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What Drives Households to Divert Loans? A Village Level Study

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This paper is based on a study on the phenomenon of loan diversion. Based on a primary survey carried out in two districts of West Bengal, India, it identifies association between the socio-economic and demographic characteristics of the borrowers to the incidences of loan diversion (that is a permanent shifting of loans for purposes other than the stated one); and the extent of such loan diversion.The descriptive analysis reveals that loans mostly from microfinance institutions are diverted. Econometric analysis shows that probability of loan diversion is high for groups who openly reveal support for political parties, apparently pointing towards some nexus between the borrower and politics. This adds an interesting political economy dimension to our findings. Also, it is found that the higher the size of the total loan, the higher is the proportion of loan diversion and the proportion of loan diversion is lower in large families.

Keywords: borrowers, microfinance, loan diversion, formal loan, India

This paper addresses an issue, which though important, has remained in relative oblivion both in theory and empirics: the issue of loan diversion. Loan diversion means using an entire loan or part of it permanently for purposes other than the purpose stated at the time of taking the loan. Such diversion can either be intentional or unintentional. The literature on rural credit market concentrates on what Hoff and Stiglitz (1990) identified as problems related to *screening, monitoring,* and *enforcement.* Mostly, the papers have concentrated on forms and nature of credit contracts in a world of asymmetric and imperfect information. The issue of default has been highlighted both in cases of indirect and direct monitoring and enforcement, but, another equally important issue has been sadly neglected and that issue is loan diversion. In a similar vein, the policy issues concerning government intervention have revolved around strengthening institutions, infrastructure, or subsidizing credit since it promotes social capital (Hoff & Stiglitz,

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1990, pp. 247-249), but very little has been discussed about implications and desirability of such loan diversion.

Therefore, from the existing discussions on the rural credit market one does not get a clear vision about the nature, causes, and implications of loan diversion. Loan diversion can occur for diverse socio-economic reasons. The literature shows that on the supply side, loans from formal and semi-formal sources are more easily available for production purposes. On the other hand, due to higher monitoring cost of consumption loans, the borrowers face credit constraint (Williamson,1987), higher collateral requirements, and high transaction cost while borrowing for consumption purposes. At the same time, demand for loans to meet consumption needs is at least as high if not higher. This is especially true for emerging economies with low savings and scant or non-existent insurance facilities, which always turn out to be very costly for the poor. The existing literature also points out that consumption smoothing is an important reason for borrowing in less developed economies. Further, in emerging economies, lack of social security facilities can also lead to loan diversion, when loans are used in lieu of income support. Part of these demands is met from informal sources (money lenders, shopkeepers, and social network), but these loans are sometimes costly and size of such loans is generally smaller than those available from formal (commercial banks and cooperative banks) and semi-formal (microfinance institutions) sources. This mismatch between supply and demand creates an incentive for loan diversion. In a theoretical study, Pearlman (2012) has identified economic vulnerability as one of the major determinants of demand for microfinance. She defined vulnerability as the inability to smooth consumption across adverse income shocks. Using a large dataset from Peru, Pearlman claimed that lack of consumption credit makes many potential borrowers dependent on informal credit from family and friends since diverting microfinance loans to consumption in bad state would make them ineligible for loans in the future. Alternatively, one may suggest that granting of microfinance loans to borrowers who do not have access to alternative source of credit for ex-ante consumption smoothing in bad states increases the probability of such loan diversion in bad states.

Such diversion of loans can have different socio-economic implications depending on the nature of the usage of such diverted loans. Diversion of loans from production to non-production purposes inevitably reduces the production potential of such loans and could well increase the probability of default. However, if the diverted loan is used for meeting nutritional needs, for educational needs, for creation of household assets or for medical emergencies, it could act as a good substitute for the non-existent social security system and is potentially welfare improving. But often it is used for conspicuous consumption which arises mainly out of a desire to maintain the social status or moving up the status ladder (Roychowdhury,2014),giving rise to the phenomenon of "keeping up with the Joneses." Loan diversion can also occur due to social pressure created by outdated social norms or unjust social practices. In the case of India, the example of dowry in its different manifestations comes to mind. Such loan diversions are not only unproductive but also do not contribute to the welfare of the individual. So it is important that we understand the causes behind loan diversion and its social and economic implications. As the Report of Rangarajan Committee (Government of India, 2008)[1] pointed out, access to various financial services is important for poverty alleviation and social cohesion. Timely availability of loans to the poor at low cost is an important aspect of financial inclusion. However, it is also important to understand the pattern of utilization of such loans. Loan diversion indicates a lack of balance between the specific demand for

loans and corresponding supply side responses that needs to be identified and addressed. This is our primary motivation behind undertaking the study which would try to identify the factors that lead to loan diversion.

The issue of loan diversion assumes importance when the loan comes from formal or semi-formal sources (Microfinance institution). The reasons for which the informal loans are taken are mainly the fungibility of these loans as they may be utilized more flexibly as the borrower is not legally answerable to the lender for the type and mode of utilization of such loans. Formal and semi-formal loans are provided for specific purposes, mostly to meet either working capital or investment needs with the strict understanding that they will be utilized for the stated purposes only.

There is also the issue of policy intervention. Unlike informal loans, formal and semi-formal loans to the rural sector are largely policy determined. Such loans often carry substantial subsidies to encourage production and investment activities. Diversion of such loans implies sub-optimal allocation of scarce resources—resources which could have been better utilized elsewhere. Not only that diversion of loans increases the probability of default ,it also imperils the viability of these institutions or programs in the long-run. So it is also important to study which type of loan is mostly diverted. This is an additional motivation for our study.

The existing literature on loan diversion, though scanty, addresses some of the issues. A group of papers discussed with the issue of agricultural loan diversion by farmers to non-farming activities (Oboh & Ekpebu, 2011; Gebeyehu, 2002; Kishore, Singh, Kumar, & Malik, 2010; Sidhu, Vatta, & Kaur, 2008; Kaur, 2011) and identified factors that led to such diversions. However, these studies considered the issue of diversion of formal loans. Our paper is more interested in the issue of diversion of loans taken from microfinance institutions (MFIs).

Loans from microfinance institutions are relatively small unsecured loans availed of by the lower income groups. The MFIs cannot screen these borrowers as they have little or no credit history and financial statements. The loans do not contain any covenants or collaterals. As pointed out by Rajan and Winton (1995), lack of collaterals and covenants can potentially reduce the lenders' incentive to monitor. Also, the microfinance institutions work with a target amount of loan disbursement. Here the microfinance institutions face a trade-off between meeting the target and strict monitoring of the loans, which often tilt in favor of meeting the targets. This is more likely to happen in the presence of competition among MFIs.

Garikipati (2008) and Vadakarasseril Anandan (2009)considered the problem of diversion of loans that the female borrowers take from the self-help groups (SHGs). Garikipati (2008) found that majority of loans were diverted into household activities for enhancing household's asset and income. According to Vadakarasseril Anandan (2009), the loans are diverted mostly for the sickness of the respondent herself, illness and unemployment of the respondent's husband, and educational needs of the children. Both studies found that women SHG-members lose their control on loan use by diverting it for any other purpose than was specified in the loan application. However, our paper does not confine itself only to the problem of loan diversion of women SHG-members but examines the issue in greater details and tries to find a relation between loan diversion and semi-formal loans.

We have come across only three studies that bear some similarities to our study. Abafita (2003) analyzing a sample of 203 observations in Ethiopia wherein loan diversion is significantly and positively affected by the frequency of borrowing, whereas suitability of microfinance loan repayment and education level of the borrower negatively and significantly affects loan diversion.

Based on 2,973 loan profiles of 2,810 households of Bangladesh, Khaleque (2010) found that about 68% of the microfinance loans have been diverted from proposed income generating projects to other activities and wage-earners have higher likelihood of diverting loans than people in other occupations. On an average, more than 28% of each loan was used for consumption purpose and lack of restrictions on availability of the subsidized loans from the microfinance institutions often lead to loan diversion.

Burki (2010) has studied the issue of multiple borrowings from multiple microfinance institutions in Pakistan. He observed that as the division between household expenditure and productive expenditure is not very clear for the households taking recourse to microfinance, "cash is easily fungible" and one per three borrowers ends up using part of the loan for unplanned consumption purposes. Also, the borrowers taking multiple loans are also more prone to loan diversion.

The unique feature of the present study is to identify the type of loan that is diverted, the pattern of such loan diversion, as well as the factors that influence the phenomenon of loan diversion. Based on a primary household survey in the southern part of West Bengal (a state in India), our study aims at identifying the socio economic and demographic variables that are correlated with the incidence of loan diversion as well as that affects the extent of such diversion.

METHODS

Our study is based on a primary household survey carried out in four villages, two of which are located in the district of North 24-Parganas and other two are located in the district of South 24-Parganas in West Bengal, India.

Initially, we took a complete enumeration of the households in each village. A respondent from each household was asked about the borrowing profile of the household for the period January 2008 to December 2008, (the previous year) and the borrowers were asked to classify the loan(s) into one of the following categories: consumption loans, working capital loans, loans for long term investment, loans to meet social obligations, educational loans, loans for medical treatment, and loans taken to repay earlier loans.

Next, we chose the sample by random sampling technique such that the sample fairly represents all loan categories as well as the non-borrowers in the area. Our planned sample size was 1,000 (roughly 56% of our population) with 500 sampling-units from each district. First, within each district we calculated the population proportion for each village and then collected the same proportion of samples from that village. The total sample was distributed across borrowers and non-borrowers within the village according to the population proportion. Further, the sample on borrowers was distributed in different loan categories according to the population proportion. For each category we followed the procedure of simple random sampling.

The final survey was conducted in two rounds on the same set of households: The first round during May 2009 to January 2010 and the second round during February 2010 to November 2010.At the end of both rounds of surveys we had loan information on 812 households for two consecutive years 2008 and 2009after omitting the outliers in income and consumption expenditure.[2]

Conceptual Framework and Nature of Information Collected

The study of loan diversion required classification of the lenders as well as different types of loans. The lenders are classified in three broad categories: formal lenders (different types of banks & cooperative credit societies), semi-formal lenders (microfinance institutions) and

informal lenders (moneylenders, social-network: family, friends and community, landlords, traders, employers, and such other persons).

To classify activities that create a need for borrowing we have used two broad categories: (1) production which includes working capital and (2) fixed investment needs and consumption which includes regular needs, sudden needs like medical expenses and depreciation expenditures like house repair. Apart from these two, we also considered loans taken to meet social obligations and loans to repay loans.

The first round survey collected extensive socio-political and economic information about the households and loan information for Jan 2008 to December 2008 and for January 2009 to March 2009. Socio-political information consists of the following aspects: religion, social category (SC/ST/OBC), number of family members. Studies by Bardhan and Mookherjee (2012) showed the evidence of existence of a clientelistic relationship between political parties and its supporters, which plays an important role in distribution of benefits in rural West Bengal. Given this observation, during the survey each respondent was asked to reveal his political support for a particular party out of the three dominant parties of the State of West Bengal.[3] Fourth group, consisting of respondents who may or may not support a particular political party but did not divulge that information to the interviewers were termed non-respondents.

Information was collected on each individual member of the household on the following heads: age, sex, education level, poverty status (BPL card holding), and SHG membership. Economic information includes the occupations and incomes of family members, family consumption expenditure, and family asset profile including landholding pattern. To judge financial inclusion and extent of financial literacy, we collected information on the bank account holding of the respondents.

We collected information on each household's borrowing: the households were asked whether they have sought loan in the reference period and whether they have actually got it. We observed that all the households that sought a loan took it from some source or the other. That is, if they did not receive it from the formal source they obtained it from semi-formal or informal sources. Thus, the number of households who asked and sought for a loan is the same as the number of individuals who actually borrowed. The loan information includes: source, size, purpose, tenure, frequency and regularity of borrowing, medium (in cash or in kind), amount, interest, duration, collateral, user right of collateral, time and cost involved in obtaining loans, repayment period, reason and consequences of non-repayment, and the amount of loan and interest already paid back. To collect information about loan diversion the respondents were asked whether they have permanently diverted any loan from stated purpose—if the answer is in the affirmative then to which other purposes they have used the diverted loans and the approximate proportion diverted.

The second round survey collected information about any unpaid loans taken in 2008 and information on income, expenditure, purchase or sale of assets and fresh loan taken, its usage pattern and diversion of loan if any for the period April 2009 to December 2009.

After studying the answers, five occupation categories were identified based on primary occupation of the principal earners: self-employed,[4] farmer, wage-earner, salaried-worker and pension-earner, and big-business men.[5]

RESULTS

As already stated, by loan diversion we mean that a loan taken for a particular purpose is being used permanently for a different purpose. In our survey, the respondents were asked whether they shifted part of their loans permanently to

some purposes other than the stated purpose. Permanent shifting means the diverted amount was never shifted back to the original use. The respondents were also asked about the proportion of loans diverted in this way. So we obtained the data on the proportion of loan diverted directly from the survey.

Descriptive Results

In our survey, we have observed that a total of 54 borrowers have diverted their loans in two years.[6] Table 1 presents the number of loans diverted across different lending sources and Table 2 presents the direction of loan diversion.

Table1 shows that borrowers mostly diverted the loans from microfinance institutions. In our survey area, we found that the microfinance institutions usually advance working capital loans with no collateral whereas the formal lending institutions usually require some collateral. We also found that the microfinance institutions have flexible lending rules and inadequate monitoring compared to that of the formal lenders. As has been already mentioned, in our survey area, the microfinance institutions work with a target amount of loan disbursement. Here, the microfinance institutions face a tradeoff between meeting the target and the strict monitoring of the loans, and more often than not the decision goes in favor of meeting the target. Also, in our survey area the microfinance loans, though group based, were individual liability loans. So peer monitoring was also somewhat absent. Hence, diverting these loans is easier. Further, we also found that the microfinance institutions charge an interest rate (14.4 % p.a. to 16.13 % p.a.) which is higher than the formal lenders (around 10-11 % p.a.) but lower than the informal money lenders (more than 50 % p.a.).[8] So while it is not the cheapest alternative, it is cheaper than taking a consumption loan from the money lender.

Table 2 reveals that mostly, the loans have been diverted to consumption followed by the medical needs. Together they account for more than 51% of loan diversion. Secondly, no loans have been diverted for the purpose of fixed investment. Thirdly, while at least 41% (23) of the diverted loans have been diverted from production (loans taken for fixed investment and working capital needs) to non-production (consumption, medical needs, social obligation, and loans taken to repay loans) purposes, only 5.3% (3) of loans have been diverted contrariwise.

To understand the nature of loan diversion we study the propensity to take semi-formal loans and extent of loan diversion across two time periods, and different occupation categories in Table 2a.

Table 1. ***Number of Borrowers Diverting Loans Across Lending Sources (2008 and 2009 Combined)***

Sources of Loans	Number of Borrowers diverting loans	Percentage of borrowers Diverting loans
Social Network	12	22.2%
Employer/ Contractor/Big-businessman	4	7.4%
Microfinance Institutions	20	37.0%
Banks and Co-operative banks	1	1.9%
Grocery Shops/ Fertilizer Shops	6	11.1%
Informal Money Lenders/ Jewelers	11	20.2%
Total Number of Borrowers Diverting Loans	54	100%

Table 2. ***Direction of Loan Diversion***[7]

		Actual use									
		Consumption	Working Capital	Medical	Social obligation	To Repay past loans	Used both for Working capital & Consumption	Used both for Consumption & Medical purpose	Used both for Working capital &Medical purpose	No Information on actual use	Total
Stated Use	Fixed -investment	7 (63.6%, 31.8%)					2 (18.1%, 66.7%)	1 (9.1%, 50%)	1 (9.1%, 100%)		11 (100%, 19.3%)
	Working-capital	11 (64.6%, 50%)		1 (5.9%, 7.7%)	2 (11.8%, 40%)	1 (5.9%, 50%)				2 (11.8%, 40%)	17 (100%, 31.6%)
	Consumption		3 (14.3%, 100%)	12 (57.1%, 92.3%)	3 (14.3%, 60%)					3 (14.3%, 60%)	21 (100%, 36.8%)
	Medical	4 (66.7%, 18.2%)				1 (16.7%, 50%)	1 (16.7%, 33.3%)				6 (100%, 10.5%)
	Social obligation							1 (100%, 50%)			1 (100%, 1.7%)
	Total	22 (39.2%, 100%)	3 (5.4%, 100%)	13 (23.2%, 100%)	5 (8.9%, 100%)	2 (3.6%, 100%)	3 (5.4%, 100%)	2 (3.6%, 100%)	1 (1.8%, 100%)	5 (8.9%, 100%)	56 (100%, 100%)

Note: First % figures within parentheses indicate percentage w.r.t row total, second % figure is w.r.t column total.

Table2a. ***Distribution of Semi-formal and Diverted Loans Across Occupations and Time Period***

Principal Earner's Occupation categories	Total	Borrowers (col.1)	Borrowers of Semi-formal loans (col.2)	Borrowers diverting loans (col.3)	Borrowers diverting Semi-formal loans (col. 4)	Semi-formal loans diverted as a proportion of total number of borrower ($\frac{col.\ 4}{col.\ 1}$ x 100) (%)	Semi-formal loans diverted in this particular category as a proportion of total semi-formal loans diverted (21) ($\frac{col.\ 4}{21}$ x 100) (%)	Semi-formal loans diverted as a proportion of total number of semi-formal loans (%) ($\frac{col.\ 4}{col.\ 2}$ x 100)	Semi-formal loans diverted as a proportion of total number of loans diverted ($\frac{col.\ 4}{col.\ 3}$ x 100) (%)
Farmer	88	72 (100%, 7.05%)	1 (1.4%, 0.7%,)	0 (0%, 0%)	0	0	0	0	0
Wage-earner	972	666 (100 %, 65.23%)	70 (10.5%, 52.2%,)	27 (4.05%, 50%,)	12	1.8	57.1	17.14	44.4
Salaried and Pensioners	128	44 (100%, 4.31%)	2 (4.5%,1.5%,)	6 (13.6%,11.1%,)	0	0	0	0	0
Big-business	316	177 (100%, 17.34%)	53 (30 %, 39.5%),	13 (7.3%, 24.1%)	6	3.38	28.6	11.32	46.15
Self-employed	120	62 (100 %, 6.07%)	8 (12.9%, 6%)	8 (12.9%, 14.8%)	3	4.83	14.3	37.5	37.5
Period-1	812	533 (100%, 52.2%)	59 (11.07%, 44%)	30 (5.6%, 54.5%)	10	1.23	47.6	16.9	33.3
Period-2	812	488 (100%, 47.8%)	75 (15.4%, 56%)	25 (5.1%, 45.5%)	11	1.35	52.3	14.67	44
Total	**1624**	**1021 (100%)**	**134 (13.1%,100%)**	**54 (5.3%, 100%)**	**21**	**2.1**	**100**	**15.7**	**38.8**

Note: In columns 2 and 3 first % figure within parentheses indicates percentage w.r.t total number of borrowers in that category, second % figure is w.r.t column total.

Table 2a shows that among the borrowers, there are 65.23% wage-earner households, the largest occupation category as well. Out of these households only 10% took a semi-formal loan. Further, only 4% wage earner families who are borrowers as well have diverted a loan from the stated use. This percentage is around 13% for the self-employed, 13.6% for the salary or pension earners, and 7.3% for the borrower-families with big-business as principal occupation.[9] Though there is no substantial difference in the number of loans diverted across the two periods, the number of semi-formal loans taken is larger in period 2. During the two-year period covered in our survey, only 36 households in the sample borrowed from the formal sector of which 27 loans were taken in 2008. So there was a drop in the number of formal loans in 2009 combined with an increase in the number of semi-formal loans. In rural areas transaction cost of a formal loan is much higher compared to the semi-formal loans. Further, the formal sector does not provide loans for consumption purposes, whereas in our survey we found that the loans from the semi-formal sector could easily be used for consumption for lack of proper monitoring. Thus, the above result signifies the fact that the semi-formal loans are becoming more popular in rural areas. In line with Table 1, Table 2a also shows that across all occupation categories, the diverted loans are mostly borrowed from the microfinance institutions. Table3 reports the Cramer's-V and tetrachoric-correlation between loan diversion, semi-formal loans[10] and other socioeconomic variables.

Here we find that there is significant positive association between the loan diversion-dummy and the semi-formal loan-dummy both in terms of Cramer's-V and tetrachoric-correlation. Also, the political-support dummies for TMC and Left-front, the two most prominent political parties in the survey region, are positively and significantly associated with instances of taking semi-formal loans and loan diversion. We observed that Left-front supporters borrowed around 33% of semi-formal loans and TMC supporters took around 23%[11], while together they have taken only 32% of formal loans. Recent financial

Table 3. ***Cramer's-V and Tetrachoric-Correlation Between Loan Diversion and Semi-formal Loans***

	Loan Diversion Dummy		Semi-formal Loan Dummy	
	Cramer's-V	Tetrachoric-Correlation	Cramer's-V	Tetrachoric-Correlation
semi-formal loan−dummy	0.1673*	0.3992*	-------	1
Time-Dummy	.016	-.0412	.064**	.1261
TMC-supporter	.081*	0.2173**	.084*	0.1825**
Left Front-supporter	.117*	0.2907*	.117*	0.2367*
Congress-supporter	.073**	-0.2699**	.055	-0.1327
Incomeclass-1	.021	.0552	.073**	-1.485**
Incomeclass-2	.012	-0.0333	.038	0.0799
Incomeclass-3	.012	0.0085	.003	-0.0274
Incomeclass-4	.108*	-0.2072	.064**	-0.2616*

*1% LS, **5%LS

scandal in West Bengal involving Ponzi[12] funds shows that different non-bank financial companies and microfinance institutions employ local political cadets as their agents to reach out to the villagers. Secondly, Bardhan, Mitra, Mookherjee, and Sarkar (2008, 2009) have pointed out the importance of "clientelistic distribution of benefits" in garnering votes. Bardhan, Mitra, Mookherjee, and Nath (2014) have also corroborated this idea. Supporters of a particular political party form a peer group, within which information dissemination and distribution of favors takes place quickly. Access to a source of finance is an important form of favor as the study by Banerjee, Roy, and Ghosh (2010) has pointed out in a different context. This can also result in supporters of political parties accessing more semi-formal loans. Further, we found that in our survey area semi-formal loans lacked proper monitoring and could be diverted more easily. These facts together may explain why supporters of a particular political party are more likely to take semi-formal loans and divert it. Finally, we find negative and significant association between the highest and the lowest income classes and incidence of taking semi-formal loans. The last result shows that the lowest income is excluded even from the purview of the microfinance institutions.

Next, we compare the average sizes of different types of loans across sources. After eliminating outliers in total loan size (loans ≥ Rs. 35000 were strong outliers) we have information on 1,006 borrower-households over the two periods, the total number of loan is 1,016 as some of the sample units have taken multiple loans from different sources.

Table 4 presents the descriptive statistics of different types of loans across sources.

Exploratory analysis shows that the total loan size is following a non-normal distribution.[13] So we apply the test of equality of medians to compare loan sizes across the sources as well as across diverted and non-diverted loans.[14] It is observed that the medians of loan size across different sources are significantly different. Table 4 reveals that the median loan size is highest for semi-formal loans. Also, the median for loans that are diverted is significantly higher than the non-diverted loans.[15] Thus predominantly, it is the larger loans that are diverted and generally, the semi-formal loans are larger in size.

Further, the partial-correlation coefficient between the amount of loan diversion and size of semi-formal loan is 0.1993 with p-value: 000[16, 17].Thus, even if we control for other socioeconomic and demographic variables there is a significantly positive association between the

Table 4. ***Descriptive Statistics of Different Types of Loans Across Sources (in Rs) and Proportion of Loan Diverted***

Type	Number	Mean	s.d	Median	Mode
Informal-loan	847	2751.06	3899.94	1500	1000
Semi-formal-loan	134	4684.70	4371.4	5000	5000
Formal-loan	35	5414.28	6294.82	3000	2000
Total-Loan	1016	3097.83	4138.39	1860	1000
Diverted-Loan	54	5727.25	5996.96	5000	500
Non-diverted-loan	961	2958.35	3972.26	1600	1000
Proportion of loan diverted	54	0.5564815	0.339262	0.5	1

size of loan diversion and the size of semi-formal loans. Secondly, the size of loan diversion is positively and significantly associated with the political-support dummy for Left-front.[18] The survey shows that among the borrower-families who declared political support for Left-Front, around 30% of the families have businessmen or self-employed as the principal earning member.[19] The median loan size for self-employed and businessmen taken together is significantly higher than that of the others.[20] Basically, these two occupation groups are likely to take bigger loans to meet demand for working capital. Also, the size of loan diversion varies positively and significantly with the total loan size.[21] This result is further confirmed by the fact that the families for which the principal earner is either self-employed or in business divert significantly higher amount of loans than others.[22] Thus, the supporters of Left-front who are in business or are self-employed are likely to take bigger loans for working capital need and are also diverting those loans.

Econometric Analysis Results

In this section, we will first identify the socio economic demographic variables that influence the probability of diverting loan by a representative household**.** But in this respect we must note that the households that have taken a loan can only divert it. Since loan diversion is conditioned upon taking a loan only, choosing just the households who actually borrowed might lead to the classic case of "sample selection bias" (Heckman, 1979). The households that did not borrow in the reference period might do so when the need arises in the future. Hence, probit regression model, taking only households who borrowed might lead to biased estimates. Thus, we proceed with bivariate probit model with sample selection. We estimate the probability of loan diversion using maximum likelihood method by fitting a regression model with selection that they had borrowed. The regression model is formulated in terms of two equations: selection equation that runs a probit regression to explain probability of borrowing (or receiving a loan) by a household; and an outcome equation that runs a probit regression on probability of loan diversion for those who had actually taken a loan. The model assumed that the error terms in the equation are following normal distribution with zero mean and unit variance. If the correlation coefficient between the equation error terms is significantly different from zero then standard probit techniques applied to outcome equation yield biased results.

Further, this bivariate probit analysis requires that at least one of the independent variables that were used to determine the selection model must be excluded from the estimation of the outcome equation to avoid identification problem. Hence, exclusion principle requires a variable that influences probability of taking a loan but does not influence probability of loan diversion by a borrower family. In this context, we have used category variable corresponding to the value of landed property[23] of the household in the selection model but excluded it from the probit regression model of probability of loan diversion of the borrower household. The property level of the household significantly affects the probability of receiving a loan. For the formal loan, land title is required as collateral. For loans taken from the money lenders, land is used as collateral. Further, in rural areas asset holding is an important measure of financial credibility. Also, the asset rich households may have a lower need for credit than the asset poor one because they can earn rental income from their landed property. Thus, the value of landed property level is an important determinant of the probability of borrowing. But it does not influence the probability of loan diversion. Table 2 shows that most of the loans are diverted for consumption smoothing or for medical need. Whenever these contingencies arise, households need ready cash or some

liquid form of asset. The landed property is not at all a liquid form of asset which can be used to meet the above mentioned needs. Thus, we exclude value of the landed property categories from the regression on probability of loan diversion. This is further confirmed by the fact that the Cramer's V between the landed property value category and loan diversion dummy is only .04 and insignificant. Other explanatory variables are as follows: In the selection equation explanatory variables are time-dummy, occupation categories, income categories, landed property value categories[24], natural log of family size, and political identification categories.[25] In the probit equation of probability of loan diversion the explanatory variables are time-dummy, occupation categories, income categories, natural log of family size, political

Table 5. ***Estimations of Probit Regressions with Sample Selection***

Explanatory Variables	Probit Regression on Probability of a loan Diversion N=1006			Probit Regression on Probability of borrowing (Selection Model) N=1609		
	Coefficient	Robust Standard Error	p value	Coefficient	Robust Standard Error	p value
Time-dummy	0.16	0.15	0.27	-0.14**	0.07	0.03
farmer	-5.42*	0.24	0.00	0.80*	0.20	0.00
Wage earner	-0.27	0.20	0.17	0.46*	0.12	0.00
salaried and pension earner	-0.11	0.28	0.70	-0.50*	0.16	0.00
Big business	-0.39***	0.23	0.09	0.09	0.14	0.53
Family income categories						
2	-0.07	0.17	0.69	0.08	0.09	0.37
3	-0.11	0.19	0.57	-0.01	0.09	0.93
4	-0.43**	0.21	0.04	0.05	0.09	0.62
ln(family-size)	-0.14	0.19	0.47	0.05	0.08	0.56
borrowers with zero interest	-0.78*	0.16	0.00	-----	-----	-----
TMC-supporter	0.31***	0.18	0.08	-0.13	0.09	0.15
Left-Front-supporter	0.40**	0.17	0.02	0.08	0.09	0.36
Congress-supporter	-0.13	0.24	0.60	0.19***	0.09	0.05
Landed-property value class						
2	-----	-----	-----	-0.23**	0.09	0.01
3	-----	-----	-----	-0.23**	0.10	0.02
4	-----	-----	-----	-0.10	0.10	0.29
Constant	-1.21	0.32	0.00	0.14	0.19	0.14
Wald test of indep. eqns. (rho = 0): chi2(1) = 15.02 Prob> chi2 = 0.0000						
Log pseudo-likelihood = -1167.405	AIC= 2396.809 BIC= 2563.694				Wald chi2(13) = 2432.85 Prob> chi2 = 0.0000	

*Significant at 1%, **Significant at 5%, *** Significant at 10%

identification categories, and a dummy variable for the borrower with zero interest. The survey observed that out of 1,006 borrowers included in the regression analysis, 664 (66%) borrowers paid no interest on the loan they have taken. Basically, loan transactions with social network, employers, and grocery shops do not carry any interest charges whereas loans taken from the formal or semiformal institutions or money lenders involve interest payments. We try to find whether interest payment has anything to do with the probability of loan diversion. The results are summarized in Table 5.

Table 5 shows that we can reject the null hypothesis of rho = 0, hence simple probit analysis is inapplicable under the circumstances.

First, the result shows that the families with farmers as principal earners have lower probability of loan diversion than the reference category of principal earner self-employed. The survey shows that the farmers do not depend on semi-formal loans (only one in two years); they mostly take formal loans (37% of the farmer borrowers have taken formal loans). The formal loans are easily available to them against their land title at a subsidized interest rate. But the monitoring is stronger for formal loans. Further, given their nature of operation, the working capital requirement of the farmers is likely to be more regular and stringent allowing less scope for shifting loans to other uses. This is evident from the fact that the selection model shows that the farmers are more likely to borrow than the reference category of self-employed families. Hence, even if they are more likely to borrow they generally do not divert loans. Selection model also shows that wage earners are more likely to take a loan but the salaried and pension earners are less likely to borrow than the reference category.

Second, the probit regression on probability of loan diversion shows that the families with principal earner in big business are less likely to divert a loan. Like the farmers, they also need to take loans to meet working capital need and they are less inclined to divert it for other purposes.

Third, the borrowers with zero interest loans are less likely to divert loans. In this context we must mention that the total loan size is an important determinant whether a loan will be diverted or not. But we cannot incorporate this in the probit analysis with sample selection as it does not allow inclusion of endogenous explanatory variables. Table 4 shows that diverted loans are larger in size. We also observed that the mean total loan size is significantly lower for loans with zero interest ($t = 4.5802$ with p value =.000). Hence, the interest dummy may be picking up the effect of the total loan size and showing that the loans without interest payment which are smaller in size are less likely to be diverted. This result also confirms the findings of Tables 1 and 4, which show that the semi-formal loans are mostly diverted. Table 4 also shows that the semiformal loans are, on the average, larger in size and they carry interest payment. Thus, this result signifies the fact that the larger loans borrowed mostly from the semi-formal institutions are more prone to diversion rather than the small loans from social network bearing zero interest.

Next we observe that the borrower families that have openly expressed their support for Left-front or Trinomool Congress are more likely to divert a loan than the no response group or the households that did not openly reveal their political support. This result actually confirms the findings in Table 3 that shows a significant positive correlation between political support dummies for left front and TMC with the semi-formal loan dummy as well as loan diversion dummy where mostly the semi-formal loans are diverted.

Finally, in the selection model, it is found that the landed property value categories are significant. The borrowers belonging to two middle property categories are less likely to borrow than the borrowers in the lowest property group. Our survey result shows that around 67%

of the households in the sample who are in the lowest asset group have borrowed whereas this percentage is around 60% for the middle two asset categories and 63% for the highest asset category. The result indicates that the asset poor groups are more inclined to borrow than the asset rich families. Also the time dummy is significant implying that those who had taken loan in 2008 are less likely to borrow in 2009.

The second issue we address is: what are the factors that affect the proportion of loan diversion. In the survey, we collected data on the proportion loan diverted. The earlier analysis identified the variables that determine the probability of loan diversion by a household but did not say anything whether the family will divert a part of its loan or the entire loan for a purpose different from the stated one. Hence, we try to identify the factors influencing proportion of loan diversion. The proportion of loan diversion is a censored variable and depends on the size of the loan. Descriptive data analysis shows that "proportion of loan diversion" significantly varies with the total loan size of a borrower.[26] In this case, we could have applied a Heckman Tobit analysis with same selection model, but that does not allow inclusion of the total loan size which is an endogenous regressor.[27] Thus, we apply "instrumental variable tobit (IVTOBIT) model"[28] that allows inclusion of a continuous endogenous variable in the tobit regression analysis. In the subsequent analysis we take natural log of total loan size as an endogenous regressor in the IV-tobit analysis. The analysis uses the dummy variable borrower with zero interest as an instrument for natural log of total loan size. As already mentioned, loan transactions with social network—employers and grocery shops—do not carry any interest and on an average smaller in size than the loans that carry interest payments. Hence, the interest dummy is one of the important determinants of the loan size of the borrowers and we use that as an instrument in the first stage regression. As a result, it is excluded from the second stage regression.

The other explanatory variables are: time-dummy, natural log of family-size, occupation categories of the principal earner, family property and income level categories, and political-support categories. We apply the maximum likelihood method of estimation with robust standard errors.

The results of the first stage regression and second stage regression are reported in Table 6. We find that in the first stage regression results, the dummy borrowers with zero interest is significantly negative indicating that non-interest bearing loans are smaller in sizes. This justifies or choice of instrument.

Table 6 shows that the chi-square statistic corresponding to Wald test of exogeneity is significant at the 1% and the null hypothesis of no endogeneity is rejected. This validates the choice of IVTOBIT model.

The results show the following factors significantly affect proportion of loans diverted:

First, the farmer dummy is significantly negative with reference to the base category of self-employed, indicating that the famers divert less proportion of loans. This is in line with the observations of the descriptive analysis and the probit model with sample selection which indicate the farmers generally do not divert loans.

Second, we observe that the explanatory variable ln (family-size) is significant and negatively affecting the proportion of loan diversion. It implies that in the large families the incidence of loan diversion is lower. This has an interesting implication. Table 2 observed that the loans have been diverted to consumption followed by medical needs. Further, it has been observed that large families have more earning members (Pearson correlation coefficient between family size and number of earning member is .43 with p value =.00). Thus, it indicates that large families act as a cushion to absorb the shock due to sudden need for consumption smoothing

Table 6. ***Instrumental Variable Tobit Regression on Proportion of Loan Diversion***

Dependent variable : natural log of total loan size (ln(total loan-size)) (First stage regression)				Dependent variable : Proportion of loan diversion		
Explanatory Variable	Coef.	Robust Std. Err.	P>z	Coef.	Robust Std. Err.	P>z
Ln (total loan size)	--------	--------	--------	2.90*	0.89	0.00
time dummy	0.12***	0.07	0.07	-0.16	0.23	0.49
ln (family-size)	0.76*	0.07	0.00	-2.37*	0.77	0.00
wage earner	-0.36*	0.12	0.00	0.62	0.54	0.26
farmer	0.30***	0.15	0.05	-5.63*	0.66	0.00
big business	0.02	0.14	0.87	-0.51	0.47	0.28
salaried and pension earner	0.08	0.22	0.72	0.01	0.69	0.98
TMC-supporter	0.26*	0.08	0.00	-0.31	0.42	0.46
Left-Front-supporter	0.02	0.09	0.80	0.35	0.32	0.27
Congress-supporter	-0.35*	0.09	0.00	0.84	0.53	0.11
Incomeclass-2	-0.03	0.09	0.75	0.08	0.32	0.80
Incomeclass-3	0.08	0.09	0.36	-0.37	0.34	0.28
Incomeclass-4	0.14	0.09	0.12	-0.87*	0.36	0.02
Landed-property class-2	-0.05	0.08	0.57	0.25	0.31	0.43
Landed-property class-3	0.00	0.09	0.98	-0.08	0.35	0.81
Landed-property class-4	-0.03	0.10	0.72	0.19	0.36	0.61
borrowers with zero interest	-0.31*	0.07	0.00	--------	--------	--------
Constant	6.87	0.16	0.00	-21.07	6.02	0.00
Wald test of exogeneity (/alpha = 0):				chi2(1) = 9.60 Prob> chi2 = 0.0019		
Wald chi2(16) = 124.42			Prob> chi2 = 0.00 N=1006			

*Significant at 1%, **Significant at 5%, *** Significant at 10%

and other medical needs as compared to small nuclear families. Hence, lower incidence of loan diversion is observed in large families or joint families where family members support each other in case of any financial crisis.

Thirdly, the highest income class (income category 4) is diverting significantly lower proportion of loan compared to the base income category (income category 1). This indicates that the lack of income is a major factor behind the loan diversion.

Finally, the endogenous explanatory variable total loan size is significantly and positively affecting the size of loan diversion. Earlier, by comparing the median value (Table 4) we found that the loans that are diverted are on an average larger in size than the loans that are not diverted. Thus, we can conclude that it is the larger loans that are generally diverted and the proportion of loan diversion increases with the total loan size. The first stage regression results indicated that the total loan size is higher for interest bearing loans. In this respect we must mention that the semi-formal loans carry interest liability and as Table 4 shows, on theaverage, they are larger in size. Table 1 shows that we did not have much

evidence of diversion of the formal loans. Hence, we can conclude that thesemi-formal loans that are larger in size are mostly diverted and higher the loan size more is the proportion of loan diversion.

All other factors including the political dummy turn out to be insignificant.

CONCLUSIONS

Our study explains the incidence of loan diversion in rural areas using data from a primary household survey. Loan diversion is a very complex socio-economic phenomenon in the sense that its roots can lie in the social structure and norms as well as may arise out of genuine economic needs. In a situation where loan diversion is driven by genuine economic needs like securing food, medical facilities, or education it is acting as a substitute to the non-existent social security system. It is performing a very important economic function even when it is diverted to uses which are not directly contributing to the physical production. In our study the descriptive analysis shows that the loans are diverted mostly to meet consumption and medical need. We can conclude, at least in our case, that the diverted loans are performing an important economic function.

Further, the loans from semi-formal institutions are more prone to diversion and households that openly reveal their political support for a party are more likely to take semi-formal loan and divert such a loan. Though in our study area it is done on a very small scale, it has the potential of resulting in higher default rates, thus destabilizing such subsidized loan programs.

Next, we analyze the determinants of the probability of loan diversion. The result is in concurrence with the finding of the descriptive analysis that households that openly reveal their support for two dominant political parties in the survey area are more likely to divert a loan. As we have mentioned in the study, probe into the recent Ponzi fund related financial scam in West Bengal have shown that different non-bank financial companies and microfinance institutions employ local political cadets as their agents to reach out to the villagers. As a result, the supporters of a particular political party in an area form a cohort within which information diffusion takes place quickly and the members resort to favoritism which may end up in supporters of a particular political party having higher probability of loan diversion in our survey area. This observation throws open a political economy question regarding opportunities of rent seeking for those who have political patronage. However, this analysis falls beyond the purview of our framework. Finally, we find that the occupation groups that are in constant need of working capital do not generally divert loans.

In the survey we observed that a loan is diverted only when the loan size reaches a critical level and from the econometric analysis it is found that the loan size positively influences the proportion of loan diversion. Among the loans which are actually diverted, the result shows that households in the highest income category divert lower proportion of loan than the reference category of lowest-income group. Furthermore, the households with larger family size divert lower proportion of loan. The rural population, especially the rural poor, have very little surplus—they always function on the margin. They also have no access to the standard social security measures. Further, the problem of non-availability of insurance is very severe in rural India. An article by Yohannan (2013) has pointed out that only about 0.2% of Indian population has health insurance and a meager25% of population has general insurance cover in 2012. Further, there is also the problem of low penetration. Penetration of insurance is calculated as the ratio of insurance premium to the GDP. Andrade, Balasubramanian, Ehrbeck, and Madgavkar (2007) observed that in Indian

villages, life insurance penetration in the banked segment is estimated to be about 40%, while it is marginal at best in the unbanked segment. Given the lack of access to insurance facility for consumption smoothing and to meet sudden medical needs, rural population primarily depend upon loans. In our survey we found that while the formal loans have stricter terms, the semi-formal loans are more easily accessible and less monitored. So they are diverted from their stated use. This gives credence to the theoretical model of Pearlman (2012), which says that ignoring ex-ante consumption smoothing in granting of formal MFI loans would lead to more diversion of semi-formal loans.

So far as the policy issues are concerned, this problem needs a two pronged approach. People should be provided with some buffer against misfortune as well as income support against permanent income loss in the form of access to insurance to cover the former and social security measures to cover the latter. Loans in easier terms to meet consumption, medical, or social obligation needs can be another solution. Also, the semi-formal loans need to be better monitored. A policy that aims at poverty alleviation through creation of productive assets and gainful employment by supplying collateral free loans to rural poor must focus on the proper utilization of these loans instead of aiming at maximum disbursement. However, to be really effective, the two policies need to work in tandem. Better monitoring of the semi-formal loans without the provision of alternative cheaper sources of loans to meet other needs is bound to fail since it does not address the problem of loan diversion.

This present study elucidates some factors that may lead to the incidence of loan diversion but much has remained unexplored. First, during the survey we have ex post information on the incidence of loan diversion, but we do not know whether it is intentional or unintentional. The issue of unintentional loan diversion for consumption smoothing caused by sudden income shock may be dealt with the provision of income support or insurance. Nevertheless, intentional diversion of loans away from the productive purpose to conspicuous consumption has deeper socio-moral implication. A microfinance loan that was provided for the creation of productive asset will prove futile if diverted to luxury consumption or to meet expenditure needs created by unjust social norms and practices like dowry.

Secondly, our study is based on information collected from a particular area and reflects the socio-cultural characteristics of this area only. Social compulsions may be different in other regions. Also, the proportion of sampling units diverting loans is low. For these reasons we cannot make any robust prediction from this analysis. Future studies involving other area will help us to get deeper insights about the issue of loan diversion.

Finally, the present study has another limitation. This pertains to the incidence of loan default. Basically, the problem of loan default is an inevitable fall out of the problem of loan diversion. However, the present study does not throw any light on this issue which can be considered as a future area of research. A study that integrates both the issues will be more comprehensive and will bring out the long-run impact of the problem on loan diversion.

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ENDNOTES

[1] The committee on Financial Inclusion was formed by Reserve Bank of India under the chairmanship of C Rangarajan to explore and expedite the possible process of financial inclusion and the committee published its report in 2008.

[2] We used the multivariate outlier detection method with Mahalanobis's distance function.

[3] Indian National Congress (Congress), Trinomool-Congress (TMC) and Left-Front.

[4] Occupations like rickshaw pulling, van pulling, small businesses like tea shop owner, basket making, bidi binding, sewing, handicraft work, vegetable grower, small vendors of fish and vegetables, people involved in animal husbandry and similar occupations are included in this category.

[5] The big shop owners, owners of small scale industries, contractors, primarily owners of business.

[6] 5.29% of borrowers (and 3.32% of total sample) had diverted a loan while taking two years together. A sample proportion test shows that these proportions are significantly different from zero at 1% level of significance. (z = 168.6866, for1021 borrowers for two years and p value = .000) and (z = 133.6024 for total sample size of 1624 with p value = .000)

[7] Number of loans diverted is 56 whereas number of borrowers diverting Loan is 54

[8] As found in our surveys.

[9] The Cramer's-V between Loan diversion dummy and Occupation categories for the borrowers is .155 and it is significant at 1% LS. And Cramer's V between semiformal Loans and Occupation category for the borrowers is .242 and it is significant at 1% LS

[10] The Pearson chi2(1) between loan diversion and semi- formal loans is 28.5938 and p value = 0.00

[11] At the time of the survey Left-front was the ruling party whereas TMC was the major opposition

[12] The Saradha Group financial scandal is a scam caused by the collapse of a Ponzi scheme run by Saradha Group, a consortium of Indian companies which was believed to be running a wide variety of collective investment schemes in Eastern India. The group collapsed in April 2013, causing an estimated loss of INR 200–300 billion (US$4–6 billion) to over 1.7 million depositors (http://en.wikipedia.org/wiki/Saradha_Group_financial_scandal)

[13] Shapiro-Wilk test statistic is .635 with p value zerc.

[14] Table A2-2 of the appendix presents the results

[15] The chi-square statistic is equal to 13.294 with df 1 and p value: .001

[16] Results of partial correlation coefficient are presented in Appendix 2: Table A2-1.

[17] Pearson Correlation between these two variables is .2307 with p value = .000.

[18] The partial correlation-coefficient between these two variables is 077 with p value = .015. The biserial correlation coefficient is .094 with p value = .002

[19] This proportion is 27% for TMC supporters, 22% for congress supporters and 21% for no-response category.

[20] The median loan size for big-business and self-employed taken together is Rs 2000 while that of others is Rs 1500. The chi-square statistics is 8.7608 df = 1 Pr = 0.003.

[21] The Pearson-correlation between these two variables is .30 with p value=.00 and partial correlation is with p value = .00.

[22] The median loan diversion amount for big-business and self-employed taken together is Rs. 254.55 whereas that of the rest is Rs. 159.69. The chi-square statistics is 4.0076 df = 1 Pr = 0.045

[23] The categorical variables are described in Appendix 1.

[24] Kendall's tau-b between income categories and property categories is .202.

[25] We omitted district-dummy as a variable to avoid the problem of multi-colinearity. (Cramer's V for district-dummy and political-support categories is 0 .5672 for the observations included in the regression analysis)

[26] Pearson-correlation between loan size and proportion of loan diversion is .1305 with p value =.000 for N = 1006. Pearson-correlation between loan size and proportion of loan diversion is -.3063, with p value = .02 for N=54. It indicates an interesting pattern. When we take the all borrowers the relationship is positive indicating that higher the loan size higher is the proportion of loan diversion; so those who have taken smaller loans either have diverted a small proportion or have not diverted at all. However, within the group who has actually diverted, N=54 the relationship is reversed indicating that lower proportion of larger loans are diverted. Thus, we may conclude that loans must be above a critical size to be diverted, but within the diverted loans smaller proportion of larger loans are diverted.

[27] Further, we try to apply Heckman tobit with selection model without incorporating total loan size which gives inconclusive results.

[28] IV-tobit analysis in STATA do not allow for a panel analysis. So we have to run a pooled model with time as a dummy variable.

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APPENDIX 1.

Description of Categorical Variables Included in the Regression Analysis

Name of the variable	Definition	Households (Two Years Taken Together)	
		1006 (only borrowers after eliminating loan outliers)	1609 (All household after eliminating loan outliers)
Incomeclass-1	income ≤ Rs 24000 (First Quartile point) (Reference category)	293	475
Incomeclass-2	Rs 24000 < income ≤ Rs 30000 (Median Value).	266	411
Incomeclass-3	Rs 30000 < income ≤ Rs 42000 (Third Quartile)	200	324
Incomeclass-4	income>Rs 42000.	247	399
Landed-property class-1	landed property ≤Rs 25000 (First Quartile point)) (Reference category)	272	407
Landed-property class-2	Rs 25000< landed property ≤Rs 50000 (Median Value)	308	507
Landed-property class-3	Rs 50000 <landed property ≤ Rs 100000 (Third Quartile)	205	344
Landed-property class-4	landed property >Rs 100000	221	351

There are five occupation categories for principal earner of the family: Farmer, wage-earner, salaried and pensioners, self-employed, big-business.

Farmer =1 = 0 otherwise	If the principal earner is a farmer.	72	88
Wage-earner = 1 = 0 otherwise	if the principal earner is a wage-earner	663	969
salaried and pensioner =1 = 0 otherwise	If the principal earner is salaried or pensioner	40	124
Self-employed = 1 = 0 otherwise (reference Category)	If the principal earner is self-employed in some small business.	62	120
Big-business = 1 = 0 Otherwise	if principal earner is in big-business	169	308
Categories for Political Identity			
Left-Front-supporter = 1 = 0 Otherwise	if head of the household has announced himself as supporter of Left-Front	206	333
TMC-supporter =1 = 0 otherwise	if head of the household has announced himself as supporter of TMC	156	281
Congress-supporter = 1	if head of the household has announced himself as supporter of Congress Party	202	286

Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
ln (family-size)	1609	1.210999	0.403324	0	2.302585
ln (total loan size)	1609	4.650239	3.705665	0	10.30895
ln (family-size)	1006	1.212513	0.42917	0	2.302585
ln (total loan size)	1006	7.437608	1.104144	3.912023	10.30895

APPENDIX 2

Table A2.1
Partial-Correlation Between Loan-Diversion Amount Other Variables

Loan Diversion Amount Variable	Partial Corr.	Semi partial Corr.	Significance Value
Semi-formal-loan Amount	0.1993	0.1959	0
Time-dummy	0.038	0.0366	0.2315
Annual-family income	0.0129	0.0124	0.6847
Value of landed property	-0.0539	-0.052	0.0893
Occupation category of Principal Earner			
farmer	-0.0212	-0.0205	0.5038
Wage-earner	-0.0293	-0.0283	0.3556
Salaried and pension	0.0278	0.0268	0.3809
Big-business	-0.0231	-0.0222	0.4671
Political support categories			
TMC	0.047	0.0454	0.1384
Left-front	0.077	0.0744	0.0151
congress	-0.015	-0.0144	0.6367
Account Holding Dummy	0.0045	0.0044	0.8866
Dependency-Ratio	-0.0067	-0.0064	0.8338

Table A2.2
Median Test

Frequencies					**Test-Statistics[b]**	
		Type of loan			Loan-size	
		Informal	Semi-formal	Formal	N	1016
Loan-size	> Median	339	78	31	Median	1860
	<= Median	448	56	4	Chi-Square	27.27[a]
					df	2
					Asymp. Sig.	.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 13.5

b. Grouping Variable: type

Table A2.3
Cramer's V Between Categorical Variable

	Time_ dummy	Occupational category of Principal Earner	Political Identity Left-Front	Political Identity TMC	Political Identity Congress	Income Categories	Landed Property Value categories	Occupation Category of Other Earning Member	Borrowers with Zero Interest
Time dummy	1								
Occupational category of Principal Earner	.0448	1							
Political Identity Left-Front	-0.0153	0.1319	1						
Political Identity TMC	-.0058	0.1325	----	1					
Political Identity Congress	-0.0009	0.1655	-----	--------	1				
Income Categories	0.0711	0.0777	0.0424	0.0865	0.1050	1			
Landed Value Property category	0.0278	0.0928	0.0239	0.0382	0.0694	0.1602	1		
Borrowers with Zero Interest	0.2249	0.1693	-0.1350	-0.1389	0.0402	0.1207	0.0445	0.1057	1

Table A2.4
Bi-Serial Correlation Between ln(family-size) and Other Category Variables

	ln(family-size)
Time dummy	0
Principal earner farmer	-0.0283
Principal earner wage earner	-0.005
Principal earner salaried and Pension holder	-0.0104
Principal earner self-employed	-0.0617
Principal earner big business	0.0702
Political Identity Left-Front	0.0412
Political Identity TMC	0.0591
Political Identity Congress	-0.1225
Income class 2	-0.0501
Income class3	0.0619
Income class4	0.0522
Landed Property Value_ 2	-0.0024
Landed Property Value_ 3	-0.0002
Landed Property Value_ 4	0.034