

AGRICULTURAL POLICY ANALYSIS PROJECT, PHASE II

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AGRICULTURAL CREDIT MARKET ASSESSMENT IN EL SALVADOR: DATA ANALYSIS APPENDIX

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ANNEX ON ANALYSIS OF CREDIT DATASET

1. INTRODUCTION

Between May and June of 1993, Daniel Carr and Associates, a Salvadoran marketing research firm, surveyed 1,161 households nationwide on land tenure and credit use issues. Detailed data were obtained about past credit use and desired future use of credit. In the cases of those farmers presently not using credit, data about the reason for non-use were obtained.

The purpose of the survey was to provide primary data with which to test various hypotheses. Agricultural credit has long been considered an important instrument in helping farmers increase their productivity and income. Despite many attempts throughout the developing world to create and bolster formal credit programs in the countryside, relatively few farm households use formal credit.

The Salvadoran situation fits the general pattern. Approximately 12 percent of the economically active rural population has had access to formal credit.¹ In the context of a newly liberalized financial market, policymakers are concerned about rural borrowers being further marginalized. In the economic literature, a strong correlation between credit use, high productivity, and higher farm income is commonly found. Therefore the question is what can be done to improve credit participation rates? What are the explanations for the large gap between those who borrow and those who do not solicit?

The objective of this study to provide a descriptive profile of users and nonusers and to identify factors that inhibit the use of credit by Salvadoran farmers, in particular, small ones with less than 8 manzanas.² Reasons commonly offered to explain why many small farmers do not use formal credit are: (1) farmers have sufficient liquidity given their planned expenditures; (2) farmers do not estimate the expected returns on feasible projects to be sufficiently high to warrant borrowing and incurring the risk of losing a substantial portion or all of their asset base; (3) farmers are discouraged from borrowing because of high transactions costs involved in applying for a formal sector loan. The latter reason may explain why farmers prefer to obtain credit from informal sources (moneylenders, trader/suppliers, friends). In the informal sector, simple, low-cost credit delivery systems often more than offset higher interest costs.

Discovering which factor is more relatively more important can serve to shape policy choices. If farmers are sufficiently liquid, no policy or institutional intervention would be warranted. If farmers do not have a large choice set of profitable projects, interventions to reduce costs or disseminate high-yielding technology may be more appropriate. If transactions

¹ Source: MIPLAN Multi-purpose Household Survey, 1991

² One manzana equals .7 hectare. Thirteen tareas equal one manzana.

costs in the formal sector are deterring use, then cost-reducing reforms in the formal lending institutions would be warranted.

2. HYPOTHESES

The households were separated into six groups according to borrowing status: (1) formal borrowers in 1992; (2) potential formal sector borrowers (refused credit in 1992); (3) formal non-borrowers (did not apply for credit in 1992); (4) informal borrowers; (2) potential informal borrowers (denied credit); and (6) informal non-borrowers. Two hypotheses were tested. First, there is a set of characteristics associated with each household that help differentiate the six classes. Second, borrowers have greater access to land, larger families that supply labor, and more tenure security as evidenced by title holding, than non-solicitors of credit. Tabular and discriminant analysis were used to test these hypotheses.

3. DESCRIPTIVE PROFILE OF FORMAL BORROWERS AND NON-BORROWERS

3.1 Profile of Formal Borrowers and Non-Borrowers

As can be seen in Table A.1, the vast majority of those surveyed did not apply for credit. There was little difference between the different borrower classes in personal characteristics. Age, educational attainment, sex, and size of household were virtually identical. What was substantially different between the borrower classes was farm size and income levels. Successfully borrowers controlled more land resources, had more livestock, and had higher on-farm incomes. Credit may have allowed more intensive production; thus factors such as initial size of initial land endowment, quality of land, and managerial ability may be the latent factors explaining the income differences.

The possible effect of the initial land endowment can be gleaned by studying tenure and acquisition patterns. Overall, the majority of respondents hold insecure tenure over their parcels. Renting (37 percent) is the most common tenure form as opposed to inheriting (10.3 percent), and purchasing directly (12.1 percent). Nonetheless, formal borrowers enjoy more security compared to formal nonborrowers. Formal borrowers purchased and squatted on their parcels to a greater extent than nonborrowers, who rented in a greater proportion. The overwhelming majority of owners (97 percent) were not interested in selling their parcels, indicating a thin land market.

Those that did not solicit formal institutional credit earned more off-farm income and received more remittances. They cultivated slightly less land than borrowers and it is unknown whether they are land-, labor-, and/or capital-constrained. If these on-farm constraints exist, it could explain why they opt to pursue more vigorously off-farm opportunities.

In regards to the degree of specialization, basic grains were widely grown by all classes and there were slight differences between classes in the percent share of land devoted to horticultural and traditional exports. In contrast, those who received loans tended to receive technical assistance in a greater proportion. Much of the assistance, however, may be a

Table A.1: Profile of Formal Credit Users and Non-Users				
Observation/Variable	Total Observations or Cumulative Percent	User of Credit in 1992	Denied Credit in 1992	Non-Borrower
Number	1133	120	32	981
Percent	100	10.59	2.8	86.5
PERSONAL CHARACTERISTICS				
Age (Mean, Std Dev.)	1133	46.03 (14.80)	43.53 (13.65)	45.53 (15.62)
Sex (Male, Female Percent)		Male 89% Female 11%	Male 94% Female 6%	Male 88.6% Female 11.4%
Education (Mean years, Std Dev.)	1133	2.35 (3.27)	2.43 (2.56)	2.18 (3.54)
Family Size (mean, Std Dev.)	1133	6.10 (3.02)	5.9 (2.33)	5.84 (3.22)
ECONOMIC CHARACTERISTICS				
Area Cultivated in m ² (Mean, Std Dev.)	1133	2.94 (6.21)	1.27 (1.13)	1.36 (1.90)
Total Livestock Value in colones (Mean, Std Dev.)	1133	2387 (7035.29)	290.62 (919)	1666.04 (6651.64)
Net Farm Income 1992 in colones (Mean, Std Dev.)	1133	6235.37 (18105.91)	-272.25 (1216.61)	1610.01 (10636.42)
Off-Farm Income in colones (Count, Mean, Std Dev.)	478	44 2339.58 (2706.82)	13 2685.46 (2399.04)	421 2712.15 (2701.87)
Remittances in 1992 in dollars (Count, Mean, Std Dev.)	127	7 552.53 (426.32)	0	120 1160 (2125.58)
Share of Farm Income from Grains (Count, Percent)	650	98 87%	17 81%	535 86%
Share of Farm Income from Coffee & Sugarcane (Count, Percent)	650	98 3%	17 6%	535 5%
Share of Farm Income from Horticultural Crops (Count, Percent)	650	98 10%	17 13%	535 9%
Travel Time to Market in minutes (Mean, Std Dev.)	300	109.8 (85.64)	87.00 (34.20)	88.75 (79.68)
Opportunity Cost of Applying for a Loan in Labor days (Mean, Std Dev.)	120	7.6 (14.43)		

Table A.1: Profile of Formal Credit Users and Non-Users				
Observation/Variable	Total Observations or Cumulative Percent	User of Credit in 1992	Denied Credit in 1992	Non-Borrower
Documentation Costs in colones (Mean, Std Dev.)	119	215.89 (553.51)		
Travel Cost in colones (Mean, Std. Dev.)	120	88.00 (118.38)		
Technical Assistance Received (Count, Percent of Total in Class)	225	67 55.8%	7 22.8%	151 15.4%
From Ministry of Agriculture (Count, Percent Columnwise)	55	13 19.4%	2 28%	40 26.4%
From Banks (Count, Percent Columnwise)	60	33 49.3%	1 14.2%	26 17.2%
From Sugar Mills (Count, Percent Columnwise)	2	0	0	2 1.3%
From CLUSA (Count, Percent Columnwise)	0	0	0	0
From Private Agronomist (Count, Percent Columnwise)	26	4 6%	2 28%	20 13.2%
From NGO's (Count, Percent Columnwise)	82	17 25.3%	2 28%	63 41.7%
Note: 1 Exchange rate 8 Colones = 1 US\$ in 1992. Source: Land Tenure and Credit Survey 1993				

misnomer. Visits by bank agents were more monitoring activities rather than technology transfer and pest consultation sessions.

3.2 Profile of Formal Non-Borrowers

Denied borrowers while similar to other classes in terms of personal characteristics, were significantly weaker on economic variables. They had substantially less livestock, less land, and less income. The main reason given for rejection, was lack of collateral (52 percent). With such a meager resource base, their capacity to cope with external production and price shocks would be extremely limited. The lack of an endowment makes this class statistically a very high risk.

Reason	Frequency	Percent
No collateral	18	56.3
Overdue debt	3	9.4
No credit availability in cooperative	3	9.4
Not informed of reason	8	25
TOTAL	32	100

In contrast, formal non-borrowers had more land, cattle, off-farm income, and remittances than denied borrowers. They gave three reasons in rank order of importance for not soliciting credit: (1) a sufficiency of liquidity (53 percent); (2) high transaction costs in second place (17 percent), and (3) a history of bad debt (11 percent). Lack of collateral and fear of default, common reasons in other developing countries, were not reported in larger percentages, (6.3% and 1.1%, respectively). The much higher level of remittances and off-farm income may permit this class to engage in more self-financing provided there are no labor or land constraints.

3.3 Collateral Requirements

Historically, lack of collateral has complicated access to formal credit for smallholders in most societies. In El Salvador formal banks usually required collateral equal to 110-120 percent of the loan amount. The most commonly used assets for collateralization are land, cattle, houses, and standing crops. Land and house titles combined accounted for 34% of collateralization. In second place were crop liens (27 percent). In sharp contrast, informal credit markets rely more on personal judgements and reputations (55 percent) and crop liens (See Table A.3). The intangible value of maintaining a good reputation in a small community,

norms of reciprocity, and interlinked commercial and personal relationships serve to "insure" transactions to a greater extent.

Table A.3: Collateral Requirements Compared: Formal vs. Informal				
Type	Formal Borrower	Percent	Informal Borrower	Percent
Land title	19	15.8	4	1.3
Crop Harvest	32	26.7	70	22.3
Livestock	1	.8	2	.6
Bill of Sale	14	11.7	2	.6
Word of Honor	1	.8	47	15
Co-Signers	9	7.5	3	1.0
Personal Property	4	3.3	1	.3
Nothing	12	10	173	55.1
Cooperative	1	.8	10	3.2
House Title	22	18.3	2	.6
Mortgage	1	.8		
ISTA (Land Reform Agency)	1	.8		
FINATA (Land Bank)	1	.8		
National Reconstruction Plan (Special Gov't Program for Dislocated)	1	.8		
Missing	1	.8		
TOTAL	120	100	314	100

In the rural areas, housing stock is modest and of low value. Titles to land also are not very uncommon. Only 4.5 percent of the entire surveyed respondents had a title. As can be seen in Table A.4, the majority of title holders used the document to access formal credit.

A.4: Security of Tenure				
Type of Document Held for Main Parcel	Formal Borrower	Percent	Informal Borrower	Percent
Purchase-Lease Contract	3	2.5	4	1.3
Deed	22	18.3	33	10.5
Notarized Deed	9	7.5	9	2.9
Title	5	4.2	6	1.9
Sales Receipts		5.0	12	3.8
No Document	75	62.5	1	.3
			249	79.3
Total	120	100	314	100

Despite the appearance of a severe collateral barrier, the lack of credit does not seem to be directly tied to the underutilization of land. The response to the question, "Why did you leave land idle", yielded inconclusive answers. The vast majority of the people did not answer the question, in large part because they are fully utilizing their parcels. Underutilization is more of a problem with large and medium farmers, and they seem to be underrepresented in this sample, because a location-based, cluster design was used. Most all medium and large farmers live in urban areas.

Table A.5: Why did you leave land idle?		
Reasons	Frequency	Percent
Lack of credit	1	.8
Lack of seed	1	.8
Lack of fertilizer	2	1.7
Fallow	4	3.3
Unprofitability in Agriculture	3	2.5
Field rented	2	1.7
Poor quality	3	2.5
Pasture	4	3.3
Construction of a home	1	.8
Missing	99	82.5
TOTAL	120	100

3.4 Interlinkage Between Formal and Informal Sectors

As can be seen in Table A.6, the two credit markets are fairly autonomous and independent of each other. Only 14 out of a total of 1133 individuals had simultaneous loans in each market. However, the informal market does seem to serve as a last resort market for those denied formal loans. Forty percent rejected in the formal market, 13 out of 32, were able to secure an informal loan. Over 60 percent of the sample were non-participants in both markets.

Table A.6: Matrix of Formal and Informal Credit Market Interaction				
FINANCIAL MARKET/BORROWER CLASS	INFORMAL APPROVED	INFORMAL DENIED	INFORMAL NON-SOLICITOR	ROW TOTAL
FORMAL APPROVED	14		106	120
FORMAL DENIED	13	5	14	32
FORMAL NON-SOLICITOR	287	2	692	981
COLUMN TOTAL	314	7	692	1133

4. DESCRIPTIVE PROFILE OF INFORMAL BORROWERS AND NON-BORROWERS

4.1 Profile of Informal Borrowers and Non-Borrowers

Unlike the formal credit sector, there is more heterogeneity among informal borrowers and non-borrowers in terms of personal and economic characteristics. There are clear differences between informal borrowers and denied borrowers on personal characteristics. Denied borrowers tend to be younger, less educated, and have smaller households. Between informal borrowers and non-borrowers, however, there is little difference on the personal characteristics and most of the economic ones, except for off-farm income, remittances, and technical assistance received (Table A.7). On the latter indicators, non-borrowers score higher on amount received and incidence of agronomist visits.

Table A.7: Profile of Informal Credit Users and Non-Users

Observation/Variabile	Total Observations or Cumulative Percent	User of Credit in 1992	Denied Credit in 1992	Non-Potential Borrower
Number	1133	314	7	812
Percent	100%	27.7%	.6%	69.9%
PERSONAL CHARACTERISTICS				
Age (Mean, Std Dev.)	1133	42.62 (13.97)	35.85 (20.59)	46.73 (15.82)
Sex (Male, Female Percent)		Male 89% Female 11%	Male 86% Female 14%	Male 89% Female 11%
Education (Mean years, Std Dev.)	1133	2.26 (2.44)	.71 (1.88)	2.2 (3.82)
Family Size (mean, Std Dev.)	1133	5.99 (2.55)	4.57 (2.50)	5.84 (3.38)
ECONOMIC CHARACTERISTICS				
Area Cultivated in m ² (Mean, Std Dev.)	1133	1.53 (1.91)	.46 (.43)	1.55 (2.99)
Total Livestock Value in colones (Mean, Std Dev.)	1133	928.29 (3611.99)	85.71 (106.90)	2017.30 (7451.13)
Net Farm Income 1992 in colones (Mean, Std Dev.)	1133	2029.42 (18824.45)	-43.42 (842.33)	2071.46 (11943)
Off-Farm Income in colones (Count, Mean, Std Dev.)	478	156 2823.98 (2688.18)	5 877 (636)	317 2633.25 (2705.95)
Remittances in 1992 in US dollars (Count, Mean, Std Dev.)	127	18 1044.44 (1666.35)	0	109 1140.93 (2138.37)
Share of Farm Income from Grains (Count, Percent)	650	202 88%	2 100%	446 85%
Share of Farm Income from Coffee & Sugarcane (Count, Percent)	650	202 3%	2 0%	446 5%
Share of Farm Income from Horticultural Crops (Count, Percent)	650	202 9%	2 0%	446 10%
Travel Time to Market in minutes (Mean, Std Dev.)	300	93.23 (93.13)	180 (0)	91.35 (74.81)
Opportunity Cost of Applying for a Loan in hours (Mean, Std Dev.)	314	4.89 (19.92)		

Table A.7: Profile of Informal Credit Users and Non-Users

Observation/Variable	Total Observations or Cumulative Percent	User of Credit in 1992	Denied Credit in 1992	Non-Potential Borrower
Documentation Costs (Mean, Std Dev.)	314	9.39 (46.19)	0	0
Travel Cost (Mean, Std. Dev.)	314	16.16 (63.52)		
Technical Assistance Received (Count, Percent Rowwise)	222	56 25.2%	1 .4%	165 74.3%
From Ministry of Agriculture (Count, Percent Columnwise)	55	11 19.6%	1 28%	43 26%
From Banks (Count, Percent Columnwise)	60	13 5.8%	0	47 28.5%
From Sugar Mills (Count, Percent Columnwise)	2	0	0	2 1.2%
From CLUSA (Count, Percent Columnwise)	0	0	0	0
From Private Agronomist (Count, Percent Columnwise)	26	5 8.9%	0	21 12.7%
From NGO's (Count, Percent Columnwise)	79	27 48.2%	0	52 31.5%

Source: Land Tenure and Credit Survey 1993

4.2 Informal Sources of Credit

Unlike Asian countries, most of the informal sources of credit are friends and relatives. There is little reported reliance on moneylenders, traders, and input suppliers (Table A.8). The second and third most common sources are cooperatives and religious organizations. During the 1980's, many non-governmental entities came to the fore, trying to assuage some of the social and economic dislocations caused by the war through credit programs. In contrast to Asia and Africa, informal money markets are relatively undeveloped. There seems to be little evidence of interlinked contracts (employment-credit, marketing services-credit, land rental-credit). What seems to be fueling the informal market is a combination of strong familial bonds, remittances from abroad, and the presence of a host of NGO's. First, better-off family members assist less well-off family members, usually with no interest charge. Second, remittances permits more self-financing of projects and injects some degree of liquidity in the rural economy. Third, the number of NGO's operating rural credit programs has mushroomed in the last decade.

A.8: Sources of Informal Credit		
Source	Frequency	Percent
Private Lender	4	1.3
Buyer/Trader	7	2.2
Local Friend/Relative	128	40.8
Overseas Friend/Relative	3	1.0
Input Supplier	21	6.7
Land Owner	1	.3
Cooperative	60	19.1
Vision Mundial	1	.3
Catholic Church	27	8.6
ASAI	1	.3
Plan Internacional	1	.3
Plan Padrino	5	1.6
Communal Banks	2	.6
CORDES	27	8.6
Fe y Trabajo	2	.6
FMLN	2	.6

In the case of informal credit non-solicitors, the main reasons given included: no need (73.4%); use of formal credit (9.1%); and high informal sector interest rates (8.1%).

5. PROFILE OF BORROWERS BY FARM SIZE CLASS

When all approved borrowers are compared according to farm size, an absolute greater proportion of both small and medium farmers secured loans in the informal sector compared to the formal. Interest rates charged in the informal sector were generally lower but with much more variability than the formal sector. The reason being the predominance of 0-interest loans from relatives and subsidized interests rates from non-governmental organizations who lend. To compound the relatively high interest rates on formal loans, total transaction costs, which include imputing the opportunity cost of time spent in the application process, travel expenses, and documentation costs, were on the order of 7.5 to 17 times larger than informal sector non-interest costs (Table A.9). Despite the heavy collateralization required for formal loans, delinquency was significantly higher for formal sector loans. Lack of aggressive collection efforts and the habit of refinancing bad loans may help to explain this phenomenon.

Table A.9: Classification by Farm Size				
VARIABLE	SMALL FARMS (LESS 8 MZ)	MEDIUM FARMS (8 AND 24 MZ)	LARGE FARMS (OVER 24 MZ)	TOTAL
COUNT	1144	14	3	1161
PERCENT	98.5%	1.2%	.3%	100%
MEAN	1.27	11.47	40.83	
STD DEVIATION	1.26	4.05	13.37	
FORMAL CREDIT USE (COUNT, PERCENT)	115 10.3%	3 21.4%	2 66.6%	
INFORMAL CREDIT USE (COUNT, PERCENT)	310 27.7%	4 28.5%	0	
FORMAL INTEREST RATES (MEAN, STD DEV.)	16.63 (6.2)	14.66 (4.16)	17.75 (2.47)	
FORMAL TOTAL TRANSACTIONS COSTS (MEAN, STD DEV.)	276.90 (384.13)	1819.33 (2813.08)	955.50 (861.96)	
INFORMAL TOTAL TRANSACTIONS COSTS (MEAN, STD DEV.)	36.56 (87.62)	107 (123.55)	0	
INFORMAL INTEREST RATES (MEAN, STD DEV.)	11.28 (23.64)	5.25 (6.18)	0	
FORMAL DELINQUENCY RATES (COUNT, PERCENT)	22 (19.1%)	2 (66.6%)	0	
INFORMAL DELINQUENCY RATES (COUNT, PERCENT)	38 (12.2%)	1 (25%)	0	

6. TABULAR ANALYSIS OF GROUP MEAN DIFFERENCES

When the group means for various characteristics were compared and a t-test conducted, statistically significant differences were obtained for a subset of characteristics indicating that formal borrowers and formal credit non-solicitors come from different populations. Formal borrowers cultivated more area, employed more labor, and enjoyed higher net incomes than non-solicitors. This may be due to the "credit effect"; additional capital allowed formal borrowers to farm more intensively and extensively. Non-solicitors, however, relied more on off-farm income and remittances. This may indicate that land and labor constraints exist. As well non-solicitors may be more often situated in formerly conflictive zones. These zones had the greatest out-migration and therefore those family members who stayed behind can be expected to receive higher levels of remittances. When informal borrowers were compared to informal non-solicitors, the latter were found to be statistically different in age, titling, off-farm income, remittance levels, and crop category concentration. With the exception of off-farm income, where informal borrowers earned more, non-solicitors had higher means on the other variables and focused more on traditional export crops (sugar and coffee) as opposed to basic grains.

Table A.10: Group Means of Differentiating Characteristics Between Borrowers and Non-Solicitors By Sector

Characteristic	Formal Borrower	Formal Non-Solicitor	F-Statistic	P-Value	Informal Borrower	Informal Non-Solicitor	F-Statistic	P-Value
Age	46.03	45.53	.540	.462	42.62	46.73	11.71	.001*
Education (years)	2.3	2.18	.38	.53	2.26	2.2	1.427	.23
Family Size	6.1	5.8	.919	.338	5.99	5.83	.483	.487
Title (Percent Holding)	4.1	4.4	.102	.749	1.9	5.5	29.44	.000*
Area Cultivated (mz)	2.9	1.36	35.439	.000*	1.50	1.55	1.33	.25
Livestock Value (colones)	2387	1666	2.394	.12	928.29	2017.30	18.77	.000
Number of Workers Employed	5.38	4.23	5.28	.02*	4.93	4.13	3.024	.083
Net Farm Income (colones)	6235.37	1610.01	23.985	.000*	2029.41	2071.46	.012	.912
Off-Farm Income (colones)	857.84	1163.93	3.57	.059*	1402.99	1028.00	8.12	.004*
Remittances (US\$)	32.23	141.99	6.95	.005*	59.87	153.15	10.70	.002*
Net Household Income (colones)	7362.03	3914.57	8.94	.003*	3913.13	4331.29	1.14	.28
Distance to Market (minutes)	109.80	88.75	1.284	.25	93.37	91.35	.80	.777
Share of Area in Coffee and Sugar (%)	2.8	4.9	3.279	.071*	2.96	5.4	7.86	.005*
Share of Area in Grains (%)	86.95	55.76	.393	.531	88.4	84.5	8.63	.003*
Share of Area Planted in Horticultural Crops (%)	10.16	9.34	.319	.572	8.56	10.06	2.13	.145

When formal borrowers and informal borrowers were compared, formal borrowers had a more sturdy economic profile. Whereas formal borrowers tended to have title more often and a higher family size. The apparent absence of land, family labor, and credit constraints, permitted more intensive production and higher incomes. Informal borrowers seem to rely more on off-farm income and remittances. This may indicate that they are relatively more land- and labor-constrained and therefore in a lower semi-proletarian, agrarian class.

Table A.11: Group Means of Differentiating Characteristics Between Formal and Informal Approved Borrowers

Characteristic	Formal Borrower	Informal Borrower	F-Statistic	P-Value
Age	44.95	42.62	.749	.387
Education (years)	2.3	2.26	2.115	.147
Family Size	6.18	5.99	2.978	.08*
Title (Percent Holding)	4.7	1.9	9.73	.002*
Area Cultivated (mz)	3.03	1.50	14.67	.000*
Livestock Value (colones)	2253.21	928.29	16.73	.000*
Number of Workers Employed	4.37	4.93	2.156	.144
Net Farm Income (colones)	6916.62	2029.41	14.25	.000*
Off-Farm Income (colones)	852.79	1492.99	6.48	.011*
Remittances (US\$)	27.05	59.87	1.98	.159*
Net Household Income (colones)	7997.98	3913.13	10.02	.002*
Distance to Market (minutes)	109.80	93.37	.778	.379
Share of Area in Coffee and Sugar (%)	3.1	2.9	.027	.869
Share of Area in Grains (%)	88.73	88.47	.001	.971
Share of Area Planted in Horticultural Crops (%)	8.13	8.56	.027	.869

7. FUTURE CREDIT NEEDS AND IMPROVEMENTS IN SERVICE DESIRED

The strongest felt need among respondents was for more credit lines. Thirty-five percent believed financial institutions should offer other lines than just short-term production. Strong demand seem to exist for marketing loans and medium-term farmstead improvement loans. Without bridge financing, many farmers are forced to sell grain immediately at harvest time, when prices are low. Productivity enhancing measures, mostly soil conservation measures, also need to be financed but are not currently. In second place, respondents wanted to see improved loan processing. Current practices are perceived to be too complicated and slow. In third place, respondents wanted lower interest rates. The third most common desire is for lower interests, an understandable and self-interested response.

Item	Frequency	Percent
Savings deposits	63	5.4
More Lines of credit	401	34.5
Lower interest rates	228	19.6
Adequate loans	13	1.1
More agile loan processing	302	26.0
More payment flexibility	100	8.6
None	19	1.6
Missing	35	3.0
TOTAL	1161	100

When the data is disaggregated by borrower class, the same general pattern is mirrored: the desire for more credit supply and better loan processing. However, denied borrowers complained the most about the limited number of credit lines. Even among approved formal borrowers, a high percentage seek an increase in lines of credit in order to increase farm efficiency and profitability. In the case of the desire for better loan processing, approved informal borrowers clamored the most. This may indicate that they were forced out of the formal market because of high transaction costs.

Table A.13: Most Desired Improvements in Formal Bank Services by Class of Applicant						
Service Improvement	Approved Formal Borrower (Column Percent)	Denied Formal Applicant (Column Percent)	Formal Non-Solicitor (Column Percent)	Approved Informal Borrower (Column Percent)	Denied Informal Applicant (Column Percent)	Informal Non-Solicitor (Column Percent)
Savings Deposits	4 (3%)		59 (6%)	14 (4.4%)		49 (6%)
More Lines of Credit	49 (40.8%)	14 (44%)	338 (35%)	105 (33.6%)	5 (71.4%)	291 (36%)
Lower Interest	27 (22.5%)	6 (19%)	195 (20%)	62 (19.8%)		166 (20.5%)
Adequate Loan Amounts			13 (1.3%)			13 (1.6%)
More Agile Loan Processing	24 (20%)	10 (31%)	268 (27.4%)	102 (32.6%)	2 (28.6%)	198 (24.5%)
More Payment Flexibility	16 (13.3%)	2 (6.2%)	82 (8.4%)	24 (7.5%)		76 (9.4%)
No Improvement Needed			19 (1.9%)	4 (1.2%)		15 (1.8%)
Missing			1 (.1%)	1 (.3%)		
TOTALS	120	32	975	312	7	808

If more or first-time credit were obtained the overwhelming majority (65 percent) would invest in crops. The other main category was cattle with 17.4%. Interestingly, less than 1 percent of respondents expressed any interest in agribusiness, which may be potentially more profitable. Lack of technical and managerial expertise may explain why non-current activities were not selected.

8. DISCRIMINANT ANALYSIS OF BORROWERS AND NON-SOLICITORS

8.1 Informal Credit Market

Univariate F-values in Tables A.10 and A.11 indicate the potential power of each individual variable in discriminating among groups. The relative importance of each characteristic is determined with discriminant functions by simultaneously entering all non-collinear variables into the discriminant analysis. When the variables are standardized, the absolute size of a coefficient indicates the relative contribution or importance of the associated variable. The direction of the association is shown by the sign of the coefficient.

Two discriminant functions are produced in Table A.14. The generation of two functions suggest that there are some distinctions between borrowers and non-borrowers in the informal credit market. The power of discrimination (square of canonical correlation coefficient) was 14 percent for function I and 1 percent for function II, a total of 15 percent. The low percentage suggests that important factors that could have explained more variation have not been included in the model. However, when the functions are used to classify each sample household into the most likely borrower group according to the set of characteristics associated with that household, the discriminant functions correctly classified 60.11 percent of all the sample households.

As denoted by the location of group centroids, Function II primarily distinguishes non-potential or denied borrowers and Function I, actual and potential borrowers. This is indicated by the larger absolute value of group centroids compared across function by category. In Function I, coefficients with positive signs indicate variables that contribute to potential credit use, those with negative signs correspond to variables that contribute to the non-use of credit.

Discriminant Function I most readily distinguishes present borrowers from the other groups. The leading positive variable is net farm income (1.37). Perhaps because higher income farm households are more dependent on purchased inputs and accordingly have higher operating costs. As expected, there is a negative relationship with transaction costs. The higher the cost, the less likely the use. On the other hand, Function II suggests that the most important variables that contribute to non-use are high net income (which is influenced heavily by the off-farm income component), older age, and high levels of remittances.

Examination of the other variable's function coefficients in combination with group means is used to understand how the variables affect the borrowing decisions and consequently differentiate the three groups. Education was not important in differentiating between groups but there was a large difference between the group mean for borrowers and denied borrowers. Age was important in discriminating among groups and non-solicitors tended to be slightly older than borrowers. Borrowers tended to be much older than denied borrowers. The age discrepancies may indicate that non-borrowers have accumulated more asset wealth relative to their operational needs, and can more easily finance themselves. The sharp difference in group means for cattle, a common yardstick of wealth in rural areas, supports this contention.

Whereas borrowers had an average cattle value of C928, non-solicitors had an average livestock worth of C2,017 (See Table A.7). Denied borrowers, on the other hand, have not had as much time to accumulate an asset base and appear to be very high-risk candidates.

Family size group means were indistinguishable between borrowers and non-solicitors, but in Function II, the one that distinguishes denied borrowers, the coefficient for family size was positive and modest in magnitude. In terms of land resources, non-borrowers had more land than borrowers. The holding of a title was also skewed in favor of non-borrowers. Because titles are usually not demanded by informal lenders title possession had no discriminatory power, although possession of a title signifies greater security and negotiating flexibility.

As expected, borrowers had higher farm incomes than other groups. Undoubtedly, this variable is highly associated with both degree of market integration and credit use. Borrowing is directly linked to access to credit. Non-solicitors, however, have a very high level of remittances, three times the average for borrowers, and live slightly closer to principal market towns. The high level of transfers and greater ease in exploiting off-farm economic opportunities resulted in higher net household income. Accordingly, non-borrowers are less eager to expand production or improve technologies and hence have less of a desire to borrow for agricultural purposes.

A.14: Discriminant Analysis of Informal Credit Market		
Household Characteristics	Standardized Discriminant Function Coefficients	
	Function I	Function II
Age	.2112	.69224
Education	.01726	.48049
Family Size	-.04775	.35277
Title	.17709	.17704
Share of Area in Grain	-.22389	.458655
Share of Area in Coffee & Sugar	.05701	.14519
Share of Area in Horticulture	.04412	.21556
Transaction Cost	-.91150	.12559
Area Cultivated	.00427	.15914
Livestock Value	.12317	.20664
Net Farm Income	1.37086	-1.2638
Remittances	.71892	-.60027
Net Household Income	-1.3853	1.41523
Group Centroids		

A.14: Discriminant Analysis of Informal Credit Market		
Household Characteristics	Standardized Discriminant Function Coefficients	
Informal Borrowers	-.68134	-.02588
Denied Informal Borrowers	.1466	-1.284
Informal Non-Solicitors	.2622	.02108
Eigenvalue	.1789	.0104
Canonical Correlation	.38	.10
Power of Discrimination	14%	1%
Wilk's Lambda	.83	.98
Chi-Square	196.56 ^a	11.59 ^b
^a Significant at .0001 level (26 DF)		
^b Not Significant (12 DF)		

8.2 Formal Credit Market

In the formal credit market, two discriminant functions were estimated also indicating some distinct characteristics between users and non-users. The power of discrimination for Function I was 6.2 percent and for Function II 0.3 percent, for a total of 6.5 percent. Much variation remains unexplained, suggesting that some important variables have been excluded. When the discriminant functions are used to classify each sample household into the most likely borrower group according to the set of attributes associated with the typical household, the functions correctly classified 34 percent of all the sample households.

As indicated by the location of the group centroids, Function I best distinguishes present borrowers and Function II non-users. Positive signs indicate variables that contribute to credit use and negative signs correspond to variables that contribute to the non-potential credit use. In terms of explaining credit use, the area devoted to grain production positively influenced credit use as well as lesser amounts of off-farm income and lower levels of estimated transaction costs. The coefficients in Function I were high for area planted and level of farm income. But because both variables are highly correlated with credit use and may result from access to credit, an inference of direction of causality should be made with caution. Non-solicitation of credit was best explained by lower levels of farm income.

A.15: Discriminant Analysis of Formal Credit Market		
Household Characteristics	Standardized Discriminant Function Coefficients	
	Function I	Function II
Age	.09646	.30207
Education	.07517	-.19905
Family Size	.11954	-.05155
Title	.00660	-.21186
Share of Area in Grain	.56378	.11954
Share of Area in Coffee & Sugar	.01160	-.07670
Share of Area in Horticulture	.23212	-.26156
Transaction Cost	-.09976	.14562
Area Cultivated	.53045	-.22842
Livestock Value	.13483	.48651
Net Farm Income	1.18903	-.59474
Remittances	.27542	-.03866
Net Household Income	-1.09218	1.13858
Group Centroids		
Formal Borrowers	.71384	.21533
Denied Formal Borrowers	-.04184	-.37769
Formal Non-Solicitors	-.08596	-.01402
Eigenvalue	.0661	.0036
Canonical Correlation	.2491	.0596
Power of Discrimination	6.2%	.35%
Wilk's Lambda	.93	.99
Chi-Square	75.99 ^{\a}	4.001 ^{\b}
^{\a} Significant at .0001 level (26 DF)		
^{\b} Not Significant (12 DF)		

In summary, formal non-solicitors seem to have better off-farm income-generating alternatives and thus are less inclined to apply for formal credit. The group means indicate small differences among the majority of variables. Other variables such as price and production

risk assessments, production and investment goals, and level of technology, may yield more differences.

9. CONCLUSIONS

Agricultural borrowers, both in the formal and informal sectors, have better initial endowments of land, labor, and livestock resources than other groups, which encourage agricultural credit use. Denied borrowers are below the critical threshold, with low levels of accumulated wealth and low incomes from all potential sources. Non-solicitors are very similar to borrowers in characteristics, but seem to be more engaged in off-farm activities. Two subgroups within the non-solicitor class seem to exist, those who are relatively older with a sufficient base of assets relative to operational expenses that permits self-financing. A second subgroup derives a larger portion of income from off-farm employment and receipt of remittances. Depending on the number of days worked off-farm, little time may be available for activities on their own farms and production goals and technology used are therefore less ambitious and modern. Those who receive remittances may be able to self-finance agricultural activities or to focus less keenly on agriculture altogether.

Traditional reasons for non-use such as lack of title and high interest rates do not seem to be major impediments to credit demand. Until recently (1992), crop liens were more heavily relied upon than titles by the leading rural lender, Agricultural Development Bank. More significant impediments were reported to be the limited number of credit lines available and the high transactions costs involved in applying for a formal loan. At present, small farmers are eligible mostly for short-term grain, sugar, and coffee production loans. Horticulture, soil conservation, marketing, and capital improvement loans are more difficult to obtain or do not exist.

The weak explanatory power of the variables used in the discriminant analysis suggests that other variables such as investment plans, operational expenditure levels, availability of labor, access to improved technology, quality of soil, perception of price fluctuations, and production risks shape expected returns to agriculture and may play a larger role in determining credit use. Unfortunately, the dataset does not have many of these variables.

Policy action, therefore, should be directed to increasing agricultural profitability through education, technology dissemination, and improvements in marketing channels. The dominance of rental tenure poses an especially vexing problem because of possible "disincentives" to invest in permanent land improvements. Particular attention should be paid to determining the impact of rental tenure on efficiency and productivity and how new contracts could be used to stimulate land improvements and cultivation of high-value perennial crops. At the same time, formal institutional lenders should be encouraged to reform and streamline operations in order to lower borrower transaction costs. Less effort and resources should be expended on titling.