The Impact of New Rural Pension Scheme on the Rural Elderly in China: Evidences of Regional Differences in Formal and Informal Labor Supply

B. Lin[1]; Z. Lin[2]; Y.Y. Zhang[3]; W. Liu[4]

1: Fujian Agriculture and Forestry University, , China, 2: Naikai University, , China, 3: Texas A&M University, , United States of America, 4: Fujian Agriculture and Forestry University, , China

Corresponding author email: bxlin@126.com

Abstract:

This paper evaluates the effect of China's New Rural Pension Scheme (NRPS) on labor supply of the rural elderly in the forms of both formal labor supply informal labor supply, using data from China Health and Retirement Longitudinal Study (CHARLS). We explore the regional differences of the NRPS effect on labor supply between the West and non-West regions of China. Our analysis shows that western rural China has a more severe problem of "ceaseless toil" compared to the rest of the country. We find that NRPS improves the "ceaseless toil" situation of the Chinese rural elderly but the results show a very different pattern between western China and other part of the country.

Acknowledegment: This work was supported by National Natural Science Foundation of China (Grant No. 71303049)and Program for New Century Excellent Talents of the Fujian Education Department.

JEL Codes: D13, D15

#2253

The Impact of New Rural Pension Scheme on the Rural Elderly in China: Evidences of Regional Differences in Formal and Informal Labor Supply

Abstract: This paper evaluates the effect of China's New Rural Pension Scheme (NRPS) on labor supply of the rural elderly in the forms of both formal labor supply informal labor supply, using data from China Health and Retirement Longitudinal Study (CHARLS). We explore the regional differences of the NRPS effect on labor supply between the West and non-West regions of China. Our analysis shows that western rural China has a more severe problem of "ceaseless toil" compared to the rest of the country. We find that NRPS improves the "ceaseless toil" situation of the Chinese rural elderly but the results show a very different pattern between western China and other part of the country.

Keywords: Urban and Rural Pension Insurance; Labor Supply; Regression Discontinuity

1. Introduction

Rural residents typically rely on extended family to support them in old life in China, and son plays an important role in taking care of the elderly. After reform and opening up, a large number of young and middle-aged population migrate to city, leaving the elderly to live on their own. And fertility restriction has reduced the family sizes, increasing the potential burden of elder-support for each child. So, many children are unwilling to or have no ability to support their parent's old life. Chinese traditional family pattern of old-age provision can not sustain, and rural elderly have to work on farm or off farm to support themselves as they age until they are no longer physically capable (Benjamin et al. , 2003). Actually, in addition to the formal labor such as agricultural practice and off-farm employment, the majority of Chinese rural elderly take up informal labor supply-work done in the home taking care of household

chores or caring for grandchildren, which makes their children are more willing to support their old-age life (Lihua Pang et al., 2004). With taking care of grandchildren, for example, on the one hand, it would bring the elderly psychological benefits (Lu Song, 2008). On the other hand, it would bring pressures of health and economic condition to the elderly and increase their labor intensity. The retirement pattern of the Chinese elderly is described as "ceaseless toil".

One of reasons for "ceaseless toil" is due to a lack of social pension security system in rural China. In fact, urban residents in China have similar formal social pension security system as residents of developed countries. However, there was no sufficient social pension security system in rural China in the past years. When the traditional family pattern of old-age broke up, many people have to work as long as possible to support themselves as they aged. In recent years, Chinese government has begun to improve the social pension security system in rural China. The new rural pension scheme (NRPS) was implemented by the Chinese government in rural regions in 2009 facing the challenge of the aging population in China. The urban resident's pension insurance system was further carried out in urban areas in China in 2012. In order to establish a fair, uniform and normative social old-age security system, the state council of China decided to combine these two systems to build urban and rural residents public pension scheme.

One of the important purpose of urban and rural residents public pension scheme is to guarantee the elderly basic living standards, keeping them from work for survival. The question remains that whether the implementation of urban and rural residents public pension scheme reduce labor supply of the rural elderly and improve "ceaseless toil"? Theoretically, retirement pension system can loose credit constrains, improve current or prospective income level, reduce labor supply or saving motives and reduce their labor supply. At the same time, pensions can reduce elderly's economic dependence to their children (Lingguo Chen, 2013), and then decrease the time of informal labor supply of elderly.

To date, evidence on the labor supply of the rural population responses to

pension receipt in China has largely relied on some careful studies. Chuanchuan Zhang (2015) finds that new rural pension system is helpful to obviously reduce the burden in working of rural elderly and make senior survive. Hongwei Huang et al. (2014) find that the pension of new rural society public pension scheme program has obvious negative effect on labor supply of the rural elderly. However, the object these studies is formal labor supply, and the empirical study of the effect urban and rural residents public pension scheme on informal labor supply of the rural elderly is insufficient.

In this paper, we evaluates the effect of public pension scheme on formal labor supply and informal labor supply of the rural elderly using data from China Health and Retirement Longitudinal Study (CHARLS) by employing fuzzy regression discontinuity method. Actually, informal labor supply include taking care of household chores and caring for grandchildren. But the data of taking care of household chores is lacking in CHARLS, so we choose caring for grandchildren to represent informal labor supply. The paper can provide the reference for related empirical studies and empirical results can offer basis for evaluating the effect of the public pension scheme and altering and improving the contents of it.

2. Hypotheses

Theoretically, retirement pension system can help household to overcome credit constrains, improve current or prospective income level, reduce labor supply or saving motives and stimulate retiring and retired elderly out of labor market or reduce their labor supply for acquiring revenues (Jie Cheng, 2014). The experiences of American and German prove that retirement pension system dramatically reduces the labor force participation rate of the elderly. Andrew(1998) argues that the growth in pension coverage during the early postwar period contributed to the decline in labor force participation in American. Axel (2000) find that policy-induced early retirement accounts for about a third of early retirement in German.

However, the reform of social security system can also increase the labor supply.

The reform of pay-as-go pension system, including delaying retirement age and cutting down the level of pension, increases the labor supply of elderly (Martin, 2010). The experiences of American and German support this viewpoint (Blau and Goodstein, 2010; Takashi Oshio et al, 2009). In addition, social security system can also increase the labor supply. The pensions are used to expand investment of human capital, employment and starting a business which can enhance employability and employment opportunity (Jie Cheng, 2014). Nevertheless, the reform of pay-as-go pension system is structural changes. And the experience of South Africa shows that social security system can increase the labor supply of pension receipts' family members rather than pension receipts themselves. So, the effect of urban and rural residents public pension scheme on labor supply of Chinese elderly should be negative.

What effect of urban and rural residents public pension scheme on the time of taking care of grandchildren of the rural elderly? On the one hand, the effect of taking care of grandchildren is positive which would bring the elderly social and economic benefits. On the other hand, the effect of it is negative which would bring the pressure of health and economic condition to the elderly (Hayslip et al., 1998). We reckon that taking care of grandchildren may bring some positive effect to the elderly, but the burden in working of rural elderly is heavily, and the behavior of caring for grandchildren of elderly is a important way to get child support in their entire live (Silverstein et al., 2002). When pension system looses credit constrain of pension receipts, the elderly would lower the economic dependency to their children' support and the time of caring for grandchildren. According to above analysis, we put forward this paper's hypothesis:

First hypothesis: the urban and rural residents public pension scheme has remarkable negative effect on formal labor supply of the rural elderly.

Second hypothesis: the urban and rural residents public pension scheme has remarkable negative effect on the time of taking care of grandchildren of the rural

elderly.

3. Data and Variables

3.1 Sample and Data

In this paper, we identify individual labor supply responses to the social pension using data of 2013 The China Health and Retirement Longitudinal Study (CHARLS). CHARLS aims to collect a high quality nationally representative sample of Chinese residents ages 45 and older to serve the needs of scientific research on the elderly. The baseline national wave of CHARLS is being fielded in 2011and includes about 10,000 households and 17,500 individuals in 150 counties/districts and 450 villages/resident committees. The individuals will be followed up every two years. All data will be made public one year after the end of data collection[1].

The CHARLS questionnaire includes the following modules: demographics, family structure/transfer, health status and functioning, biomarkers, health care and insurance, work, retirement and pension, income and consumption, assets (individual and household), and community level information. The samples we use in this paper choose from the modules of work, retirement and pension and family structure/transfer. Modules of work, retirement and pension has 17524 samples. Modules of family structure/transfer has 10708 samples. We choose these rural samples ages between 50 and 70 who have joined urban and rural residents public pension scheme to estimate the labor effect of urban and rural residents public pension scheme. Because some samples we choose lack information about demographics and economic, we delete these samples. The numbers of final samples for our study we choose is 6504 and 3119.

3.2 Variables

[1]The situation and downloading of The China Health and Retirement Longitudinal Study (CHARLS) can visit CHARLS official website: http://charls.ccer.edu.cn/zh-CN.

Labor supply of rural elderly

According to above analysis, we divide Chinese elderly' labor supply into formal and informal. Formal labor supply in our study includes work on the farm, farm for a wage, off the farm for a wage, off-farm self-employment and earnings from the household's family-run business. We calculate the hours of these different types of weekly labor supply respectively, and then the proportion of months of different types of labor supply account for time of whole year as the weight to aggregate the hours of weekly formal labor supply of rural elderly. Informal labor supply in our study is the time of taking care of grandchildren. We calculate the time of taking care of grandchildren under the age of 16 of whole year.

Control variables

Lihua Pang et al. (2003) find that the labor participation rate of the elderly is high, and the determinants of labor participation are age, health status, being the head ofthe household, gender, whether living with the children, and landholding. Lihua Pang et al. (2004) argue that pensions, which are scarce and small do not have any significant effect on formal employment. when rural residents that are over 50 live with a married son, they systematically work less. Juanjuan Zhang and Hangkong Zhang (2013) discover that the older groups with younger age, better physical health, higher educational attainments, middle-level economic income are more likely to help to care theirgrandchildren.

According these studies, we select gender, degree of education, marital and living status, health status[2], household income[3], wage and the contracted land scale as control variables into the model of formal labor supply. And we pick gender, degree of

2There are so many health indicators in CHARLS, we choose the second time self-evaluation of health. The second time self-evaluation is taking up after asking household's disease profile. We reckon that it is more objective.

3 Household income include agroforestry products income, livestock and aquatic products, animal by-products income, household labor income, self-employment income and the government transfer payments.

education, marital and living status, health status, household income, wage,economic supports from children and the contracted land scale as control variables into the model of informal labor supply. In addition, some studies find that the elderly of western china have more work time than the elderly of other regions, so we put west region as a control variable into the model.

Table 1 The definition of variables and descriptive statistics

Variable	Definition	Mean	SD
Labor	Week of work time (hour).	38.097	37.421
Clabour	Time of taking care of grandchildren (hour).	1534.663	2964.188
OPI	If household received urban and rural residents public pension scheme payment (=1).	0.434	0.496
Pension	The pension of urban and rural residents public pension scheme (yuan) .	38.383	98.845
Age	Age of household (year).	59.305	5.478
Male	If household is male (=1).	0.471	0.500
Elementary	If primal education of the farm operator (=1).	0.030	0.171
Junior	If junior school education of the household (=1).	0.248	0.432
High	If high school education of the household (=1).	0.067	0.250
Married	If household have married and live with spouse (=1).	0.841	0.366
Health	The health status of household (1=Excellent；2=Very good；3=Good；4=Fair；5=Poor；6=Very poor).	4.037	0.949
Wage	The household’s one year wage (yuan).	3866.365	15367.180
Land	Total land area including plough, forest land, meadow, pool (mu).	12.635	85.447

Income	The family's one year income (yuan).	15870.48	40668.46
Transfers	Economic supports from children (yuan).	84.772	937.841
West	If household is the resident of west china (=1).	0.265	0.441

资料来源：CHARLS，2013-2014.

4. Model

We employ regression discontinuity method (RD)[4] to evaluate the effect of urban and rural residents public pension scheme on labor supply of the rural elderly. Regression discontinuity method can divide into the sharp and fuzzy regression discontinuity. The key condition for an RD analysis to approximate a quasi-experiment is that the positioning of an individual at either side of the threshold is randomly determined in the neighborhood near the threshold. In an RD design, the participation status can depend, either completely or partly, on the value of an observed pre-program characteristic being above or belowa specified threshold (Hung-Hao Chang , 2013). Complete participationleads to a sharp RD model, and partial participation leads to a fuzzy RD model. A standard fuzzy RDdesign can be directly applied because not all ofthe urban and rural residents public pension scheme aged 60 or older can receive pensions.Under the regularityassumption that the mean value of the labor supply among the urban and rural residents public pension scheme non-recipients isconditional on the household's age (the runningvariable) being a continuous function around 60, the effect of the urban and rural residents public pension scheme on labor supply of elderly can be defined as:

$$E\left[OPI_i \middle| Age_i\right] = P\left[OPI_i = 1 \middle| Age_i\right] = g_0\left(Age_{60}\right) + \left[g_1(Age_{60}) - g_0(Age_{60})\right]T_i$$

[4]The model description, model identification andRD design estimation can be found in reviewpapers byImbens and Lemieux (2008),and Leeand Lemieux (2010).

Where OPI_i is the dummy variables of the household who receiveand do not receive pensions. Age_i indicates the age of sample. Age_{60} indicates the cutoff age of the operator for the urban and rural residents public pension scheme payment. $g_0(Age_i)$, $g_1(Age_i)$ indicate the function of the relationship between treatment status and covariant, and $g_1(Age_{60}) \neq g_0(Age_{60})$. We assume that $g_1(Age_{60}) > g_0(Age_{60})$. T_i is the dummy variable which indicate the discontinuity point of function $E[OPI_i | Age_i]$. And $T_i = 1(Age_i > Age_{60})$.

So we setup the first stage model:

Error! Reference source not found.（1）

Second stage model：

Error! Reference source not found.（2）

Where Y variable indicates formal labor supply and the time of taking care of grandchildren of the rural elderly, X_i variable indicate control variables.

5. Empirical results

5.1 Formal labor supply

Fig1 plots the relationship between probability of the urban and rural residents public pension scheme aged 60 or older receive pensions and the age, the points of graph indicate partial average value. The horizontal axis measures the age cohorts of household, and vertical axis measures probability of the urban and rural residents public pension scheme aged 60 or older receive pensions. It is obvious that there is a striking discontinuous jump at zero point (age 60) in Fig1. Fig2 illustrate the RD estimate of the effect of urban and rural residents public pension scheme on formal

labor supply of elderly. The horizontal axis measures the age cohorts of household, and vertical axis measures week of work time of elderly. As apparent from the figure, there is a discontinuous jump.

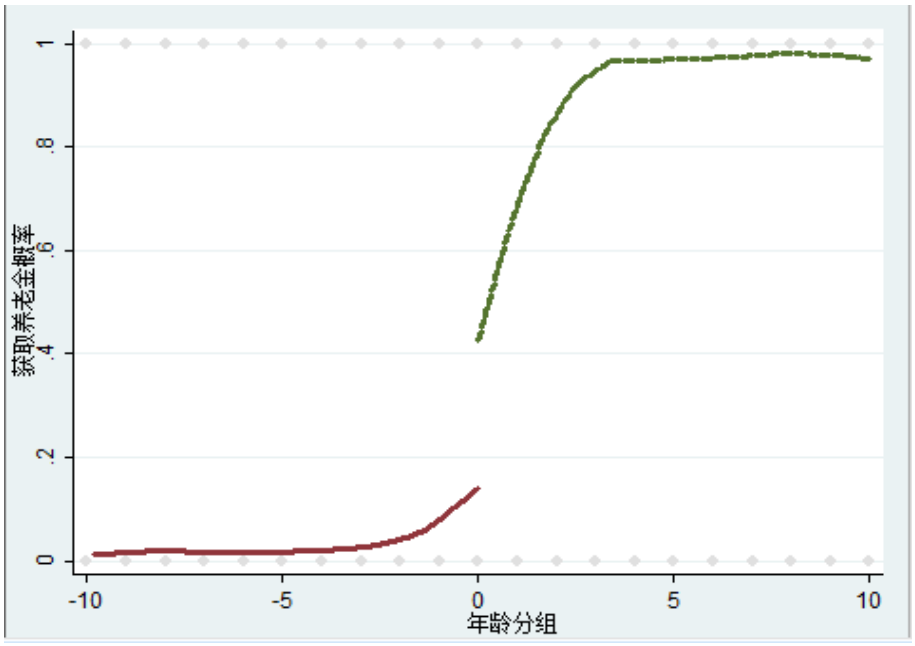

Fig1 age and probability of receiving pensions

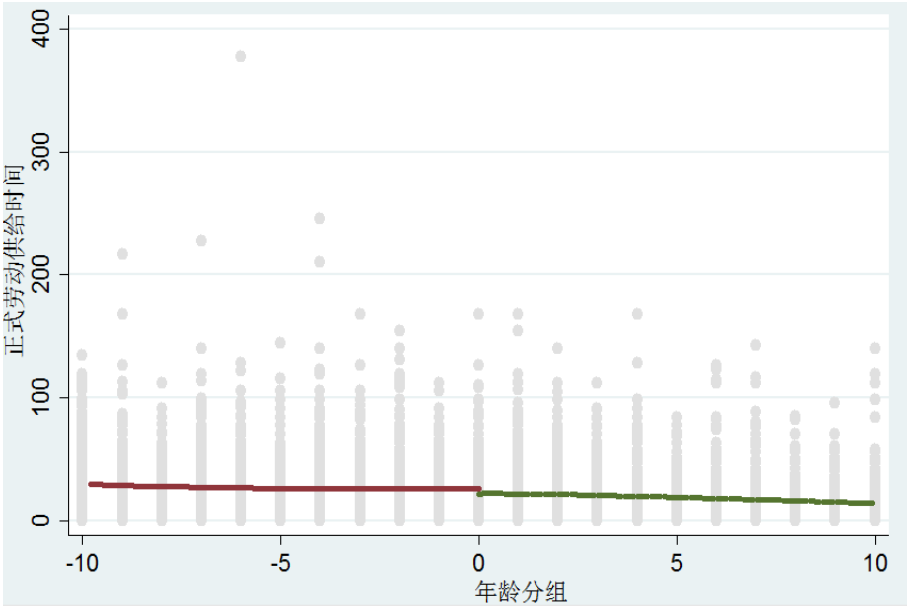

Fig2 age and formal labor supply

And then we use model 1 and model 2 to estimate the effect of the urban and rural residents public pension scheme on formal labor supply of elderly. We present fuzzy regression discontinuity results in Table 2. In column (1), the result of RD shows that urban and rural residents public pension scheme has no significant effect on formal labor supply of the rural elderly. In column (2), we put pension variable into the model, and considering the possibility of non-liner correlation, the square and cube of age variable are brought into the model. The result shows that the result of OPI variable's coefficient estimation is still non-significant, and pension variable and square and cube of age variable's coefficient estimation is also non-significant. Considering some studies find that the elderly of western china have more work time than the elderly of other regions, so we put west region as a control variable into the model. The result presents in column (3). It is apparent that the result of OPI variable's coefficient estimation is non-significant, but west variable is statistically significant at the 1% level. The elderly of west China have more 4.8 hours week of work time than other regions with controlling other variables.

The elderly of western China have lower economic development level and the living standard than the elderly of other regions, and work time of them is more than the elderly of other regions. Does urban and rural residents public pension scheme have more positive effect than other regions? The interaction term of west variable and OPI variable is added into the model to answer this question, and the result of regression is presented in column (4) . However, the result shows that OPI variable still has non-significant on formal labor supply of elderly, and the result of interaction term of west variable and OPI variable's coefficient estimation is also non-significant. It seems that we have no evidence to prove that urban and rural residents public pension scheme have more positive effect than other regions.

Table 2 RD results of public pension scheme effect on formal labor supply

Variable	(1)	(2)	(3)	(4)
OPI	-2.432	-1.028	-2.179	-2.455
	1.948	1.968	1.942	2.154

Pension		-0.002		
		0.004		
Age	-0.439***	1.011	-0.464***	-0.468***
	0.150	0.619	0.149	0.147
Male	7.504***	7.470***	7.299***	7.314***
	0.667	0.667	0.665	0.665
Elementary	0.664	0.790	1.317	1.299
	1.872	1.874	1.868	1.868
Junior	-2.267***	-2.103**	-1.785**	-1.805**
	0.879	0.883	0.879	0.880
High	3.019**	3.019**	3.160**	3.129**
	1.441	1.440	1.436	1.437
Married	2.685***	2.636***	2.946***	2.961***
	0.875	0.875	0.873	0.873
Health	-0.443*	-0.446*	-0.583**	-0.578**
	0.247	0.247	0.247	0.247
Income	0.00002***	0.00002***	0.00002***	0.00002***
	0.00001	0.00001	0.00001	0.00001
Wage	0.0003***	0.0003***	0.0003***	0.0003***
	0.00002	0.00002	0.00002	0.00002
Land	0.001	0.001	0.002	0.002
	0.004	0.004	0.004	0.004
West			4.781***	4.271***
			0.727	1.066
West*POI				1.089
				1.665
Age^2		-0.009		

	0.020
Age^3	-0.000004
	0.0002

*significant at 1%; ** significant at 5%; *** significant at 10%.

Considering the samples of west region is only 1725, which accounts for 26.52 percent of overall samples. So the effect of west samples can not show in overall samples. In order to preferably test whether urban and rural residents public pension scheme have more positive effect than other regions or not, we divided all samples into west group and other regions group[5]. And then, we use these two group samples to test it by discontinuity regression respectively. The results are summarized in table 3.

Table 3 Regional RD results of public pension scheme effect on formal labor supply

	West region		Other regions
Variable	(1)	(2)	(3)
OPI	-6.733**	-6.339*	-1.225
	3.158	3.590	2.560
Pension		-0.004	0.0002
		0.011	0.005
Age	-1.375	-1.390	-0.585***
	1.158	1.154	0.179
Health	-0.752	-0.755	-0.516*
	0.489	0.489	0.287

[5]West region include Xinjiang, Chongqin, Sichuan, Guizhou, Yunnan, Shanxi, Gansu and Qinghai. Other regions include Hebei, Jiangsu, Zhejiang, Shandong, Fujian, Guangdong, Liaoning, Jilin, Heilongjiang, Shanxi, Henan, Hubei, Hunan, Anhui, Jiangxi, Guangxi and Neimenggu.

Age^2	0.067*	0.068*	
	0.038	0.038	
Age^3	-0.001**	-0.001**	
	0.0003	0.0003	
Control variable	Yes	Yes	Yes

*significant at 1%; ** significant at 5%; *** significant at 10%. Control variables include male, elementary, junior, high, married, health, income, wage and land.

The result of west samples regression shows that, OPI variable can lower 6.73 hours week of work time with controlling other variables. We add pension variable in column (2). The result shows that pension variable has non-significant on formal labor supply of elderly, and the OPI variable is statistically significant at level dropping from 5% to 10%, and the coefficient falls from 6.73 to 6.34. By contrast, OPI variable has non-significant on formal labor supply of elderly in other regions. So we can draw a conclusion that: urban and rural residents public pension scheme have more positive effect than other regions.

What is noteworthy is that age and health variables' coefficient estimation is also non-significant in west region. However, age and health have significantly negative effect on formal labor supply of other region elderly. The "retirement" pattern of the Chinese elderly is described as "ceaseless toil" which means that elderly work until they are no longer physically capable. Age and health variables have significantly negative effect on labor supply of elderly in other regions, but the effect is so small which means that even though it's "ceaseless toil" eases a little bit, the labor situation of rural elderly do not have fundamental improvement. The result of west samples regression shows that their"ceaseless toil" has not any change. So the situation of work and welfare for rural elderly need to be given more concern. The next step of reform of urban and rural residents public pension scheme should be improving the level of pension.

However, whether it will be having better effect with improvement of the level of pension or not? According the public pension scheme, local government can improve suitably local level of pension. Actually, the level of pension is a little different in

every regions. We choose samples who have received the pension to estimate the effect of different level of pension on the formal labor supply of elderly by OLS. The results of regression are listed in table 4.

Table 4 The effect of pension on formal labor supply of elderly

Variable	Coefficient	Standard error	P-value
Pension	-0.006*	0.003	0.071
Age	-0.583***	0.136	0.000
Control variable		Yes	
Sample		2821	

*significant at 1%; ** significant at 5%; *** significant at 10%. Control variables include male, elementary, junior, high, married, health, income, wage and land.

The result shows that the pension variable is statistically significant at the 10%. With improvement of the pension 1yuan, the formal labor supply of elderly can reduce 0.006 hours. So, the reform of urban and rural residents public pension scheme will better protect the life of elderly, improving their situation of "ceaseless toil", increasing their welfare.

5.2 Taking care of grandchildren

We also use fuzzy RD to estimate the effect of urban and rural residents public pension scheme on the time of taking care of grandchildren. The results are summarized in table 5. In column (1) , the result of RD shows that urban and rural residents public pension scheme has no significant effect on the time of caring for children of the rural elderly. In column (2), we put the square and cube of age variable into the model. The result shows that OPI variable’s coefficient estimation is still non-significant, and square and cube of age variable’s coefficient estimation is also non-significant. Considering the difference between west region and other regions, we add west and pension variables into model. The result shows west variable has no positive effect on the time of caring for children of the rural elderly. And even though OPI variable’s coefficient estimation is non-significant, pension variable is statistical

significant at the 10% level. It means that with improvement of level of pension, the elderly would reduce the time of caring for grandchildren. As above analysis, even though taking care of grandchildren may bring the elderly social and economic benefits, it would bring more pressures of health and economic condition to the elderly. Hence, with improvement of the level of pension, it would lose the budget constraint, improve the economy independence and reduce the dependency to their children (Lingguo Chen, 2013), and the elderly would reduce the time of caring for grandchildren to have more leisure time.

Table 5 RD results of public pension scheme and the time of caring for grandchildren.

Variable	(1)	(2)	(3)
OPI	375.466	236.681	503.548
	316.382	291.623	344.608
Pension			-1.078*
			0.630
Age	-82.424***	-11.216	-87.814***
	25.263	108.560	25.442
Male	-326.891***	-341.145***	-336.110***
	111.268	111.328	111.326
Elementary	-479.124	-462.867	-441.284
	312.683	312.480	311.991
Junior	118.084	142.568	143.206
	146.937	147.336	146.952
High	-417.181*	-409.008*	-420.429*
	238.964	238.797	239.093
Married	174.075	159.481	183.516
	127.587	127.640	127.558

Health	49.135	48.938	34.428
	49.723	49.677	49.779
Income	0.003***	0.003***	0.003***
	0.001	0.001	0.001
Wage	0.002	0.002	0.002
	0.003	0.003	0.003
Land	-0.754	-0.777	-0.723
	0.628	0.628	0.626
Transfers	-0.004	-0.001	-0.005
	0.057	0.057	0.057
West			177.531
			119.688
Age2		2.674	
		3.539	
Age3		-0.036	
		0.029	

*significant at 1%; ** significant at 5%; *** significant at 10%.

6. Conclusion

Using data from China Health and Retirement Longitudinal Study (CHARLS) and employing fuzzy regression discontinuity method, the paper evaluates the effect of urban and rural residents public pension scheme on formal labor supply and the time of taking care of grandchildren of the rural elderly. The statistical results that:

(1) Urban and rural residents public pension scheme has no significant effect on labor supply of the rural elderly. We reckon the reason for this is that the current level of pension is so low that it could not have a significant impact on labor supply of the rural elderly.

Firstly, we evaluate the effect of urban and rural residents public pension scheme on formal labor supply of rural elderly. The result shows that urban and rural residents public pension scheme has no significant effect on formal labor supply with controlling another variables. Considering that the elderly of western China have more work time than the elderly of other regions, we estimate the effect of urban and rural residents public pension scheme on formal labor supply of elderly of west and other regions respectively. We find that the negative effect of urban and rural residents public pension scheme on formal labor supply of the rural elderly is more obvious in the west region than other regions.

And then, we evaluate the effect of urban and rural residents public pension scheme on time of taking care of grandchildren of rural elderly. We draw a conclusion that: OPI variable's coefficient estimation is non-significant, and enionvariable is statistical significant at the 10% level, which means that with improvement of level of pension, the elderly would reduce the time of caring for grandchildren. Even though the elderly are willing to take care of their grandchildren because of grandchild preference, with the increase of age, taking care of grandchildren would bring more pressure to old man. Hence, with improvement of the level of pension, it would loose the budget constraint, improve the economy independence and reduce the dependency to their children , and the elderly would reduce the time of caring for grandchildren to have more leisure time.

(2) Even though the "ceaseless toil"of the Chinese elderly in some regions has eased,Chinese rural elderly' labor supply conditions do not fundamentally improve under the background of universal implement of urban and rural pension insurance. Age and health variables' coefficient estimation is non-significant in west region, which means that the west elderly' situation of "ceaseless toil" has not any change. Age and health variables have significantly negative effect on labor supply of elderly in other regions, but the coefficient is so small which means that even though the "ceaseless toil"of the Chinese elderly in some regions has eased, Chinese rural elderly' labor supply conditions do not fundamentally improve.

These conclusions have significant implications for reforming of urban and rural residents public pension scheme system:

(1) To some degree, the implementation of urban and rural residents public pension scheme in rural regions reduce the injustice of institution, and it has significant effect on formal labor supply of the rural elderly in west China. Actually, present level of pension can not completely withdrawal from the labor market, and "ceaseless toil"of the Chinese elderly in rural regions is still a very common problem. Urban and rural residents public pension scheme has significant effect on formal labor supply of the rural elderly in other regions. At present, the level of pension has increased to 70 yuan per month, but annual pension accounts for only 10% of 2013 per capital rural income[6]. By contrast, the South African Social pension is 370 rand per month, which is a very generous program (Posel et al., 2004), so it has a broad social effect. The next step of reform of urban and rural residents public pension scheme, should be improving the level of pension.

(2) The result shows that the negative effect of urban and rural residents public pension scheme on formal labor supply of the rural elderly is more obvious in the west region than other regions, which means this institution has heterogeneity.And urban and rural residents public pension scheme has different effect to different age population. However, the present policy takes up one-size-fits-all approach (Hongwei Huang, 2014), and it does not consider the difference of region and age. The important thing for the next step of reform of urban and rural residents public pension scheme is that to improve the standard setup of pension according to the different characteristic of population.

(3) The statistical results of non-west regions shows that the "ceaseless toil"of the Chinese elderly in these regions has eased. In contrast, age and health has no significant effect on labor supply in west China, and the elderly have to continuous work to sustain their later life. Even though social security system has been implemented in China, the pension model for the aged is "family supporting" and "self-support by aged". If the Chinese rural old-age model need to be changed

[6]2013 per capital rural income is 8895.9.

thoroughly, the old-age policy need to be changed thoroughly.

Reference

[1]Andrew A., S. (1998), New Evidence on Pensions, Social Security, and the Timing of Retirement, *Journal of Public Economics*. Vol.70, 207-236.

[2]Axel B.S. (2000), Incentive Effects of Social Security on Labor Force Participation: Evidence in Germany and across Europe, *Journal of Public Economics*. Vol.78, 25-49.

[3]Benjamin D., Brandt L. and J. Fan (2003), Ceaseless Toil?Health and Labor of the Elderly in Rural China,*William Davidson Institute Working Paper*.No.579.

[4]Chuanchuan Zhang. (2015), Pension and labor supply of rural elderly-based on the analysis of regression discontinuity method, *world Economic papers*. Vol.6, 76-89.

[5]Cheng jie.(2014), The Effect of Old-age Security on Labor Supply, *Economic research journal*.Vol.10, 60-73.

[6]David B., and Ryan G. (2010), Can Social Security Explain Trends in Labor Force Participation of Older Men in the United States?.*Journal of Human Resources*.Vol.45(2),328—363.

[7]Huang Hongwei, Zhanjing Tao, Cheng Chao. (2014), The Effect of the New Rural Social Public pension scheme Pension Income on the Rural Elderly Labour Supply, *Chinese Journal of Population Science*. Vol.2, 106-128.

[8]HayslipB., Shore R. J.,HendersonC., and Lambert P.(1998), CustodialGrandparenting and Grandchildren with Problems: Their Impact on Role Satisfaction and Role Meaning,*Journal of Gerontology: Social Sciences*, Vol.53, 164–174.

[9]H. H. Chang (2013), Old Farmer Pension Program and Farm Succession: Evidence from a Population-Based Survey of Farm Households in Taiwan, *American Journal of Agricultural Economics*.Vol.95(4), p976.

[10]Lihua Pang, Scott Rozelle, Alan De Brauw. (2003), Labor Supply of the Elderly in Rural China,*China Economic Quarterly*. Vol.2, 721-730.

[11]L. H. Pang, Alan D. B. and Scott R. (2004), Working Until You Drop: The Elderly of Rural China, *ChinaJournal*. Vol.52, 73-96.

[12]Lee D. and Thomas L. (2010), Regression Discontinuity Designs in Economics, *Journal of EconomicLiterature*. Vol. 48, 281 -355.

[13]Martin A. R. S. (2010), Endogenous Retirement and Public Pension System Reform in Spain, *Economic Modelling*. Vol.27, 336-349.

[14]Posel D., James A. F. and Frances L. (2006), A Reconsideration of the Impact of Social Pension on Labor Supply in South Africa, *Economic Modelling*. Vol.23(5), 836-853.

http://www.sciencedirect.com/science/article/pii/S0264999305000970

[15]Song Lu, LishuZhuo, Li Liang. (2008), The Impact of Care for Grandchildren on Psychological Well-being of the Rural Elderly, *Population and Development*. Vol.14, 10-18.

[16]Sun Juan-juan, Zhang Hang-Kong. (2013), The Situation and Influencing Factors of Chinese Older People Taking Care of Their Grandchildren, *Population and Development*. Vol.4, 70-77.

[17]Tokashi O., Akiko S. O. and Satoshi S. (2009), Social Security Reforms and Labor Force Participation of the Elderly in Japan, *Japanese Economic Review*, 1-23.