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Determinants of Bank Default in the Non-Agricultural Sector in the District of Hooghly and Bankura

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ABSTRACT

The study attempts to investigate the determinants of bank bank default in repayment of loan of non-agricultural sector in the district of Hooghly and Bankura in West Bengal. For this purpose, we have collected the primary data from 128 sample borrowers who have taken loans from Commercials and Regional Rural bank. We employ the probit and logit models to identify the main determinants that influence default of the borrowers. This study shows that the involuntary default influenced by the education, ability to repay loans, proportion of investment financed by loans, rate of increase in per capita family expenditure, higher dependency ratio of the family, unproductive use of loans, entrepreneurship is run by male and or female.

KEY WORDS

Ability to repay, Loan Repayment, Wilful Defaulter, Investment, Overdue Loan

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I INTRODUCTION

We know bank loans are taken with the purpose of investment. If the loans are utilized for productive purpose, then their income will be generated and it is expected that the borrowers will be able to repay the loans to the banks and thus reduces the bank default. If the process goes on in this manner the wheel of development will smoothly run. But, in the rural areas, we see that many institutional credit sectors are seriously breaking down due to growing number of bank defaulters or loan overdue. As a result, the banking facilities cannot be spread in rural areas. So the bank default is the vital factor to build up the social banking. Now here we find out the presence and causes of defaulter in the non-agricultural sector.

There are three important factors for default of co-operative numbers namely- Environmental, Financial and Personal. Among these environmental factors is the most important factor[1]. Political factors play a significant role in a sovereign's decision to default [2, 3] indicates that a women borrower has lesser probability to default in comparison to a male borrower. The one –third of repaying capacity is based on the realized value of produce and total income [4]. There is a positive correlation between increase in borrower's net income and the level of repayment of loans [5]. Default rate will be reduced in agricultural sector due to the adoption of new technology, greater diversification in production and inclusion of commercial crops and animal husbandry programme in the production plans [6]. The overdue were found highest in the case of medium farmers follower by the small and large farmers [7]. There is no association between land owned, amount borrowed, level of literacy of the borrowers. But there is a strong association between repayment of loans and irrigation [8]. But they cannot examine the relationship between the farm size and probability of default. In this paper we examine the different causes of bank default and also find out the relation of probability of bank default with firm size that indicates the presence of wilful defaulter.

The paper is organized as follows. Section II presents the objective of the study. Section III discusses the data and methodology. Section IV and V consider the model specification and the results and discussion respectively. Section VI presents the suggestion and conclusion.

II OBJECTIVE OF THE STUDY

- It attempts to investigate the determinants of bank default in repayment of loan in the non-agricultural sector of the district of Hooghly and Bankura in West Bengal.
- It also looks in to the presence of wilful defaulter.

III DATA AND METHODOLOGY

The study has been conducted in the district of Hooghly and Bankura in the state of West Bengal. There are 19 districts in the state of West Bengal. We have chosen two districts, namely, Hooghly and Bankura, simply purposively. The rational behind the choice of these districts lies in the consideration of economic condition. Contrasted with Bankura, the district of Hooghly is economically more advanced and prosperous in respect of agriculture, industry and infrastructural aspects of development.

We have collected the primary data for the year 2009– 2010 from one hundred twenty-eight sample borrowers. We have selected the districts purposively. From each district, one subdivision was randomly selected. These two subdivisions are Arambagh from the district of Hooghly and Visnupur from the district of Bankura. From each subdivision two blocks were randomly selected. We have chosen Khanakul – 1 and Pursura as two blocks from Arambagh subdivision of Hooghly. From each of these two blocks, we have chosen nine borrowers randomly. Again we have chosen Indus and Jaypur as two blocks from Visnupur subdivision of Bankura. From each of these two blocks, we have chosen forty six borrowers randomly. Thus, a sample of 128 borrowers was selected for the study.

Primary data were collected for non-agricultural year 2009-2010 from 128 sample borrowers who took loans from the formal sector such as commercial, regional rural and co-operative bank branches operating in the two blocks through personal interview on the basis of a pre-structured questionnaire.

IV MODEL SPECIFICATION

Probability of bank default is influenced by a number of factors. We have considered it for all households, households for Hooghly district and households for Bankura district. The analytical model of bank default has been considered as follows.

$$BANKDEFAULT = \beta_0 + \beta_1\ AGE + \beta_2\ EDUCATION + \beta_3\ ARTPLOANS + \beta_4\ PINFLOAN + \beta_5\ WPR + \beta_6\ RIPCFMEXP + \beta_7\ DINTRATE + \beta_8\ CASTE + \beta_9\ MLOANSAUT + \beta_{10}\ NALOANUSE + \beta_{11}\ ENTRPRBMF + error \qquad (1)$$

Here the dependent binary variable is bank default (BANKDEFAULT) and the independent variables are given below.

- (i) Age (Age)
- (ii) Educational qualification (EDUCATION)
- (iii) Ability to repay loans (ARTPLOANS)
- (iv) Proportion of investment financed by loans (PINFLOAN).
- (v) Worker population ratio (WPR)
- (vi) Rate of increase in per capita family expenditure (RIPCFMEXP)
- (vii) Difference in the interest rates (DINTRATE)
- (viii) Caste (CASTE)
- (ix) Membership of the governing body of the loan sanctioning authority (MLOANSAUT)
- (x) The fact that the loan is used for the productive or non-productive purpose (NALOANUSE)
- (xi) Entrepreneurship is run by male or female (ENTRPRBMF)

Here logit analysis has been used as the statistical tool since the dependent variable, namely, the borrower is bank default or not. The dependent variable taking two values 0 and 1 and hence dichotomous. Its unitary value implies the positive response and the zero value the negative response.

V. RESULTS AND DISCUSSION

In this section we are going to provide with the empirical results on the probability of bank default loans in the non-agricultural sector in the district of Hooghly and Bankura. Refer to the table – 1, 2 and 3 below.

Consider first the model of all borrowers. Refer to table 1, we consider the goodness of fit of the fitted regression line to a set of collected data. The coefficient of determination R-squared is a measure that tells how well the sample regression line fits the data. Refer to table 1 the empirical value of R-squared statistics is 0.83. This means that about 83% of the variation in the response variable is explained by the explanatory variables. In the case for the model of borrowers of Hooghly district we see that the empirical value of R-squared statistics is 0.86. Again, refer to the table 2 where the empirical

results for borrowers of Bankura district are presented. In this case the value of R squared is 0.84. This implies that the sample regression line fits the data very well.

First. Age has got no statistically significant effect on the probability of bank default in the districts of Hooghly and Bankura combined together and in the individual districts of Hooghly and Bankura. Second, the coefficient of education is negative and statistically significant. This implies that education leads to a fall in the probability of bank default in the districts of Hooghly and Bankura combined together and in the individual districts of Hooghly and Bankura. Third, we consider an explanatory variable is ability to repay loans. Here we have identified those borrowers as having ability to repay loans to the banks whose income has increased at least by 10% or more prior to the intake of bank loans. But why do we take10% increase in the level of income as the criterion of the ability to repay loans to the banks? The reason is very clear. Let the rate of interest of the financial institution is approximately 10% for the borrower of loans. In 2009-2010, the rate of interest of regional banks where the borrowers have taken their loans was around 10%. Hence, if the borrower can earn a return of 10% by investing the borrowed amount, then it will be possible for them to repay the loans in time. Now it is a dichotomous one taking two values namely 1 if there is an increase of 10% or more growth rate of income and 0 if there is an increase of below 10%. Here with the increase in the ability to repay loans we find that the probability of bank default in the districts of Hooghly and Bankura combined together and in the individual districts of Hooghly and Bankura declines.

Fourth, the proportion of investment financed by loans affect the probability of bank default inversely. The coefficient of the proportion of investment financed by loans (PINFLOAN) is negative and statistically significant at 1% level of significance in the districts of Hooghly and Bankura combined together and in the individual districts of Hooghly and Bankura. Thus, for both the districts the hypothesis that proportion of investment financed by loans affects indirectly the probability of bank default to repay loans is accepted. The probability that the households are bank default increases marginally by 0.07%, 0.05% and0.16% in the districts of Hooghly and Bankura combined together and in the individual districts of Hooghly and Bankura respectively.

Table – 1. Determinants of Bank Defaults in Non-Agricultural Sector

Dependent variable is BANKDEFAULT						
	Households in the districts of					
	Hooghly and Bankura Combined Together Number of Observations = 128			Hooghly Number of Observations = 36		
Regressor	Coefficient	Standard Error	t-Statistic	Coefficient	Standard Error	t-Statistic
CONSTANT	-1.504	1.859	-0.809	5.385	4.595	1.172
AGE	0.042	0.039	1.065	-0.031	0.048	-0.656
EDUCATION	-0.098*	0.011	-8.857	-0.356**	0.141	-2.524
ATRPLOANS	-0.154*	0.052	-2.952	-0.531*	0.119	-4.447
PINFLOAN	-0.269*	0.079	-3.412	-0.242*	0.026	-9.297
WPR	-0.297	0.422	-0.704	-0.801***	0.438	-1.830
RIPCFMEXP	0.093*	0.016	5.808	0.006*	0.003	2.225
DINTRATE	0.009	0.026	0.339	-0.086	0.069	-1.250
CASTE	0.052	0.051	1.014	0.082	1.424	0.057
MLOANSAUT	0.130*	0.046	2.808	0.157*	0.059	2.682
NALOANUSE	-1.386**	0.605	-2.291	-0.788*	0.301	-2.620
ENTRPRBMF	-0.090**	0.039	2.289	-0.082*	0.032	-2.599

	Hooghly and Bankura Combined Together	Hooghly
Mean of BANKDEFAULT	0.32609	0.72222
Mean of fitted BANKDEFAULT	0.24638	0.80556
Goodness of fit	0.83333	0.86111
Pseudo-R-Squared	0.30369	0.38794

Source: Author's own calculation. * stands for significant at 1% level; ** stands for significant at 5% level; *** stands for significant at 10% level.

Fifth, the worker population ratio and the probability of bank default are inversely connected in the districts of Hooghly and Bankura combined together and in the individual districts of Hooghly and Bankura. In this case the marginal increases in probability that the households are default to repay loans are respectively 0.07%, 0.18% and 0.07% for the districts of Hooghly and Bankura combined together and in the individual districts of Hooghly and Bankura. Sixth, the rate of increase in per capita family expenditure increases the probability of bank default.

Table – 2. Determinants of Bank Defaults in Non-Agricultural Sector

Dependent variable is ATRPLOANS (Ability to Repay Loans)			
	Households in the District of Bankura Number of Households = 92		
Regressor	**Coefficient**	**Standard Error**	**t-Statistic**
CONSTANT	-1.169	2.791	-0.419
AGE	0.029	0.034	0.858
EDUCATION	-0.033**	0.015	-2.166
ATRPLOANS	-0.351*	0.136	-2.586
PINFLOAN	-0.665**	0.281	-2.363
WPR	-0.318*	0.088	-3.603
RIPCFMEXP	0.006	0.003	1.632
DINTRATE	0.070	0.049	1.437
CASTE	-1.452	0.906	-1.603
MLOANSAUT	0.089**	0.043	2.060
NALOANUSE	-0.227**	0.094	-2.422
ENTRPRBMF	-0.127**	0.054	-2.376
Mean of BANKDEFAULT	0.74194		
Mean of fitted BANKDEFAULT	0.79570		
Goodness of fit	0.83871		
Pseudo-R-Squared	0.52489		

Source: Author's own calculation. * stands for significant at 1% level; ** stands for significant at 5% level; *** stands for significant at 10% level.

Seventh, the difference in the interest rate has got no statistically significant effect on the probability of bank default in the districts of Hooghly and Bankura combined together and in the individual districts of Hooghly and Bankura. Eighth, caste is not statistically significant in affecting the probability of bank default. Ninth, the membership variable is statistically significant in affecting the probability of bank default in the districts of Hooghly and Bankura combined together and in the individual districts of Hooghly and Bankura.

Table – 3. Logit, Odds Ratio, Probability and Marginal Change in Odds Ratio and Probabilities Bank Default in the Non-Agricultural Sector

	Households in the Districts of Hooghly and Bankura		Households in the District of Hooghly		Households in the District of Bankura	
Logit	-0.406		-0.736		-0.174	
Odds Ratio	0.666		0.479		0.840	
Probability	0.400		0.324		0.457	
	Change in		Change in		Change in	
Regressor	Odds Ratio	Probability	Odds Ratio	Probability	Odds Ratio	Probability
CONSTANT	-77.767	-0.376	21717.555	1.204	-68.926	-0.274
AGE	4.291	0.011	-3.076	-0.007	2.980	0.007
EDUCATION	-9.325	-0.024	-29.945	-0.080	-3.289	-0.008
ATRPLOANS	-14.315	-0.039	-41.210	-0.119	-29.578	-0.082
PINFLOAN	-23.601	-0.067	-21.466	-0.054	-48.564	-0.156
WPR	-25.699	-0.074	-55.097	-0.179	-27.203	-0.074
RIPCFMEXP	9.706	0.023	0.563	0.001	0.552	0.001
DINTRATE	0.894	0.002	-8.279	-0.019	7.258	0.016
CASTE	186.337	0.263	8.521	0.018	-76.590	-0.340
MLOANSAUT	13.864	0.032	17.030	0.035	-8.482	-0.021
NALOANUSE	-74.983	-0.346	-54.527	-0.176	-20.270	-0.053
ENTRPRBMF	9.392	-0.022	-7.905	-0.018	-11.957	-0.030

Tenth we note that the coefficient of nature of loan use (NALOANUSE) is negative and statistically significant in our estimated logit model of   Bank default. This means that the hypothesis that the productive use of loans decreases the probability that the households are able to repay loans in the districts of Hooghly and Bankura combined together and in the individual districts of Hooghly and Bankura is accepted empirically. The marginal increases in the probability that the households are able default are 0.35%, 0.18% and 0.05% respectively in the districts of Hooghly and Bankura combined together and in the individual districts of Hooghly and Bankura.

Eleventh, the coefficient of the dummy variable ENTRPRBMF (= 1, if the entrepreneurship is run by male and 0, otherwise) is seen to be negative and statistically significant at 1% level of significance. This imply that the male entrepreneurship in rural scale business in the non-agricultural sector in the districts of Hooghly and Bankura combined together and in the individual districts of Hooghly and Bankura we see that there is an decrease in the probability of bank default. The probabilities that the households are able to repay loans for the districts of Hooghly and Bankura

combined together and in the individual districts of Hooghly and Bankura decrease by 0.02%, 0.02% and 0.03% respectively.

We also note that in the districts of Hooghly and Bankura combined together and in the individual districts of Hooghly and Bankura the probabilities that the households are able to repay loans are 0.40, 0.32 and 0.46. Thus, in the district of Bankura the probability that the households are bank default in the non-agricultural sector is greater than that in the district of Hooghly.

VI SUGGESTION AND CONCLUSION

In the non-agricultural sector, though this study relates only to the district of Hooghly and Bankura, but the findings are fairly general in the rural areas. From the empirical findings we found that the probability that the households are bank default is indirectly related with the ability of the borrowers to repay loans to the banks. So reduce the number of defaulters, all attempts should be employed to increase the ability to repay loans to the banks. It will be possible if income of the borrowers will be generated. So income generation must be the necessary condition for the repayment of bank loans. And this income generation takes place at a sufficient level only through the productive use of loans. Further, empirically we get an interesting result that some borrowers did not repay their loans in time though they have got the income generation sufficiently. They are called wilful defaulters. For these reasons the borrowers must be made conscious and it is only possible through regular campaign and proper education.

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