PIONEER
ACADEMIC PUBLISHING LIMITED

Journal of World Economy
ISSN 2709-3999
www.pioneerpublisher.com/jwe
Volume 2 Number 4 December 2023

Re-Examine: The Power of China's New Rural Pension Scheme

Xi Chen[1]

[1] Independent Researcher, China
Correspondence: Xi Chen, Independent Researcher, China.

doi:10.56397/JWE.2023.12.12

Abstract

Drawing upon data from the China Family Panel Studies (CFPS) and the China Health and Retirement Longitudinal Study (CHARLS), this paper employs a Difference in Differences (DID) approach to investigate the varying impacts of the New Rural Pension Scheme (NRPS) across different regions in China. The empirical results reveal that the NRPS has generally improved the health outcomes of residents. Notably, the benefits of the NRPS are more pronounced in rural and economically advanced areas, while its effects are not statistically significant in less developed and urban regions. This analysis elucidates the underlying reasons for these regional disparities, attesting to the pension policy's efficacy and advancing the scholarly conversation on pension policy research.

Keywords: China economy, China Family Panel Studies, rural pension

1. Introduction

In the context of developing countries, social security systems frequently emphasize national social pensions and provisions for retirees' livelihoods (Lund, 1993). Post-retirement, the aged typically rely on these pensions as their principal income source, having ceased active participation in the workforce and thereby their job skills (Ranchhod, 2006). The significance of pension systems lies not only in their impact on senior citizens' health but also on broader family consumption and labour supply (Woolard, Harttgen & Klasen, 2011). Furthermore, pension schemes are pivotal in combating the challenges of an ageing population (Huang & Zhang, 2021).

Previous studies have shown that pension programs in South Africa have reduced poverty and enhanced health outcomes (Woolard, Harttgen & Klasen, 2011). In China, the implementation of the New Rural Pension Scheme (NRPS), introduced in 2009, has shown promise in meeting basic sustenance needs for rural elderly, reducing intergenerational cohabitation, and influencing labour supply dynamics (Zhang, Luo & Robinson, 2018; Cheng et al., 2018; Chen, 2017; Ning et al., 2016; Shu, 2018; Eggleston, Sun & Zhan, 2018; Chen, Wang & Busch, 2019).

Our study addresses a gap in the literature concerning the heterogeneous impacts of NRPS across different regions of China, with a focus on whether the program effectively prevents malnourishment among the elderly and how cultural practices surrounding wheat and rice cultivation may influence these outcomes (Talhelm et al., 2014; Dong, Talhelm & Ren, 2019).

We hypothesize that the NRPS improves health outcomes (Hypothesis 1), with more pronounced effects in the rice-cultivating southern regions compared to the northern, wheat-growing areas (Hypothesis 2). Additionally, we examine the disparity between developed and less developed provinces in terms of NRPS efficacy (Hypothesis 3).

Employing a regional studies approach, this report divides the sample based on geographic and cultural lines to assess the pension policy's effectiveness. This methodological choice facilitates nuanced policy reform discussions relevant to developing countries, aiming to guide scientific policymaking.

The structure of the paper is as follows: The introduction outlines the research problem, objectives, and hypotheses. The second section discusses the data and descriptive statistics. The third section details the empirical strategy and methods for addressing potential endogeneity concerns. The fourth and fifth sections present the results and provide interpretational discussions. Lastly, the conclusion synthesizes the paper's contributions to the literature on pension policies in developing economies.

2. Data

Utilizing data sourced from Huang & Zhang (2021), this study leverages the longitudinal surveys of the China Health and Retirement Longitudinal Studies (CHARLS) and the China Family Panel Studies (CFPS) to examine the effects of the New Rural Pension Scheme (NRPS) on health outcomes. The original data encompass biennial survey responses related to familial and community aspects and health metrics of residents aged 45 and above (CFPS), with the current analysis incorporating data from 2010 to 2013 across 302 counties and over 70,000 observations.

The dependent variables of interest are indicators of health status: underweight prevalence, self-reported health, and disability rates. For the purpose of streamlining analysis, underweight prevalence is the sole health indicator employed. The key independent variable is the provision of an NRPS pension, while control variables include gender, age, urban registration status (hukou), employment status, and total household income.

Geographically, China is bifurcated into northern and southern regions demarcated by the Yangtze River Basin, using provincial IDs to categorize provinces accordingly. The north, designated by a binary indicator where North=1, is identified with wheat-cultivating regions, while the south (North=0) corresponds to rice-farming areas.

Economic demarcations further split the regions into developed and less developed provinces, with identification based on per capita GDP figures. Specific prosperous provinces and metropolitan areas such as Beijing, Shanghai, Tianjin, Guangdong, and Shandong (SEZ=1), are distinguished from their less-developed counterparts (SEZ=0), facilitating a nuanced assessment of the NRPS's impact on health stratified by regional development levels.

Table 1. Descriptive statistics

Variable	mean	sd	min	p25	p75	max	N
Dependent variable							
underweight	0.0860	0.280	0	0	0	1	57000
sh detail	2.637	1.113	1	2	3	5	57000
disa	0.184	0.387	0	0	0	1	57000
Independent variable							57000
have pension	0.550	0.498	0	0	1	1	57000
Control variable							57000
men	0.490	0.500	0	0	1	1	57000
age	59.46	10.03	45	51	66	99.75	57000
age2	36.36	12.62	20.25	26.01	43.56	99.50	57000
urbanhk	0.261	0.439	0	0	1	1	57000

self emplo~d	0.0430	0.204	0	0	0	1	57000
urban area	0.421	0.494	0	0	1	1	57000
fttinc	48000	83000	0	13000	59000	3.900e+06	57000

Table 1 provides descriptive statistics of the variables utilized in this study. The dependent variable 'underweight' has a mean of 0.086 with a substantial standard deviation of 0.280, indicating variability in nutritional status across the sample. Notably, 55% of the sample population is covered by a pension plan, as indicated by the 'have pension' independent variable, which has a mean of 0.550 and a standard deviation of 0.498, illustrating a near-equal distribution between those with and without pension access. This reflects a variation in pension coverage across different provinces.

3. Empirical Strategy

Huang and Zhang (2021) utilized a Difference in Differences (DID) methodology to assess the impact of the New Rural Pension Scheme (NRPS) on the incidence of underweight individuals among residents. A critical prerequisite for employing the DID approach is the parallel trends assumption, meaning that in the absence of the policy intervention, the outcome variables for both the treatment and control groups would have followed a similar trajectory over time. Huang and Zhang performed a trend analysis of local economic indicators, finding no significant pre-intervention differences between counties that adopted the NRPS at different times, thereby satisfying this assumption.

The authors implemented two types of controls in their analysis. The horizontal control differentiated between rural hukou holders (the experimental group) and urban hukou holders (the control group), while the vertical control compared rural residents aged over 60 who are entitled to pensions (the experimental group) with those aged between 45 and 60 who are eligible for NRPS but yet ineligible for pension benefits (the control group). This dual control framework allowed Huang and Zhang to robustly isolate the effect of the NRPS on the targeted demographic, delineating the policy's effectiveness in reducing underweight outcomes among rural elderly residents:

$$Y_{ict} = \beta_0 + \beta_1 NRPS_{ct} + \delta_c + \delta_t + X_{ict} + \varepsilon_{ict} \quad (1)$$

The *NRPSct* is an indicator of whether **c** county receives NRPS in **t** year. If *NRPSct* =1 means county **c** receives NRPS in **t** year, while *NRPSct* =0 means no NRPS. In addition, county dummies (δc), year dummies (δt), and other demographic controls ($Xict$) are covariables (Huang & Zhang, 2021, p. 189).

In order to verify the research conclusions of the original paper, this paper conducts regression analysis on *have_pension* and the health indicators of pension, *underweight*, and obtains the following OLS function:

$$Underweight_i = \beta_0 + \beta_1 have\_pension_i + X_i + \varepsilon_i \quad (2)$$

The specified regression function examines the impact of receiving the New Rural Pension Scheme (NRPS) on the health of individual i, where the 'have_pension' is a binary indicator: a value of 1 denotes receipt of NRPS, while 0 indicates no receipt. The vector Xi encompasses control variables for individual i, such as gender, age, possession of urban hukou, self-reported employment status, and total household income, providing a more comprehensive assessment of the factors influencing health.

Addressing endogeneity is crucial for robust conclusions. Endogeneity arises from measurement errors, omitted variable bias, and reverse causality. The latter, which indicates a reciprocal influence between the independent and dependent variables, can threaten the validity of the regression. This study seeks to mitigate reverse causality by analyzing post-NRPS receipt data, and examining its impact on the same year's health outcomes. For instance, if individual i began receiving NRPS in 2010, and the survey data corresponds to 2010, subsequent data from 2011 to 2013 on living conditions and pension level will be evaluated against health status in 2010. This temporal distinction ensures that changes following pension receipt do not retrospectively alter the initial health outcomes, thereby addressing the issue of reverse causality and enhancing the credibility of the independent variable's effect. Although this methodology does not resolve all endogeneity concerns, it significantly diminishes the likelihood of such issues, facilitating more reliable predictions.

4. Results

The baseline regression results are shown in Table 2.

Table 2. OLS regression result and further research for North-south contrast

	(1)	(2)	(3)	(4)
	OLS_noCV	OLS	North	South
VARIABLES	underweight	underweight	underweight	underweight
have_pension	-0.0200***	-0.0241***	-0.0232***	-0.0230***
	(0.00235)	(0.00236)	(0.00337)	(0.00314)
Control	YES	YES	YES	YES
Year Fixed	YES	YES	YES	YES
Observations	57000	57000	57000	57000
R-squared	0.001	0.046	0.034	0.043

Table 2 evaluates the correlation between receiving pensions under the New Rural Pension Scheme (NRPS) and the prevalence of underweight status among residents. The initial two columns present outcomes from ordinary least squares (OLS) regression models, the first excluding control variables and the second incorporating them. Both models suggest a negative association between NRPS receipt and underweight prevalence.

The first column reveals that each additional unit of pension received corresponds to a 2 percent decline in underweight levels, assuming other factors are constant. The second column confirms this association even after accounting for control variables. The statistical significance of this relationship is robust, marked at the 1 percent level in both instances, underscoring the positive influence of NRPS on health outcomes.

Further analysis in the subsequent two columns of Table 2 explores the differential impact of NRPS on underweight status among residents in northern and southern regions. Here, the data indicates a slight variation in the effect by region. Holding other variables constant, a one-unit increase in pension receipt leads to a 2.3 percent reduction in underweight levels in the south and a 2.32 percent decrease in the north, with these estimates also significant at the 1 percent level. Notwithstanding the substantial role of NRPS in mitigating malnutrition among older adults, the results do not manifest any considerable divergence in effects between regions typically distinguished by wheat cultivation and those known for rice cultivation.

Table 3 delves into the disparate impacts of the New Rural Pension Scheme (NRPS) on the health levels of urban and rural residents. The findings highlight a significant regional differentiation in response to the pension policy, as illustrated in the reported outcomes.

Table 3. Further research for urban and rural contrast and developed and underdeveloped contrast

	(1)	(2)	(3)	(4)
	urban	rural	SEZ	NonSEZ
VARIABLES	underweight	underweight	underweight	underweight
have_pension	-0.00758**	-0.0233***	-0.0384***	-0.00623*
	(0.00369)	(0.00447)	(0.00633)	(0.00353)
Control	YES	YES	YES	YES
Year Fixed	YES	YES	YES	YES
Observations	21,974	31,451	10,726	42,921
R-squared	0.035	0.062	0.063	0.052

The second column of Table 3, which focuses on rural residents, clearly indicates that an incremental unit of NRPS is linked to a 2.3 percent decrease in the incidence of underweight individuals, assuming ceteris paribus. This underscores the effectiveness of the scheme in improving the health outcomes of rural populations. In contrast, the first column suggests that urban residents' health levels do not appear to be substantially influenced by the pension policy to the same extent, indicating a negligible response among the urban cohort.

Further investigation is presented in the latter pair of columns, contrasting the NRPS's health impact in economically developed versus less developed provinces. According to the third column, in regions with more developed economies, every unit increase in NRPS leads to a substantial 3.8 percent decline in the proportion of underweight residents, while holding other factors constant. This notable effect does not carry over to the less developed provinces, as evidenced by the results in the fourth column, where the NRPS's influence on health is not as pronounced.

These variations in outcomes across differing geographical and economic contexts are consistently statistically significant at the 1 percent level. The results affirm the conclusion that the NRPS's effectiveness in reducing underweight prevalence among residents is contingent on the rural-urban divide and the level of economic development, with rural and more affluent areas exhibiting a stronger positive response to the pension scheme.

5. Discussion

The analysis of Table 2 confirms the initial hypothesis, suggesting a negative association between the New Rural Pension Scheme (NRPS) and underweight levels among residents. This aligns with prior research, corroborating the findings of Huang and Zhang (2021) and reinforcing the credibility of their conclusions—NRPS contributes to improved health outcomes in the elderly rural population.

Moreover, the same table further demonstrates no significant regional health impact distinctions between northern and southern provinces, thereby not supporting the hypothesis concerning geographical differences. According to Huang and Zhang, NRPS's monthly provision of financial support should theoretically reduce the necessity for rural labour and increase leisure time, potentially decreasing the incidence of illness and medical expenditure among the elderly. The lack of regional disparity in health improvements suggests that participation in the NRPS might be influenced more by individual awareness than by cultural norms associated with wheat or rice cultivation, refuting the hypothesis that broader cultural factors play a determinant role.

Table 3's findings reveal that the NRPS exerts differentiated health effects when contrasting urban with rural residents and comparing developed with less developed regions. Given that the NRPS primarily targets rural elderly populations, it's notably more efficacious in rural settings compared to urban ones. Residents in developed areas are likely to have better access to information and are thus more responsive to the NRPS than those in less developed areas, where informational constraints may persist. Additional factors, such as the migration of rural populations to more affluent cities, could also influence policy efficacy, though this paper does not provide a detailed examination of rural population mobility trends.

Consequently, the data analysis confirms that policy implementation is more potent in improving health conditions for residents in rural and economically developed areas, which substantiates the third hypothesis and addresses the corresponding research question.

6. Conclusion

This study employs a Difference in Differences (DID) model to conduct a nuanced regional analysis, yielding several key insights. First, it confirms that the New Rural Pension Scheme (NRPS) positively impacts resident health, aligning with the findings of earlier research. Importantly, the scheme's impact is more pronounced for the elderly in rural and economically developed areas, substantiating Hypothesis 3. Conversely, the policy's effect on the health of urban residents and those in less developed areas is less marked, and no meaningful health outcome variations are observed between northern and southern regions, diverging from Hypothesis 2. The cultural distinction between rice and wheat cultivation seems to bear minimal relation to these health impacts.

A limitation of this paper, it should be noted, is the potential lack of granularity in data

categorization. Particularly, there may be merit in disaggregating residents in urban and developed zones based on their hukou status, which could better differentiate between urban and rural pension recipients. This aspect offers room for refinement. Future research directions could probe the roots of the insignificant variance observed in pension policy impacts between north and south, as well as delve into the causes of differing health outcomes between the more and the less developed areas. Furthermore, integrating considerations of rural-urban population dynamics could enrich the understanding of NRPS effects.

Based on these findings, it would be prudent for policymakers to heighten policy awareness in less developed regions. Additionally, expanding the reach of NRPS to include the urban elderly could significantly enhance the well-being of a broader demographic, ensuring greater living security for these populations. Such strategies could fortify the overall social safety net and elevate public welfare across various regions.

Reference

Chen, X, Eggleston, K, & Sun, A. (2018). 'The impact of social pensions on intergenerational relationships: Comparative evidence from China'. *The Journal of the Economics of Ageing, 12*, pp. 225–235, doi: 10.1016/j.jeoa.2017.04.001.

Chen, X, Wang, T, & Busch, SH. (2019). 'Does money relieve depression? Evidence from social pension expansions in China'. *Social Science & Medicine (1982), 220*, pp. 411–420, doi: 10.1016/j.socscimed.2018.12.004.

Chen, X. (2017). 'Old age pension and intergenerational living arrangements: a regression discontinuity design'. *Review of Economics of the Household, 15*(2), pp. 455–476.

Cheng, L, Liu, H, Zhang, Y, & Zhao, Z. (2018). 'The heterogeneous impact of pension income on elderly living arrangements: evidence from China's new rural pension scheme'. *Journal of Population Economics, 31*(1), pp. 155–192, doi: 10.1007/s00148-017-0655-y.

Dong, X, Talhelm, T, & Ren, X. (2019). 'Teens in Rice County Are More Interdependent and Think More Holistically Than Nearby Wheat County'. *Social Psychological & Personality Science, 10*(7), pp. 966–976, doi: 10.1177/1948550618808868.

Eggleston, K, Sun, A, & Zhan, Z. (2018). 'The Impact of Rural Pensions in China on Labor Migration'. *The World Bank Economic Review, 32*(1), pp. 64–84. doi: 10.1093/wber/lhw032.

Huang, W & Zhang, C. (2021). 'The Power of Social Pensions: Evidence from China's New Rural Pension Scheme'. *American Economic Journal. Applied Economics, 13*(2), pp. 179–205. doi: 10.1257/app.20170789.

Leong, CK. (2013). 'Special economic zones and growth in China and India: an empirical investigation'. *International Economics and Economic Policy, 10*(4), pp. 549–567, doi: 10.1007/s10368-012-0223-6.

Lund, F. (1993). 'State social benefits in South Africa'. *International Social Security Review (English Edition), 46*(1), pp. 5–25, doi: 10.1111/j.1468-246X.1993.tb00358.x.

Ning, M, Gong, J, Zheng, X, & Zhuang, J. (2016). 'Does New Rural Pension Scheme decrease elderly labor supply? Evidence from CHARLS'. *China Economic Review, 41*, pp. 315–330, doi: 10.1016/j.chieco.2016.04.006.

Ranchhod, V. (2006). 'The Effect of the South African Old Age Pension on Labour Supply of the Elderly'. *The South African Journal of Economics, 74*(4), pp. 725–744, doi: 10.1111/j.1813-6982.2006.00098.x.

Shu, L. (2018). 'The effect of the New Rural Social Pension Insurance program on the retirement and labor supply decision in China'. *The Journal of the Economics of Ageing, 12*, pp. 135–150, doi: 10.1016/j.jeoa.2018.03.007.

Talhelm, T, Zhang, X, Oishi, S, Shimin, C, Duan, D, Lan, X, & Kitayama, S. (2014). 'Large-Scale Psychological Differences Within China Explained by Rice Versus Wheat Agriculture'. *Science (American Association for the Advancement of Science), 344*(6184), pp. 603–608, doi: 10.1126/science.1246850.

Talhelm, T. (2020). 'Emerging evidence of cultural differences linked to rice versus wheat agriculture'. *Current Opinion in Psychology, 32*, pp. 81–88, doi:10.1016/j.copsyc.2019.06.031.

Woolard, I, Harttgen, K, & Klasen, S. (2011). 'The history and impact of social security in South Africa: experiences and lessons'.

Revue Canadienne D'études Du Développement, *32*(4), pp. 357–380, doi: 10.1080/02255189.2011.647654.

Zhang, Z, Luo, Y, & Robinson, D. (2018). 'Reducing Food Poverty and Vulnerability among the Rural Elderly with Chronic Diseases: The Role of the New Rural Pension Scheme in China'. *International Journal of Environmental Research and Public Health, 15*(6), pp. 1–20, doi: 10.3390/ijerph15061253.

Zhou, M, Sun, X, & Huang, L. (2022). 'Does Social Pension Expansion Relieve Depression and Decrease Medical Costs? Evidence From the Rural Elderly in China. *International Journal of Public Health, 67*, pp. 1604296–1604296, doi: 10.3389/ijph.2022.1604296.