

The Labor Supply Effect of the New Rural Social Endowment Insurance

—Empirical Analysis Based on CHALRS Data

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ABSTRACT

Using the data from the China Health and Senior Care Tracking Survey (CHARLS), a Tobit model was established to investigate the impact of the new rural insurance on the labor supply of rural middle-aged and elderly people, and propensity score matching (PSM) was used to deal with the self-selection of samples. The results show that the new rural insurance does not have a significant impact on the total labor supply of the rural middle-aged and elderly people, but the distribution of labor time has changed significantly, non-agricultural employment time has decreased, and agricultural self-employment time has increased. With the change of rural residents' concept and the continuous improvement of family income level, the guarantee and "catalysis" role of the new rural insurance will be further brought into play, and the significance of rural residents' life and rural economic development will become more and more significant.

Keywords: *The new rural social endowment insurance, Labor supply, Propensity score matching.*

1. INTRODUCTION

At present, social endowment insurance is playing an increasingly important role in the protection of our national livelihood, and the level of protection is also increasing year by year. On the one hand, the construction of the new rural insurance system has received strong support from governments at all levels. On the other hand, it also undertakes a series of important policies such as expanding consumer demand, narrowing the urban-rural gap, changing the urban-rural dual structure, and promoting the equalization of basic public services. task. This paper uses the annual baseline survey data of the CHARLS database to study the impact of the "new rural insurance" system on the labor supply behavior of the rural middle-aged and elderly through the construction of the model and corresponding data analysis.

2. LITERATURE REVIEW

2.1. Theoretical Research on the Impact of the New Rural Insurance on the Labor Supply of Rural Residents

The current theoretical framework of the New Rural Insurance and the labor supply of rural residents is mainly based on the comparative static analysis of labor supply in neoclassical economic theory or the A Theory of Time Allocation proposed by Becker (1965). The main analysis ideas and conclusions of the above theories are that under the assumption of rational people, individuals or families will pursue maximum utility under resource constraints, thereby realizing the optimal allocation of labor supply and leisure time. Although pension income is unlikely to have the substitution effect caused by changes in the wage rate, it may still have an indirect substitution effect (Cheng Jie, 2014). That is to say, pensions help increase the investment in human capital and employment and entrepreneurship by the insured and their families, thereby increasing labor productivity, thereby increasing the opportunity cost of leisure consumption and increasing the level of labor supply.

2.2. Empirical Research on the Impact of the New Rural Insurance on the Labor Supply of Rural Residents

In terms of overall labor supply, most studies have shown that the new agricultural maintenance pension can help reduce the labor burden of the rural elderly and reduce the labor participation rate and labor supply level of farmers (Cheng Jie, 2014; Zhang Chuanchuan et al., 2015). However, some studies believe that due to the low level of pensions, the new rural insurance cannot significantly change the labor supply level of the rural elderly (Jie Chak, 2015), which includes total labor time and agricultural labor time.

2.3. Research Ideas

First of all, this article relies on the CHARLS database of the China Health and Pension Tracking Survey, and after drawing on relevant theoretical foundations, explores the impact of the new rural insurance on the labor supply of rural middle-aged and older persons aged 45 and above. Secondly, from a research perspective, this article divides the labor supply time of the elderly into three categories: total labor, agricultural labor and non-agricultural labor, and uses multiple statistical methods to conduct empirical analysis. Finally, according to the relevant characteristics of individuals, continue to explore the impact of the new social security on labor supply. The research content is closely related to the development of the rural pension insurance system and the construction of the labor market and has strong practical significance.

3. MODEL DESIGN

3.1. Model

Considering that the explained variable is a continuous variable and there are a large number of zero values, the data is truncated, so the Tobit regression model is used to analyze the factors that affect the working hours of rural middle-aged and elderly people. Based on the existing related literature, this paper sets the labor time model as follows:

$$worktime_i = \beta_0 + \beta_1 Participate_i + \beta_2 X_i + \varepsilon_i \quad (1)$$

$worktime_i$ represents the three explanatory variables set above corresponding to the i -th sample, the annual total agricultural self-employment time, the annual total non-agricultural employment time and the annual total labor time. The explanatory variable $Participate_i$ indicates whether the sample has participated in the new rural insurance, the value is 1, otherwise the value is 0. X_i is other control variables, including age, age squared, education level, marital status, self-rated health, etc. ε_i is a random error term.

3.2. Data Sources

The data used in this article comes from the China Health and Retirement Longitudinal Survey (CHRLA) national baseline survey in 2013, 2015 and 2018. CHALRS is a set of high-quality micro-data that collects family and personal information of middle-aged and elderly people aged 45 and above.

3.3. Variable Selection and Definition

According to the previous theoretical analysis, personal characteristics, family characteristics, whether to participate in insurance, etc. are all important factors that cause the difference in labor supply between the middle-aged and elderly in rural areas. There are three explained variables, because rural residents will not strictly follow the national legal holidays and rest, and the daily working time has great uncertainty (the questionnaire shows: when the farm is busy, the daily working time of farmers is between 12-16 hours) Therefore, the three explained variables in this article are all calculated in hours. The first is the total annual agricultural self-employment time; the second is the total annual non-agricultural Employment time; the third is the total annual labor time. The units of measurement for the above explained variables are all hours.

The core explanatory variable is whether you have purchased the new rural social endowment insurance. Other explanatory variables include gender, age, age squared, education level, social activities, health status (self-rated health and chronic disease), and whether to retire or resign.

Table 1. Grouped descriptive statistics

variable	Full sample		Participate		Did not participate	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
total work	274.932	446.393	273.718	447.999	286.892	450.478
self-farm	108.905	192.047	120.71	197.112	75.187	172.75
non-farm	131.354	268.515	116.583	253.811	179.007	305.994
gender	0.467	0.499	0.460	0.498	0.498	0.500
age	61.818	10.092	61.969	9.823	61.366	10.921
age2	3923.31	1309.902	3936.612	1272.52	3885.076	1427.433
edu	0.091	0.317	0.061	0.244	0.189	0.467
married	0.847	0.360	0.851	0.356	0.839	0.368
self_health	3.024	1.037	2.973	1.036	3.179	1.013
social	0.503	0.500	0.484	0.500	0.562	0.496
Chronic	0.443	0.497	0.441	0.497	0.445	0.497
retire	0.017	0.129	0.005	0.068	0.056	0.230

From the grouped descriptive statistics in Table 1, it can be found that there is no big gap between the total working hours of each group, but there is a big gap between agricultural self-employment time and non-agricultural employment time. The average annual total agricultural self-employment time of the experimental group participating in the new rural insurance is 120.71 hours, and the average non-agricultural employment time is 116.583 hours, while the non-insured control group has an average annual total agricultural self-employment time of 75.187 hours and the average non-agricultural employment time 179.007 hours. Compared with the control group, the total annual agricultural self-employment time of the experimental group is longer, and the non-agricultural employment time is shorter.

4. EMPIRICAL RESULTS AND ANALYSIS

4.1. Basic Regression Results

Table 2 shows the estimated results of whether participating in the new rural insurance system affects the three types of labor supply time. The first three are listed as no control variables, and only the correlation between the core explanatory variables and the explained variables is considered. It does not affect the total working time, but it will affect the agricultural self-employment time and the non-agricultural employment time at a significant level of 1%. Compared with the uninsured farmers, the insured farmers increase the agricultural self-employment time by 45.523 hours each year, which is a decrease of 62.423. Hours of non-agricultural employment time.

The last three columns are the regression results of adding the control variables. It can be seen whether participating in the insurance still does not significantly affect the total labor supply time. At a significance level of 1%, the insured farmers will increase 34.803 hours of

agriculture per year compared with the uninsured farmers. Self-employment time reduced 38.345 hours of non-agricultural employment time. Observing the control variables, it can be found that age and age square have positive and negative effects on the labor supply time of farmers, respectively, and both are significant at the 1% level, indicating that the relationship between age and farmers' labor time shows an inverted U-shaped change, that is, with the increase of age, the labor supply time of farmers increases, but after reaching a certain age limit, the labor supply time of farmers begins to decrease. The labor supply time of men is also significantly higher than that of women. The education level of farmers has a significant negative correlation with agricultural self-employment time, and a significant positive correlation with non-agricultural employment time. After marriage, farmers' total labor supply time and agricultural self-employment time increased significantly, but non-agricultural employment time was not significant. The better the self-rated health, the longer the non-agricultural employment time of farmers. There is a significant negative correlation between social activities and agricultural self-employment time and total labor supply time at the 1% level. If farmers suffer from chronic diseases, their non-agricultural employment time will be significantly reduced, and the total labor supply time will also be reduced, which is significant at the 1% level. After farmers retire or retire, labor supply time and agricultural self-employment time will be significantly reduced, significantly at the level of 5% and 1% respectively.

Table 2. The impact of insurance participation on the labor supply of rural middle-aged and elderly people

variable	total_work	self_farm	non_farm	total_work	self_farm	non_farm
	(1)	(2)	(3)	(5)	(6)	(4)
participate	-13.174 (8.5549)	45.523*** (3.650)	-62.423*** (5.101)	0.547 (8.932)	34.803*** (3.955)	-38.345*** (5.128)
gender				105.599*** (7.516)	13.563*** (3.328)	75.960*** (4.315)
age				-25.227*** (4.44)	12.932*** (1.968)	-32.546*** (2.552)
age2				0.111*** (0.035)	-0.113*** (0.015)	0.196*** (0.020)
edu				-3.757 (11.970)	-45.643*** (5.300)	48.618*** (6.872)
married				59.409*** (11.403)	37.039*** (5.049)	8.171 (6.547)
self_health				36.822*** (3.764)	1.659 (1.667)	28.968*** (2.161)
social				-19.710*** (7.538)	-23.855*** (3.338)	1.041 (4.328)
Chronic				-25.171*** (7.701)	-5.033 (3.410)	-14.217*** (4.421)
retire				-69.987** (29.027)	-56.528*** (12.853)	7.124 (16.666)
Constant	286.892*** (7.433)	75.187*** (3.172)	179.007*** (4.433)	1215.805*** (139.613)	-294.411*** (61.822)	1275.379*** (80.159)
Sample size	14875	14875	14875	13760	13760	13760

Note: The numbers in parentheses are robust standard errors. *, **, and *** are significant at the 10%, 5%, and 1% levels respectively.

4.2. Endogenous Testing (PSM)

Because farmers' own qualities and family backgrounds often have significant differences, such as higher education, stronger abilities and younger, farmers may have higher labor supply time, agricultural self-employment time, or non-agricultural employment time. That is, the sample is not random, and there is a sample selection problem. If the regression is performed directly through the Tobit model, it may cause estimation bias. Aiming at the self-selection problem that may exist in the sample, this paper adopts the propensity score matching method (PSM) to deal with it.

In order to estimate the robustness of the results, this article first takes insurance participation as the dependent variable and other control variables as independent variables, and then uses three different matching methods: nearest neighbor matching, radius matching and kernel matching to compare the control group (insured farmers) with the treatment the samples with the closest scores in the group (uninsured farmers) are matched to eliminate the selection bias. Finally, the difference in labor supply time between the insured farmers and the uninsured farmers, namely the average treatment effect (ATT), is calculated to evaluate the

participation Guarantee the net effect of labor supply time. The calculation formula of ATT is as follows:

$$ATT = \frac{1}{NR} \sum_{i \in R} [Y_i^R - \sum_{j \in C(i)} w_{ij} Y_j^C] \quad (2)$$

Among them, N^R represents the number of samples in the treatment group, Y_i^R and Y_j^C are the results of the treatment group individual i and the control group individual j , respectively, and w_{ij} is the weight.

This paper examines the impact of insurance participation on agricultural self-employment, using three matching methods such as nearest neighbor matching, radius matching and kernel matching to ensure the robustness of the results. The matching results are shown in Table 3. It can be seen from the neighbor matching results that the average treatment effect (ATT) of whether to participate in the insurance on agricultural self-employment time is 31.909, which is significant at the 1% level. This shows that the insured sample agricultural self-employed the supply time is 31.909 hours longer than the uninsured sample, which is less than the 34.586 hours in the stepwise regression results. Regardless of whether it is radius matching or nuclear matching, the conclusions are consistent with the above. The behavior of participating in the new agricultural insurance has a significant positive impact on the labor supply time of farmers'

agricultural self-employment at the level of 1%, and the

Table 3. Endogenous test

	Neighbor matching		Radius matching	Kernel matching
	Whether to participate in insurance	Treatment group	125.974	125.974
Control group		94.065	94.558	93.199
ATT		31.909***	31.416***	32.775***
		(5.311)	(3.924)	(3.880)
Sample size		13760	13760	13760

Note: (1) *, **, and *** indicate significance levels of 10%, 5%, and 1%, respectively; (2) Robust standard deviation in parentheses; (3) Neighbor matching uses one-to-two matching, radius the radius in the matching is set to 0.01, and the core matching uses the default bandwidth.

impact results are less than the basic the regression results show that there are still certain endogenous problems in the basic regression model, but the supply of agricultural self-employment for farmers after participating in the insurance still has a significant positive impact.

5. CONCLUSIONS AND POLICY RECOMMENDATIONS

Based on the above analysis, the following conclusions can be drawn there is no big difference between the insured rural middle-aged and the uninsured in the total labor supply time; but there is a big gap between agricultural self-employment time and non-agricultural employment time. The average annual total agricultural self-employment time participating in the new agricultural insurance is greater than the total annual agricultural self-employment time without insurance, and the average non-agricultural employment time participating in the new agricultural insurance is less than the non-agricultural employment time not participating in the new agricultural insurance; In other words, after participating in the insurance, the total labor supply time of rural middle-aged and elderly people has not increased or decreased significantly, but the distribution of labor time has changed significantly, non-agricultural employment time has decreased, and agricultural self-employment time has increased.

With the transformation of rural residents' concepts and the continuous improvement of family income levels, the guarantee and "catalysis" of the new rural insurance will be further exerted, and its significance to rural residents' lives and rural economic development will become more and more significant. It is necessary to further improve China's social endowment insurance system, establish a dynamic adjustment mechanism for basic pensions, and focus on account accumulation; broaden the income channels of rural middle-aged and elderly people, reshape land security capabilities, promote land circulation, increase property income, and

promote the adjustment of rural industrial institutions to increase Non-agricultural income for the elderly in rural areas; promote the coordinated development of multiple old-age care methods, encourage rural elderly people to purchase commercial endowment insurance, and continue to play the basic role of family pension.

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