Microcredit Programs, Poverty and Vulnerability in Rural Iran

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Abstract

The main purpose of this paper is to study if two major microcredit programs, namely Women Microcredit Funds (WMF) and Self-Help Groups (SHG), in Southern Iran reach rural poor and vulnerable households. We use primary panel data that consist of monthly consumption and income information for 280 households. The results showed that although both programs are successful at reaching poor, evidence on propensity of vulnerable households joining programs is relatively limited. Furthermore, results indicate that vulnerable households are more likely to join SHG, while poor households mostly choose to join WMF program.

Key words: Microcredit Programs, Poverty, Vulnerability, Iran

1. Introduction

Microfinance is an effective tool not only in reducing poverty, but also in increasing economic activities, especially for those whose livelihood depend on agriculture (Najafi, 2005). Using Microcredit programs as a tool for poverty alleviation has become a common approach in development projects (Absar, 2005). Generally speaking, microcredit programs are programs focused on poverty that provide financial and business services to the poorest segments of the population for generation of self-employment and a sustainable income (Latifee, 2003). The role of microcredit programs in reducing poverty is well recognized in contemporary development literature. Women are particularly targeted by some of these programs; some studies suggest that credit provided to women has a multiplier effect since they tend to invest the credit for the benefit of the household (Yasmine, 2007).

Since introduction of microcredit in Bangladesh, its usage as a poverty alleviation tool has been widely implemented with varying success rates (Dowla, 2006). For example, Heginson and Freeman (2007) note that some micro-credits programs serving women have failed due to local

culture and customs in these developing countries. On the other hand, Hulem and Mosely (1996) report that in Indonesia, India and Sri Lanka, the borrowers of microcredit were able to raise their income more than non-borrowers.

In Iran, there two relatively new microcredit programs: Women Microcredit Funds (WMF[1]) and Self-Help Groups (SHG[2]). These two programs are now the largest microcredit providers in Iran. In this paper, we analyze the impact of these two new microcredit programs on poor and vulnerable groups in Fars Province, Southern Iran, using primary data collected on consumption and income of 280 households. As to our knowledge, this paper is the first attempt to quantify how successful the new program is in reaching out to households who need the microcredit most – poor and vulnerable. We use a unique data set from two villages in Southern Iran to test if members of microcredit programs are indeed less poor and less vulnerable than nonmembers. A household is defined as "poor" if it has low consumption levels, and "vulnerable" if it faces large consumption variability and is unable to smooth consumption in the face of income shocks.

The second contribution of the paper is to assess the targeting of an antipoverty intervention by the use of the risk-sharing framework in village economies (Townsend, 1994). The presence of vulnerable households is an indication of an institutional or market failure. Therefore, assisting the vulnerable and vulnerable-poor groups may improve overall welfare (Amin et al., 2003). We consider alternative vulnerability measures to account for measurement error and to allow for different specifications of the risk-sharing model. Our results on the relation of vulnerability and microcredit membership are fairly robust to the alternative measures.

1. Persian name of the program is 'Sandughe Etebarate Khorde Zanane Roustaei'.
2. Persian name of the program is 'Grouhaye Khodyare Mali'.

The rest of the paper is organized as follows: Section 2 describes the programs. Section 3 and 4 describe the methods and survey design and data. Section 5 presents the results on programs impacts and section 6 contains conclusions.

2. Self-Help Groups (SHG) and Rural Women Microcredit Funds (WMF) in Iran

Self-Help Group (SHG) and Women Microcredit Fund (WMF) are composed of 10-20 men and women, and 25-50 women members, respectively in each village. These groups have similar economic and social backgrounds and deposit small amount of money regularly.

The SHG was first formed in 2004 and co-funded by the Bank Keshavarzi of Iran and International Fund for Agricultural Development. After the groups accumulate their own capital and set up a record of repayments, they can borrow money from the bank. In this program, a market rate of interest is paid by the bank to small rural depositors.

There are 28 SHG and 40 WMF groups in Fars Province, with 434 and 2000 members, respectively. The main difference between WMF and SHG is in how they provide the initial investment. While initial funds in WMF come from government sources, SHG rely on their own saving. The Bank Keshavarzi of Iran gives a loan to groups in SHG six months after formation. The minimum initial deposit for each member is 50000 Rials (=$5), and credit is extended to members with prevailing market interest. On the other hand, the funds for initial investment for WMF program come from government sources. The office of rural women in the Ministry of Agriculture gives the members of WMF members 20 million Rials (=$2000) loan with 10-14% interest rate as initial investment. Both SGH and WMF programs have important training components. Both people who run the project and members who utilize microcredit are provided training on various areas such as primary business skills, networking with other women who have same challenges, and improving vocational skills, like livestock extension.

The administrators of WMF and SHG choose villages and screen out well off borrowers. To be eligible for microcredit, member should live in the village. The participants get together to collect savings and distribute loans every week and every other week, in SHG and WMF, respectively. The participation of all members in meetings is important. Management committee in SHG includes a president and three persons in charge of the cash book, saving administration and loan administration. Management committee in WMF consists of a president, an accountant, and a loan administrator.

SHG loan term is six week and interest rate over this time is 5%. The fine on late payments is 2% per late week. Loan term, interest rate on loans, and amount of weekly required savings can be changed by collective group decision in SHG. By the end of the year, members can receive their share of the profit given that loans are paid back. WMF groups consist of sub-groups of 5-7 members, and new members have to wait 6 months after joining the group before they can take out a loan. The loan term is at most 10 months and the monthly interest rate is 5%. If a member has outstanding loan payments left after six months, the savings of that member are blocked by the WMF group. Members in both programs can apply for emergency loans in cases of death in family, health problems, or accidents. These emergency funds are free of interest.

Table 1. Summary Information on WMF and SHG in Fars Province

	WMF	**SHG**
Number of Groups	40	28
Number of Village	40	17
Number of Members	2000	434
Training	Yes	Yes
Minimum Loan (Us Dollars)	100	50
Maximum Loan (US Dollars)	300	500
Loan Interest Rate (percent)	4-10	16-20
Saving Interest Rate (percent)	-	10-18

Exchange Rate in 2008 was US $1= 10000 Rials (local currency).

3. Data and Survey Design

The study uses transactions data collected during 6 months in Fars Province in Southern Iran. Using stratified random sampling method, three townships, namely Zarrin Dasht, Arsenjan, and Kazerun were selected for survey. The selected townships were stratified into two programs. The first group consisted of 5 villages that had WMF members and the second one consisted of 5 villages with SHG membership. Overall, we interviewed 381 member and non-member households in 10 villages of these three townships. 92 households in Kazerun village, 92 households in Zarrin Dasht village and 96 households in Arsenjan village were sampled. Since one of our objectives is to compare these two programs, we included 280 households who were member of only one of the two programs. Of the 280 households, 200 households are members of a microcredit program, and 80 households are non-members. The non-member households do not have loans from any other source. All applicants are accepted as borrowers; none of the micro-credit programs screen applicants in these villages. For the sake of brevity, from this point forward, we will denote the three villages in townships of Kazerun, Zarrin Dasht and Arsenjan as villages A, B, and C, respectively. Below is a map of Iran indicating approximate locations of these villages.

Location of the Villages of Sample Observation

Table 2 reports summary statistics of the variables considered for the empirical analysis for each village. The unit of observation is a household. For example, monthly income per household is 171698.8 Rials (USD 171.69) in village C, and 172336.6 Rials (USD 172.33) in village B.

Table 2. Summary Statistics

	Village A		Village B		Village C	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
All Consumption	47427.54	28543.69	44038.95	24797.01	52024.31	71670.04
Food Consumption	36204.71	13744.62	36351.45	13574.28	37038.19	13496.48
All income	163205.6	69957.8	172336.6	79630.82	171698.8	62525.11
Household Size	5.13	2.09	4.89	2.73	4.26	2.24
Age	35.31	11.49	39.73	16.52	37.64	15.25
Number of Children	2.83	2.09	2.56	2.63	2.07	2.18

Exchange Rate in 2008 was US $1= 1000 Rials.

Members of SHG and WMF groups are agrarian households. Consumption and income of each household were collected for 6 consecutive months. We asked households about their monthly total consumption and monthly food consumption separately. Food consumption consists of consumption of households' own production of wheat, rice, fruit, vegetables and meat, as well as other purchased food. All consumption includes food consumption and expenditures on services and other goods, such as medicine and clothing. Total household income includes income from own crop production, animal farming activities and wages.

We computed the poverty line based upon Salehi's (2009) calculation (7,679 Rials, or $2.71 in PPP per day). According to this measure, village A is poorer than village B and C. 52% of the sampled households are below the poverty line in in village A, and 39% of village B is below the poverty line. On the other hand, village C is slightly richer than the two other villages as only 28.2% of the sampled households are below poverty line. Table 3 summarizes the village composition in terms of other characteristics such as education level of the household head,

whether household is female headed, or whether household owns land. The participation rates of rural households in two programs have been high, and 72% of members were women. 83% and 76% of credits were taken as agricultural production loans in WMF and SHG programs, respectively; however, only 61% and 45% of these loans ended up being used as agricultural investment, the rest of the loans were used to meet basic needs such as purchasing food and clothing, or school and health care expenses. In addition, some member households have used part of the credit for marriage expenses.

Table 3. Household Categories and Microcredit Program Membership

	Village A	Village B	Village C
Total number of sampled household	92	92	96
Educated Household Head	80	75	78
Uneducated Household Head	12	17	18
Landed	29	27	22.1
Landless	63	65	73.8
Female Headed	63	75	73
Male Headed	29	17	23
Members of SHG	33	31	33
Members of WMF	34	35	35
Nonmembers	25	26	28

4. Measuring Vulnerability and Estimation

Rural households typically lack access to insurance to protect themselves against risks like sickness, flood and crop damage. Conceptually, “vulnerable” households are these households who are not able to perfectly insure themselves against such shocks. Vulnerability is a broader measure than a simple measure of consumption variability. Efficient risk-sharing within a village represents that household consumption moves only with aggregate consumption, not household income (Deaton (1997), Townsend (1994), Townsend (1995)). In this study, vulnerability was measured based on risk-sharing assumption, where changes in log marginal

utility of consumption should be equated within households in each village and time period. Assume households have a constant absolute risk aversion utility function:

$$u^h(c_t^h) = -\frac{1}{\gamma_t^h} n_t^h \left[\exp(-\sigma \frac{c_t^h}{n_t^h}) \right] \quad (1)$$

where c_t^h present consumption for household *h* at time *t*, n_t^h : number of adult equivalent in the household *h* at time *t*, γ_t^h defines a preference shock and σ denotes the coefficient of absolute risk aversion. Efficient risk sharing for each household *h* implies:

$$\Delta\left(\frac{c_t^h}{n_t^h}\right) = -\frac{1}{\sigma} k_t - \frac{1}{\sigma} \Delta \ln \gamma_t^h \quad (2)$$

where k_t is the first differences of logarithms of the discounted multiplier related with the aggregate resource constraint, and changes in a household's income should not affect changes in that household's consumption. Under full risk sharing and the assumption that preference shocks are uncorrelated with changes in income, household's utility remains the same when the total consumption in the household and the number of adult equivalents increase proportionately (Amin et al., 2003).

A linear regression model was estimated based on equation (2) to determine vulnerable households. If γ_t^h, the preference shocks, treated as mean zero error terms uncorrelated with the other regressors, equation (2) can be represented as the following regression equation

$$\Delta\tilde{c}_t^h = \alpha^h \Delta\tilde{y}_t^h + \phi_t MD_t + \varepsilon_t^h \quad (3)$$

Where $\tilde{c}_t^h$ is per adult equivalent consumption of household *h* in month *t*, $\tilde{y}_h^t$ is per adult equivalent household income at time *t*. Following Townsend (1994), we use the following age–sex weights to compute adult equivalence: 1.0 for adult males, 0.9 for adult females, and 0.52 for children. MD_t denotes month dummies, and ε_t^h are zero-mean errors that are uncorrelated with independent variables.

Since households have different sizes and consumption and income levels, the variances of residuals vary across households. Therefore, we test whether heteroscedasticity is reasonable to assume using White's test. Results point to heteroscedasticity; therefore, we estimate equation (3) by Feasible Generalized Least Squares (FGLS), assuming that error variance across households depends on observable characteristics, including household size, education, and land ownership.

Based on the null hypothesis of full risk sharing in the village as a whole, $\hat{\alpha}$ in equation (3) must be equal to zero. Full risk-sharing hypothesis can be rejected for the village as a whole, if there is a significant positive coefficient $\hat{\alpha}$. All three villages in the study fail the full risk-sharing test. In village A, $\hat{\alpha}$ = .0693 (p-value=0.003); in village B, $\hat{\alpha}$ =0.0733 (p-value= 0.000), and in village C, $\hat{\alpha}$ = 0.122 (p-value= 0.019). This implies independent, household-level decision making. Therefore, we turn our interest to estimate a separate $\hat{\alpha}^h$ parameter for each household *h*. The baseline regression (3) was estimated separately for each village and household. Thirteen households in village A, eleventh households in village B and ten household in village C have positive and significant $\hat{\alpha}^h$ at a 10% statistical significance level. Alternative vulnerability measures have been considered for robustness checks and to allow for various characteristics of the basic risk sharing model. A different version of equation (3) is estimated with the addition of household-specific medical expenditures X_t^h in each period as a proxy for the preference shock γ_t^h. Sickness shocks may be correlated with income shocks and affect household's consumption variability.

$$\Delta\tilde{c}_t^{\,h} = \alpha^h \Delta\tilde{y}_t^{\,h} + \phi.MD_t + \delta X_t^{\,h} + \varepsilon_t^h \qquad (4)$$

Female-headed households are typically considered more risk averse than male-headed ones. Another version of risk sharing model (2) is to allow the coefficient of absolute risk aversion to differ across male and female headed household.

$$\Delta(\frac{c_t^h}{n_t^h}) = -\frac{1}{\sigma^F} K_t - \frac{1}{\sigma^F} \Delta \ln \zeta_t^h \qquad (5)$$

Assuming that preference shocks have zero-mean and are not correlated with the other regressors, another version of the model would be:

$$\Delta\tilde{c}_t^h = \alpha^h \Delta\tilde{y}_t^h + \phi_t MD_t + \phi_{FT} MD_t F + \varepsilon_t^h \qquad (6)$$

where *F* is a dummy variable which is one for female headed in household h and zero otherwise. ϕ_t and $\phi_t + \phi_{1t}$ are parameters for male-headed and female-headed households, respectively. They reflect differences in risk aversion across male and female headed.

Total of 33 households in three villages have positive and significant $\hat{\alpha}^h$ estimates with the baseline measure of vulnerability at the 10% significance level. The alternative models that account for female headship and medical expense shocks result in 31 and 37 households with positive and significant $\hat{\alpha}^h$ estimates, respectively. Therefore, our robustness checks reveal that the identity of households with significantly positive $\hat{\alpha}^h$ estimates stays unhanged for the alternative models of vulnerability. The baseline measure of vulnerability is robust; therefore the rest of the analyses are based upon the baseline model.

5. Empirical Results

5.1. Vulnerability, Variability and Poverty

Table 4 reports correlations between vulnerability, consumption, and microcredit membership. Vulnerability is negatively correlated with consumption in three villages. This result is robust for three other alternatives of vulnerability measure. It should be noted that the measure of vulnerability is different from measures of consumption variability, such as the coefficient of variation (CV) of consumption. Table 4 shows that the neither baseline nor other three alternative measures of vulnerability are not correlated with consumption variability.

Household food consumption is positively correlated with the CV of consumption in all three villages. Table 4 also highlights that correlations between microcredit membership and average monthly consumption are positive in three villages and significant in village B.

Table 4. Correlation between Vulnerability, Consumption, Variability and Microcredit Membership

	CV (consumption)	All consumption	Food Consumption	MC member
Village A				
Vulnerability(base)	0.08	-0.22**	0.03	0.14
Vulnerability(Medical)	0.07	-0.17*	0.03	0.14
Vulnerability (female)	0.07	-0.17*	0.03	0.14
CV consumption	1.00	-0.23**	0.33***	0.02
All consumption	-0.23**	1.00	0.51***	0.09
Village B				
Vulnerability(base)	-0.05	-0.01	0.08	0.01
Vulnerability(Medical)	-0.08	-0.05	0.08	-0.01
Vulnerability (female)	-0.09	-0.06	0.09	-0.01
CV consumption	1.00	-0.43***	0.48***	-0.13
All consumption	-0.43***	1.00	0.71***	0.33***
Village C				
Vulnerability(base)	-0.04	-0.30***	0.13	-0.08
Vulnerability(Medical)	-0.03	-0.04	0.07	-0.06
Vulnerability (female)	-0.03	-0.04	0.07	-0.06
CV consumption	1.00	-0.29**	0.42***	-0.08
All consumption	-0.29**	1.00	0.10	0.03

*Statistically significant at 10% level.
**Statistically significant at 5% level.
***Statistically significant at 1% level.

Table 5 shows that households below the poverty line are slightly more vulnerable than those above the poverty line in village A using the baseline vulnerability measure, and in village B using medical expenses and female headship vulnerability models. It is not surprising that poorer households almost always are more vulnerable than richer households.

Table 5. Vulnerability, Variability, Consumption by Poverty Status and Microcredit Membership

	Poor	Nonpoor	p-value	Member	Nonmember	p-value
Village A						
Vulnerability(base)	0.014	-0.130	0.006	-0.017	-0.14	0.02
Vulnerability(medical)	0.006	-0.131	0.018	-0.007	-0.191	0.000
Vulnerability(female)	0.006	-0.131	0.018	-0.008	-0.19	0.004
%Below poverty line				67	15	0.000
All consumption				49575.76	41974.36	0.004
Food consumption				37626.26	32596.15	0.000
Village B						
Vulnerability(base)	0.120	0.086	0.831	0.147	-0.021	0.338
Vulnerability(medical)	-0.225	0.052	0.020	-0.057	-0.054	0.979
Vulnerability(female)	-0.225	0.052	0.020	-0.057	-0.054	0.979
%Below poverty line				49.4	13.4	0.000
All consumption				46441.92	37939.1	0.000
Food consumption				36898.99	34961.54	0.131
Village C						
Vulnerability(base)	0.022	-0.291	0.197	-0.30	0.082	0.126
Vulnerability(medical)	-0.113	0.016	0.145	-0.05	0.063	0.214
Vulnerability(female)	-0.113	0.016	0.146	-0.05	0.063	0.214
%Below poverty line				34.5	13	0.000
All consumption				53250	49047.62	0.522
Food consumption				37889.71	34970.24	0.018

5.2 Poverty and Vulnerability

5.2.1. Poverty

In this section, we examine if microcredit programs were successful at reaching vulnerable and poor households by comparing average vulnerability and consumption of members to those of non-members using multinomial logistic regressions. Furthermore, multinomial logit model enables us to further compare SHG and WMF programs at reaching poor and vulnerable households.

We find that households that joined microcredit programs are poorer than those who did not join. Recall from Table 5 that 67 percent of microcredit members in village A, 49 percent of members in village B and 34 percent of members in village C are below the poverty line; these are significantly higher proportions compared to the ratio of non-member households that are below the poverty line. Second, the average monthly consumption of member households is significantly higher than that of non-members in villages A and B. The average monthly food consumption of members are higher than that of non-members in village C.

Multinomial logit regressions in Tables 6, 7 and 8 present that as the number of households below the poverty line increases, the probability of choosing WMF increases by 39 percent in village A, 17 percent in village B, and 14 percent in village C. Overall results indicate that WMF was successful at reaching poor households in village A while SHG program was not. This result does not change when we control for vulnerability (model5) and household characteristics (model4). Both SHG and WMF programs are successful at reaching poor households in village B (Table7 models 2,4,5,6, and Table7, model2). In village C, only WMF was successful in attracting poor households.

Table 6. Multinomial Logit regression of microcredit membership on poverty, vulnerability and household characteristics in village A

Variable	Model(1)		Model(2)		Model(3)		Model(4)		Model(5)		Model(6)	
	SHG	**WMF**	**SHG**	**WMF**	**SHG**	**WMF**	**SHG**	**WMF**	**SHG**	**WMF**	**SHG**	**WMF**
Vulnerability	0.112	-0.082			0.023	-0.085			0.035	-0.128	0.085	-0.211
	(0.001)	(0.014)			(0.539)	(0.026)			(0.391)	(0.002)	(0.164)	(0.001)
Poor			0.012	0.388			0.065	0.455	0.058	0.473	0.053	0.483
			(0.30)	(0.000)			(0.254)	(0.000)	(0.31)	(0.000)	(0.361)	(0.000)
Vul*poor											-0.070	0.162
											(0.421)	(0.051)
Land					-0.069	-0.034	-0.065	-0.002	-0.071	0.003	-0.071	0.001
					(0.005)	(0.158)	(0.023)	(0.918)	(0.015)	(0.913)	(0.016)	(0.952)
Age					-0.010	0.005	-0.013	0.001	-0.013	0.001	-0.013	0.001
					(0.000)	(0.046)	(0.000)	(0.669)	(0.000)	(0.646)	(0.000)	(0.608)
Size					0.030	0.038	0.028	-0.017	0.031	-0.017	0.028	-0.012
					(0.018)	(0.006)	(0.066)	(0.321)	(0.047)	(0.328)	(0.078)	(0.490)
Education					-0.082	0.048	-0.089	0.056	-0.089	0.053	-0.090	0.054
					(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Head					0.207	-0.334	0.213	-0.324	0.219	-0.352	0.223	-0.358
					(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Each cell shows the marginal effects and p-value is reported in parentheses.

Table 7.Multinomial Logit regression of microcredit membership on poverty, vulnerability and household characteristics in village B

Variable	Model(1)		Model(2)		Model(3)		Model(4)		Model(5)		Model(6)	
	SHG	**WMF**	**SHG**	**WMF**	**SHG**	**WMF**	**SHG**	**WMF**	**SHG**	**WMF**	**SHG**	**WMF**
Vulnerability	0.045	-0.033			0.057	-0.040			0.056	-0.032	0.002	0.124
	(0.002)	(0.014)			(0.00)	(0.006)			(0.000)	(0.023)	(0.960)	(0.016)
Poor			0.130	0.175			0.075	0.240	0.065	0.251	0.056	0.269
			(0.000)	(0.002)			(0.159)	(0.00)	(0.234)	(0.000)	(0.306)	(0.000)
Vul*poor											0.054	-0.175
											(0.285)	(0.001)
Land					-0.017	0.010	-0.018	0.014	-0.015	0.012	-0.015	0.009
					(0.14)	(0.248)	(0.142)	(0.150)	(0.191)	(0.209)	(0.196)	(0.306)
Age					0.004	-0.001	0.003	-0.0004	0.004	-0.001	0.004	-0.001
					(0.009)	(0.676)	(0.016)	(0.806)	(0.010)	(0.613)	(0.008)	(0.443)
Size					0.027	0.012	0.016	-0.014	0.017	-0.015	0.016	-0.015
					(0.003)	(0.215)	(0.130)	(0.191)	(0.106)	(0.187)	(0.143)	(0.184)
Education					-0.043	0.032	-0.043	0.033	-0.045	0.035	-0.046	0.035
					(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Head					-0.092	-0.028	-0.076	-0.035	-0.085	-0.031	-0.070	-0.060
					(0.167)	(0.688)	(0.244)	(0.616)	(0.211)	(0.659)	(0.300)	(0.407)

Each cell shows the marginal effects and p-value is reported in parentheses.

Table 8. Multinomial Logit regression of microcredit membership on poverty, vulnerability and household characteristics in village C

Variable	Model(1)		Model(2)		Model(3)		Model(4)		Model(5)		Model(6)	
	SHG	WMF	SHG	WMF	SHG	WMF	SHG	WMF	SHG	WMF	SHG	WMF
Vulnerability	0.017	-0.032			0.047	-0.052			0.061	-0.076	0.136	-0.194
	(0.217)	(0.015)			(0.025)	(0.004)			(0.009)	(0.001)	(0.001)	(0.000)
Poor			0.061	0.145			-0.226	0.423	-0.258	0.485	-0.275	0.499
			(0.178)	(0.002)			(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Vul*poor											-0.264	0.334
											(0.015)	(0.002)
Land					0.026	-0.049	0.027	-0.043	0.030	-0.051	0.031	-0.049
					(0.102)	(0.009)	(0.107)	(0.026)	(0.078)	(0.015)	(0.062)	(0.020)
Age					0.011	0.001	0.012	0.001	0.011	0.001	0.010	0.003
					(0.000)	(0.374)	(0.000)	(0.534)	(0.000)	(0.447)	(0.000)	(0.141)
Size					0.027	-0.015	0.045	-0.069	0.054	-0.082	0.058	-0.091
					(0.015)	(0.201)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(.000)
Education					-0.033	0.045	-0.035	0.046	-0.039	0.051	-0.037	0.050
					(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Head					0.016	0.033	0.052	-0.007	0.048	0.016	0.038	0.016
					(0.774)	(0.582)	(0.359)	(0.907)	(0.411)	(0.788)	(0.505)	(0.803)

Each cell shows the marginal effects and p-value is reported in parentheses.

5.2.2. Vulnerability

Table 5 highlights that the average vulnerability of members is higher than that of nonmembers in village B and C, but nonmembers are more vulnerable in village A. In addition, according to Table 4, correlation between vulnerability and microcredit membership is positive (but not significant) for villages A and B and negative in village C (but not significant).

Multinomial logit regression results in Tables 6, 7 and 8 reveal that as vulnerability increases, the probability of joining SHG in village A increases by about 11 percent, but the effect of vulnerability on WMF is insignificant. Interestingly, effect of vulnerability on program membership is insignificant if we control for poverty (model5) and other household characteristics (column 3). Overall SHG seems to reach vulnerable households more

effectively than WMF in village A. SHG was also successful at reaching vulnerable households in village B; as vulnerability increases, the probability of a household choosing WMF increases by 5 percent. This result is fairly robust as we control for households characteristics (model3) and poverty (model5). Effect of vulnerability on WMF membership propensity is significant when we control for poverty, household characteristics, and poor-vulnerable households (model6). Overall, vulnerable households are likely to join SHG rather than WMF program in village B. Similarly, vulnerability in village C increases the probability of these households joining SHG over WMF program; WMF program seems to crowd-out vulnerable households in village C.

5.2.3 Interaction and households characteristics

We would like to determine if vulnerable households that are also above the poverty line have a lower probability of joining these two programs than those below the poverty line. Therefore, an interaction term in the logit regression has been applied in Tables 6,7 and 8.

The coefficient of the interaction term is significant for WMF in village A and village C (model 6). The probability of choosing WMF in village A and village C increases by 16 and 33 percent, respectively for households that are both vulnerable and poor. SHG membership is not affected by presence of poor-vulnerable households in villages A and B. In addition, ownership of arable land significantly reduces the probability of joining SHG in village A and probability of joining WMF in village C. The land ownership effect is not significant in village B.

6. Conclusion

This paper aims to study if two major microcredit programs, namely Women Microcredit Funds (WMF) and Self-Help Groups (SHG), in Southern Iran reach rural poor and vulnerable

households. We use a risk sharing framework to primary panel data that consist of monthly consumption and income information for 280 households.

Results clearly indicate that microcredit programs were successful at reaching poor. Evidence on propensity of vulnerable households joining programs is relatively limited. Although both programs are successful to attract poor households, it seems poor households mostly choose to join WMF program. On the other hand, results indicate that vulnerable households are more likely to join SHG rather than WMF program.

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