

Article

Do Social Pension and Family Support Affect Farmers' Land Transfer? Evidence from China

Zuojuan Li, Guofeng Li *, Ke Zhang and Jingxin Zhu

School of Statistics and Mathematics, Shandong University of Finance and Economics, Jinan 250014, China; 191114001@mail.sdufe.edu.cn (Z.L.); zk19980923@mail.sdufe.edu.cn (K.Z.); zhujingxin@mail.sdufe.edu.cn (J.Z.)

* Correspondence: 19869070@sdufe.edu.cn

Abstract: The issues of farmers' old-age security and land use have long been the focus of Chinese scholars' and governmental attention. Land transfer plays a vital role in promoting agricultural scale operations, adjusting agricultural structures, and improving land utilization, while the old-age security function of land is one of the important factors affecting land transfer. Based on the data of the China Health and Retirement Longitudinal Study (CHARLS), this study uses the probit and structural equation models to explore social pension and family support mechanisms and pathways with regard to farmers' land transfer. The results show that: (1) Social pension has a significant negative effect on farmers' rent-out land, but a significant positive effect on rent-in land. Compared to farmers who do not participate in the New Rural Pension System (NRPS), the probability of rent-out land for farmers who participated in NRPS decreased by 2.44%, and rent-in land increased by 2.26%. (2) Family support has a significant positive effect on farmers' rent-out land, but a negative effect on rent-in land. (3) Agricultural labor time plays a mediating role in the effect of social pension and family support on both farmers' rent-out land and rent-in land.

Keywords: social pension; family support; land transfer; probit model; structural equation model



Citation: Li, Z.; Li, G.; Zhang, K.; Zhu, J. Do Social Pension and Family Support Affect Farmers' Land Transfer? Evidence from China. *Land* **2022**, *11*, 497. <https://doi.org/10.3390/land11040497>

Academic Editor: Hossein Azadi

Received: 21 February 2022

Accepted: 25 March 2022

Published: 30 March 2022

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright: © 2022 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

1. Introduction

China is the world's most populous country with a massive demand for food, but the arable land per capita is less than 50% of the world average. The scale of farmers' land operations is limited. According to the third agricultural census, the scale of agricultural operations in China accounted for 230 million farmers, and 210 million farmers operate arable land less than 10 mu (1 mu $\approx$ 0.067 ha) in area, accounting for 91.3%. With accelerated industrialization and urbanization in China, a large number of rural laborers have been transferred to cities, resulting in the abandonment of arable land [1–3]. Some farmers have changed the use of their arable land to factory construction and real estate development, etc., which hinders the realization of the goal of sustainable agricultural development. Therefore, it has become one of the most important government policy objectives to protect arable land and promote land transfer in order to bring the moderate scale effect into play.

The meaning of land transfer varies from country to country due to differences in geographical background and policy regimes. Most developed countries practice land privatization. Landowners can realize land transactions through land ownership sale and purchase, land mortgage, land lease, etc. [4]. However, the ownership of farmland in China is collective. In 2014, the Chinese government issued a land transfer policy for farmland, which proposes to separate the ownership, contracting, and management rights of farmland. Land transfer refers to land management rights in China, i.e., farmers can rent-in or rent-out their land by transferring their management rights to economic organizations or other farmers [5,6]. Accelerated land transfer can pool the limited land resources of each family to form large-scale and industrialized agricultural operations, maximizing agricultural production efficiency and improving farmers' income and quality of life [7–10].

With the support of government policies, China has been able to expand its land transfer area, rising from 64 million mu in 2007 to 530 million mu in 2018. However, the area transferred only accounts for 31% of the total contracted arable land, and only 25% of farmers have participated in land transfer [11]. China's land transfer market is still in its infancy, and there are large regional disparities, with some provinces accounting for less than 10% of the total agricultural land transferred [12]. Promoting land transfer to enhance agricultural productivity and efficient use of land resources is a pressing challenge.

Many factors influence the willingness of farm households to engage in land transfer. Some scholars have studied the influence of individual and household characteristics, such as gender, age, marital status, and agricultural income, on farmers' land transfer [13–15]. Some extended their studies to examine the effects of market-based factors and social policies on farmers' land transfer, such as transaction costs and agricultural policies [16–18]. These studies have shown that the willingness of farmers to participate in land transfer varies significantly according to their personal and family characteristics and their social environment [19–21]. China has entered a stage of rapid aging development, and 2016 statistics show that the total population dependency ratio in rural areas is as high as 45.38%. The heavy burden of paying for old-age pensions has become a vital obstacle limiting the economic development of rural China. There are two types of old-age security for farmers in China: family support and social pension. Family support refers to the provision of resources for aging by family members [22]. Social pension refers to the elderly enjoying the pension services provided by social agencies. According to the current policy, the main form of social pension for the rural elderly is participation in NRPS and medical insurance. Land provides employment and income for farmers and is an important material basis for the old-age security of farmers [23]. Therefore, social pension and family support are also essential factors influencing farmers' land transfer in China.

With the increase in people's material and income levels, and the continuous expansion of social security coverage, research findings are inconsistent as to whether social pension and family support enhance Chinese farmers' willingness to transfer their land. Some scholars have studied the impact of farmers' participation in pension insurance on land transfer in China and found that farmers' participation in NRPS had a positive impact on the withdrawal of land management rights [24]. Participation in pension insurance increased farmers' expected level of old-age security, reduced their dependence on the land, and promoted rent-out land [11]. In contrast, Luo et al. [25] concluded that farmers' participation in NRPS did not promote the renting out of their land but instead created a disincentive effect. Xu et al. found that farmers' participation in pension insurance did not significantly affect land transfer [26]. The inconsistency of the findings may be due to the fact that some studies are limited to small regions and the sample size is too small to be representative of national characteristics [25], or the data of the studies are from 2011 or earlier. In addition, Lv et al. [27] investigated the impact of family support on rent-out land using Logistic and Tobit models.

Existing studies have helped us to gain a better understanding of the relationship between farmers' old-age security and land transfer. However, we noted that most of the literature focuses on the impact of farmers' social pension on rent-out land, with fewer studies on rent-in land and even fewer explorations of the impact paths. This paper used the large-scale national micro-data CHARLS 2018 to study the impact on farmers' rent-out land and rent-in land from two perspectives: social pension and family support. Social pension includes whether farmers participate in NRPS and medical insurance; family support includes financial support, in-kind support, daily care, and emotional support. Firstly, this paper used the probit model to observe the relationship between key observable explanatory variables and farmers' land transfer. Then the structural equation model was used to test the effects of two latent variables, social pension and family support, on farmers' land transfer. This paper also examined whether agricultural labor time plays a mediating role between farmers' old-age security and land transfer. Finally, we put forward targeted policy recommendations based on the research results.

2. Literature Review and Research Hypothesis

Pension systems have been operating for decades in most developed countries, and social security systems are relatively well established. Several studies on countries such as the U.S. have shown that social pension accelerates people's withdrawal from the labor market [28]. In China, the construction of social security in rural areas started late. The State Council of China initiated a new round of rural pension system reform and established a new scheme called the New Rural Pension System (NRPS) in 2009. The NRPS includes an individual contribution component, a collective subsidy component, and a government subsidy component. The reform was first launched in 320 pilot counties and then expanded to all counties nationwide by the end of 2012. NRPS is moving toward universal coverage [29]. Rural residents over the age of 16 who have not participated in any other pension plan are eligible for NRPS. Farmers pay the required premiums and become eligible for pension benefits once they are over 60 years old.

Some farmers choose to participate in diversified pension insurance, such as NRPS and health insurance, to improve their ability to cope with uncertain risks such as future living and medical costs [30,31]. However, the current level of NRPS benefits is relatively low. It varies across regions, with the minimum value of the pension being about 55 yuan per month, increasing to 310 yuan in some more prosperous provinces [32,33]. In this paper, statistics using data from CHARLS 2018 sample revealed that farmers participating in the NRPS received an average of 124.73 yuan per month, while farmers' average monthly farm income was 767.16 yuan. In other words, the income brought via NRPS for farmers was lower than the income brought by cultivating the land. NRPS cannot fully replace the economic role of land in farmers' old-age security. Moreover, farmers participating in the NRPS must pay a portion of their premiums, and participation in the NRPS may encourage farmers to rent in the land.

A further literature survey found that several scholars in China have also studied the impact of family support on farmers' land transfer. With the rapid development of the economy, children have more employment options and diversified income sources. Elderly farmers receive progressively more financial support from their children. Moreover, there is a tradition of family members living together in China, and some of the children will still live with their parents when they reach adulthood [34]. Children can provide adequate life care and emotional support, reducing older farmers' dependence on the land [27]. Lv et al. [27] studied the effect of family support on rent-out land in China and found that children's financial support to their fathers had a positive impact on rent-out land, while life care had a negative impact on rent-out land. Based on the above analysis, the following hypotheses were proposed:

Hypotheses 1 (H1). *Social pension negatively impacts farmers' rent-out land and positively impacts farmers' rent-in land.*

Hypotheses 2 (H2). *Family support positively impacts farmers' rent-out land and negatively impacts farmers' rent-in land.*

Studies in most developed countries show that adequate resources for old-age security increase the welfare of the rural elderly. To some extent, this changes their willingness to work and the quantity of labor supply and influences their productive decisions on whether to transfer land. Some studies using data from the U.S. Health and Retirement Study found that social pension accelerated withdrawal of the elderly from the labor market and reduced labor time [28,35]. The impact of social pension on farmers' labor participation decisions depends on some key assumptions, such as credit constraints, insurance, and life expectancy [36]. Martin's [37] study on the reform of the PAYG pension system in Spain pointed out that policy measures such as cutting pension levels will incentivize older people to increase their labor supply.

A study using Chinese data found that farmers' participation in pension insurance does not completely withdraw the rural elderly from the labor market [38]. Cheng [39] explored the impact of the pension security system on labor supply and found that the

NRPS system increased the overall labor supply and agricultural labor supply of farmers. However, increasing the number of pensions paid to farmers by NRPS can reduce farmers' labor hours [40]. Some scholars have also found that intergenerational family economic transfers in China can significantly reduce the labor supply of farmers, and farmers with more economic support have substantially lower labor force participation rates [41]. In conclusion, most studies concluded that social pension and family support affected the agricultural labor input of farmers. This study further explored the mediating role of agricultural labor time between old-age security and land transfer of farmers. Based on the above analysis, the following hypotheses were proposed:

Hypotheses 3 (H3). *Agricultural labor time plays a mediating role in the relationship between social pension and rent-out land.*

Hypotheses 4 (H4). *Agricultural labor time plays a mediating role in the relationship between social pension and rent-in land.*

Hypotheses 5 (H5). *Agricultural labor time plays a mediating role in the relationship between family support and rent-out land.*

Hypotheses 6 (H6). *Agricultural labor time plays a mediating role in the relationship between family support and rent-in land.*

Farmers' land use decisions are complex and dynamic, subject to the combined effect of family support and social pensions. Based on the above theoretical analysis and literature research, this study constructed an SEM in which social pension, family support, and agricultural labor time influenced farmers' land transfer. We assumed interaction between the two latent variables of social pension and family support. Taking the rent-out land as an example, the path diagram of the structural equation model is shown in Figure 1.

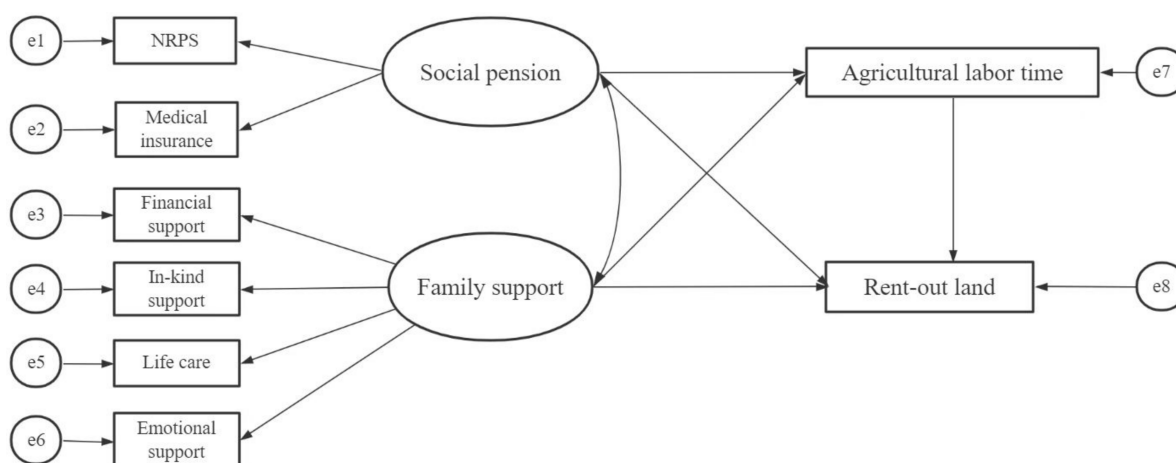


Figure 1. Structural equation model. Note: The model is also applicable to rent-in land.

3. Data and Methods

3.1. Data Source

This paper employed survey data from the China Health and Retirement Longitudinal Study (CHARLS) in 2018. The CHARLS is a large interdisciplinary research project hosted by the Institute of Social Science Research at Peking University. The survey data covers about 18,000 respondents in 150 counties, 450 villages, and more than 10,000 households in 28 provinces (autonomous regions and municipalities directly under the central government). It is a high-quality micro database representing the population aged 45 and above in China. The CHARLS questionnaire contains basic personal information, household structure, income, assets, and old-age security information. The data is nationally representative and can comprehensively describe the current status of old-age security and land transfer

in rural China. All variables selected for this paper were from the CHARLS database. The variables selected for this study were as follows.

3.2. Description of Variables

3.2.1. Dependent Variables

Farmers can rent out their land by transferring their management rights to others, and can likewise rent in the land [42,43]. The rent-out variable was derived from the farmers' response to the question "Do farmers rent out land in the past year?" If the farmers have done so, the value is "1", otherwise, "0". The rent-in variable was derived from the farmers' response to the question "Do farmers rent in the land from others (including the collective) in the past year?" If the farmers have done so, the value is "1", otherwise, "0".

3.2.2. Independent Variables

The independent variables included social pension and family support. The latent variable of social pension was primarily measured by two observable variables: NRPS and medical insurance. Family support was expressed using inter-generational support between farmers and their children, as measured by four observable variables: financial support, in-kind support, life care, and emotional support.

3.2.3. Control Variables

The omission of variables may cause some bias to the model estimation. To make the estimation results more robust, this study introduced micro variables that have been confirmed by previous studies and can affect land transfer as control variables. Specifically, the control variables include farmers' gender, age, marital status, number of children, household farmland area, and agricultural income.

3.2.4. Intermediate Variable

Family support and social pension improve the welfare level of farmers and may affect their land transfer behavior by changing their agricultural labor time. Therefore, in this study, agricultural labor time was selected as a mediating variable, and the data was derived from the question, "How many hours do you work on agricultural labor per day?"

The main research object of this paper was the population of rural residents, and we organized the data according to our research needs. We obtained a total of 5890 samples after excluding individuals containing missing values. The specifics regarding the variables and their descriptive statistics are shown in Table 1.

3.3. Method

3.3.1. Probit Model

This study first used the probit model to investigate the relationship between each observable variable and farmers' land transfer behavior. The probit model in this study is a regression model for the dichotomous dependent variable with the following equation.

$$Pr(Y = 1|x_1, x_2 \cdots x_k) = \Phi(\alpha + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_k x_k) \quad (1)$$

Y is the explained variable of rent-out land, or rent-in land. X is the set of all critical explanatory and control variables. Φ is a standard normal cumulative distribution function, and α and β are the parameters to be estimated. Meanwhile, the model can examine the change in the probability of rent-out land or rent-in land occurring with changes in the explanatory variables by estimating the marginal effects.

Before the model was fitted, we used the variance inflation factor (VIF) to test the collinearity of the independent variables. The results showed that the VIF values of all variables were less than 1.7, and the average VIF value was 1.23, indicating that there was no severe collinearity problem among the variables.

Table 1. Definition and descriptive statistics of the variables.

Variable Type	Variables	Variable Specific Definition	Mean	SD
Dependent variable	Rent-out land	Whether farmers have rent-out land (0 = no; 1 = yes)	0.2292	0.4204
	Rent-in land	Whether farmers have rent-in land (0 = no; 1 = yes)	0.0973	0.2964
Intermediate variable	Agricultural labor time	Average daily hours of agricultural labor performed by farmers (hour)	4.3147	3.7169
Social pension	NRPS	Whether farmers participated in the new rural pension system (0 = no; 1 = yes)	0.6277	0.4835
	Medical insurance	Whether farmers participated in medical insurance (0 = no; 1 = yes)	0.9687	0.1740
Family support	Financial support ^a	Money in total provided to farmers by their children (yuan ^b)	5.3657	3.8192
	In-kind support ^a	In-kind payment worth in total provided to farmers by their children (yuan ^b)	5.2117	3.0878
	Life Care	Whether farmers received child-care (0 = no; 1 = yes)	0.0946	0.2926
	Emotional support	Average number of contacts between farmers and their children (times) Numbers 1–9 are defined from “Almost never” to “Almost every day”.	5.4489	1.7285
Control variable	Age	Age of farmers (years old)	64.7245	9.7977
	Gender	Gender of farmers (0 = female; 1 = male)	0.7357	0.4410
	Marriage	farmers’ marital status (0 = unmarried; 1 = married)	0.8117	0.3910
	Income ^a	Annual agricultural income (yuan ^b)	5.1351	4.2378
	Children	Number of farmers’ children (persons)	3.0058	1.5711
	Farmland area	Amount of cultivated land (mu ^c)	5.7897	16.6201

Note: ^a The “Financial support”, “In-kind support” and “Income” in the above table have been taken as logarithm.

^b 1 yuan 0.1571 US dollar; ^c 1 mu 0.067 ha.

3.3.2. SEM

This study aimed to explore the impact mechanism and pathways of social pension and family support on the land transfer of farmers. SEM integrates the ideas and methods of factor analysis, path analysis, and multiple linear regression analysis. It allows for independent and dependent variables with measurement errors. Meanwhile, SEM uses path diagrams and covariance between variables while estimating model factor parameters and factor structure relationships [44]. This paper tested the proposed research hypotheses via the SEM.

SEM is composed of a measurement model and a structural model. The measurement model is used to measure the relationship between observable and latent variables, and the structural model is used to measure the relationship between latent variables. Observable variables are obtained directly from the data and can be divided into endogenous and exogenous observable variables. Latent variables cannot be measured directly but can be quantified by observable variables. In this paper, social pension and family support indicators are latent variables. The relationship between exogenous latent variables and exogenous observable variables is usually expressed according to Equation (2), and the relationship between endogenous latent variables and endogenous observable variables is usually expressed according to Equation (3):

$$X = \Lambda_X \zeta + \delta \quad (2)$$

$$Y = \Lambda_Y \eta + \varepsilon \quad (3)$$

Here, X and ζ represent the exogenous observable variables and latent variables, respectively, and Y and η represent the endogenous observable variables and latent variables respectively. Λ_X is the factor loading matrix of the exogenous observed variable on the exogenous latent variable ζ . Λ_Y is the factor loading matrix of the endogenous observed variable on the endogenous latent variable η . δ and ε are the error term of the exogenous observed variable and the endogenous variable, respectively. The relationship between latent variables is usually expressed according to Equation (4):

$$\eta = B\eta + \Gamma\zeta + \theta \quad (4)$$

The structural equation illustrates the structural relationship between the latent variables. B and Γ are the path coefficient, and B denotes the relationship between the endogenous latent variables. Γ denotes the effect of the exogenous latent variables on the endogenous latent variables. θ is the error term of the structural equation.

The probit model can examine the relationship between each observable explanatory variable and farmers' land transfer, and control variables can be added to the model to enhance the robustness of the results. However, the probit model cannot deal with latent variables. The SEM combines the features of multiple methods such as regression analysis and factor analysis, which can deal with latent variables and can facilitate the testing of the mediating effects of variables. According to the advantages of the two methods, this study first used the probit model to test whether there was a significant association between each observable explanatory variable and farmers' land transfer. Then, this study used SEM to test the effects of two latent variables, social pension and family support, on rent-out land and rent-in land, which not only helps to test the robustness of the results but also allows further exploration of whether agricultural labor time plays a role as a mediating variable.

4. Results

4.1. Results from Probit Model

Table 2 shows the probit models estimation results of land transfer. Specifically, model 1 to model 3 show probit models for rent-out land. Among them, model 1 mainly contained explanatory variables related to social pension, model 2 mainly contained explanatory variables related to family support, and model 3 contained all key explanatory variables. The last column of model 3 showed the results of the marginal effects of probit regressions, indicating the marginal probability effects of each variable on the rent-out land of farmers. Similarly, model 4 to model 6 showed probit models for rent-in land. Among them, model 4 mainly contained explanatory variables related to social pension, model 5 mainly contained explanatory variables related to family support, and model 6 contained all key explanatory variables. To enhance the robustness of the regression results, all six models included control variables related to individual farmers and households.

The results of model 1 and model 3 indicate that NRPS was significantly negatively correlated with rent-out land, and the results were robust. The marginal effect showed that the probability of rent-out land of farmers who participated in NRPS decreased by 2.44% compared to farmers who do not participate in the NRPS. Similarly, medical insurance was significantly positively correlated with rent-out land, and the results were robust. The marginal effect showed that the probability of rent-out land of farmers who participated in medical insurance increased by 5.73% compared to those who do not participate in medical insurance. The results of model 2 and model 3 indicate that financial support and in-kind support were positive at the 1% significance level. These results implied that financial support and in-kind support positively correlated with rent-out land. Similarly, life care was positive at the 5% significance level. The emotional support variable was not significant.

Table 2. Probit models estimation results.

Variables	Rent-out Land				Rent-in Land			
	Model 1	Model 2	Model 3	Margin	Model 4	Model 5	Model 6	Margin
	Coef.	Coef.	Coef.		Coef.	Coef.	Coef.	
NRPS	−0.0507 * (0.078)	-	−0.1074 ** (0.012)	−0.0244	0.1467 *** (0.004)	-	0.1506 *** (0.003)	0.0226
Medical insurance	0.4609 *** (0.000)	-	0.2518 * (0.061)	0.0573	0.2865 (0.144)	-	0.2972 (0.130)	0.0446
Financial support	-	0.1855 *** (0.000)	0.1864 *** (0.000)	0.0424	-	−0.0192 *** (0.007)	−0.0198 *** (0.006)	−0.0030
In-kind support	-	0.1551 *** (0.000)	0.1533 *** (0.000)	0.0349	-	0.0067 (0.446)	0.0068 (0.443)	0.0010
Life care	0.0045 * (0.055)	0.1495 ** (0.043)	0.1549 ** (0.036)	0.0353	-	0.0628 (0.544)	0.0642 (0.538)	0.0096
Emotional support	-	0.0014 (0.905)	0.0021 (0.858)	0.0005	-	−0.0032 (0.818)	−0.0048 (0.729)	−0.0007
Age	−0.0045 * (0.055)	−0.0058 ** (0.036)	−0.0059 ** (0.031)	−0.0014	−0.0234 *** (0.000)	−0.0224 *** (0.001)	−0.0225 *** (0.000)	−0.0034
Gender	0.0158 (0.733)	0.0384 (0.480)	0.0301 (0.580)	0.0069	0.2402 *** (0.000)	0.2347 *** (0.000)	0.2422 *** (0.000)	0.0364
Marriage	−0.0335 (0.541)	−0.1552 ** (0.014)	−0.1608 ** (0.011)	−0.0366	0.3358 *** (0.001)	0.3521 *** (0.000)	0.3499 *** (0.000)	0.0526
Farmland area	0.0018 * (0.099)	0.0019 * (0.072)	0.0018 * (0.083)	0.0004	0.0031 ** (0.021)	0.003 ** (0.025)	0.0030 ** (0.025)	0.0005
Income	−0.0579 *** (0.000)	−0.0580 *** (0.000)	−0.0576 *** (0.000)	−0.0131	0.1055 *** (0.000)	0.1061 *** (0.000)	0.1045 *** (0.000)	0.0157
Children	−0.0288 ** (0.046)	−0.0816 *** (0.000)	−0.0795 *** (0.000)	−0.0181	−0.0056 (0.780)	0.0003 (0.987)	−0.0020 (0.921)	−0.0003
Constant	−1.0611*** (0.000)	−1.949*** (0.000)	−2.1167*** (0.000)	-	−1.3715*** (0.000)	−1.0179*** (0.000)	−1.3745*** (0.000)	-
Prob > chi2	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	
Pseudo R2	0.1336	0.2392	0.2406		0.1069	0.1362	0.1393	

Note: ***, ** and * indicate significantly different from zero at the 1%, 5% and 10% levels; numbers in brackets are *p* values.

As shown in the results for model 4 and model 6, the coefficients of NRPS were all positive and significant at the 1% test level, respectively, suggesting that NRPS was significantly positively correlated with rent-in land, and the results were robust. The results from the marginal effects showed that the probability of rent-in land of farmers who participated in NRPS increased by 2.26% compared to farmers who did not participate in the NRPS. Medical insurance was not significantly correlated with rent-in land. The results of model 5 and model 6 indicate that financial support was negatively correlated with farmers' rent-in land at the 1% significance level. The in-kind support, life care, and emotional support were not significantly correlated with rent-in land. The effects of other variables on land transfer were in line with expectations. Farmers with more farm land were more inclined to transfer their land. The number of children was significantly negatively correlated with rent-out land.

4.2. Results from SEM

This study further used SEM to examine whether the latent variables, such as social pension and family support, have significant effects on farmers' land transfer. Additionally, this study used SEM to investigate whether agricultural labor time plays a mediating role in the effect of social pension and family support on land transfer.

The estimated values of the SEM fitting indices are shown in Table 3. Model 7 shows the SEM of family support and social pension latent variables on farmers' rent-out land; Model 8 shows the SEM of family support and social pension latent variables on rent-in land. The GFI reflects the model's explanatory power, the AGFI is the explanatory power after considering the model complexity, and RMSEA tests the measurement model's overall fitment. The values of GFI, NFI, IFI, CFI, and AGFI were all greater than 0.9, and the value

of RMSEA is less than 0.08. Therefore, all model indices meet the requirements, indicating the good model fit.

Table 3. Goodness-of-fit (GOF) measures of SEMs.

GOF Measures	Recommended Levels	Model 7	Model 8	Result
GFI	>0.90	0.993	0.993	pass
NFI	>0.90	0.943	0.922	pass
RMSEA	<0.08	0.040	0.040	pass
IFI	>0.90	0.948	0.929	pass
CFI	>0.90	0.948	0.929	pass
AGFI	>0.90	0.984	0.984	pass

Figure 2 shows the results of the SEM for the effects of social pension and family support on farmers' rent-out land (Model 7). Figure 3 shows the results of the SEM for the effects of social pension and family support on farmers' rent-in land (Model 8). Both Figures 2 and 3 showed the standardized coefficients and significance results. As shown in Figures 2 and 3, the coefficient of social pension on rent-out land was significant at the 10% level and negative; the coefficient of social pension on rent-in land was significant at the 5% level and positive. Thus, H1 was not rejected, i.e., social pension negatively impacts farmers' rent-out land and positively impacts farmers' rent-in land. Similarly, the coefficient of family support on rent-out was 0.512 and significant at the 1% level, and the coefficient of family support on rent-in land was -0.075 and significant at the 1% level. H2 was not rejected, i.e., family support has a positive impact on farmers' rent-out land and negative impact on farmers' rent-in land.

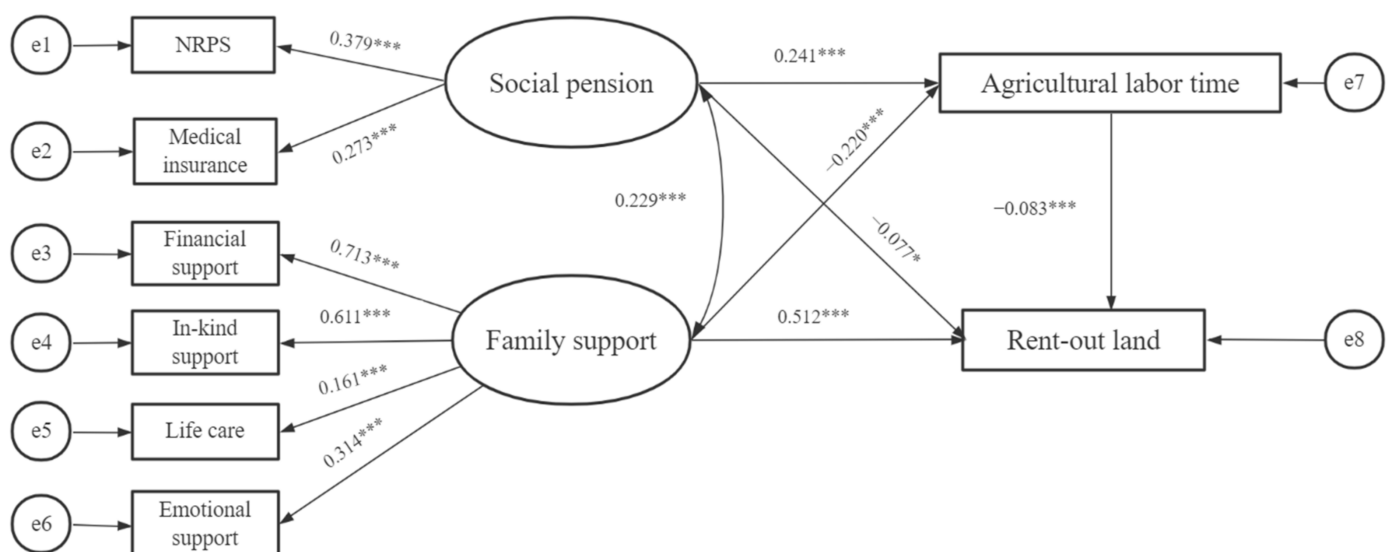


Figure 2. SEM model results of social pension and family support on rent-out land. Note: *** and * indicate significantly different from zero at the 1% and 10% levels.

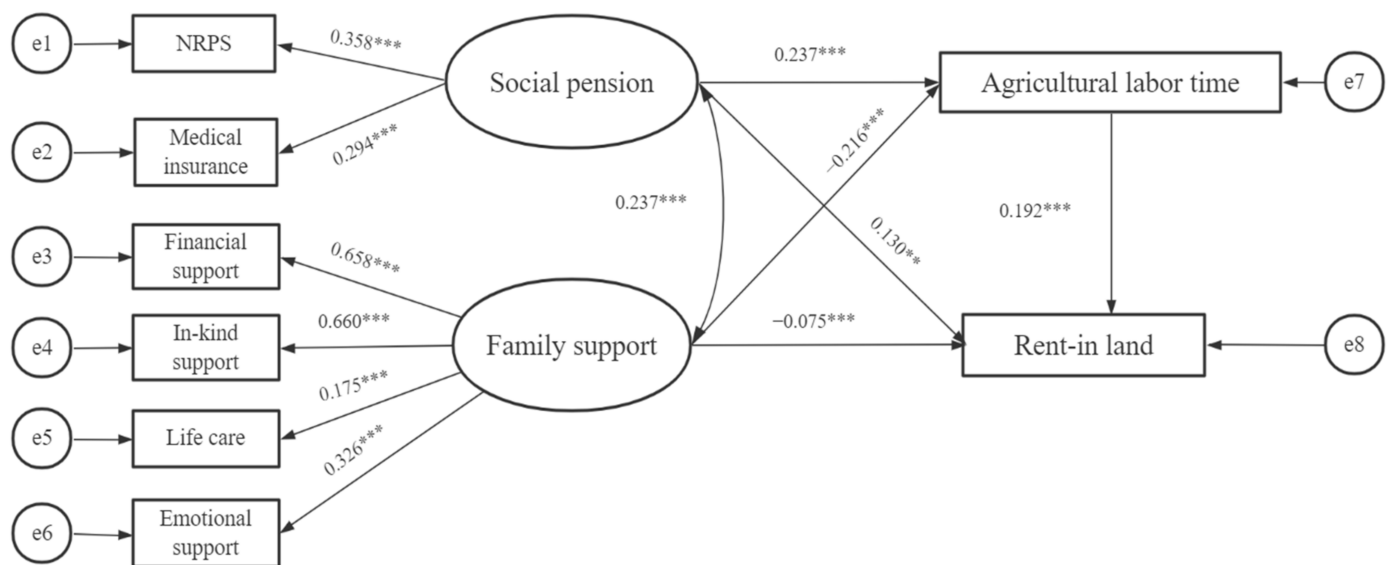


Figure 3. SEM model results of social pension and family support on rent-in land. Note: *** and ** indicate significantly different from zero at the 1% and 5% levels.

4.3. Mediating Effect Test

This study further examined the mediating effects of agricultural labor time and estimated 95% confidence intervals (CI) for the effects using the bootstrap estimation procedure in AMOS [45,46]. If CI of the test results does not contain 0, it is statistically significant and a mediating effect exists [47,48]. Taking the effect of social pension on rent-out land as an example, the direct effect was the standardized path coefficient of social pension and rent-out land estimated in Figure 2 (−0.077). The indirect effect was the effect of social pension on rent-out land indirectly by affecting agricultural labor time, calculated as the product of the path coefficients “Social pension—Agricultural labor time” and “Agricultural labor time—Rent-out land”, which was $0.241 \times (-0.083) = -0.02$. The total effect was the sum of the direct effect and the indirect effect, i.e., $(-0.077) + (-0.02) = -0.097$.

The results are shown in Table 4 for the total and indirect effects of social pension and family support on land transfer. The CI of the total effect of social pension on rent-out land was −0.169 to −0.026 and did not contain 0. Thus the total effect held ($p < 0.05$). The CI of the indirect effect of social pension on rent-out land was −0.032 to −0.012 and did not contain 0. Social pension exerted significant indirect effects on rent-out land via agricultural labor time ($p < 0.05$). Thus, H3 was not rejected, i.e., agricultural labor time plays a mediating role in the relationship between social pension and rent-out land. Similarly, social pension exerted significant indirect effects on rent-in land via agricultural labor time. Thus, H4 was not rejected. Agricultural labor time also plays a mediating role between social pension and rent-in land.

Table 4. Mediating effect test results from SEM.

Model Categories		Pathways	Estimate	Lower	Upper	p Value
Rent-Out land	Total Effects	Social pension → Rent-out land	−0.097 **	−0.169	−0.026	0.016
		Family support → Rent-out land	0.530 ***	0.501	0.569	0.005
	Indirect Effects	Social pension → Rent-out land	−0.020 ***	−0.032	−0.012	0.003
		Family support → Rent-out land	0.018 ***	0.011	0.026	0.009
Rent-In land	Total Effects	Social pension → Rent-in land	0.175 ***	0.118	0.267	0.006
		Family support → Rent-in land	−0.116 **	−0.165	−0.069	0.014
	Indirect Effects	Social pension → Rent-in land	0.045 **	0.028	0.060	0.013
		Family support → Rent-in land	−0.041 ***	−0.053	−0.032	0.006

Note: *** and ** indicate significantly different from zero at the 1% and 5% levels.

The CI of the total effect of family support on farmers' rent-out land was 0.501 to 0.569 and did not contain 0, thus the total effect held ($p < 0.05$). The CI of the indirect effect of family support on rent-out land was 0.011 to 0.026 and did not contain 0, thus family support exerted significant indirect effects on rent-out land via agricultural labor time ($p < 0.05$). This reflected that family support promoted farmers' rent-out land by reducing their agricultural labor time. H5 was not rejected, i.e., agricultural labor time played a mediating role in the relationship between family support and rent-out land. Similarly, agricultural labor time also played a mediating role between family support and rent-in land, so H6 was also not rejected.

5. Discussion

In China, a country with a large population, the problem of the conflict between people and land is particularly prominent. The Chinese government and scholars have paid a lot of attention to the issue of old-age security and land among farmers [49]. Based on the latest survey data from the CHARLS in China, this study used the SEM to analyze the impact of social pension and family support on farmers' land transfer.

There are some similarities and differences between this study and similar studies. In terms of social pension and land transfer, the research hypothesis H1 was not rejected, i.e., social pension had a negative effect on rent-out land and a positive effect on rent-in land. This is different from the results of some previous scholars' studies [11]. The results from the probit model showed that NRPS was significantly negatively related to rent-out land and significantly positively related to rent-in land. Possible reasons are as follows: firstly, although the NRPS provides formal institutional protection for farmers' old-age security, the current protection intensity of the NRPS is relatively low, and it is challenging to meet the basic needs of farmers. Based on the analysis of the sample data in this study, farmers participating in NRPS received an average of 124.73 yuan per month, while the average monthly consumption of farmers in 2018 was about 1010.33 yuan. Secondly, the NRPS policy stipulates that farmers can receive pensions only after they reach 60 years of age, so farmers participating in NRPS do not receive immediate economic income, and the payment of NRPS premiums increases their current cash expenses [50]. Therefore, the NRPS was significantly negatively related to rent-out land.

In terms of family support and land transfer, the research hypothesis H2 was not rejected and family support had a positive effect on rent-out land and a negative effect on rent-in land, which is consistent with the findings of some scholars [27]. The financial support and in-kind support that elderly farmers received from their children enhances their living standards and weakens their dependence on the land. Agricultural labor time plays a mediating role in the relationship between social pension, family support and farmers' land transfer. Research hypotheses H3, H4, H5 and H6 were not rejected. Social pension and family support indirectly affect farmers' land transfer behavior by influencing their agricultural labor time.

Compared with existing studies, this study has made the following contributions: it focused on the effects of social pension and family support on farmers' land transfer simultaneously. Compared with previous studies, it was more comprehensive in its consideration. Moreover, in addition to using the probit model to observe the relationship between critical observable explanatory variables and land transfer, this study also used SEM to examine the effects of two latent variables, social pension and family support, on farmers' land transfer. Finally, this study examined the mediating role of agricultural labor time between social pension, family support, and farmers' land transfer. In addition, it had certain limitations that can be addressed in future research. For example, the study only used cross-sectional data to explore the effect of farmers' old-age security on land transfer. In contrast, farmers' old-age security and land transfer are a dynamic change process, and the causal relationship between them can be further explored in the future using panel data. In addition, the probit models had small Pseudo R2 values and the explanatory power of the exogenous variables was limited.

6. Conclusions

Based on the above analysis, this study drew the following two main conclusions.

(1) The results showed that social pension had a negative effect on rent-out land and a positive effect on rent-in land. The social pension was one of the essential factors driving land transfer. Compared to farmers who do not participate in the NRPS, the probability of rent-out land of farmers who participated in NRPS decreased by 2.44%, and rent-in land increased by 2.26%. Agricultural labor time as a mediating variable played a mediating role in the relationship between social pension and farmers' land transfer.

(2) Family support had a positive effect on rent-out land and a negative effect on rent-in land. Financial support, in-kind support, and life care were significantly and positively associated with farmers' rent-out land. Financial support was negatively correlated with farmers' rent-in land. These findings suggest that family support was also one of the essential factors driving land transfer, and agricultural labor time also played a mediating role between family support and farmers' land transfer.

This study puts forward the following policy implications. Firstly, the social security pension system in rural areas should be further improved. The NRPS includes individual contributions, collective subsidies, and government subsidies. The government can appropriately lower the proportion of individual contributions and increase the proportion of government subsidies to reduce the burden on farmers. On the other hand, the government should support and guide farmers to participate in diversified pension protection methods and provide diversified social pension options, such as commercial pension insurance, for rural residents with different economic conditions. There is a need to fully improve the level of social pension security, weaken the old-age security function of land, and solve the worries of farmers, leading them to withdraw from land.

Secondly, the social security system for migrant workers should be further improved. Migrant workers can not enjoy the same social benefits in housing, medical care, and pensions that urban residents have. Improving social security for migrant workers can reduce their urban living costs and increase their income. Thereby, migrant workers can provide more stable financial support for their parents' retirement. In conclusion, land transfer can be facilitated by strengthening social pension and family support, thus promoting sustainable agricultural development.

Author Contributions: Conceptualization, Z.L. and G.L.; Data curation, K.Z. and J.Z.; Methodology, Z.L. and G.L.; Supervision, G.L.; Writing—original draft, Z.L.; Writing—review & editing, G.L., K.Z. and J.Z. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Acknowledgments: The authors extend great gratitude to the anonymous reviewers for their helpful review and critical comments. Additionally, all authors are very grateful to the Center for Social Science Survey at Peking University who provides the data.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Xu, D.D.; Deng, X.; Guo, S.L.; Liu, S.Q. Labor migration and farmland abandonment in rural China: Empirical results and policy implications. *J. Environ. Manag.* **2019**, *232*, 738–750. [\[CrossRef\]](#) [\[PubMed\]](#)
2. Chen, R.S.; Ye, C.; Cai, Y.L.; Xing, X.S.; Chen, Q. The impact of rural out-migration on land use transition in China: Past, present and trend. *Land Use Policy* **2014**, *40*, 101–110. [\[CrossRef\]](#)
3. Liu, G.S.; Wang, H.M.; Cheng, Y.X.; Zheng, B.; Lu, Z.L. The impact of rural out-migration on arable land use intensity: Evidence from mountain areas in Guangdong, China. *Land Use Policy* **2016**, *59*, 569–579. [\[CrossRef\]](#)
4. Joshua, M.; Marisova, E.D.; Bandlerova, A.; Slovinska, J. Price repression in the slovak agricultural land market. *Land Use Policy* **2004**, *21*, 59–69.
5. Gao, J.; Song, G.; Sun, X. Does Labor migration affect rural land transfer? Evidence from China. *Land Use Policy* **2020**, *99*, 105096. [\[CrossRef\]](#)
6. Long, H. Land use policy in China: Introduction. *Land Use Policy* **2014**, *40*, 1–5. [\[CrossRef\]](#)

7. He, Q.; Deng, X.; Li, C.; Kong, F.; Qi, Y. Does land transfer improve farmers' quality of life? Evidence from rural China. *Land* **2022**, *11*, 15. [\[CrossRef\]](#)
8. Hui, C.; Zhu, X.Q.; Wim, H.; Zhao, K. The impact of land transfer and farmers' knowledge of farmland protection policy on pro-environmental agricultural practices: The case of straw return to fields in Ningxia, China-ScienceDirect. *J. Clean. Prod.* **2020**, *277*, 123701.
9. Wang, W.W.; Gong, J.; Wang, Y.; Shen, Y. Exploring the effects of rural site conditions and household livelihood capitals on agricultural land transfers in China. *Land Use Policy* **2021**, *108*, 105523. [\[CrossRef\]](#)
10. Li, C.; Jiao, Y.; Sun, T.; Liu, A. Alleviating multi-dimensional poverty through land transfer: Evidence from poverty-stricken villages in China. *China Econ. Rev.* **2021**, *69*, 101670. [\[CrossRef\]](#)
11. Wang, Y.; Yang, Q.; Xin, L.; Zhang, J.Y. Does the new rural pension system promote farmland transfer in the context of aging in rural China: Evidence from the CHARLS. *Int. J. Environ. Res. Pub. Health* **2019**, *16*, 3592. [\[CrossRef\]](#) [\[PubMed\]](#)
12. Wang, Y.; Li, X.; Li, W.; Tan, M. Land titling program and farmland rental market participation in china: Evidence from pilot provinces. *Land Use Policy* **2018**, *74*, 281–290. [\[CrossRef\]](#)
13. Baumgart-Getz, A.; Prokopy, L.S.; Floress, K. Why farmers adopt best management practice in the United States: A meta-analysis of the adoption literature. *J. Environ. Manage.* **2012**, *96*, 17–25. [\[CrossRef\]](#) [\[PubMed\]](#)
14. Teklu, T.L.A. Factors affecting entry and in-tensity in informal rental Land markets in Southern Ethiopian highlands. *J. Agric. Econ.* **2015**, *30*, 117–118. [\[CrossRef\]](#)
15. Kung, J.K. Off-Farm labor markets and the emergence of land rental markets in rural China. *J. Compar. Econ.* **2002**, *30*, 395–414. [\[CrossRef\]](#)
16. Lerman, Z.; Shangaida, N. Land policies and agricultural land markets in Russia. *Land Use Policy* **2007**, *24*, 14–23. [\[CrossRef\]](#)
17. Pavel, C.; Johan, F.M.S. EU land markets and the common agricultural policy. *Soc. Sci. Electron. Publ.* **2010**, *229*, 1–31.
18. Klaus, D.; Jin, S.Q. The potential of land rental markets in the process of economies development evidence from China. *J. Dev. Econ.* **2005**, *78*, 241–270.
19. Davis, J.; Lopez-Carr, D. Migration, remittances and smallholder decision-making: Implications for land use and livelihood change in Central America. *Land Use Policy* **2014**, *36*, 319–329. [\[CrossRef\]](#)
20. Deng, X.; Huang, J.; Rozelle, S.; Zhang, J.; Li, Z. Impact of urbanization on cultivated land changes in China. *Land Use Policy* **2015**, *45*, 1–7. [\[CrossRef\]](#)
21. Yang, H.X.; Huang, K.; Deng, X.; Xu, D.D. Livelihood capital and land transfer of different types of farmers: Evidence from panel data in sichuan province, China. *Land* **2021**, *10*, 532. [\[CrossRef\]](#)
22. Xu, Y.B. Family support for old people in rural China. *Soc. Policy Adm.* **2001**, *35*, 307–320. [\[CrossRef\]](#)
23. Gutiérrez, R.L.; Hogarth, N.J.; Zhou, W.; Xie, C.; Zhang, K.; Putzel, L. China's conversion of cropland to forest program: A systematic review of the environmental and socioeconomic effects. *Environ. Evid.* **2016**, *5*, 21–42. [\[CrossRef\]](#)
24. Wang, L.S.; Wang, C.P.; Sun, Z.X. Impact of rural-household differentiation on the exit willingness of farmland contracting and management rights. *China Land Sci.* **2015**, *29*, 27–33. (In Chinese)
25. Luo, B.L. Land contract management rights: Analysis of farmers' willingness to withdraw and its influencing factors—Farmers' questionnaire based on Guangdong Province. *Chin. Rural Econ.* **2012**, *6*, 4–19. (In Chinese)
26. Xu, H.Z. Theoretical and empirical research on influential factors of rural land transfer: Based on the perspective of occupation differentiation and pension security mode. *Energy. Proced.* **2011**, *5*, 397–402.
27. Lv, S.J.; Dai, Z.; Sun, J. Social endowment, intergenerational support and land transfer: A research based on CHARLS. *Econ. Survey* **2019**, *36*, 25–31.
28. Coile, C.; Gruber, J. Future social security entitlement sand the retirement decision. *Rev. Econ. Stat.* **2007**, *2*, 234–246. [\[CrossRef\]](#)
29. Liu, T.; Sun, L. Pension reform in China. *J. Aging Soc. Policy.* **2016**, *28*, 15–28. [\[CrossRef\]](#)
30. Michael, T.; Hayden, B.M.; Anne, K. Exploring state pension provision policy for the farming community. *J. Rural Stud.* **2021**, *86*, 262–269.
31. Zhao, G.; Li, F. Non-agricultural employment, social security and farmer's land transfer: An empirical analysis based on 476 farmers in 30 towns and 49 villages. *China Popul. Res. Environ.* **2012**, *22*, 102–110.
32. Chen, X.; Eggleston, K.; Sun, A. The impact of social pensions on intergenerational relationships: Comparative evidence from China. *J. Econ. Aging.* **2018**, *12*, 225–235. [\[CrossRef\]](#) [\[PubMed\]](#)
33. Ko, P.C.; Möhring, K. Chipping in or crowding-out? The impact of pension receipt on older adults' intergenerational support and subjective well-being in rural China. *J. Cross-Cult. Gerontol.* **2021**, *36*, 139–154. [\[CrossRef\]](#)
34. Wu, H.X. The impact of care for grandchildren on the supports for elderly parents of first-generation only-child parents in urban China. *China Popul. Dev. Stud.* **2019**, *2*, 412–429. [\[CrossRef\]](#)
35. Vere, J.P. Social security and elderly labor supply: Evidence from the health and retirement study. *Labor Econ.* **2011**, *18*, 676–686. [\[CrossRef\]](#)
36. Vincent, P.C.; David, M.L. Social security and the retirement decision. *Q. J. Econ.* **1981**, *3*, 505–529.
37. Martin, A.R.S. Endogenous retirement and public pension system reform in Spain. *Econ. Modelling.* **2010**, *27*, 336–349. [\[CrossRef\]](#)
38. Huang, H.W.; Zhan, J.T.; Chen, C. The impact of "NRPS" pension income on the labor supply of rural elderly. *China J. Popul. Sci.* **2014**, *2*, 106–128. (In Chinese)
39. Cheng, J. The effect of old-age security on labor supply. *Econ. Res. J.* **2014**, *10*, 60–73. (In Chinese)

40. Lin, B.X.; Lin, Z.J.; Zhang, Y.Y.; Liu, W.P. The impact of the new rural pension scheme on retirement sustainability in China: Evidence of regional differences in formal and informal labor supply. *Sustainability* **2018**, *10*, 4366. [[CrossRef](#)]
41. Wu, H.S. Factors influencing the agricultural labor participation of rural elderly people—An empirical study based on Jiangsu. *Issues Agric. Econ.* **2008**, *5*, 96–102. (In Chinese)
42. Wang, Q.; Qiu, J.; Yu, J. Impact of farmland characteristics on grain costs and benefits in the North China Plain. *Land Use Policy* **2019**, *80*, 142–149. [[CrossRef](#)]
43. Hong, Z.; Sun, Y. Power, capital, and the poverty of farmers' land rights in China. *Land Use Policy* **2020**, *92*, 104–471. [[CrossRef](#)]
44. Anderson, J.C.; Gerbin, D.W. Structural equation modeling in practice: A review and recommended two-step approach. *Psychol. Bull.* **1998**, *103*, 411–423. [[CrossRef](#)]
45. Edwards, J.R.; Lambert, L.S. Methods for integrating moderation and mediation: A general analytical framework using moderated path analysis. *Psychol. Methods* **2007**, *12*, 1–22. [[CrossRef](#)] [[PubMed](#)]
46. Mackinnon, D.P.; Fairchild, A.J.; Fritz, M.S. Mediation analysis. *Annu. Rev. Psychol.* **2007**, *58*, 593–614. [[CrossRef](#)] [[PubMed](#)]
47. Kristopher, J.P.; Andrew, F.H. Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behav. Res. Methods.* **2008**, *40*, 879–891.
48. Kristopher, J.P.; Derek, D.R.; Andrew, F.H. Addressing moderated mediation hypotheses: Theory, methods, and prescriptions. *Multivar. Behav. Res.* **2007**, *42*, 185–227.
49. Xu, D.; Yong, Z.; Deng, X.; Zhuang, L.; Qing, C. Rural-urban migration and its effect on land transfer in rural China. *Land* **2020**, *9*, 81. [[CrossRef](#)]
50. Wang, Y.H.; Li, X.B.; He, H.Y.; Xin, L.J.; Tan, M.H. How reliable are cultivated land assets as social security for Chinese farmers? *Land Use Policy* **2019**, *90*, 104318. [[CrossRef](#)]