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The Influence of Rural Land Transfer on Rural Households' Income: A Case Study in Anhui Province, China

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Abstract: This paper looks into the impact of China's new rural land reform, the three rights separation policy (TRSP), on Chinese farmers' income. Based on data collected from 360 rural households in Anhui Province, China, 2021, this paper constructed the influence pathways of the TRSP on household income and estimated the effects along different pathways using the structural equation model (SEM) model. It showed that through expanding the planting scale and promoting resource-use efficiency, the new land tenure system can indirectly increase transfer-in household income. However, the TRSP has a significant negative direct effect on transfer-out households' income, and only a slight impact on transferring rural labor to other industries or relaxing the liquidity constraint. In short, the TRSP's effect on income gains is more prominent in transfer-in households than transfer-out ones, which in the long run would lead to an increased income gap, more so if transfer-out households lack easy access to non-farm employment. Our findings suggest that public authorities should respect farmers' autonomy in land transfer decisions and pay special attention to labor transfer in poverty alleviation. Meanwhile, widening income disparities among different groups should be heeded while implementing local governments' service roles.

Keywords: three rights separation policy (TRSP); rural land transfer; household income; structural equation model (SEM) model; Anhui

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1. Introduction

Poverty is one of the most serious challenges facing not just developing countries but the whole world today [1,2]. Eliminating poverty is the constant pursuit of humanity, and at the heart of the 17 sustainable development goals put forward by the United Nations is the eradication of all forms of poverty by 2030 [3]. Though China historically eliminated absolute poverty in 2020 [4] and has made great contributions to the world's poverty reduction, it does not mean that China's poverty problem has been solved. As a relatively poor population in China is concentrated in rural areas [5,6] the focus of China's anti-poverty work will shift to relative poverty [7].

Now that China has embarked on a new phase of relative poverty, higher requirements for establishing long-term national poverty alleviation are necessitated. Since poverty in China is mainly concentrated in rural areas, a series of policies has been implemented by the Chinese government in the past decades to alleviate rural poverty, including increasing

capital accumulation, expanding investment in education, infrastructure, and public service, providing effective insurance and credit, as well as increasing non-agricultural income [8–10].

Being the most basic element of rural development, land is in some cases the most important productive asset of rural households in developing countries [11]. So, the land system reform plays a particularly critical role in alleviating poverty in China [12,13]. In 1978, the Household Responsibility System (HRS) reform defined farmland ownership rights and contracted operation rights, realizing "two rights separation" [14], which terminated the free rider issue and promoted productivity in the agricultural sector [15,16], with the number of people living in poverty decreasing almost by half between 1978 and 1985. It was considered one of the largest increases in economic well-being in the last decades [17]. Along with the achievement of poverty reduction, there are some negative impacts, such as the shrinkage of farmland area, fragmentation of farmland, and a sharp decline in agricultural investment [18–20]. To tackle the mounting problems with the HRS, the Chinese government proposed the "Three Rights Separation Policy" (TRSP) in 2014. Under it, land ownership, land contract, and land management rights co-exist as separate entities (see Figure 1). Separating their management rights from contracting rights facilitated the circulation of land management rights in a wider range and was conducive to the allocation of land resources according to the law of the market [21]. The separation of three rights, from the perspective of policy design, aims to expand rural land rights, open new channels to increase farmers' property income, and transform the poverty alleviation method to stimulate the "hematopoietic" power of endogenous poverty alleviation in rural areas. The land management rights transfer is now an established means to reallocate land resources, promote agricultural modernization, and reduce rural poverty [22,23].

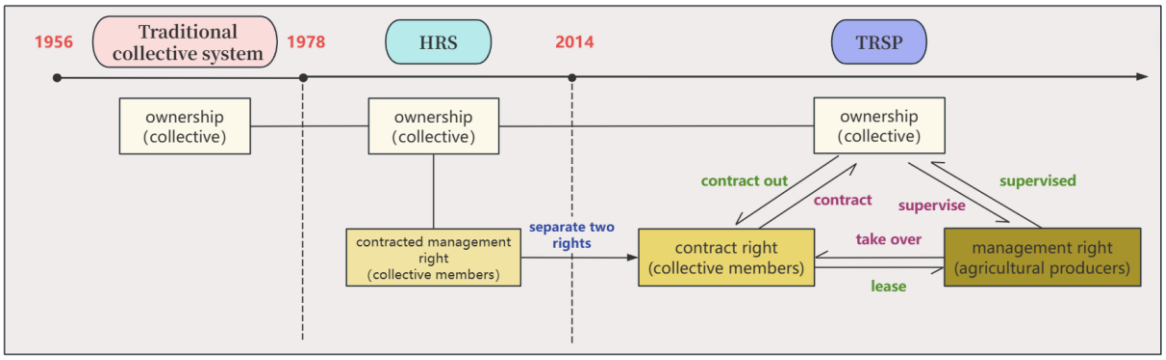


Figure 1. The evolution of the farmland property rights system. Note: Modified from Liu [24] and Xu et al. [25].

The TRSP has been shown to facilitate land transfers in China. After the TRSP, China's agriculture land transfer area increased from 29.78 million hectares in 2015 to 37.13 million hectares in 2023 [26]. In turn, the land transfer promoted large-scale production, with many small farmers transferring out of the agricultural land, and produced new agricultural subjects such as large growers, family farms, agricultural cooperatives, and agribusinesses (agricultural companies). By the end of September 2021, China had more than 3.8 million family farms with an average operation scale of 8.95 hectares, and 2.23 million agricultural cooperatives, driving nearly half of the country's farmers' income [27]. This leads to realistic questions with significant research value for China—can land transfer continue to promote farmers' income under the TRSP? If so, how is this income distributed among rural subjects, and does land transfer help alleviate relative poverty in rural areas?

Unlike the goal of absolute poverty alleviation, which is only to increase the level of total income, relative poverty alleviation also focuses on income gap and income distribution. Scholars have gradually reached a consensus that agricultural land transfer can improve the overall income level of farmers [28,29], but the relative poverty reduction effect is not clear, and the income gap and income distribution among farmers have become a new focus of attention [30–32]. One view is that land transfer is conducive to narrowing the income gap between farmers and alleviating unequal distribution [33–36]. For example, Jin et al. [37] found out that the land rental market can play a crucial role in improving both efficiency and equity in land use and acquisition. Han et al. [38] indicated that the land rental market has been reemphasized as important for providing access to land for the poor and as an efficiency-enhancing institution in uncertain times, especially in transition countries. Similar research conclusions have been obtained from scholars such as Tseng et al. [39], Tan et al. [40], Guo et al. [41], Jiao et al. [42], and Li et al. [43]. However, the other view is that land transfer has exacerbated the inequality of farmers' income to some extent. For instance, Xu et al. [44] pointed out that from the perspective of the income gap, the land transfer intensified the income gap among farmers, and the Gini coefficients of transfer-in households and transfer-out households increased by 49.83% and 24.93%, respectively, compared with that before transfer. Zhang et al. [45] concluded that renting-in land increases income significantly, while renting-out land fails to do so. There are also concerns that land market liberalization can lead to a reconcentration of land and elites so that other interest groups can use the land market as an instrument to reinforce and expand their privileges [46]. Some studies have also critically demonstrated the widespread land appropriation and marginalization of smallholder farmers in land transfer [47–49].

Scholars have discussed the relative poverty reduction effect of rural land transfer, but due to disparity in the research period, area, and methods, a difference exists in the main findings or opinions (Table 1).

Table 1. List of literature on the relationship between rural land transfer and rural households' Income.

Research Period	Research Area or Data Resource	Methods	Main Findings	References
1999–2018	1. Panel data of prefecture-level and above cities in China from 1999 to 2008 2. 2018 China Family Panel Studies (CFPS) data	Unconditional Quantile Treatment Effects Model, Endogenous Regression Model (ERM), Quantile Regression Model (QRM), Difference-in-Differences Model (DID), Propensity Score Matching (PSM)	Land transfer has a general positive effect on rural households' income, and an evident increase effect on the rural middle- and low-income groups, which helps to narrow the income gap. The income effect of farmers with different income levels shows a U-shaped trend and the regional differences are obvious.	[50,51]
2010–2014	1. 2016 CFPS data 2. 2018 CFPS data 3. Typical poverty-stricken counties in Henan, Shandong, Sichuan, Hunan, and Gansu Province 4. 2014 and 2018 CFPS data	PSM, Ordinary Least Square, Generalized Propensity Score	Rural land transfer can reduce rural residents' vulnerability to poverty.	[52–55]
2013–2016	1. Shandong, Henan and Anhui Province 2. Data from 14 provinces (including Shanxi, Henan, Anhui, etc.)	PSM, Re-centered Influence Function	Land transfer promotes the overall income of farmers but intensifies the income gap among farmers.	[56,57]
2013–2019	1. 2014, 2016, and 2018 China Labor-force Dynamics Survey (CLDS) data 2. 6 provinces in the West of China (including Yunnan, Gansu, Guizhou, etc.)	PSM, Literature Analysis, Logic Analysis, Policy Text Analysis	Land transfer promotes farmers' overall income and non-agricultural income, but the impact of agricultural land outflow on non-agricultural income is much lower than that of inflow on agricultural income.	[58,59]

Table 1. *Cont.*

Research Period	Research Area or Data Resource	Methods	Main Findings	References
2014–2019	1. Guanyun and Jinhu County in the north of Jiangsu Province 2. 6 provinces in the Eastern and Middle China 3. Yunnan Province 4. 2014 and 2016 CLDS data	QRM, ERM, PSM, Logistic Regression Model	Land transfer has brought significant income increases to the flow-in households, and the income of the flow-out households has not increased significantly. The effect on the income of different types of farmers is very different, and there are obvious regional differences in the eastern, central, and western regions.	[60–63]
2014–2024	1. 5 cities in Hunan Province 2. 9 counties in Eastern Hubei Province 3. 2018 CFPS 4. 2018 CFPS	PSM, Multiple Linear Regression, Gini Coefficient Measurement	Land transfer has effectively increased the per capita total income of rural households participating in the transfer, and the growth rate of per capita income of households transferring out is higher than that of households transferring in.	[64–67]
2017–2019	1. Lanxi County in Heilongjiang Province 2. China Rural Household Panel Survey data from 22 provinces	PSM	The more farmland is transferred out, the better it is to get rid of poverty. The effect of farmland area on the poverty of peasant households is U-shaped.	[68,69]

These contrasting results suggest that there is a need to re-examine the impact of the TRSP on rural household income in China. This is because, firstly, in terms of research time and region, previous studies focused on south-central or south-eastern China, as well as the early stage of China's rural land renting market [51,62]. The TRSP was enacted in 2014 as an entirely new land rights system in China, but agricultural land transfer has acquired new characteristics after its emergence. This means the empirical studies to capture the income effect of this new agricultural policy should be abundant. Secondly, many existing studies have proven that land transfer can promote an increase in farmers' overall income, but the impact of the income gap among farmers is still controversial. There has been an obvious neglect of farmers as a relatively homogeneous entity, because previous studies focused on the gap between transfer-in households and transfer-out households regarding the land transfer effect on agricultural income, non-agricultural income, and property income [68,69]. In addition, the impact mechanism of the TRSP on rural households' income has not been analyzed in any depth, and the path of how land transfer affects farmers' income remains to be examined.

Therefore, this study tries to fill these gaps by exploring impact mechanisms and provides theoretical and practical insights into the TRSP's impact path on different types of farmers' incomes. In this paper, an integrative structural equation model (SEM) was used to analyze the complex relationships between the TRSP and household income, based on household survey data from Anhui Province, China in 2021. The main research aims are (1) to measure the impact of the new round of agricultural land system reform on incomes of transfer-in and transfer-out households separately; and (2) to understand the contribution and influence path of the TRSP on relative poverty alleviation. The innovations of this study reveal significant differences in the impact of land transfer on different farmers' incomes, as well as the pathways through which the impacts work, which helps to understand the complexity and nuances of rural land reform policies. The study contributes to the existing literature by not only discussing the positive impact of rural land transfer but also focusing on the risk of widening the income gap, which is an important supplement to the previous literature, particularly in the context of China's ongoing agricultural land system reform. In short, the results can more accurately evaluate the ongoing farmland transfer policy on rural households' income and relative poverty alleviation, provide experience for policy optimization, and provide a reference for the promotion and improvement of land market reforms in other developing countries.

The remainder of this paper is organized as follows: Section 2 proposes a theoretical framework; Section 3 presents the study area, dataset, model specifications, and estimation strategies; Section 4 presents empirical results, followed by further discussion and policy recommendations in Section 5. The final Section 6 draws conclusions.

2. Theoretical Hypotheses

We divided land transfer into two types—land transferred-in and land transferred-out—so there are two types of farm households accordingly: those with transfer-in land, and those with transfer-out land. Land transfer has direct and indirect impacts on households' income (Figure 2).

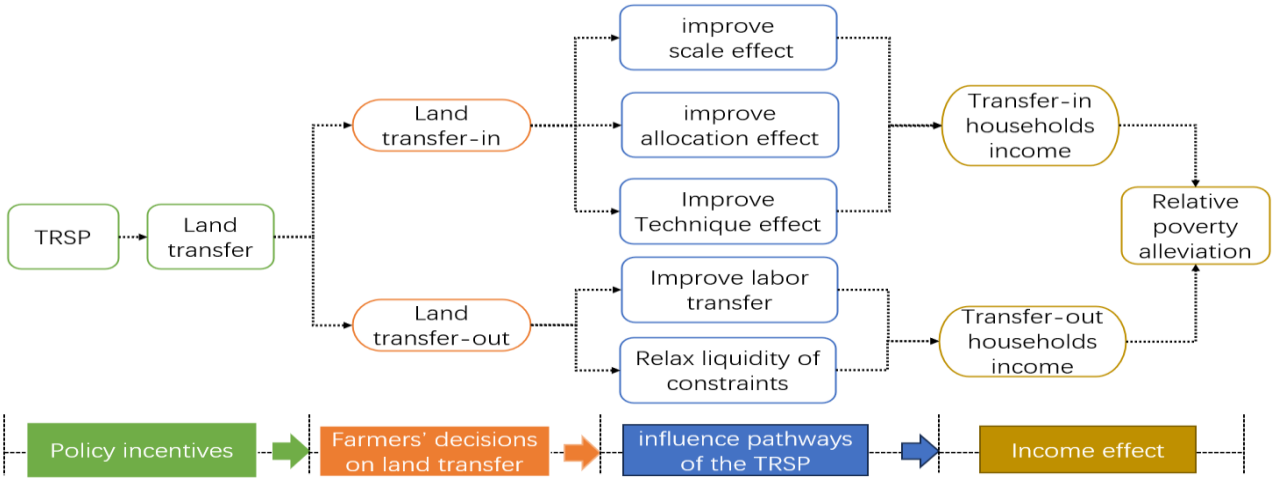


Figure 2. The mechanism of how land transfer affects household income.

2.1. The Effects of the TRSP on Transfer-In Households

The most likely effects of land transfer on transfer-in households' income are the following:

(1) *Direct effect on transfer-in households' income.* The land transfer subsidy is a special subsidy policy to promote orderly land transfer, appropriate scale management of agriculture, and increase rural household income. Therefore, it is a major direct contributor to income increase in transfer-in households.

(2) *Indirect effect (Scale effect) on transfer-in households' income.* Under the HRS, land is often reallocated according to demographic changes [70]. The TRSP is an approach to encourage land transfer, solve the problem of fragmented rural land, optimize land resource allocation, and promote the agricultural economy. In China, agricultural land scale management is a necessary precondition for using intensive technology and applying modern agriculture [71]. The TRSP helps farmers with higher agricultural productivity to transfer in land and expand the scale of land management. Also, with the implementation of the TRSP, stable land operation rights enable farmers to obtain mortgage loans for agricultural production, which will help increase agriculture input and income [72].

(3) *Indirect effect (allocation effect) on transfer-in households' income.* The allocation effect mainly refers to promoting the optimal allocation of the land, labor, and capital resources of households. Some studies provide empirical evidence on the allocative efficiency and agricultural productivity impact of the land rental market [73,74]. A land rental market can increase allocative efficiency by equalizing the marginal product of land across households with different endowments. Then, households remaining in agriculture can consolidate farmland and specialize in agricultural production and, hence, obtain a higher increase in

both land and labor productivity [75]. Thus, land transfer can encourage resource allocation efficiency and boost agricultural income.

(4) *Indirect effect (technique effect) on transfer-in households' income.* The technological changes resulting from land transfer mainly manifest in three aspects: (1) labor-saving technologies (mechanization) [76]; (2) land-saving technologies (new products) [77]; and (3) field management technologies (new types of professional farmers) [78,79]. Therefore, land transfer is a method for cultivating new professional farmers who would adopt new technology and expand on-farm income.

Consequently, the total income effect, the aggregate of the direct and indirect effects of land transfer-in on household income is expected to be positive if the actual growth of farm revenue is higher than the payment for transfer-in land.

Overall, we hypothesize the following:

H1. *Participation in the TRSP has had a positive direct impact on household income.*

H2. *The TRSP has a positive indirect effect on household income through its induced impact on promoting larger-scale operations.*

H3. *The TRSP has had an indirect effect on household income through its positive influence on improved allocation efficiency.*

H4. *The TRSP has had an indirect effect on household income through its positive influence on improving technological efficiency.*

2.2. The Effects of the TRSP on Transfer-Out Households

The most likely effects of land transfer on transfer-out households' income are as follows:

(1) *Direct effect on transfer-out households' income.* Farmland transfer compensation is for the agricultural income loss caused by transferring land management rights, so it has a major direct impact on transfer-out household income. If the compensation is larger than the opportunity cost caused by the agricultural production method changing, then land transfer has a positive impact on household income.

(2) *Indirect effect (labor transfer) on transfer-out households' income.* The TRSP has significantly accelerated large-scale agricultural land transfer [80], thus greatly promoting levels of household part-time employment (a transition from traditional 'smallholder' farmers to agricultural employees, or secondary and tertiary industrial workers) and significantly increasing their wage income [81]. Several studies noted that better off-farm employment opportunities and well-functioning land rental markets are dominant mechanisms for enhancing household incomes and increasing productivity, especially in poor rural areas [75,82]. The fact is that farmers' livelihoods have increasingly become dependent on non-agricultural activities in China in the last two decades [83].

(3) *Indirect effect (relax liquidity constraints) on transfer-out households' income.* Rural households in developing countries suffer from high transaction costs, "imperfect institutions", and other market regulations, China being no exception. As a result, they might be restricted in their choice of production activities and off-farm employment [84]. Some scholars revealed that the land rental market has loosened the household liquidity constraint, allowing laborers to be reallocated to off-farm employment and other business sectors [75]. In addition, off-farm activities allow households to diversify their sources of income, thus overcoming credit constraints [85,86].

The total effect of land transfer on transfer-out household income will be positive if the farmland transfer compensation and the growth of off-farm income is higher than the decreased agricultural income.

So, we propose the following:

H5. *Participation in the TRSP has a positive direct impact on household income.*

H6. *The TRSP has a positive indirect effect on household income through its induced impact on labor transfer.*

H7. *The TRSP has an indirect effect on household income through its positive influence on relaxing liquidity constraints.*

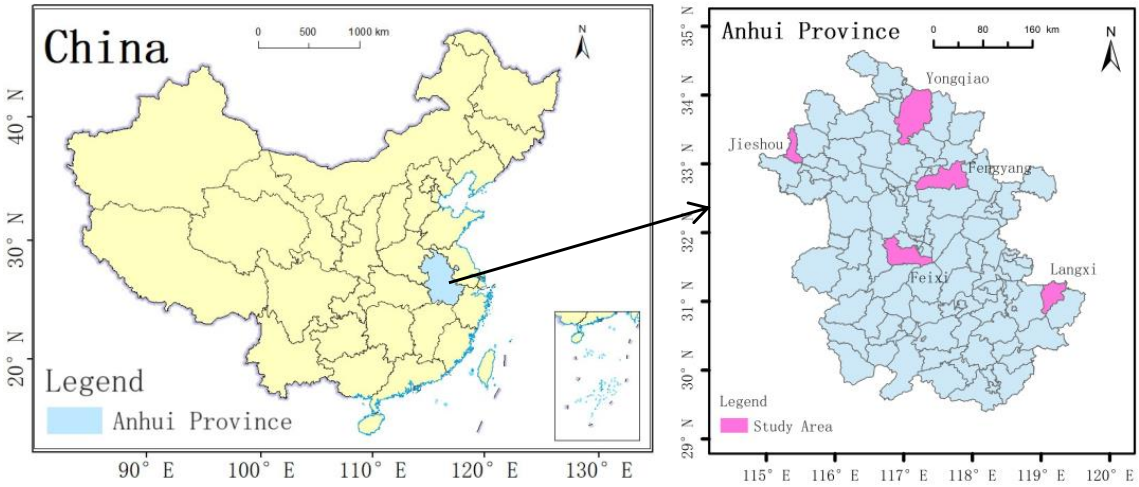
3. Data and Methods

3.1. Study Site and Data

Anhui is well-suited for research on land rights reform and rural household's income. First of all, it occupies a vital position in the process of rural land rights reform. The HRS dates back to the 1970s in an Anhui village—Xiaogang Village, with Anhui being one of the first provinces to carry out the trial of the TRSP. HRS practice in Anhui Xiaogang Village is a milestone in China's rural land rights reform, which has not only greatly improved Anhui's agricultural production capacity but also narrowed the gap between farmers' income levels in different regions of China [14]. Meanwhile, Anhui is also one of the first provinces to carry out a trial of the TRSP and has accumulated rich practical experience and a solid policy foundation. Secondly, there is a significant income gap between urban and rural residents in Anhui. The disposable income of rural residents in Anhui is CNY 511 lower than that of the whole country, and the urban–rural income ratio was 1:2.37 in 2020 (data source: Anhui Provincial Bureau of Statistics). Finally, Anhui is not only a major province in terms of grain production but also a major province in terms of land transfer. Anhui is China's major agricultural province and the fourth-largest grain-producing province, accounting for about 6% of the country's annual grain output. In 2020, the area of cultivated land transfer in Anhui is 2.71 million hectares, and the transfer rate is 50.5%, which is 10% higher than that of the whole country (data source: Anhui Provincial Department of Agriculture and Rural Affairs). The system design of the TRSP is intended to maximize the efficiency of agricultural development from the margin by promoting the confirmation of land contracting rights and activating land management rights, to increase farmers' property income, and to provide a guarantee for national food security. Therefore, the TRSP in Anhui plays an indispensable role in the reform of rural land rights in China and in ensuring China's food security.

Based on the land transfer of the study area and stratified random sampling strategy, the household survey data used in this study were gathered from the North (Jieshou City, Yongqiao County), Central (Fengyang County, Feixi County), and South (Langxi County) of Anhui Province in July and August of 2021 (Figure 3). These four counties are evenly distributed in Anhui and have similar agricultural production conditions and social and economic development levels, which can eliminate the interference caused by different geographical distribution differences. According to the principle of stratified random sampling, where 2 towns were selected from each county, 3 villages were selected from each town, and 14–16 households participating in land transfer were selected from each village. The questionnaire includes household characteristics, farming activities, non-farming/business activities, income and assets, and TRSP participation. Removing questionnaires with invalid or incomplete information, this research collected a total of

360 valid samples, including 60 transfer-in households and 300 transfer-out households. Considering possible recall bias and/or missing information, face-to-face interviews were conducted with the household heads or a member of the family who was familiar with farm activities.



(**a**) Map of Anhui Province in China (**b**) The study area in Anhui Province

Figure 3. Map of the study area.

3.2. SEM-Model Specification

A structural equation model (SEM) was specified to test the proposed hypotheses using household survey data from Anhui Province. SEM, which consists of a measurement model and a structural model, is a method to establish, estimate, and test causality by analyzing the relationship between variables based on the covariance matrix of variables. This model helps to calculate the direct and indirect effects that cannot be distinguished in correlation analysis and is an important tool for multivariate data analysis [87,88]. Based on the proposed hypothesis, factors affecting farmers' income, namely the possible outcomes of TRSP's implementation, are the scale effect, the allocation effect, the technique effect, the labor transfer, and the liquidity constraint. Therefore, the direct, indirect, and overall impacts of the TRSP on household income can be detected and decomposed through the identification pathways (Figure 4).

The econometric equations corresponding to Figure 4 are given as the following:

$$SE = \beta_{2a} \times TRSP + \xi_{2a} \quad (1)$$

$$AE = \beta_{3a} \times TRSP + \xi_{3a} \quad (2)$$

$$TE = \beta_{4a} \times TRSP + \xi_{4a} \quad (3)$$

$$HI_{transfer-in} = \beta_{1a} \times TRSP + \beta_{2b} \times SE + \beta_{3b} \times AE + \beta_{4b} \times TE + \xi_{1a} \quad (4)$$

$$LT = \beta_{6a} \times TRSP + \xi_{6a} \quad (5)$$

$$RLC = \beta_{7a} \times TRSP + \xi_{7a} \quad (6)$$

$$HI_{transfer-out} = \beta_{5a} \times TRSP + \beta_{6a} \times LT + \beta_{7a} \times RLC + \xi_{5a} \quad (7)$$

where $TRSP$, SE, AE, TE, LT, RLC, and HI represent the latent variables—the TRSP participation, the scale effect, the allocation effect, the technique effect, the labor transfer, the liquidity constraint, and household income; β_{1a-7a} and β_{1b-7b} are regression coefficients; ξ_{1a-7a} are measurement errors.

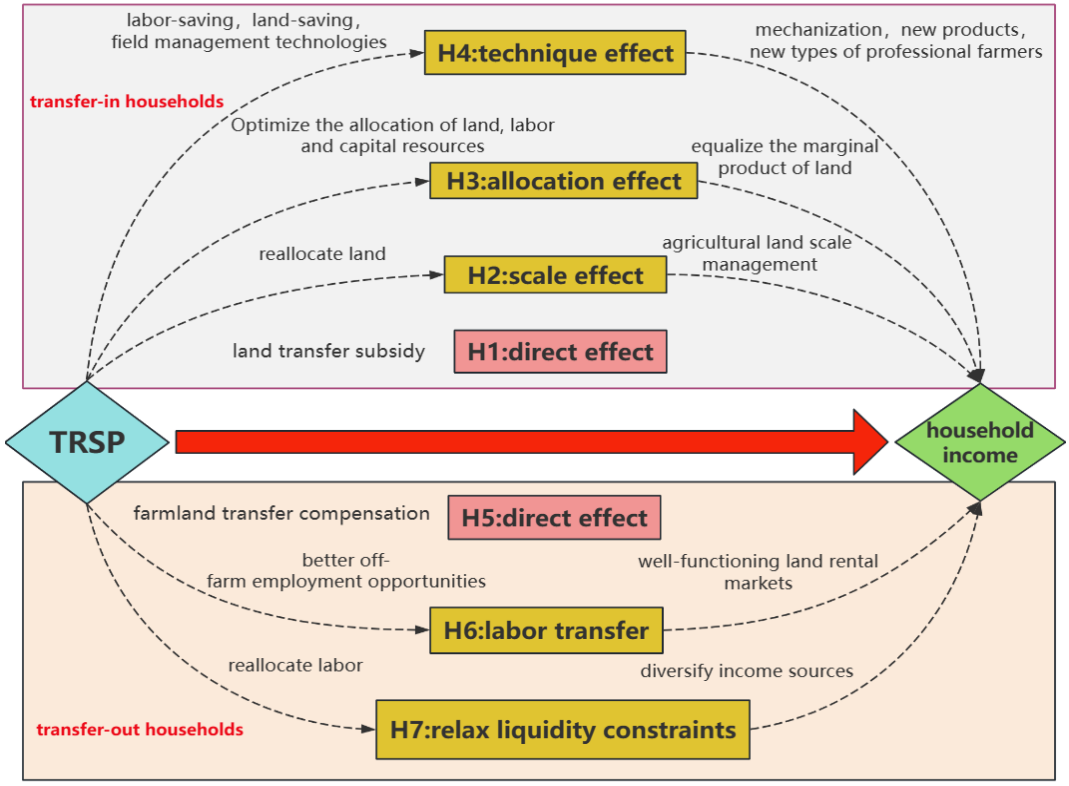


Figure 4. Theoretical framework and research hypotheses as to the influence of the TRSP on households' income.

3.3. Descriptions of Variables

Based on theoretical analysis, appropriate indicators were chosen to represent the following latent variables: the TRSP participation, scale effect, allocation effect, technique effect, labor transfer, liquidity constraint, and household income.

As is mentioned above, land transfer is a crucial aspect of the TRSP. So, in the following analysis, land system reform will be regarded as land transfer. We use the agricultural land transfer variables, such as land transfer area, land transfer period, land transfer mode, and land transfer subsidy (transfer-in households)/compensation (transfer-out households) to characterize the TRSP at the practical operation level [89]. The dependent variable considered in this study refers to household income. Grain crops income, economic crops income, and total income as measures of transfer-in households' income, and off-farm income, transfer income, and total income as measures of transfer-out households' income.

The latent variables include the following: seeded area, family agricultural labor time, and family agricultural capital investment measures of scale effect [90]; the ratio of land output, labor output, and capital output as measures of allocation effect [91]; the ratio of mechanized farming, improved variety, and technical training as measures of technical effect; the number of non-farmers, off-farm working time, and ratio of non-farmers to family laborers as measures of labor transfer; and social capital, borrowing capital, fixed productive assets, living consumption as measures of relaxation of the liquidity constraint [92]. Table 2 shows the descriptive statistics of these variables.

Table 2. Descriptive statistics of transfer-in households and transfer-out households. (All figures are sample means. Unless otherwise specified, the data come from the author's survey in Anhui Province in 2021).

	Transfer-In		Transfer-Out	
	Mean	**Std.**	**Mean**	**Std.**
Three Right Separation Policy				
Land transfer area (ha)	13.31	29.45	0.58	0.47
Land transfer period (year)	5.92	5.14	12.24	6.91
Land transfer mode (=1 if land transfer is led by local government; =0 if land transfer is led by rural households)	0.87	0.34	0.30	0.46
Land transfer subsidy/compensation (CNY)	4981.17	24,645.78	1107.19	3951.98
Scale effect				
Seeded area (ha)	25.43	59.18		
Family agricultural labor time (person-day)	475.75	554.98		
Family agricultural capital investment (CNY)	187,533.11	462,376.01		
Allocation effect				
Ratio of land output (%)	2,319,404.93	3,636,945.18		
Ratio of labor output (%)	184,029.96	4228.15		
Ratio of capital output (%)	303.51	2.32		
Technical effect				
Ratio of mechanized farming (%)	92.53	0.73		
Improved variety (=1 if households improve variety after land transfer; =0 otherwise)	0.63	0.49		
Technical training (=1 if households participated in technical training after land transfer; =0 otherwise)	0.48	0.50		
Labor transfer				
Number of non-farmers (person)			1.69	1.62
Off-farm working time (person-day)			297.75	430.51
Ratio of non-farmers to family laborers (%)			52.63	0.46
Relaxation of the liquidity constraint				
Social capital (=1 if the household member now is or once was a leader of village; =0 otherwise)			284.75	4522.02
Borrowing capital (=1 if the household can borrow from banks, friends, relatives, or others; =0 otherwise)			0.10	0.30
Fixed productive assets (CNY)			3743.43	8589.11
Living consumption (CNY)			14,005.40	36,626.91
Household incomes				
Off-farm income (CNY)			26,510.10	47,853.13
Transfer income (CNY)			7160.50	16,526.58
Grain crops income (CNY)	469,995.90	1,082,699.37		
Economic crops income (CNY)	21,472.33	84,965.84		
Total income (CNY)	512,202.18	1,069,680.80	48,080.75	180,046.51

Notes: (1) Since the survey was conducted in 2021, the results represent the situation in 2020, such as their income and consumption. (2) Family agricultural labor time refers to household members' working days in one year in agriculture; Family agricultural capital investment refers to how much money household members spent in agriculture in one year. (3) Ratio of land output = agricultural output in one year/seed area × 100%; Ratio of labor output = agricultural output in one year/family agricultural labor time × 100%; Ratio of capital output = agricultural output in one year/family agricultural capital investment × 100%. (4) Ratio of mechanized farming = area of machine-cultivated land/seed area × 100% (5) Number of non-farmers refers number of household members who have a non-farm job; Off-farm working time refers to how many days they work off-farm in one year; Ratio of non-farmers to family laborers = non-farm laborers/total number of labors in the family × 100% (6) Fixed productive assets refer agricultural machines, cars, and others; Living consumption refers the money that households spent on foods, clothes, housing, transportation, and others. (7) According to the production/employment activities in the study area, household income consists of on-farm income, off-farm income, and property income. Property income in the study area mainly refers to the rental income obtained from the transfer-out land.

4. Results

The estimated results are reported in Supplementary Materials (Tables S1 and S2). Similar to other studies [93], this study selected $\chi 2$, degree of freedom (Df), goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), and root mean square error of approximation (RMSEA) for evaluating the models. The transfer-in model fitting indexes are $\chi 2/Df = 3.400$, GFI = 0.645, AGFI = 0.503, and RMSEA = 0.202. The transfer-out model fitting indexes are $\chi 2/Df = 1.964$, GFI = 0.937, AGFI = 0.909, and RMSEA = 0.057. These indexes indicate that the model fit is good, but the CFI and the NFI of the transfer-in model indicate that the model can still be improved with a larger sample size.

Our empirical results are not totally consistent with our hypotheses. The estimated income effects of the TRSP through direct and indirect pathways were estimated.

4.1. The Effect of the TRSP on Transfer-In Households

Table 3 shows the results of transfer-in households. The TRSP has a direct positive influence on households' income, though the effect is insignificant with a path coefficient of 0.00. So H1 is false, indicating that land transfer subsidies have a very weak impact on household income improvement. Further, participation in the TRSP has positively affected the scale of operation, with a path coefficient of 1.01. The scale effect has, in turn, positively affected households' income with a path coefficient of 0.58 and is significant at the level of 1%. That is, the TRSP has an indirect effect on household income through scales of operation. This confirms our hypothesis H2. Approximately 59% of household income gains are attributed to the indirect effect of the TRSP through the scale effect.

Table 3. Estimated income effects of TRSP on transfer-in households under different pathways.

Hypothesis	Path Relations	Estimate ß (*p*)	Text Result
	Direct effect		
H1	TRSP→HI	0.00	False
	Indirect effect		
H2	TRSP→SE	1.01 **	
H2	SE→HI	0.58 ***	
	TRSP→SE→HI	0.59	Tenable
H3	TRSP→AE	0.38 **	
H3	AE→HI	0.65 ***	
	TRSP→AE→HI	0.25	Tenable
H4	TRSP→TE	0.52 **	
H4	TE→HI	−0.02	
	TRSP→TE→HI	−0.01	False
	Total effect	0.83	

Notes: (1) Arrows indicate the direction of causation. (2) *, **, *** respectively represents the significant tests for bilateral $p < 0.1, 0.05, 0.01$.

Participation in the TRSP has improved the allocation resource efficiency, with a path coefficient of 0.38. The improved resource allocation efficiency has led to a positive influence on households' income, with a path coefficient of 0.65. Thus, the indirect effect of the TRSP on households' income through the allocation effect is 25%. Therefore, our H3 is acceptable.

The TRSP also can engender a significant technical effect (ß = 0.52), but household income has not risen with the improved techniques (ß = −0.02). The indirect effect of the TRSP on households' income through technical effect is −1%. Thus, H4 is not acceptable. It shows that the TRSP has improved farmers' planting technology but has failed to transform technology into income.

The direct effect of the TRSP on transfer-in households' income is weak, but the indirect effect of the policy is greater than its direct effect, mainly because the TRSP's role in expanding the scale of operations and optimizing resource allocation has led to an overall positive effect on households' income. The TRSP's total effect on households' income is 83%.

4.2. The Effect of the TRSP on Transfer-Out Households

Table 4 shows the results of transfer-out households. Firstly, the TRSP has a direct negative and significant influence on households' income, with the standard factor loading of 0.39. It shows that land transfer compensation cannot make up for the loss caused by lost land management rights. Thus, hypothesis H5 is rejected.

Table 4. Estimated income effects of the TRSP on transfer-out households under different pathways.

Hypothesis	Path Relations	Estimate ß (*p*)	Text Result
	Direct effect		
H5	TRSP→HI	−0.39 ***	False
	Indirect effect		
H6	TRSP→LT	0.22	
H6	LT→HI	0.37 ***	
	TRSP→LT→HI	*0.08*	Tenable
H7	TRSP→RLC	0.68	
H7	RLC→HI	1.00	
	TRSP→RLC→HI	*0.68*	Tenable
	Total effect	*0.37*	

Notes: (1) Arrows indicate the direction of causation. (2) *, **, *** respectively represents the significant tests for bilateral $p < 0.1, 0.05, 0.01$.

Second, the TRSP promotes the transfer of surplus rural labor (ß = 0.22), and labor transfer could significantly increase household income (ß = 0.37). Meanwhile, the TRSP indirectly increases 8% of households' income by labor transfer, which confirms our hypothesis H6.

Again, the TRSP can help by relaxing the liquidity constraint of households (ß = 0.68) and thus making a positive contribution to households' income (ß = 1). The TRSP indirectly increases 68% of household income by relaxing the liquidity constraint, indicating that hypothesis H7 is acceptable.

Finally, the TRSP can have direct negative effects on transfer-out households' income, but it increases household income indirectly by labor transferring and relaxing liquidity constraints. The results also show that the indirect effects of the policy are stronger than its direct effect. It should be noted that the percentage of households' income attributable to the TRSP is still 37%.

4.3. Robustness Test

Drawing on existing research to test the robustness of the regression results, we altered the variable, taking the logarithm of income to re-estimate the model (Table 5). In addition to the variable substitution method, methods such as eliminating missing variables (Table 6) that may increase the value of unusual data were also carried out for calculation [94,95]. The regression results show no significant changes in direction or significance except for the difference in coefficient size, indicating that the research results in this study are robust.

Table 5. Robustness of the regression results (take the logarithm of income).

Path Relations	Transfer-In Estimate ß (*p*)	Path Relations	Transfer-Out Estimate ß (*p*)
Direct effect		***Direct effect***	
TRSP→HI	0.03	TRSP→HI	−0.34
Indirect effect		***Indirect effect***	
TRSP→SE	0.87 ***	TRSP→LT	0.21 ***
SE→HI	0.76 ***	LT→HI	0.37 ***
TRSP→SE→HI	0.66	TRSP→LT→HI	0.08
TRSP→AE	0.36 **	TRSP→RLC	0.76 **
AE→HI	0.45 **	RLC→HI	0.69
TRSP→AE→HI	0.10	TRSP→RLC→HI	0.52
TRSP→TE	0.48	***Total effect***	0.26
TE→HI	−0.02		
TRSP→TE→HI	0.00		
Total effect	0.76		

Notes: (1) Arrows indicate the direction of causation. (2) *, **, *** respectively represents the significant tests for bilateral $p < 0.1, 0.05, 0.01$.

Table 6. Robustness of the regression results (eliminating missing variables).

Path Relations	Transfer-In Estimate ß (*p*)	Path Relations	Transfer-Out Estimate ß (*p*)
Direct effect		***Direct effect***	
TRSP→HI	0.01	TRSP→HI	−0.38
Indirect effect		***Indirect effect***	
TRSP→SE	0.62 ***	TRSP→LT	0.22
SE→HI	0.65 ***	LT→HI	0.37 ***
TRSP→SE→HI	0.40	TRSP→LT→HI	0.08
TRSP→AE	0.45 **	TRSP→RLC	0.67
AE→HI	0.68 ***	RLC→HI	1.00
TRSP→AE→HI	0.30	TRSP→RLC→HI	0.67
TRSP→TE	0.93 **	***Total effect***	0.37
TE→HI	−0.05		
TRSP→TE→HI	−0.04		
Total effect	0.67		

Notes: (1) Arrows indicate the direction of causation. (2) *, **, *** respectively represents the significant tests for bilateral $p < 0.1, 0.05, 0.01$.

5. Discussion

5.1. The Impacts of the TRSP on Households

For transfer-in households (Figure 5), the TRSP has a direct positive effect on farmers' income, but this effect is minor. This can be explained as follows. Not every transfer-in household can obtain a subsidy from the local government, as only projects with a certain spatial or investment scale are eligible for applying for subsidies. In our survey, only 18.33% of transfer-in households received a subsidy. This is consistent with the findings of Huang et al. [96] and Yi et al. [97], which reported that the grain subsidies mostly went to the land contractor rather than the cultivator, while machinery-purchase subsidies are received by only a small fraction of farmers. Therefore, the subsidies have a limited effect on farmers' income. Nevertheless, it should be pointed out that our results do not mean to deny subsidies as an important means to improve household income. However, they do reveal the limitations of the subsidy policy. To further optimize the policy, barriers to entry to the TRSP should be reduced so as to create a more inclusive environment in which poorer farmers can enter and gain more from the program. In the meantime, the TRSP increases transfer-in household income by expanding the scale of operation and improving allocation efficiency. The TRSP also can have significant technical benefits, but household income has not risen with the technical improvements. Our results are in line with Peng et al. [98], who pointed out that the most important source of income growth of land flow-in farmers is the cultivated land area with a contribution rate of 43.75%. Chavas et al. [99] also found that participation in the land rental market has no effect on technical efficiency but has a large positive effect on allocative efficiency. One possible reason is that most technical improvements may save labor and land, such as mechanization and crop rotation, but they leave no direct impact on income. Furthermore, it usually takes a long time to translate technical improvements into income increases. For example, Wang et al. [100] found that if the scale of agricultural production expands, farmers are more willing to take on new farming strategies such as sowing high-yield crops and improving soil quality.

For transfer-out households (Figure 5), the TRSP has directly negative effects on household income, but it increases household income indirectly by transferring labor and relaxing liquidity constraints. One of the main purposes of the land reform is to increase farmers' income by refining farmland property rights [101]; however, in our survey, the results show that land transfer compensation itself cannot compensate for the loss caused by losing land management rights. Our findings are consistent with those of Min et al. [102] and Kijima et al. [103], which point out that farmers' property income, such as land rental

income, is unstable due to irregular land transfer procedures and immature rural land transfer markets. If the loss in farm income exceeds the increase in off-farm income plus transfer income, the transfer-in households will suffer a drop in total income. Therefore, the off-farm income is playing an increasingly significant role in total income in the transitional period of China. Removing barriers to labor mobility is extremely important for transfer-out households. Without off-farm employment, rural poverty and inequality would have been much more serious. This also indicates that rural income gaps have widened under the TRSP.

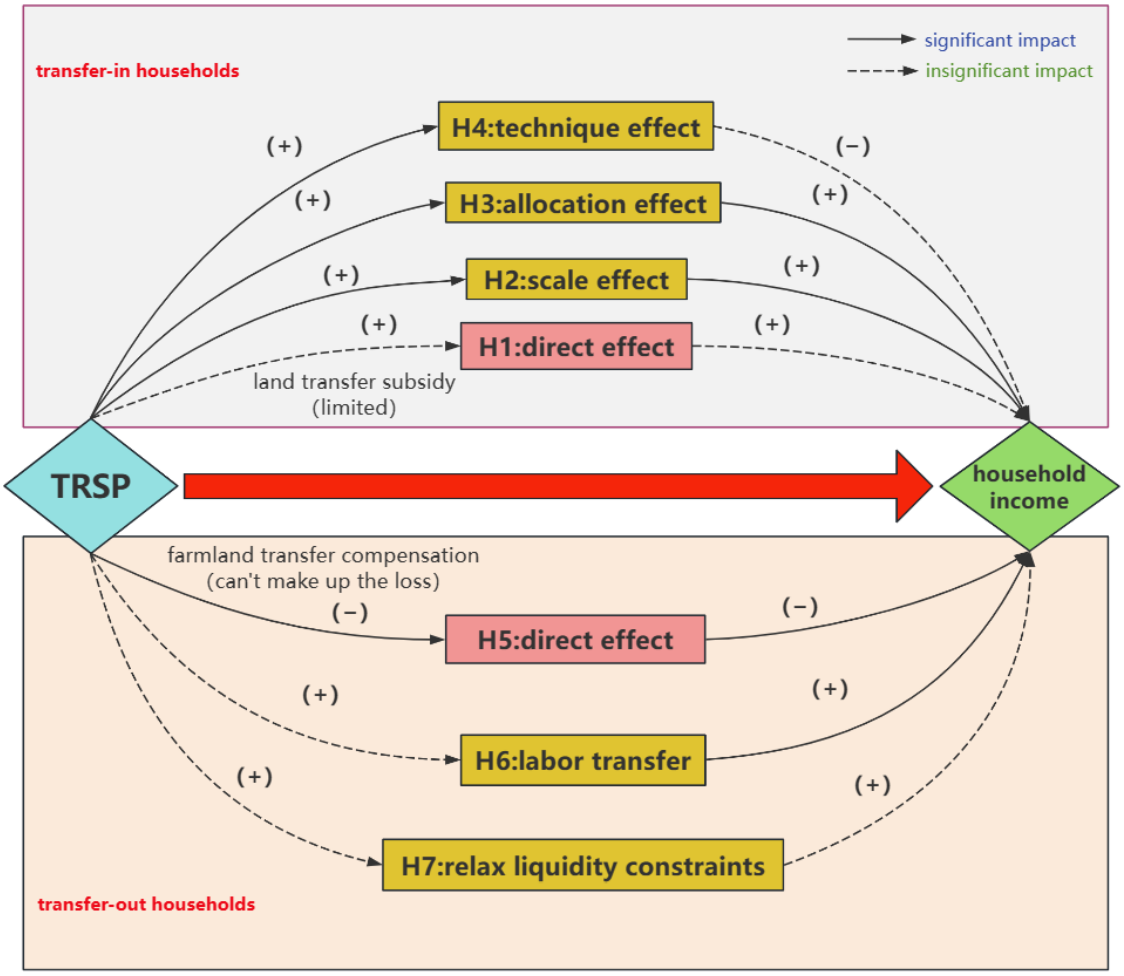


Figure 5. The impacts of TRSP on households.

5.2. Policy Suggestion

After analyzing the results of the study, several policy implications can be drawn.

5.2.1. Respect Farmers' Autonomy in Land Transfer Decisions and Emphasize the Role of Labor Transfer in Poverty Alleviation

The finding that transfer-out households experience negative directive income effects implies that local governments should pay more attention to the autonomy of rural households in making land transfer decisions. Our survey results indicate that some households, particularly in poorer regions, did not want to rent their land out. These are usually large households with older individuals with no other employment ability. Some villages, keen to increase village collective income and build up their image by undertaking land transfer projects, strongly persuaded or even forced farmers to rent land out while showing them

little respect. These farmers, same as the landless farmers caused by land acquisition, became new landless farmers due to imposed land transfer.

Past academics show that rural labor's migration into cities contributes to the increase in household income and socioeconomic development as well as the transformation of production and lifestyle in poor areas [104–106]. Our results also support the idea that land transfer only increases labor output under the premise of reasonable settlement of rural surplus labor [107]. Therefore, more policy measures to promote labor transfer and to relax liquidity constraints should be devised.

5.2.2. Beware Widening Income Disparities Among Different Groups

Our results indicate that the TRSP led to larger income gains for transfer-in households than transfer-out ones. The government needs to be careful to avoid letting the TRSP become a profit tool for officials and capitalists. Without good access to non-farm employment for transfer-out households, the enforcement of the TRSP can be dangerous to the economy in the long run. As noted by Geng et al. [108], participation in the farmland rental market significantly increased the income of renting-in households, while it decreased the income of renting-out households, which might be a result of the temporary lag effect of the land system reform. As Han et al. [38] discussed, land transfer may be captured by elites and other interest groups as an instrument for reproducing and reinforcing privileges. According to a 2014 Anhui provincial government estimation, large grain growers managing an area of over 100 mu could achieve twice the labor productivity of ordinary farm households, and a five percentage points higher ROI (Return on Investment) rate than that managed by an individual [109]. Therefore, the government should attend to the growing inequality in the rural land rental market, taking measures to better the income distribution mechanism and increase farmers' income lest the income gap be further widened.

5.2.3. Strengthen the Service Role of Local Governments

In addition, land transfer practices in recent years demonstrate that the policies should be optimized to be more targeted for farmers who are actively employed in the agricultural sector, and local governments should assume the new role as service providers. Firstly, the agricultural service system needs to be further improved so that it can serve as moderate-scale operators. For example, the "social service organization + farmers" model of the Songjiang can infuse small-scale agricultural entities with vitality and competitiveness [110]. Secondly, the government should strengthen the work of information services, through the implementation of the "Internet + agricultural government services" model, to break information barriers and promote rational and optimal allocation of agricultural land resources. Finally, the government should tighten the control of agricultural land use and supervise the agricultural land market. On the one hand, non-grain and non-agricultural behavior that changes the use of agricultural land is prevented to ensure national food security. Lastly, the agricultural land market should be properly supervised to avoid unreasonable market transactions that infringe on the legitimate rights and interests of farmers.

5.3. Limitations and Future Research

A major limitation of our study is that we could not interview transfer-in households that rented land. Due to the large scale of agricultural land operated by transfer-in households (the average operation scale of transfer-in households in this survey is 13.31 hectares), the number of transfer-in households is smaller and more dispersed than that of transfer-out households. There are often only a few transferred households in a village, and it is more difficult to interview them. According to the Third National Agricultural Census data of China, more than 90% of households in China operate less than

1 hectare of agricultural land [111]. The constantly rising operation costs dictate that profit is more probable with a considerable scale of agricultural land, explaining why agricultural land transfer households tend to operate on a large scale, and why the agricultural land transfer-out households far outnumber the transfer-in ones. The proportion of both agricultural land transfer-in and transfer-out households in our study is consistent with the structure of agricultural land operators in China, yet in the future, the research area should be expanded to obtain more samples of transfer-in households for more comprehensive data.

In addition, after the TRSP, new forms of agricultural management subjects emerged such as family farms, large professional households, agricultural enterprises, and production cooperatives—both production subjects that are directly engaged in agricultural production, and service subjects that provide pre-production, in-production, and post-production services for agricultural producers [112,113]. Different from the homogeneous smallholder production and management in the past, the diversification of management subjects has become an important basic feature of China's modern agricultural management system. Exploring the income effect of the TRSP on the new subject types is not only in line with the characteristics of modern agricultural management in China, but also an important way to further testify to the effect of the TRSP on relative poverty in the future.

6. Conclusions

The TRSP lies at the core of the Chinese government's new rural land system reform. The transition from two rights division to three rights separation is considered a major step forward in policy development by the Chinese government. Existing research focuses on the positive effects on the agricultural growth of the reform, but less attention has been paid to the effects on household income, especially the different influences on transfer-in households versus transfer-out households.

This research examined the effect of the TRSP on the household's income by providing seven hypotheses. Four of the seven hypotheses are accepted, whereas H1, H4, and H5 are rejected. This yields some important research results. Firstly, the TRSP had a weak direct income effect on transfer-in households, but a significantly direct negative income effect on transfer-out households' income. Secondly, the TRSP can increase transfer-in household income indirectly through scale of operation effects and allocation effects, and also increase transfer-out household income indirectly by transferring labor and relaxing liquidity constraints. Thirdly, the TRSP leads to bigger gains in the income of transfer-in households than transfer-out households. Therefore, regarding transfer-out households, more attention is needed to promote labor transfer and ensure employment stability in non-agricultural sectors.

Based on the empirical results of this research and the development status of Chinese agriculture, some policy implications can be drawn. First, farmers should be respected in the land transfer process, and labor transfer should be recognized as a key contributor to poverty reduction. Secondly, the income gap should be vigilantly observed as it may widen among different groups under the TRSP. Finally, the local governments should adopt the new role emphasizing their service function in land reform.

By highlighting the complex interplay of different factors influencing household income through land transfer, the article sets the stage for future research to delve deeper into these relationships and to explore potential interventions that could further enhance the benefits of rural land transfer policies for households in China. The research results provide important insights into how much Chinese government policies, which aim at promoting agricultural land transfer, reach their goals of boosting household incomes and reducing income inequality in rural China. It may offer reform experience for other countries with similar agricultural production conditions. Many developing countries such

as India, Brazil, and Nigeria are also faced with problems such as unequal distribution of land resources and low production efficiency of households. The research results suggest that other developing countries need to fully consider regional differences and diversity of households when formulating and implementing land policies and should pay attention to creating more income channels for households and improving their production capacity and living standards, ensuring that policies reach the broadest group of households.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/land14020294/s1. Section A: The estimated results tables. Table S1. Estimation of the SEM of transfer-in households. Table S2: Estimation of the SEM of transfer-out households. Section B: Farmer questionnaire.

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