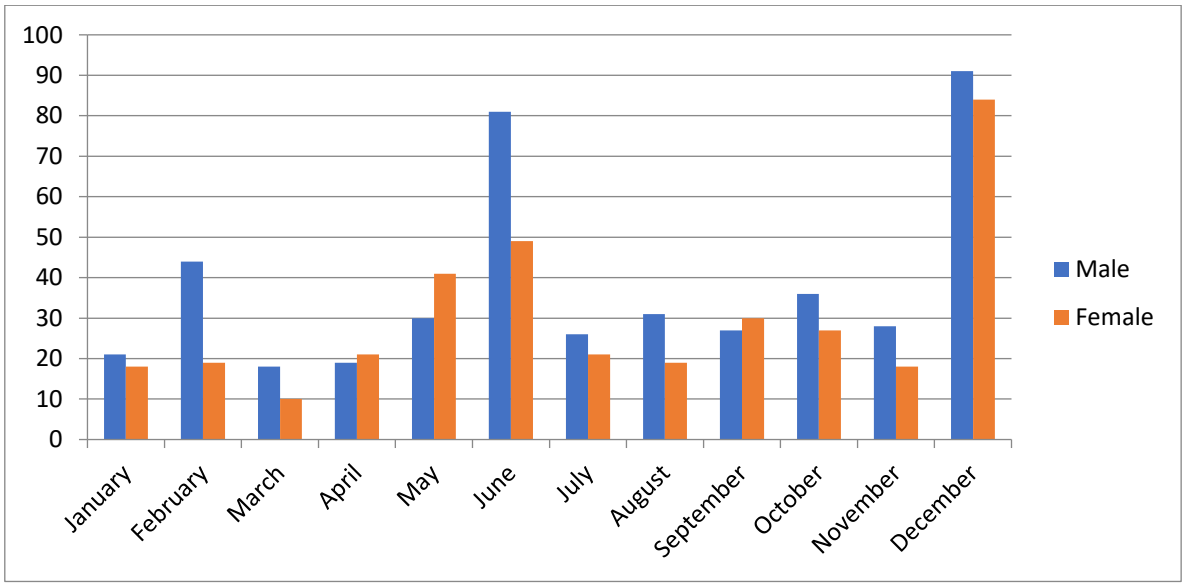

Fig. 1: Bar Chart Showing Gender Distribution of the Loan Defaulters in Year 2021

Figure 1 gives the gender distribution of the loan defaulters. It is of interest to note that with respect to the data distribution, the bank recorded that of the number of defaulters in year 2021, Men are more default in paying back the loan than women from January to December of the year.

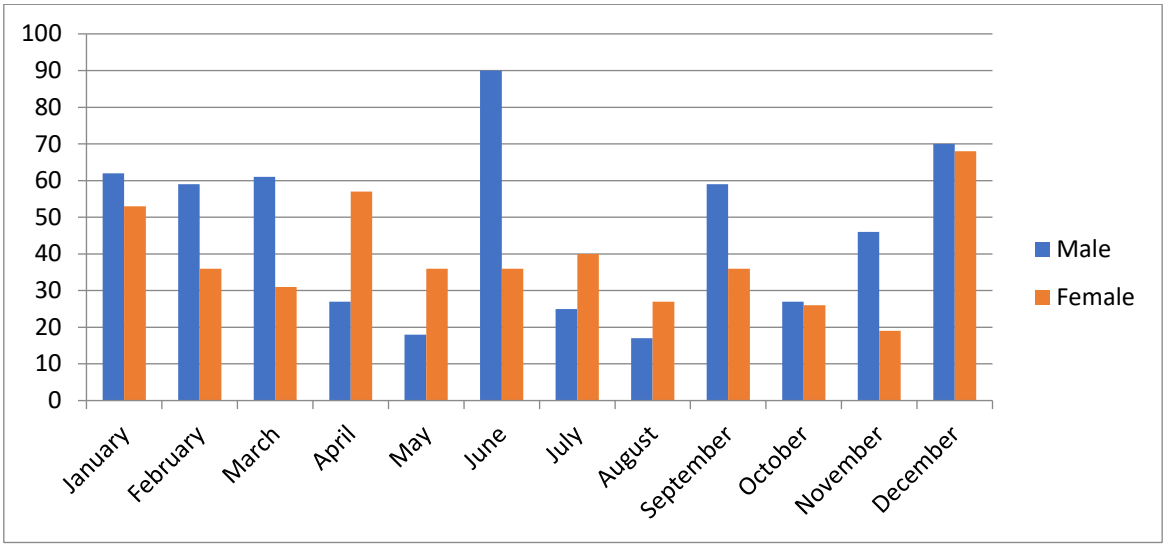

Fig. 2: Bar Chart Showing Gender Distribution of the Loan Defaulters in Year 2022

The distribution of the loan defaulters by their marital status is depicted by figure 4.1b. It is worth noting that, in terms of the distribution, the data on loan defaulters show male defaulters are more than female defaulters in January, February, March, June, September, October, November and December while the female defaulters are more in the month of April, May, July and August in year 2022.

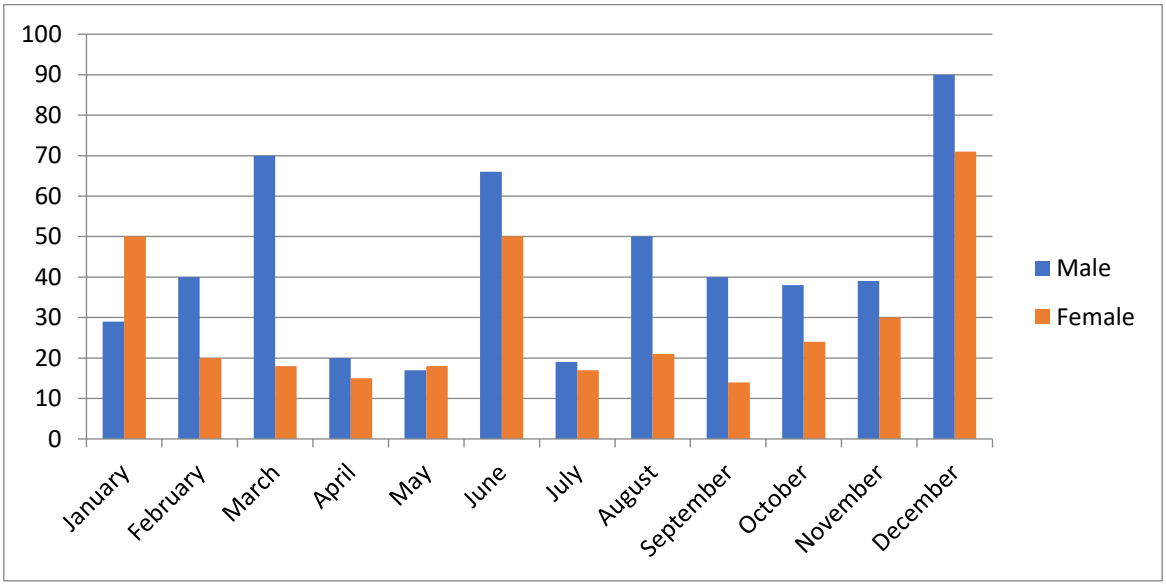

Fig. 3: Bar Chart Showing Gender Distribution of the Loan Defaulters in Year 2023

Figure 3 presents the gender distribution of the loan defaulters. It is of interest to note that with respect to the data distribution, the bank recorded that of the number of defaulters in year 2023, Men are more default in paying back the loan than women from month to month of the year except in January where female defaulters is much more

Test of Normality in the Data

Sometimes the data distribution is "skewed" by the presence of a few large outliers. Since parameter estimation is based on the minimization of squared error, a few extreme observations can exert a disproportionate influence on parameter estimates. The best test for normally distributed is a normal probability plot or normal quartile plot of the residuals. These are plots of the fractals of error distribution versus the fractals of a normal distribution having the same mean and variance. If the distribution is normal, the points on such a plot should fall close to the diagonal reference line. A bow-shaped pattern of deviations from the diagonal indicates that the residuals have excessive skewness (i.e., they are not symmetrically distributed, with too many large errors in one direction). An S-shaped pattern of deviations indicates that the data have excessive kurtosis--i.e., there are either too many or two few large errors in

both directions. Sometimes the problem is revealed to be that there are a few data points on one or both ends that deviate significantly from the reference line ("outliers"), in which case they should get close attention. The QQ plot is used here to visually check the normality assumption. The normal probability plot of residuals should approximately follow a straight line. In our example, all the points fall approximately along this reference line, so we can assume normality.

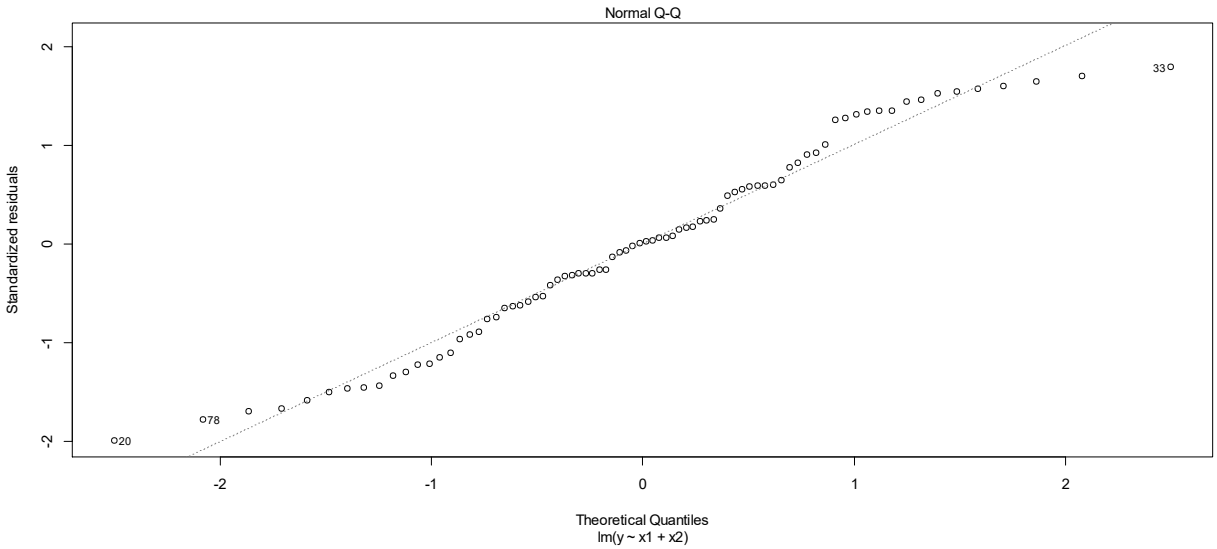

Fig. 4: Normality of Residual Plot

The normal probability plot should approximately follow a straight line. In our fig. 4 above, all the points fall approximately along this reference line, so we can assume normality.

Test of Normality (Shapiro-Wilk Normality Test)

There are varieties of normality test but the common Shapiro-Wilk Normality Test is used in this study. Calculation of confidence intervals and various significance tests for coefficients are all based on the assumptions of normally distributed errors. If the error distribution is significantly non-normal, confidence intervals may be too wide or too narrow.

Table 1: Normality Test

Year	Gender	Test Statistic (W)	P-Value (p)	Null Hypothesis (H_0)	Decision
2021	Male	0.97052	0.00612	There is normality	Accept H_0 (data is normal)
	Female	1.7089	0.00126	There is normality	Accept H_0 (data is normal)
2022	Male	0.97052	0.00613	There is normality	Accept H_0 (data is normal)
	Female	1.7089	0.00126	There is normality	Accept H_0 (data is normal)
2023	Male	1.44728	0.0036	There is normality	Accept H_0 (data is normal)
	Female	1.18566	0.0085	There is normality	Accept H_0 (data is normal)

The analysis in the table 1 shows that the data values are normal because the p-value is less than 5% level of significance and therefore accept Ho. Hence, the data is normal.

Homoscedasticity Test

A further test was carried out using non-homoscedasticity test to determine whether the assumption of homoscedasticity holds in the data. The table 2 below shows the result of the test.

Table 2: Homoscedasticity Assumption Test Using NCV Statistic

Year	Gender	Test Statistic (χ^2)	P-Value (p)	Null Hypothesis (H_0)	Decision
2021	Male	1.5243	0.035	There is homoscedasticity	Accept H_0
	Female	1.8329	0.041	There is Homoscedasticity	Accept H_0
2022	Male	2.1415	0.047	There is homoscedasticity	Accept H_0
	Female	1.4501	0.053	There is homoscedasticity	Accept H_0
2023	Male	2.7587	0.059	There is homoscedasticity	Accept H_0
	Female	2.0673	0.065	There is homoscedasticity	Accept H_0

The analysis in the table 2 shows that there homoscedasticity because the p-value is greater than 5% level of significance and therefore accept Ho for all categories

Test of Significant t-test between Male and Female Gender in Loan Defaulting

Having carried out the assumptions of t-test and it is being satisfied. The test of significant difference was tested among the gender of the defaulters from year to year using two sample independent t-tests and the result is displayed in the table 3.

Table 3: Independent t-Test for the Data

Periods	Data Assumptions	t	df	Sig. (p-value)	Mean Difference	Std. Error Difference	95% C. I. of the Difference	
							Lower	Upper
Year2021	Equal variances assumed	29.878	22.000	0.0389	7.917	9.013	-10.775	26.608
	Equal variances not assumed	29.878	21.444	0.0389	7.917	9.013	-10.803	26.637
Year2022	Equal variances assumed	31.010	22.000	0.0324	8.000	7.923	-8.432	24.432
	Equal variances not assumed	31.010	17.947	0.0326	8.000	7.923	-8.649	24.649
Year2023	Equal variances assumed	31.699	22.000	0.0103	14.167	8.337	-3.124	31.457
	Equal variances not assumed	31.699	21.070	0.0104	14.167	8.337	-3.168	31.502

The p-values of the t-test are less than 5% level of significance and the values of their calculated t's are outside the confidence interval for all years. Hence we reject the null hypothesis which says that there is no significant difference and conclude that there is significant difference in the male and female defaulters

Conclusion

The findings from the above preliminary investigations and diagnostics of assumptions or deviation it indicates that the data distribution for the loan is normal and homoscedasticity. Having carried out the assumptions of t-test, it was concluded that there is significant difference in the male and female loan repayments defaulters in Guaranty trust bank of Maiduguri. It is also of interest to note that with respect to the data distribution, the bank recorded increase in the number of loan repayments defaulters from year 2021 t0 2023 where male gender record more defaulters as compared

with the female. This study recommends the use of guarantor to all loan customers and monthly check list of defaulters and proper follow up for immediate repayment.

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