



Social capital and farmer's willingness-to-join a newly established community-based health insurance in rural China

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Abstract

In 2002, China announced a new funding strategy that would reestablish community-based health insurance (CHI) in rural areas, whereby the Chinese government will entice farmers' participation by providing each participant an annual subsidy of 10–20 Yuan (US\$ 1.25–2.50). However, there is no evidence demonstrating how many farmers would be willing-to-join (WTJ) such newly developed government subsidized voluntary-based CHI scheme and what factors influence farmers' willingness-to-join. In this study, we examine the probability of farmers' willingness-to-join such CHI under the different scenarios of government subsidy and individual contribution, and also explore factors that influence farmers' willingness-to-join with the emphasis on social capital. The study is based on data collected from a 2002 household survey conducted in Fengsan Township, located in China's Guizhou Province. Logistic regression is used in the analysis. The findings from this study show that even with the government subsidy to the premium, the probability of WTJ the new voluntary-based CHI only reach 50%. The results also indicate that community level social capital, as measured by reciprocity index, and individual level social capital, as measured by trust index, are significantly and positively associated with the probability of farmers' WTJ newly developed government subsidized CHI. Policy recommendations have been made based on those findings.

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1. Introduction

Prior to the 1979 economic reform, the community-based health insurance (CHI) played an important role in addressing health care issues, especially for poor populations living in rural China. The Cooperative Medical System (CMS), one type of CHI schemes,

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covered 90% of all villages in the mid-1970s and provided widespread financial mechanism for the farmers to access to basic health services in rural China.

However, CMS started to collapse since China transformed its economic system of collective agricultural production to that of private production in 1978 [1,2]. According to the 1998 China National Health Service Survey, only 6.6% of villages in 1998 had CMS; more than 87% of rural residents did not have any health insurance in China [3]. One of the major reasons for the collapse of CMS was the lack of financial support from collective economy. CMS was mainly financed by the collective economy. This economic system was replaced by the individual responsible economic system since 1978. Therefore, the funding sources for CMS from collective economy no longer exist.

Those farmers who lack of health insurance have to pay out-of-pocket for all health services. The out-of-pocket payment mechanism creates barriers for farmers to access basic health services and leads to exclusion among poor individuals who cannot afford to pay the charges [3,4]. The 1998 China National Health Service Survey indicated that the two-week outpatient utilization rate reached only 13% in poor rural areas (22% lower than the average level in rural areas). Among those who were admitted but did not use inpatient services, 71% of them are due to unable to afford high hospitalization expenses [3].

Several attempts have been taken by the Chinese government to reestablish CMS to increase farmers' accessibility to the basic health services in rural China, however, most of these attempts failed, especially in the poor rural areas of China due to lack of willingness-to-pay or lack of ability to pay [5]. In October 2002, China announced a new funding strategy for a newly established CHI. The government would entice farmers to participate in the new CHI by providing each participant with an annual subsidy of 10–20 Yuan (US\$ 1.25–2.50). This newly reestablished CHI is a voluntary-based scheme and its benefit package design is left open to the decision of community themselves [6].

It is expected that with the government subsidy, farmers' willingness-to-join (WTJ) the CHI would be increased. However, farmers' WTJ may also be influenced by many other factors. A substantial body of previous researches has shown that the individual's demand for CHI is influenced by many factors, which

include ability-to-pay, health status, education, household size and demographic status such as age and gender [7–9]. Very few study, however, examined the effects of social capital on the demand of CHI. A study from rural Burkina Faso displayed that the demand for CHI is influenced by social capital, such as solidarity and reciprocity [10]. A qualitative study from China also suggested that trust may have impact on the sustained development of CMS in rural China [11]. Yet, very few empirical researches examined the effects of social capital on the individual's demand for CHI, especially in rural China [12].

The value of social capital was identified by Bourdieu [13] and was given a theoretical framework by Coleman [14,15]. Social capital is defined as those features of social structures, such as levels of interpersonal trust and norms of reciprocity and mutual aid, which act as resources for individuals and facilitate collective action [15,16]. It is characterized by levels of trust, civic engagement and norms of reciprocity [16,17]. Putnam presented that two of the key theoretical ingredients of social capital are general community trust and generalized reciprocity [18].

Most social capital studies use theoretical frameworks and corresponding statistical models to measure the level of social capital, to examine the relationship between social capital and governance [19–24], and to identify the association between communal trust and the performance of large organizations [25]. There has also been an emphasis on the association between social capital and economic growth [26].

In the area of health service research, there is growing interest in the effects of social capital on health and health care, including studies on relationship between social capital and health care access, mental health, mortality and health status [27–32]. The literature suggests that high social capital is associated with higher self-rated health [31–33], more benign health-related behaviors [34] and lower mortality [35,36]. However, there are relatively few studies exploring the relationship between social capital and health financing.

The objective of this study is to empirically assess the relationship between level of social capital and individual demand for the newly established voluntary-based CHI, as measured by the probability of WTJ, under different scenarios of government subsidies. The contingent valuation (CV) method is used to elicit individual's demand. "Trust" and "reciprocity" indexes are

used to measure the level of “social capital” at community level and at individual level.

2. Methodology

2.1. Concept framework and empirical model

Farmers’ choice of joining CHI is a discrete decision process consistent with qualitative choice models [37]. From an economic perspective, farmers’ choice of joining CHI is grounded in the comparison of the expected utility of having health insurance versus having no health insurance. If the expected utility to be derived from joining the CHI at the stated premium is greater than having no CHI, an individual will opt to join and pay for the scheme. The purpose of this study is to use the discrete decision choice model to predict the probability of farmers’ WTJ the voluntary-based CHI and to examine the relationship between social capital and the WTJ in rural China. The most widely used empirical model for the qualitative choice model is logistic or probit model. We use the logistic regression model with odds ratios (ORs) estimation in this study.

2.2. Source of data

This study is based on a data set collected from a 2002 household survey conducted in Fengsan Township, Guizhou Province of China. When we conducted the survey, the CHI scheme did not exist yet. One of the purposes of collecting WTJ and WTP information was to help developing a new CHI scheme for local community. Based on government statistics, the annual income per capita in Fengshan Township was about 2000 Chinese Yuan (US\$ 250) in 2001. This township has one township health center and 56 village doctors who serve in village health posts across the entire township.

The sample population was chosen through a multistage sampling approach. In the first stage, random sampling method was used to select 6 villages from 25 villages. In the second stage, all households with at least one “high-risk” family member, as well as about forty percent of other households chosen at random, were selected (“high-risk” was defined as: single elderly; the disabled; those with dementia; women who were pregnant in the previous year or at the time of interview; those admitted to the hospital in the previous year; or

those with severe disease diagnosed by the village doctors). The entire sample includes 1157 households with 2830 residents whose ages are 18 years old and above. A sample weight variable was created for weighted analysis based on different sampling probabilities for households with at least one “high-risk” family member and other random selected households [38].

The contingent valuation method is used to elicit individual’s demand for the newly developed voluntary-based CHI. A description of the newly established CHI with the government subsidy was proposed to the farmers first, then followed with the questions regarding to the willingness-to-join and pay for the schemes corresponding to different amounts of government subsidies in the questionnaire. For example, the interviewer asks the farmer if he/she was willing to join the new CHI while government subsidy is 10 Yuan (US\$ 1.25). If the answer from farmer is ‘yes’, then the interviewer will ask how much he/she is willing to pay for such a CHI scheme. Similar questions are asked to the farmers while government’s subsidy is 15 Yuan (US\$ 1.88) or 20 Yuan (US\$ 2.50). The response rate of the survey is 99.6%.

2.3. Dependent variables: willingness-to-join and pay for the new CHI

Based on contingent valuation questions described above, we generate a series of dependent variables. These dependent variables include: the dummy variables representing the farmers who are willing to pay the same amounts and above at each level of government subsidies to join the newly developed CHI (at 10, 15 or 20 Yuan subsidy levels); the dummy variables representing the farmers who are willing to pay 5 Yuan less than government subsidies and above to join the newly developed CHI (only at 15 and 20 Yuan subsidy levels); and the dummy variable representing the farmers who are willing to pay 10 Yuan less than the government subsidy and above to join the newly developed CHI (only at 20 Yuan subsidy level). All of these dependent variables and summary statistics are listed in Table 1.

2.4. Independent variables

Based on the objective of this study, social capital is our primary interests in terms of the factors that

Table 1
Description of dependent variables, $N = 2594$

Variables	Description	Percentage ^a
Individual's willingness-to-pay is the same as the government subsidies		
M2020	1 if government's subsidies is 20 Yuan and individual's willingness-to-pay is 20 Yuan and above, 0 if otherwise	43.1
M1515	1 if government's subsidies is 15 Yuan and individual's willingness-to-pay is 15 Yuan and above, 0 if otherwise	44.8
M1010	1 if government's subsidies is 10 Yuan and individual's willingness-to-pay is 10 Yuan and above, 0 if otherwise	53.2
Individual's willingness-to-pay is 5 Yuan less than the government subsidies and above		
M2015	1 if government's subsidies is 20 Yuan and individual's willingness-to-pay is 15 Yuan and above, 0 if otherwise	54.2
M1510	1 if government's subsidies is 15 Yuan and individual's willingness-to-pay is 10 Yuan and above, 0 if otherwise	63.3
Individual's willingness-to-pay is 10 Yuan less than the government subsidies and above		
M2010	1 if government's subsidies is 20 Yuan and individual's willingness-to-pay is 10 Yuan and above, 0 if otherwise	75.9

^a The percentage is weighted estimation.

influence WTJ the newly developed government subsidized CHI in rural China. Social capital is measured by 'trust' and 'reciprocity'. Each of which is composed of five questions with the answers scaled from agree (5 score) to disagree (1 score). We combined the China experiences with the knowledge we learnt from the questionnaire related to social capital suggested by World Bank to choose the five questions for 'trust' and another five questions for 'reciprocity' [39]. 'Trust' could be either vertical trust (trust in the government, institutions, municipal authorities, etc.) or horizontal trust (generalized trust in other people). In this study, we investigated mainly horizontal trust. 'Trust' is assessed by five questions: "Generally speaking, would you say most villagers of the village can be trusted?", "Do you think most villagers of the village would try to take advantage of you to achieve their own goals if they got a chance?", "Do you think most villagers would return what they pick up to the original owner?", "Do you think most of your neighbors can be trusted" and "Do you think the village leaders can be trusted"; The questions that assess 'reciprocity' include: "Do you think villagers concern issues that not only relate to themselves, but also relate to others", "Do you think villagers will provide help if someone really needs it", "Would you lend money to your neighbor if he/she needs it to see a doctor", "Would you say if your village were a large family, you would be a member in this family" and "Would you like to support a project that might not benefit you most, but benefit other villagers".

We created trust index and reciprocity index for analysis. The individual level social capital is measured by the sum of scores from each question divided by total

maximum sum of scores. These social capital indexes are ranged between 0 and 1. The quartiles are used to group the individual level trust and reciprocity index into low, middle and high level (Table 2). According to social capital theory, the distinctive feature of social capital is that it is external to the individual. It should be properly considered a feature of the collective level (neighborhood, community, society) to which the individual belongs. Thus, social capital ought also to be measured at community level [40]. We aggregated individual trust and reciprocity index to the village level and assigned village mean to each individual observation. The community level trust/reciprocity index is divided into low trust/reciprocity and high trust/reciprocity categories, three villages with lowest indexes are in low category and other three villages with highest indexes are in high category (Table 2).

We hypothesize that both "trust" and "reciprocity" would influence farmers' WTJ the CHI, whereas the probability of WTJ the CHI for farmers with higher "trust" and "reciprocity" would be greater than the probability of WTJ for those with lower "trust" and "reciprocity".

In addition to social capital variables, farmers' WTJ the CHI may also associate with other socio-demographic characteristics. These factors are included in the analysis as control variables, which include age, gender, family size, marital status, level of education, income, assets, health status, go out work and the distances from farmer's home to the village health post, township health center and county hospital. It is noteworthy that the amount of non-medical consumption is used as a proxy for farmers' income

Table 2
Description of independent variables, $N = 2594$

Variables	Description	Percentage/mean ^a
Community level social capital		
Trust		
L-C-trust ^a	Mean of village level trust is at the low 50% percentile. Omitted group	48.59
H-C-trust	1 if mean of village level trust is at the high 50% percentile, 0 otherwise	51.41
Reciprocity		
L-C-reciprocity ^a	Mean of village level reciprocity is at the low 50% percentile. Omitted group	53.88
H-C-reciprocity	1 if mean of village level reciprocity is at the high 50% percentile, 0 otherwise	46.12
Individual level social capital		
Trust		
L-I-trust ^a	Trust index at the low 25% percentile. Omitted group	26.00
M-I-trust	1 if trust index is between 25 and 75% percentile, 0 if otherwise	51.83
H-I-trust	1 if trust index is in the high 25% percentile, 0 if otherwise	22.17
Reciprocity		
L-I-reciprocity ^a	Reciprocity index at the low 25% percentile. Omitted group	39.39
M-I-reciprocity ^a	1 if reciprocity index is between 25% and 75% percentile, 0 if otherwise	39.95
H-I-reciprocity	1 if reciprocity index is in the high 25% percentile, 0 if otherwise	20.56
Social support		
Financials	Number of people who can lend money	9.80
Age		
Age	Age	41.19
Gender		
Female ^a	Female. Omitted group	48.12
Male	1 if male, 0 if otherwise	51.88
Household size		
Houses	Number of household member	3.89
Marriage		
Unmarried ^a	Unmarried. Omitted group	20.74
Married	1 if married, 0 if otherwise	72.17
Divorced	1 if divorced or separated, 0 if otherwise	7.09
Education		
Illiterate ^a	Illiterate and age ≥ 6 . Omitted group	27.25
Elementary	1 if elementary school, 1–6 years, 0 if otherwise	43.16
Junior high	1 if primary school, 7–9 years and above, 0 if otherwise	29.60
Income		
Income	Annual post-tax expenditure per person of a household (100 Yuan)	19.44
Assets		
Assets	1 if having any of assets including TV, motor car, car, refrigerator, washing machine and telephone, 0 otherwise	39.67
Go out work		
Outwork	1 if having going out working in a year, 0 otherwise	5.17
Health		
Chronic disease	1 if having diagnosed chronic conditions/diseases, 0 otherwise	22.01
Worry about MEDical expense		
Not worry ^a	Individual is not worried about medical expense. Omitted group	30.26
Little worry	1 if individual is worried about medical expense a little, 0 otherwise	41.79
Much worry	1 if individual is worried about medical expense very much, 0 otherwise	27.95

Table 2 (Continued)

Variables	Description	Percentage/mean ^a
Distance to health sector		
Villagehp	Distance (km) from home to village health post	2.66
Townhc	Distance (km) from home to township health center	16.01
Countyh	Distance (km) from home to county hospital	44.15
Weight		
Weight	Weight = 1 if high risk households, weight = 2.41 if other households	38.9% in high risk households

^a Percentages/means listed in the table are all weighted estimations.

because of the sensitivity and difficulty of obtaining income level using an interview approach. We assume that people who consume more non-medical goods also have the high capacity to pay for CHI. We considered also financial social support and worry about the medical expense as the other control variables. Table 2 provides the description and the summary statistics for each of these variables.

2.5. Data analysis

The study uses logistic regression model to estimate probabilities of WTJ the newly established CHI and to examine the association between social capital and the WTJ. Weighted analysis is used due to sampling strategy. The standard errors are adjusted in the regression analysis to reflect the correlation of the errors terms among farmers within the same household. All data are analyzed with STATA statistical software.

3. Results

3.1. WTJ the newly established voluntary-based CHI

The results of this study show that while the government subsidy is fixed, the lower an individual's contribution to the premium is, the higher the probability of farmers' WTJ the CHI at each level of government's subsidy. As indicated in Table 1, while the annual government subsidy to the premium equals 20 Yuan, 75.9% of the farmers are willing to join the new CHI with 10 Yuan contribution per year. The probability of WTJ the CHI declines to 54.2 and 43.1% when the minimum individual contribution increases to 15 and 20 Yuan, respectively. The similar trend also appears in the scenario while the annual government subsidy is

15 Yuan. While the annual government subsidy equals 15 Yuan, 63.3% of the farmers are willing to join the new CHI with 10 Yuan contribution per year. The probability declines to 44.8% when the minimum individual contribution is 15 Yuan per person per year.

Simultaneously, while the individual contribution is fixed, the higher the annual government subsidy to the premium is, the higher the probability of the farmers' WTJ at each level of individual contribution. While the farmers are willing to pay 10 Yuan and above to join the new CHI scheme and the annual government subsidy is 20 Yuan, the probability of farmers' WTJ is 75.9%. However, the probability of WTJ with the same individual contribution declines to 63.3 and 53.2% when the annual government subsidy reduces to 15 and 10 Yuan, respectively. The similar trend also appears in the case of the farmers' willingness-to-pay is 15 Yuan and above to join the CHI scheme. If the annual government subsidy is 20 Yuan, the probability of WTJ is 54.2%. However, this WTJ probability declines to 44.8% when government subsidy reduces to 15 Yuan (Table 1).

The probabilities of farmers' WTJ range from 13.6 to 15.3% while the farmers are willing to pay higher amounts than the annual government subsidies at 10, 15 and 20 Yuan (these results are not listed in the table). Due to the potential problem of adverse selection, the voluntary-based CHI might not be sustainable under such low probabilities of WTJ. Therefore, we did not include options that individuals' willingness-to-pays are higher than government subsidies in our following regression analysis.

3.2. Social capital and the probability of WTJ the CHI

The results from regression analysis showed that both individual level trust index and community level

Table 3
Probabilities of WTJ the CHI by various government subsidies and individual contributions

Variables	OR (M2020)	OR (M1515)	OR (M1010)	OR (M2015)	OR (M1510)	OR (M2010)
H-C-trust	1.2679 (0.1973)	1.2654 (0.1983)	1.1042 (0.1746)	1.1442 (0.1798)	0.9692 (0.1600)	1.1274 (0.2114)
H-C- reciprocity	1.4707 (0.2485)**	1.6807 (0.2856)***	1.4735 (0.2499)**	1.4050 (0.2446)*	1.2700 (0.2299)	0.8305 (0.1717)
M-I-trust	1.6118 (0.2179)***	1.4873 (0.2030)***	1.3770 (0.1830)**	1.5063 (0.1980)***	1.3796 (0.1877)**	1.2613 (0.1933)
H-I-trust	1.8219 (0.3342)***	1.6370 (0.3016)***	1.6916 (0.3061)***	1.4361 (0.2581)**	1.3621 (0.2525)*	1.4944 (0.3183)*
M-I- reciprocity	0.8903 (0.1184)	0.9477 (0.1274)	1.0850 (0.1438)	0.9922 (0.1308)	1.0980 (0.1472)	1.2048 (0.1866)
H-I- reciprocity	0.7298 (0.1385)*	0.7881 (0.1490)	0.7872 (0.1470)	1.0202 (0.1902)	0.8760 (0.1692)	0.8145 (0.1721)
Financialss	1.0099 (0.0045)**	1.0103 (0.0046)**	1.0090 (0.0048)*	1.0077 (0.0045)*	1.0066 (0.0049)	1.0171 (0.0066)***
Age	1.0065 (0.0051)	1.0088 (0.0051)*	1.0101 (0.0051)**	1.0065 (0.0051)	1.0106 (0.0054)**	1.0066 (0.0061)
Male	0.9419 (0.0621)	0.9317 (0.0618)	0.9798 (0.0641)	0.9302 (0.0605)	0.9144 (0.0610)	0.8641 (0.0658)*
Family size	1.0740 (0.0643)	1.0871 (0.0647)	1.0798 (0.0652)	1.0863 (0.0683)	1.0600 (0.0693)	1.0775 (0.0830)
Married	1.0152 (0.1990)	0.9845 (0.1922)	0.9997 (0.1892)	1.2062 (0.2284)	1.1288 (0.2191)	0.9877 (0.2152)
Divorced	0.7862 (0.2413)	0.7864 (0.2402)	0.6289 (0.1879)	1.0218 (0.3014)	0.7823 (0.2367)	0.9280 (0.3120)
Elementary	1.1628 (0.1556)	1.1870 (0.1600)	1.0475 (0.1395)	1.0635 (0.1413)	1.1285 (0.1538)	1.3544 (0.2113)*
Junior high	1.3208 (0.2301)	1.3697 (0.2385)*	1.1644 (0.2036)	1.4521 (0.2513)**	1.4518 (0.2585)**	1.4524 (0.2952)*
Income	1.0094 (0.0047)**	1.0083 (0.0046)*	1.0154 (0.0047)***	1.0076 (0.0050)	1.0123 (0.0048)***	1.0052 (0.0053)
Asset	1.3677 (0.2262)*	1.4967 (0.2456)**	1.4415 (0.2338)**	1.4051 (0.2296)**	1.1843 (0.1979)	1.6591 (0.3176)***
Outwork	1.0480 (0.2423)	1.0974 (0.2621)	0.9315 (0.2163)	1.1086 (0.2556)	1.1801 (0.2812)	0.9887 (0.2647)
Chronic disease	0.9316 (0.1131)	0.9360 (0.1132)	0.9576 (0.1145)	0.8861 (0.1051)	0.8653 (0.1052)	0.9772 (0.1332)
Little worry	0.8286 (0.1505)	0.7858 (0.1421)	0.7832 (0.1396)	0.7394 (0.1320)*	0.8746 (0.1576)	1.0985 (0.2285)
Very worry	1.6012 (0.3107)**	1.8143 (0.3509)***	2.0633 (0.4091)***	1.7373 (0.3380)***	2.5115 (0.5367)***	2.0084 (0.4913)***
Villagehph	0.8883 (0.0289)***	0.8871 (0.0284)***	0.8913 (0.0268)***	0.8965 (0.0275)***	0.8952 (0.0259)***	0.8868 (0.0313)***
Townhc	1.0035 (0.0047)	1.0028 (0.0047)	1.0026 (0.0047)	0.9985 (0.0056)	0.9984 (0.0052)	0.9972 (0.0048)
Countyh	1.0428 (0.0107)***	1.0396 (0.0107)***	1.0199 (0.0102)**	1.0374 (0.0108)***	1.0181 (0.0109)*	1.0467 (0.0130)***
Observations	2586	2586	2586	2586	2586	2586
Wald chi2	99.12	106.79	112.12	98.32	92.04	81.54
P	<0.0000	<0.0000	<0.0000	<0.0000	<0.0000	<0.0000
Log pseudo- likelihood	-1634.7376	-1626.9334	-1637.816	-1651.3717	-1581.0642	-1302.7027
Pseudo R2	0.0746	0.0846	0.0848	0.0745	0.0713	0.0813

Robust standard errors in parentheses.

* Significant at 10%.

** Significant at 5%

*** Significant at 1%.

reciprocity index is significantly and positively associated with the probability of farmers' WTJ the CHI. As indicated in Table 3, if both individual and government contributions to the premium is 20 Yuan (model M2020), farmers in high community level reciprocity bracket are 1.47 times more likely to join the CHI than those in low community level reciprocity bracket. Under the same circumstance, farmers in middle individual level trust bracket are 1.61 times more likely to join the CHI than those in low-trust bracket. This odds ratio increases to 1.82 for the farmers in high individual level trust bracket after controlling for other variables.

The same trend appears in the models where both individual and government contributions to the premium are 15 Yuan (model M1515) and where individual and government's contributions to the premium is 10 Yuan (model M1010).

The positive association between community level reciprocity index and the probability of farmers' WTJ the CHI is not statistically significant when the farmers are willing to pay only 10 Yuan and lower than the government subsidy to the premium (models M2010 and M1510 in Table 3). There is still a significant and positive relationship between individual level

trust index and the probability of farmers' WTJ the CHI.

3.3. Financial social support and the probability of WTJ the CHI

The result indicates that the number of people who can lend money to interviewee is positively and significantly associated with the probability of farmers' WTJ the CHI. With one additional person who can lend money, the probabilities of WTJ the CHI increase about 0.7–1.7%.

3.4. Socio-economic status and the probability of WTJ the CHI

As expected, both income and asset has strongly positive associations with the probabilities of WTJ the CHI in all options of government subsidies and individual's contributions. The results in Table 3 indicate that the probability of WTJ the CHI would increase 0.83–1.54% if income increase 100 Yuan across all models. The farmers who own luxury asset are 1.37–1.66 times more likely to join the CHI than those who do not own luxury asset. The farmers with junior high education are 1.37–1.45 times more likely to join the CHI than farmers with illiteracy education status.

3.5. The probability of WTJ the CHI and other variables

The results displayed that age is positively associated with the WTJ the CHI, which may imply the adverse selection of joining the health insurance scheme. The concern to the medical expense is also positively associated with the WTJ the CHI. The farmers who are in the very worry bracket are 1.60–2.51 times more likely to join the CHI than those who are not worry to medical expenditure.

The distance from farmers' home to village health post is negatively associated with the probability of farmers' WTJ the CHI. This result is consistent with our hypothesis. Farmers who are closer to village health facility might be more likely to use health care services than those who live far away from village health facilities. Therefore the farmers who are closer to village health facility might be more likely to join CHI

than those who live far away from village health facility. The results also indicate that the distance from a farmer's home to the county hospital is positively associated with the probability of farmer's WTJ the CHI. This result might imply that farmers who live far away from a county hospital rely more on the health services provided by the village health post, and are therefore, more likely to join CHI since the probability of using the health services at the village health post is much higher than at the county hospital.

4. Discussion and policy implications

There are two significant findings that have important policy implications in terms of newly established voluntary-based CHI in rural China. The first is that community level social capital, as measured by reciprocity index and individual level social capital, as measured by trust index, are significantly and positively associated with the probability of farmers' WTJ newly developed government subsidized CHI. The second is that even with government subsidy, the probabilities of participation are ranged from 43.1 to 75.9% under different scenarios of government's subsidies and individual's contributions.

In addition to trust and reciprocity index, the results also displayed the number of person who can lend money to the interviewee is positively associated with WTJ the CHI. This results may imply the effect of norm of reciprocity on WTJ because if a person who can obtain the financial support from others, he/she might also be willing to help others with financial contribution.

The results described above imply that the participation rate of CHI might be increased by enhancing social capital in rural China. However, social capital is affected by many socio-economic factors, such as income inequality; and several research results suggest that social capital and income inequality are negatively associated [35]. Studies in China also show that the social capital is declining in current rapid economic transitional period in China [41]. Therefore, increasing CHI participation rate by enhancing social capital might not be feasible in short run. It would be more feasible to enhance the farmers' "trust" to the CHI scheme itself to increase the farmers' WTJ the CHI. We expected to achieve the objective by enhancing

farmers' "trust" to the funding management, to the quality and availability of health services and to the sustainability of government subsidy. We adopted a series of approaches when we designed the new CHI scheme. These strategies include establishing a funding management office separate from government, increasing the transparency of financing resource (both government subsidy and collected premium from farmers) and funding use, increasing the participation and monitoring by the farmer representatives, recruiting physician to check the prescription and hospitalization records, implementing the drug bulk purchase and so on.

Second, the findings from this study suggest that even with the government subsidy to the premium, the participation rate of voluntary CHI may not as high as expected, if in the means of enrollment is strictly voluntary. The probabilities of WTJ the CHI are only 43.1–53.2% when individual contribution is the same as the government's subsidy to the premium; about 50% farmers are still not willing to join CHI. When individual contribution is 5 Yuan less than government's contribution, the probability of WTJ the CHI is only slightly higher than 50%. Even if the government subsidizes 20 Yuan to the premium, nearly one out of four farmers are still not willing to join the CHI scheme with 10 Yuan and above contribution. This result implies that though the farmers respond to the economic incentive to join the voluntary-based CHI, social mobilization and government intervention might still be the important measures to increase the coverage rate of health insurance in rural China.

It is expected that adverse selection would be severe in the voluntary based CHI since farmers have such high expectation of benefit return from the CHI. Less healthy farmers might have a higher probability of WTJ than farmers who are relatively healthy. Although the association between health status and the probability of WTJ is not statistically significant, age is positively associated with the WTJ, which partially explained the adverse selection phenomena.

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