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WHAT DETERMINES FINANCIAL EXCLUSION? EVIDENCE FROM BOLIVIAN HOUSEHOLD DATA

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Abstract

We use a bivariate probit model with sample selection to investigate the factors affecting financial exclusion of Bolivian households. We find evidence that for heads of households, being female and indigenous is likely to result in exclusion from formal credit mechanisms, though being employed in the public sector and, for females, by having a university education, mitigates this.

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1. Introduction

There is increasing evidence that the benefits of financial development often accrue to the privileged few, especially in developing countries.[1] As a result, many households are limited in the extent to which they can smooth their income, insure against risks, and broaden investment opportunities, which constrains their growth and welfare opportunities. In this short paper we examine the factors affecting financial exclusion of Bolivian households. We find evidence that for heads of households, being female and indigenous is likely to result in exclusion from formal credit mechanisms, though being employed in the public sector and, for females, by having a university education, mitigates this.

Empirical research on the determinants of financial exclusion is relatively new.[2] Moreover, it has largely been confined to the experience of developed economies and to access to financial services generally, rather than access to bank credit. Recent studies of this type include Hogarth et al. (2005) for the US, Devlin (2005) for the UK, Simpson and Buckland (2009) for Canada, and the European Union (2008) for EU member countries. All these authors find financial exclusion (typically defined as having access to a bank account) to be determined mainly by factors such as levels of income, net worth, education, employment status, age, housing tenure, family size, and being white. In sum, the research suggests that the provision of financial services is often geared towards already better-off households and individuals. The research provides little information on access to bank credit per se, which is a key indicator of country's financial depth, or on whether financial exclusion was voluntary or involuntary on the

[1] Financial exclusion 'rates' of between 1 and 40 percent have been reported for European Union member countries (European Union, 2008), 9 percent for the US (Hogarth et al., 2005), and 3 percent for Canada (Simpson and Buckland, 2009). Access is much lower for most developing countries with use of a basic bank account typically between 10-30 percent (Claessens, 2005).

[2] A good recent survey of research issues relating to financial exclusion is World Bank (2007).

part of the excluded, or on whether it was more prevalent among certain ethnic and social groups. Our results suggest some answers to these questions.

2. Data and methodology

Our dataset is derived from the Bolivian National Institute of Statistics Household Survey of 2002, which covered 5,703 households in urban and rural areas and was carried out between November and December 2002. This enables us to examine financial exclusion at the level of the national economy, in contrast to most recent research, which has focused on population sub-groups. The survey provides information on population demographics relating to migration status, health, education, employment, income, housing, and household finances and expenses. In particular, survey participants were asked whether any member of the household had borrowed from a bank or participated to an informal financial mechanism.[3]
The sample is restricted to households as a unit of observation and we assume that it is the head of the household that most influences the decision to borrow.

Table 1 provides summary statistics. Around 58% of households in the survey were located in urban areas and almost 60% of households were considered to be in poverty. The average household had 4.3 members with 1.9 working members. 20% of household head's were female and 60% were of indigenous origin. Average education per household head was 6.9 years with about 14% of household head's having been educated to university level. Finally, 9.6% of the households surveyed had access to credit, of which 63.4% borrowed from the formal credit market and the rest borrowed in the informal market.

We use a bivariate probit model with sample selection to examine the borrower characteristics that lead to credit exclusion from formal financial institutions. In the selection equation we use a probit model to estimate the probability of household borrowing, including both formal and

[3] An important informal credit mechanism in Bolivia is provided by the rotating savings and credit associations (ROSCAs), which are voluntary groupings of individuals who create a fund that is allocated in accordance with some prearranged principle to each member of the group in turn (see Calomiris and Rajaraman, 1998).

informal mechanisms. This helps us to determine those household characteristics that lead to borrowing in the first place, and hence tackles the problem of selection bias. The model is as follows:

$$\Pr(borrowing_i) = \beta_0 + \beta_1 Female_i + \beta_2 Single_i + \beta_3 Indigenous_i + \beta_4 Members_i + \beta_5 Urban_i + \beta_6 Poverty_i + \beta_7 Income_i + \beta_8 Public_i + \sum \beta_m \times Age + \sum \beta_n \times Education + e_i \quad (1)$$

where: Female takes the value of 1 if household head is female and 0 otherwise; Single takes the value of if household head is single and 0 otherwise; Indigenous takes the value of 1 if household head speaks a native language as mother tongue and 0 otherwise; Members is the number of members in the household; Urban takes the value of 1 if the household lives in an urban area and 0 otherwise; Poverty takes the value of 1 if the total income of the household is below poverty level and 0 otherwise; Income is the total income of the household; Public takes the value of 1 if the head of household is employed in the public sector and 0 otherwise;
Age is a series of dummy variables depending on the age of the head of household, and Education is a series of dummy variables relating to the educational attainment of the head of household.

In the second step, we focus on the borrowing households and estimate the probability of getting a credit from a formal financial institution. Specifically, we are looking for the attributes that lead to credit exclusion and force potential borrowers to use informal funding arrangements. This is modeled as a function of characteristics of the head of household. It estimates the impact of household characteristics on credit exclusion after the households' initial decision to borrow. The dependent variable, Formal, takes the value of 1 if the household borrows from formal financial institutions and 0 if the borrowing is through informal. This model is as follows:

$$\Pr(formal_i) = \beta_0 + \beta_1 Female_i + \beta_2 Single_i + \beta_3 Indigenous_i + \beta_4 University_i + \beta_5 Public_i + \beta_6 Inverse\ of\ Mill's\ ratio_i + v_i \quad (2)$$

where: Female, Single, Indigenous and Public are as described above, and University takes the value of 1 if the head of household has a university education and 0 otherwise.

3. Empirical results

The results are presented in Tables 2 and 3. The main independent variables are employed separately and jointly in alternative specifications (columns 1 to 9). Our findings are robust in all specifications. First we comment briefly on the results of the selection model from step 1 (table 2). We find that borrowing—regardless of the source of the credit—is positively related to the level of household income, the educational level and age of the household head, the size of household, and to the household being located in an urban area. Smaller households, households with a female household head or an indigenous background are less likely to access the credit market.

After controlling for selection bias and determining the attributes of the possible borrowers, we focus on 546 borrowing households in the main model estimated in step 2 (table 3). The results indicate that females and indigenous borrowers are most likely to be excluded from the formal credit institutions and be forced to use informal credit mechanisms. Being a university graduate or a public employee eases the ability to access bank credit. It is highly likely that university graduates hold better paying jobs and have longer term income guarantee. Similarly, public sector jobs typically require literacy and pay higher average salaries, which increase the ability to access the formal credit market (Schreiner and Nagarajan, 1998).[4]

We also utilize interaction variables to examine the data further. Interacting education and public sector employee variables with indigenous and female borrowers, suggests that having a job in the public sector increases the likelihood of access to the formal credit market for both females and the indigenous. In developing economies public sector employment is typically more

[4] We also ran regressions using other employment and educational criteria (results not reported) but the estimated coefficients were not statistically significant.

stable than private sector employment, and male employment may be more stable than female employment. Accordingly, being employed in the public sector may be especially important for reducing barriers to female access to the formal credit market (Handa and Kirton, 1999; Anderson and Baland, 2002). A university education increases significantly the probability that females will access the formal credit market but does not appear to increase the access of the indigenous. As most financial services in Bolivia are offered in Spanish, language could be a natural barrier to those indigenous unable to speak it and may lead to self-exclusion. However, indigenous people with university education—for whom the teaching medium was almost certainly Spanish, would appear to face exclusion from the
formal credit market. Finally, being located in an urban or rural area does not appear to affect the probability of accessing the formal credit market.

4. Conclusions

In this short paper, we present evidence suggesting that in Bolivia access to the formal and informal credit market is positively related to factors such as levels of household income and educational, age, and to household size and location. Additional factors come into play when we focus on access to the formal financial sector, however. In this case, our results suggest that females and the indigenous are more likely to face exclusion and be forced to use informal credit mechanisms, though this is mitigated by their being employed in the public sector and, for females, by having a university education. These results are consistent with other recent research suggesting indicating that the provision of financial services is often skewed towards the already better-off households and individuals.

References

Anderson, S., Baland, J.M., 2002. The economics of Roscas and intra-household resource allocation. Quarterly Journal of Economics 117, 963-995.

Calomiris, C., Rajaraman, I., 1998. The role of Roscas: lumpy durables or event insurance? Journal of Development Economics 56, 207-216.

Claessens, S., 2005. Access to financial services: a review of the issues and public policy objectives. World Bank Research Observer 21, 207-240.

Devlin, J.F., 2005. A detailed study of financial exclusion in the UK. Journal of Consumer Policy 28, 75–108.

European Union, 2008. Financial services provision and prevention of financial exclusion. European Commission, Brussels.

Handa, S., Kirton, C., 1999. The economics of rotating savings and credit associations: evidence from the Jamaican 'Partner'. Journal of Development Economics 60, 173-194.

Hogarth, J.M., Anguelov, C.E., Lee, J., 2005. Who has a bank account? Exploring changes over time, 1989–2001. Journal of Family and Economic Issues 26, 7-30.

Schreiner, M., Nagarajan, G., 1998. Predicting creditworthiness with publicly observable characteristic: evidence from ASCRAS and ROCAS in the Gambia. Journal of Savings and Development 22, 399-414.

Simpson, W., Buckland, J., 2009. Examining evidence of financial and credit exclusion in Canada from 1999 to 2005. The Journal of Socio-Economics 38(6), 966–976.

World Bank, 2007. Finance for all? Policies and pitfalls in expanding access. The World Bank, Washington DC.

Table 1
Descriptive Statistics

A. Characteristics of households	Number	% of total
Total number of households	5,703	100.0
Borrowing households	546	9.6
Formal financial institutions	346	6.1
Informal arrangements	200	3.5
Urban households	3,331	58.4
Income below poverty level	3,415	59.9
Average monthly income per member (US$)	59.7	1.0
Average number of members	4.32	0.1
Average number of working members	1.89	0.0
B. Characteristics of heads of households		
Female	1,142	20.0
Single	565	9.9
Indigenous	3,397	59.6
Average years of education	6.9	0.1
Less than three years	1,217	21.3
High school level	780	13.7
University level	813	14.3
Public sector employee	123	2.2
Average age (years)	44.8	0.8
15 to 24	426	7.5
25 to 34	1,213	21.3
35 to 44	1,413	24.8
45 to 54	1,196	21.0
55 to 64	740	13.0

Note: Data is from the 2002 Bolivian National Institute of Statistics Household Survey.

Table 2

Probability of household borrowing

	1	2	3	4	5	6	7	8	9
Characteristics of household and household head									
Public sector employee	-0.005	-0.009	-0.032	-0.038	-0.017	-0.031	-0.052	-0.031	-0.038
	(0.144)	(0.145)	(0.144)	(0.142)	(0.140)	(0.144)	(0.142)	(0.141)	(0.141)
Female	0.159*	0.150**	0.158**	0.148**	0.152**	0.156**	0.164**	0.154**	0.150**
	(0.065)	(0.067)	(0.066)	(0.066)	(0.066)	(0.066)	(0.066)	(0.066)	(0.070)
Single	-0.446**	-0.442***	-0.426***	-0.443***	-0.405***	-0.427***	-0.410***	-0.435***	-0.444***
	(0.115)	(0.116)	(0.117)	(0.116)	(0.118)	(0.117)	(0.117)	(0.117)	(0.116)
Indigenous	-0.125**	-0.111**	-0.108**	-0.121**	-0.110**	-0.108**	-0.111**	-0.111**	-0.121**
	(0.051)	(0.051)	(0.054)	(0.052)	(0.051)	(0.054)	(0.051)	(0.051)	(0.052)
Education									
Less than three years	-0.194**	-0.193	-0.192**	-0.193**	-0.190**	-0.192**	-0.190**	-0.193**	-0.193**
	(0.086)	(0.087)	(0.087)	(0.087)	(0.087)	(0.087)	(0.087)	(0.087)	(0.087)
High school level	0.184***	0.185***	0.187***	0.185***	0.186***	0.188***	0.186***	0.187***	0.185***
	(0.069)	(0.070)	(0.070)	(0.070)	(0.070)	(0.070)	(0.070)	(0.070)	(0.070)
University education	0.314***	0.308***	0.296***	0.309***	0.294***	0.295***	0.296***	0.300***	0.310***
	(0.072)	(0.074)	(0.071)	(0.074)	(0.071)	(0.072)	(0.071)	(0.076)	(0.074)
Age									
Younger than or equal to 14years	-3.323***	-3.321***	-3.707***	-3.321***	-3.358***	-3.701***	-3.357***	-3.698***	-3.325***
	(0.164)	(0.166)	(0.165)	(0.165)	(0.169)	(0.164)	(0.170)	(0.164)	(0.165)
Between 15 and 24 years	0.284*	0.275*	0.255*	0.277*	0.230	0.257*	0.236	0.267*	0.277*
	(0.151)	(0.151)	(0.153)	(0.151)	(0.153)	(0.153)	(0.153)	(0.152)	(0.364)
Between 25 and 34 years	0.414***	0.417***	0.419***	0.417***	0.415***	0.418***	0.418***	0.419***	0.416***
	(0.111)	(0.112)	(0.112)	(0.112)	(0.112)	(0.112)	(0.112)	(0.112)	(0.112)
Between 35 and 44 years	0.424***	0.427***	0.427***	0.427***	0.422***	0.427***	0.424***	0.428***	0.427***
	(0.109)	(0.110)	(0.110)	(0.110)	(0.111)	(0.110)	(0.111)	(0.110)	(0.110)
Between 45 and 54 years	0.403***	0.401***	0.394***	0.401***	0.381***	0.395***	0.397***	0.398***	0.402***
	(0.110)	(0.111)	(0.112)	(0.111)	(0.113)	(0.112)	(0.112)	(0.112)	(0.111)
Older than 54 years	0.332***	0.330***	0.325***	0.330***	0.316***	0.325***	0.319***	0.328***	0.331***
	(0.117)	(0.118)	(0.118)	(0.118)	(0.119)	(0.119)	(0.119)	(0.118)	(0.118)
Number of household members	0.062***	0.062***	0.063***	0.062***	0.062***	0.063***	0.062***	0.063***	0.062***
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
Urban	0.484***	0.491***	0.491***	0.503***	0.499***	0.503***	0.501***	0.496***	0.491***
	(0.065)	(0.065)	(0.065)	(0.065)	(0.064)	(0.065)	(0.064)	(0.065)	(0.065)
Income below poverty level	-0.395***	-0.407***	-0.407***	-0.406***	-0.433***	-0.422***	-0.430***	-0.415***	-0.404***
	(0.065)	(0.065)	(0.065)	(0.064)	(0.062)	(0.065)	(0.062)	(0.064)	(0.064)
Total household income per capita	0.086***	0.084***	0.079***	0.084***	0.075***	0.080***	0.076***	0.080***	0.081***
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)
Constant	-2.144***	-2.148***	-2.144***	-2.142***	-2.127***	-2.144***	-2.134***	-2.146***	-2.145***
	(0.130)	(0.131)	(0.132)	(0.131)	(0.134)	(0.132)	(0.132)	(0.132)	(0.131)

Dependent variable takes the value of 1 if the household borrowed in the formal and informal credit markets and 0 otherwise.

*, **, and *** indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 3
Probability of household borrowing in the formal credit market

	1	2	3	4	5	6	7	8	9
Characteristics of household head									
Female	-0.284**				-0.277**	-0.434***			-0.307**
	(0.129)				(0.132)	(0.159)			(0.134)
Indigenous		-0.307**			-0.355***		-0.268**	-0.333***	
		(0.119)			(0.111)		(0.120)	(0.120)	
University education			-0.512***		0.508***	0.386***	0.714***		
			(0.153)		(0.137)	(0.166)	(0.179)		
Public sector employee				1.054***	0.961***			0.763***	0.866**
				(0.372)	(0.364)			(0.400)	(0.387)
Urban household					-0.218				
					(0.221)				
Interactive variables									
Female*university education						0.569*			
						(0.315)			
Indigenous*university education							-0.340		
							(0.246)		
Indigenous*public sector employee								4.791***	
								(0.407)	
Female*public sector employee									4.319***
									(0.40)

Dependent variable takes the value of 1 if the household borrowed from the formal credit market and 0 otherwise.
*, **, and *** indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Robust standard errors reported in parenthesis.