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Micro-credit impact in Kyrgyzstan: A study case

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Abstract

Microcredit impact in Kyrgyzstan: A Study Case

Microcredit has expanded rapidly since its beginnings in the last 1970s, but whether and how much it reduces poverty is the subject of intense debate. Generally it depends on how the program is implemented and the set of policies that regulate it. In this spirit, microcredit impacts in the Kyrgyz Republic are investigated and a modest program evaluation undertaken. Using data set for 5012 households from the Kyrgyzstan Integrated Household Survey (KIHS) that covers 2006-2010. Results indicate micro-credit is more driven forward durable assets as house, land, and to start a new business and less to fight against food insecurity.

Microcredit impact in Kyrgyzstan: A study case

The first example of microfinance was in the 15th century when Franciscan monks established the community oriented pawnshops (Ref.). Currently microfinance entails the provision of financial services to small businesses and households, which have limited access to financial services. In particular, credit may not available as a result of information asymmetry leading to high lender transactions costs. This credit constraint adversely affects low income households and small businesses, contributing to high levels of sustained poverty in many developing countries. Thus, providing microcredit loans is an avenue toward lifting targeted groups out of poverty.

(Microcredit). The goal is to expand microcredit to ensure that the poorest households have access to credit and other financial services. In Asia, public donors are the main funding support for microcredit. The question is are they cost-effective and is the credit utilized for investment opportunities that increase borrowers' income stream and enhance their welfare. In an effort to address this question, a case study in microcredit in Kyrgyzstan, a small country in Central Asia, was undertaken. The primary objective was to determine the effect on poverty reduction from access to microcredit.

Literature Review

The first theoretical model to capture mechanisms of microcredit in an asymmetric environment is due to Stiglitz (1990). He demonstrates theoretically the introduction of microcredit reduces lender risk by information asymmetric through larger loans and by decreasing the interest rate more than amount that would be necessary to compensate the

borrowers for the higher risk that they have to incur. The result is an increase in welfare of the borrower.

Subsequent to Stiglitz (1990), the literature on microfinance is extensive, with a large amount assessing the efficiency of microfinance institutions. However, the focus here is on the impact of microfinance on poverty reduction and social welfare. The underlying idea is based on the Separation Theorem, which states the availability of credit allows consumption to be separate from investment decisions. Such separation can reduce household poverty and improve social welfare. Microcredit empirical studies are undertaking to test the validity of this theory. Amin, Rai, and Topa (2003) studied the availability of microcredit for the poor economically and vulnerable population in Bangladesh, where poor is defined as a household who cannot completely satisfy basic living standards while the vulnerable population is a household that is unable to smooth it consumption with respect to income fluctuations. They employed first degree stochastic dominance to check if households who received microcredit have an income distribution that dominates noncredit households. The results confirm credit is available to the poor but less so for the vulnerable. Unanswered is if microfinance generates positive externalities at the Bangladesh village level. To answer this question, Khandker (2005) employs a fixed effects model to panel data for considering the idiosyncratic characteristics at the household and aggregate income levels. He defines the credit demand (microcredit loan size) as a function of household characteristics, such as age and education, and then estimates it jointly with food and total household expenditures, that are hypothesized to be affected by credit. The results confirm that microcredit has long-run positive effects at both the household and aggregate levels.

Positive microfinance impacts are also observed in other countries. Katshushi, Arun, and Annim (2010) analyzed the question if microfinance reduces poverty in India. They develop a treatment effects model, which avoids the self-selection bias (households usually self-select adopting microfinance). The results indicate targeting women who are more often the typical clients for microfinance has a stronger impact on poverty reduction. (p.). In contrast, Duflo (2008) analyzes microfinance in Morocco, for households living on under $2 per day. Employing probit and duration models, she determines households are so dispersed that microfinance institutions are unable to effectively reach them.

Empirical evidence does suggest microcredit impacts are mixed and are likely to vary by country. There is also concern that the Separation Theorem may not hold. Instead, easing credit constraints with microcredit may just stimulate increased consumption with little or no associated investment gains. Some analysts hypothesize that low income households are myopia and violate rational expectations hypotheses. Recently, Banerjee et al., (2010) analyze household impatience leading to increased consumption with no investment. They hypothesized that low income households spend more of their income on temptation commodities (cigarettes, alcohol, and sugar) rather than investment opportunities. Karlan and Zinman (2008) investigate this possibility with a field experiment. They test this hypothesis by comparing the answers of the marginal clients with and without a loan. The results indicate a positive impact of MF in terms of improved income, food, consumption and client or family health; however, no evidence is found regarding the over-borrowing effect. (Explain).

Turning to the impacts of microfinance has on consumer behavior, Field and Rohini (2008) investigated whether there is a trade-off between the number of payments (cost) and probability of repayment. A rigid payment system (more frequent) involves additional lender costs, but lower probability of borrower failure. A field experiment was undertaken involving two groups of households with similar characteristics. One group had a previous loan; the second were first-time borrowers. The first group moves from a weekly to a monthly payment frequency. The second one starts with the monthly frequency. Their results indicate that with monthly payments the resulting reduction in transaction costs are not offset with any increase in repayment failure probability.

The repayment issue was also investigated by Gine' and Karlan (2010) in terms of borrowers moving from group control to individual control. With group lending (joint liability), the group (village) selects the households with the highest probability to succeed and guarantees the loan. For their repayment analysis, Gine' and Karlan (2010) selected two groups of households, one with group liability and the other moves from group to individual liability. The results indicate no effect on the repayment, default probability, and lender profits. The only difference is that moving from the group control to the individual monitoring increases the bank costs, but globally it reduces the social costs. The number of controls that a single lending institution has to do is smaller than the number of controls that the group members have to do to ensure loan repayment.

It is possible to show that if the utility function is homogeneous and additive over time periods, the positive sloping demand for credit is justified by the temptation tax: poorer a person is and more temptation tax she pays. However, when the income

increases, the share of expenditure on these commodities goes to zero and the demand takes back the traditional shape.

In conclusions, even if it seems that the relaxing of the credit constraint has positive effect on poverty reduction, the final effect on other kinds of decisions seems more ambiguous.

Microcredit in Kyrgyzstan

The Kyrgyz Republic, located in Central Asia, received its independence in 1991 after the collapse of the Soviet Union (USSR). As with many of the satellite Soviet empire countries, its economy was dependent on trade within the USSR, and after the collapse its economy witnessed a large drop in GDP and living standards.

In the Kyrgyz Republic, agriculture is an important economic sector accounting for one-third of the population. Livestock is the main agricultural sector in Kyrgyzstan, but Kazakhstan and Russia imposed a ban on the imports of meat and dairy products from Kyrgyzstan because of outbreaks of foot-and-mouth disease and anthrax in the country. Thus labor migration to Russia has been growing in the last few years. (Abdulhamidov, 2012). However, the Kyrgyz Republic does have substantial mineral reserves consisting of coal, gold, uranium, antimony, and other rarer earth minerals. (The World Factbook).

The gross national income per capita is between $500 and $ 1000's, the household's final consumption per capita is slightly above $300 per year; while one-third of the population lives at the lowest poverty threshold of $1.25 a day (Table 1).

The trend of microcredit loans in terms of their size and relative interest rate is illustrated in Table 2. As indicated in Table 2, microcredit in Kyrgyzstan is growing both

in terms of size and number of loans. The average loan is $400 to $500, which in not so "micro" if compared with the per capita income (Table 1) and with the standard size of micro-loans in other Asia countries ($100 dollars.)

Data

The data set employed is based on the Kyrgyzstan Integrated Household Survey (KIHS). The KIHS was collected by the National Statistical Committee and it covers 2006-2010 for a sample size of 5012 observations (households). The survey is a rotating panel with only a maximum of one-quarter of the sample being replaced annually. The KIHS broadly consists of seven sections: general information about respondents including age, gender, and marital status; family status (education, internal migration, and health status); consumption and expenditure composition; employment status; purchase of non-food commodities; household income and expenditure; and housing conditions (An exhaustive description of the KIHS survey data is available in Esenaliev, Kroeger, and Steiner 2011.)

Household Profile

A summary household statistics based on the KIHS are provided in the following tables. The median family size is four across all the years. (Table 3). On average, the number of households with one or more loan in a given year is 610. In a population of 5,012 households, this corresponds to 12%. The total number of households with one or more micro-loans in five years is 562(Table 4), equal to approximately 2% of the sample population in five years.

The monetary budget measures the amount of basic needs provided thorough the market. For example, if the poverty budget is $1,000 as defined by and the household has a

monetary budget of $600, it indicates that 60% of the basic needs is monetary; it comes from the market. (Table 5). In general, for a developed country, this share is 1 because all the basic needs are satisfied by the market, but for a developing economy a share of the total income and expenditures will come for Kyrgyzstan from direct activities such as subsistence farming or fishing. In 2006-2010, the per capita monetary budget is $230, which implies a market share for basic needs of approximately 50%.

Model of Micro credit and poverty Reduction in Kyrgyz Republic

To investigate the consumer behavior with respect to the micro credit a multivariate binary response model has been adopted.

Part 6, sub part 6 of the survey – Other family expenditure – at question n. 10 asks to classify the purpose of the debit in 9 categories:

- House construction;
- Purchase of a house, apartment, summer cottage, land parcel;
- Purchase of food products to improve family nutrition quality, other goods;
- To start private business;
- Education;
- Medicaments;
- Agricultural needs: purchase of livestock, land, crops etc. ;
- Other.

The multivariate probit model is particularly fitted to this analysis because it allows considering all the categorical variables as jointly distributed and also because it allows choosing more than one option at the same time. However, considering that the panel data set has been built with yearly frequency by taking the summation over all the sub

periods (months, quarters), it is possible that in one period an household chooses one option more than once. Consequently, the answers have been reduced to a binary choice and this means that the model does not catches the intensity of any choice, but only if the household chooses at least once a certain option. For instance, Table 7 shows that in 2008 there are 29 households who decided to start a business at least once in that year.

The estimation results are shown in Table 8 and 9. The Wald test on the jointly regression is 79.3 with a p-value basically 0. This suggests that the multivariate regression performs better than running several univariate regressions. This is further confirmed by the likelihood ratio rest on the equality of all the coefficient of the covariance matrix of the error term with a chi2 equals to 116.724 and a p-value 0 (Table 9.)

Regarding the interpretation, microfinance has an effect only on some choices. It affects positively the purchase of a house/land, but it does not affect the choice to build a new house. This could be partially motivated by the lack of infrastructures in Kyrgyzstan (double check) that makes prohibitive for the household to sustain this effort.

The second effect of microfinance is on food expenditure (t-value -2.26), but in this case the sign of the coefficient is negative. A possible explanation comes out if we consider the loan size of micro-finance. If we compare this value (Table 2) with the average income, it is clear that the average size is not so small and that probably the loan is used not to buy food, but especially for something that lasts more like some land or an apartment.

This approach is confirmed if we check the third variable: starting a business. In this case the microfinance effect on the probability to start a new economic activity is significant and positive (t-value 2.48.) In fact, the World Bank ranking for the Kyrgyzstan Republic about starting a business is 15 out 184 countries (US is 13th and China 151th)[2].

Graph 1 shows the cumulative density function for the three significant variables with respect to the micro credit loan size. How it is possible to see, the probability to buy a house or some land and to start a private business increases with the loan size. The opposite path is showed by the food.

Conclusions

This project studies the impact of microfinance on consumer behavior in the Kyrgyzstan Republic since 2006-2010. Results indicate that the effect is more oriented forward more durable assets and activities than the simple food security. For future research, it has to be tested if the micro-loans go to poor people or not. Secondly, we should check if the household choices have permanent effects on his life standard or they are only a consequence of over-borrowing. The first investigation will be made with a first stochastic dominance test on the income distribution while the second with the Heckman selection model.

Footnotes

Micro-credit is the borrowing-lending activity while micro-finance interests a wide variety of micro-financial services including saving accounts and micro-insurance.

[2] http://www.doingbusiness.org/data/exploretopics/starting-a-business

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Table 1. Kyrgyzstan Gross National Income, Household Income, Population, and Poverty Measures

	2006	2007	2008	2009	2010	2011
GNI[a] (per capita)	$500	$610	$770	$860	$840	$920
Household expenditures (per capita)	318	323	361	305	315	339
Population (millions)	5.22	5.27	5.32	5.38	5.45	5.51
Poverty number[b] (millions)	0.31	0.1	0.34	0.33	0.33	NA
Poverty gap (percentage)	0.79	0.08		1.36	NA	NA

Source: World Bank (Ref)

[a] Gross National Income (GNI)
[b] Population living with $1.25 per day income

Table 2. Microcredit loans in Kyrgyzstan, 2006-2011

Loans	2006	2007	2008	2009	2010	2011
Dollar value (millions)	$78.9	$112.4	$148.8	$161.2	$195.4	$274.8
Number	172,702	188,166	311,126	412,302	484,953	579,714
Average amount	$457	$597	$478	$391	$403	$474
Annual interest rate	34%	36%	36%	40%	36%	44%

Source: Kyrgyzstan National Statistical Committee

Table 3. Household Size in Kyrgyzstan

Year	Number of Observations	Number of Households	Minimum	Maximum	Median	Mean
2010	18734	4980	1	13	4	3.96
2009	18917	4984	1	15	4	3.97
2008	18835	4984	1	19	4	4.05
2007	18528	4803	1	20	4	3.86
2006	19169	4863	1	20	4	4.20

Source: Kyrgyzstan Integrated Household Survey (KIHS)

Table 4. Number of Microcredit Loans in Kyrgyzstan, 2006-2010

Year	Observations	Number of Loans	Number of Households At Least One Loan	Mean Loan Amount U.S. $
2010	58,850	559	145	$465
2009	59,273	288	130	$404
2008	54,556	416	120	$396
2007	54,777	269	85	$459
2006	19,742	151	82	$506

Source: Kyrgyzstan Integrated Household Survey (KIHS)

Table 5. Per Capita Income and Consumption Expenditures in Kyrgyzstan, 2006-2010

	2006	2007	2008	2009	2010	Average
Income (dollars)	$292	$744	$551	$739	$1,537	$773
Monetary budget	$171	$219	$242	$247	$268	$230

Source: Kyrgyzstan Integrated Household Survey (KIHS)

Table 6. Socio-Demographic Variables of Micro Finance Borrowers in Kyrgyzstan, 2006-2010

Years

	2006	2007	2008	2009	2010
OBS No.	82	85	120	130	145
Head of Household	46	45	48	48	48
Family Size Ave	5	4	4	4	4
Gender					
Males	61	63	62	54	57
Females	21	22	58	26	88

Source: Kyrgyzstan Integrated Household Survey (KIHS)

Table 7. Purpose of credit of Micro Finance loan in Kyrgyzstan, 2006-2010

Years

	2006	2007	2008	2009	2010
Obs. No	82	85	120	130	145
House construction	1	1	7	9	17
Purchase of a house, apartment, summer cottage, land parcel	2	0	2	2	3
Purchase of food products to improve family nutrition quality, other goods	34	31	51	80	56
To start private business	33	28	29	43	17
Education	5	7	5	9	5
Medicaments	5	3	5	3	4
Agricultural needs: purchase of livestock, land, crops etc.	13	27	39	36	52
Other	21	13	20	24	19

Source: Kyrgyzstan Integrated Household Survey (KIHS)

Table 8. Multivariate Binary Response Probit Model – Output

Multivariate probit (SML, draws 250)		Number of obs	562
		Wald chi2(35)	79.3
Log likelihood	-1595.8825	Prob > chi2	0.0002

		Coefficient	Std. Err.	z	P>|z|	[95% Conf. Interval]	
House construction							
	Micro loan (US real dollars)	-0.0000551	0.00014	-0.39	0.697	-0.0003	0.00022
	Gender = 1 male	0.0031163	0.19518	0.02	0.987	-0.3794	0.38567
	Age (years)	0.005753	0.00834	0.69	0.491	-0.0106	0.02211
	Family size (N. members)	0.0183473	0.05853	0.31	0.754	-0.0964	0.13306
	Education (Years)	-0.0303713	0.04667	-0.65	0.515	-0.1218	0.0611
	Intercept	-1.563288	0.81273	-1.92	0.054	-3.1562	0.02964
Purchase of a house, apartment, summer cottage, land parcel							
	Micro loan (US real dollars)	0.0003517	0.00013	2.64	0.008	9.1E-05	0.00061
	Gender = 1 male	-0.0957522	0.37095	-0.26	0.796	-0.8228	0.63129
	Age (years)	-0.0288126	0.01838	-1.57	0.117	-0.0648	0.00721
	Family size (N. members)	0.1152284	0.10178	1.13	0.258	-0.0843	0.31472
	Education (Years)	0.1134146	0.11876	0.95	0.34	-0.1194	0.34619
	Intercept	-2.820743	1.61609	-1.75	0.081	-5.9882	0.34673
Purchase of food products to improve family nutrition quality, other goods							
	Micro loan (US real dollars)	-0.0002552	0.00011	-2.26	0.024	-0.0005	-3E-05
	Gender = 1 male	-0.2762795	0.12581	-2.2	0.028	-0.5229	-0.0297
	Age (years)	-0.0048588	0.00545	-0.89	0.373	-0.0155	0.00583
	Family size (N. members)	-0.0228934	0.03647	-0.63	0.53	-0.0944	0.04858
	Education (Years)	0.0332489	0.03128	1.06	0.288	-0.0281	0.09456
	Intercept	0.1630906	0.53102	0.31	0.759	-0.8777	1.20387

Coefficient	Std. Err.	z	P>|z|	[95% Conf. Interval]

To start private business							
	Micro loan (US real dollars)	0.0001964	7.9E-05	2.48	0.013	4.1E-05	0.00035
	Gender = 1 male	-0.2148968	0.13415	-1.6	0.109	-0.4778	0.04804
	Age (years)	-0.0067859	0.00578	-1.17	0.24	-0.0181	0.00454
	Family size (N. members)	0.0676201	0.03882	1.74	0.082	-0.0085	0.1437
	Education (Years)	0.0182757	0.03472	0.53	0.599	-0.0498	0.08632
	Intercept	-0.7178393	0.56325	-1.27	0.202	-1.8218	0.3861
Education							
	Micro loan (US real dollars)	-0.0002109	0.00022	-0.97	0.332	-0.0006	0.00021
	Gender = 1 male	0.2429718	0.22274	1.09	0.275	-0.1936	0.67953
	Age (years)	0.0014646	0.00977	0.15	0.881	-0.0177	0.02061
	Family size (N. members)	0.0207314	0.06066	0.34	0.733	-0.0982	0.13962
	Education (Years)	0.0791525	0.06116	1.29	0.196	-0.0407	0.19903
	Intercept	-2.721199	0.97011	-2.81	0.005	-4.6226	-0.8198
Medicaments							
	Micro loan (US real dollars)	-0.000301	0.00028	-1.08	0.279	-0.0008	0.00024
	Gender = 1 male	-0.1076207	0.24026	-0.45	0.654	-0.5785	0.36328
	Age (years)	0.0033229	0.01072	0.31	0.757	-0.0177	0.02434
	Family size (N. members)	0.1049416	0.06719	1.56	0.118	-0.0268	0.23664
	Education (Years)	0.106143	0.07454	1.42	0.154	-0.04	0.25225
	Intercept	-3.403329	1.13876	-2.99	0.003	-5.6353	-1.1714

					[95% Conf. Interval]
	Coefficient	Std. Err.	z	P>|z|	
Agricultural needs: purchase of livestock, land, crops etc.					

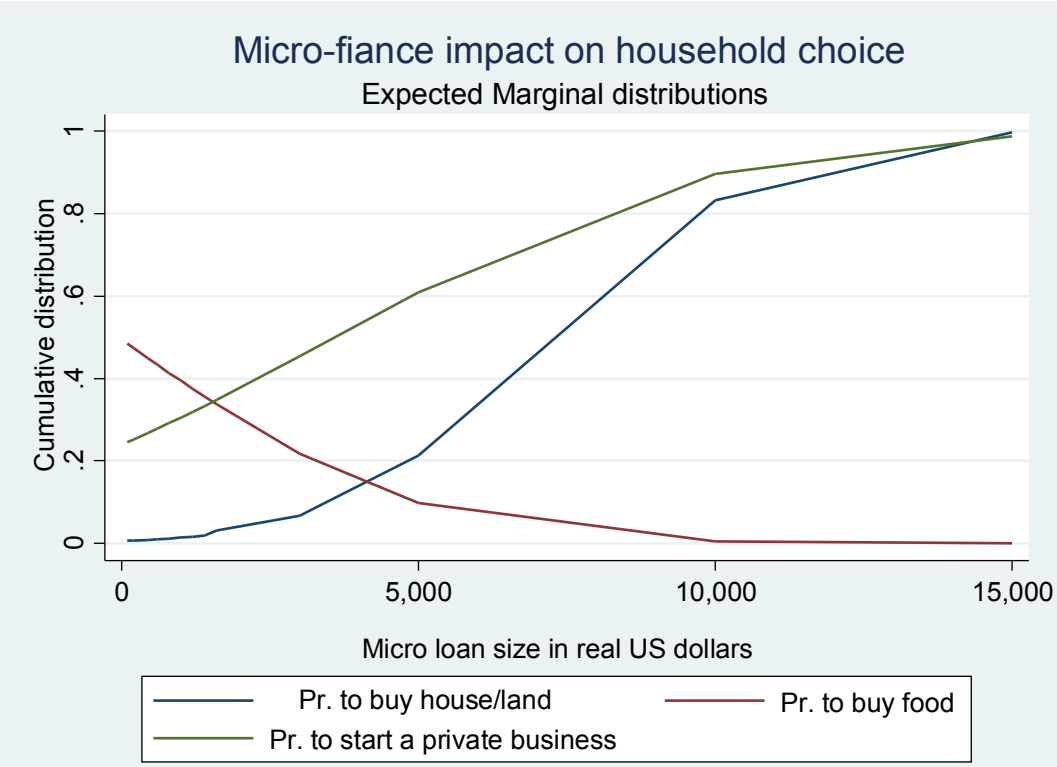
	Micro loan (US real dollars)	0.0000726	8.4E-05	0.86	0.388	-9E-05	0.00024
	Gender = 1 male	0.3132177	0.13222	2.37	0.018	0.05407	0.57237
	Age (years)	0.0156646	0.0056	2.8	0.005	0.0047	0.02663
	Family size (N. members)	0.0953836	0.03759	2.54	0.011	0.0217	0.16907
	Education (Years)	0.0360794	0.03288	1.1	0.273	-0.0284	0.10053
	Intercept	-2.347311	0.5647	-4.16	0	-3.4541	-1.2405
Other							
	Micro loan (US real dollars)	0.0001364	9.1E-05	1.51	0.132	-4E-05	0.00031
	Gender = 1 male	0.2415971	0.15188	1.59	0.112	-0.0561	0.53927
	Age (years)	0.0054329	0.00647	0.84	0.401	-0.0073	0.01812
	Family size (N. members)	-0.1038662	0.04411	-2.35	0.019	-0.1903	-0.0174
	Education (Years)	-0.0224445	0.03706	-0.61	0.545	-0.0951	0.05019
	Intercept	-0.7543461	0.63244	-1.19	0.233	-1.9939	0.48522

Note: the estimation has been performed with STATA. For the multivariate probit model, STATA applies a simulation with 5 draws by default based on maximum likelihood estimation. The number of default draws is sufficient for the estimation of the coefficients and relative standards errors, but not for the error term covariance matrix. In this case the number of draws has been 250 to allow a high ratio number of draws to square root of the sample size. See Cappellari and Jankins (2003.)

Table 9. Multivariate probit model - error term covariance matrix

	House constr.	House purchase	Food purchase	Start private business	Education	Medicaments	Agricultural needs	Other
House constr.	1							
House purchase	-0.46833	1						

Food purchase	-0.1598	0.102121	1					
Start private business	-0.13589	-0.03835	-0.20849	1				
Education	0.011666	-0.0863	0.15319	-0.10045	1			
Medicaments	-0.207	-0.02898	0.209417	0.162681	0.015933	1		
Agricultural needs	-0.16	-0.12057	-0.25194	-0.39142	-0.14215	-0.01517	1	
Other	-0.06425	-0.01535	-0.00899	0.015417	-0.12024	-0.02487	0.103973	1

Likelihood ratio test – null hypothesis all the coefficient jointly equal to 0 – chi2(28) = 116.724, Prob > chi2 = 0.0000

Graph 1