

Article

Land Transfer and Rural Household Consumption Diversity: Promoting or Inhibiting?

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Abstract: Land resources are important for millions of rural households in China. With the land tenure system reform and the trend of nonfarm employment, land transfer affects household income and consumption diversity significantly. Utilizing the data from the China Family Panel Studies (CFPS) 2018, this study investigated the effects of land transfer on Chinese rural households' consumption diversity, measured by the Simpson index. In order to mitigate the endogeneity problems caused by reverse causality and selection bias between farmers' household land transfer decisions and consumption behavior, we employed the propensity score matching (PSM) method and instrumental variable (IV) method. Besides, the Shannon index was also used to measure consumption diversity for the robustness test. The results showed that the rural households who have transferred others' land in would decrease their consumption diversity, while the households who have transferred their land out would increase their consumption diversity. Heterogeneity analysis showed that land transfer had different degrees of impact on rural households with different income groups and was more significant for low-income households. Specifically, compared with higher-income households, both the promotion effect of land transfer out and the inhibitory effect of land transfer on consumption diversity were more obvious for lower-income households.

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1. Introduction

Land resources have played a crucial role in economic structural transformation and agricultural modernization [1–3]. As the largest developing country, the Household Responsibility System (HRS) implemented in 1978 provides conditions for the Chinese growth miracle [4], and the core of the HRS is to mobilize the enthusiasm of farmers by clarifying property rights [1,5], thereby improving the efficiency of land productivity. Since 2014, the Chinese government has implemented the “Three Property Rights Separation” (TPRS, that is, land ownership, contractual rights and management rights are divided, land ownership belongs to rural collectives, contractual rights belong to the farmers, and management rights can be transferred and owned by the actual operator) reform to activate the land transfer market and improve the efficiency of land resources allocation [6,7]. According to the National Bureau of Statistics of China, from 2004 to 2019, the transfer area of farmland contracted by farmers increased from 3.89 million hm² to 37.18 million hm². The scale of land transfer is constantly expanding. In the meantime, the enthusiasm of rural households to participate in the land transfer market is also increasing. Based on the CFPS dataset, from 2012 to 2018, the rate of rural households who have transferred land in increased from 9.6% to 14.87%.

Land transfer is conducive to rural poverty reduction and market commercialization [8]. Under the background of continuous development and improvement of the land transfer

market, the per capita disposable income of rural residents rose from 3026 yuan in 2004 to 18,931 yuan in 2021. With the increase in disposable income, the consumption of rural households also increases, and the per capita consumption expenditure of rural residents increases from 2185 yuan in 2004 to 15,916 yuan in 2021. In fact, the existing literature has focused on the impact of land transfers on household consumption [9,10], studying it from the perspectives of consumption expenditure [11] and consumption structure [12]. However, consumption diversity is also an important dimension reflecting the characteristics of consumption. As living standards improve, households move from pursuing food consumption to pursuing goods such as smart devices and electronic products, enhancing consumption diversity. Therefore, this paper attempts to analyze the impact of land transfers on rural residents' household consumption from the perspective of consumption diversity and to explore the differential impact of land transfer in and out separately.

As the most frequent and important economic activity of households, consumption is directly related to sustainable and inclusive growth [13]. Affected by COVID-19 and the increasing downward pressure on the economy, urban consumers' demand is weak. How to release the potential of rural consumption and upgrade the consumption structure has important strategic value to stabilize the domestic demand market and maintain the high-quality development of China's economy. A significant and growing body of research is devoted to investigating the influencing factors of consumption expenditure and consumption structure, such as income [14,15], income gap [16,17], population age structure [18,19], development of financial market [20,21] and the improvement of social security systems such as pensions, medical care, education and housing [22–24]. Besides, as the key factor of the utility function [25,26], consumption is also affected by the popularity of the Internet, such as consumption scale, structure, inequality and diversity [27–30].

Though land transfer markets are rather thin [31], an increasing incidence of land transfer activities are taking place under the background of population aging and rural-to-urban migration [32,33]. Land is an important resource, rational farmers will realize income improvement through the rational allocation of land and labor factors; whether this income increase can be translated into consumption is the focus of this study. As we all know, income and access to markets influence families' consumption decisions, including purchasing frequency, consumption expenditure and consumption diversity [13]. On the one hand, low-productive households can transfer their land to the high-productive ones to obtain land rent, and reallocate some idle labor to non-farm employment, thus increasing the family income and diversity income resources diversity [34]. Increased income always leads to increased consumption spending and diversity. Some results show that as household income increases, the proportion of food consumption decreases [35], while the consumption of industrial goods increases [36]. However, the decline in agricultural activity also makes it impossible to achieve self-sufficiency in food, vegetables, etc., and has necessitated greater expenditure in these areas [37]. Besides, other scholars find that rising incomes allow farmers to have fewer financial constraints, and more money is invested in agricultural production [36,38], such as equipment, seed, chemical fertilizer, and hired labor [39]. Land transfer has a heterogeneous impact on the household consumption of farmers with different characteristics. Land transfer and social security are complementary conditions, and they should be promoted simultaneously to promote household consumption [40]. On the other hand, land transfer changes the consumer market faced by the rural labor force in the process of rural-urban mobility. After migrant workers enter the city, their original concept of consumption will be impacted, and they will unconsciously learn and imitate the consumption habits and modes of urban residents [41]. The comparison of the quantity and types of consumer goods improves the consumption structure of rural residents and increases the diversity of consumption [42]. Specifically, migrant workers may increase spending on housing, health care, entertainment and so on. In addition, they may also spread the new consumption concept to their families and even to the whole village, thus prompting a broader shift in consumption.

Consumer utility depends on both the quantity and types of goods consumed. The richer the types of goods that can be consumed, the better the welfare of consumers. In rural China, with the continuous improvement of living standards and the consumption environment, consumer demand is increasingly diversified and personalized, and the diversity of household consumption is rising. From the perspective of China's development practice, there is an upward trend among land transfer rate, income and consumption diversity. Does land transfer increase household rural consumption diversity? What are the differences between families with different income levels?

In order to answer the above questions, this study utilized representative micro-level data from China to investigate the effects by establishing the OLS estimation. The propensity score matching (PSM) method and instrumental variable (IV) method were used to alleviate the possible endogeneity problem. In summary, the marginal contribution of this study mainly has the following aspects: (1) focus on the relationship between land transfer and rural household consumption, and provide suggestions to deepen the reform of the land system in rural areas and release rural consumption potential; (2) compare the different effect between land transfer in and transfer out; (3) discuss the heterogeneous effects of land transfers on household consumption with different incomes; (4) carry out research from the perspective of consumption diversity measured by Simpson index, and enrich the consumption literature.

The remainder of this study is organized as follows. Section 2 outlines the theoretical analysis and hypothesis. Section 3 describes the methodology. The empirical results are presented in Section 4. The discussion, conclusions and policy implications are given in Sections 5 and 6, respectively.

2. Theoretical Analysis and Hypothesis

2.1. Effects of Land Transfer on Consumption Diversity

According to the theory of Consumer Economics, income and consumption environment are the key factors for consumption [43]. At the same time, land transfer has a direct or indirect effect on household income and the consumption environment that households face [6,44]. On the one hand, the farmer households who have transferred others land in have a larger arable area, and improve agricultural efficiency through large-scale and mechanized investment [45], but this leads to cash flow into agriculture, and more time to invest in agricultural planting, and having less leisure to pay attention to consumer information and consumer markets, thereby reducing consumer diversity. In addition, while specialization and large-scale investment can increase income [46], they also face longer investment cycles and high riskiness, and uncertainty in income cash flows, which in turn discourage household consumption decisions. On the other hand, farmers who have transferred their land out, while obtaining property income, shift from agricultural production to non-agricultural employment, obtain higher comparative income and a broader consumer market, which will promote their consumption diversity.

Hypothesis 1. *Transferring land in squeezes out households for consumption cash flow, restricts the consumption environment and reduces consumption diversity.*

Hypothesis 2. *Transferring land out increases property income, and labor mobility improves the consumption environment and promotes consumption diversity.*

2.2. Heterogeneous Effects of Household Income

According to economic theory, income is the basis for influencing consumption. Household income plays an important role in the impact of land transfer on household consumption diversity. There are heterogeneous effects of land transfer on consumption diversity due to different budget constraints for different income groups [47].

For farmers with higher income, on the one hand, such households have less consumption budget constraints, and have been able to allocate funds to consumption categories such as health care, culture, education and entertainment, and have more diversified consumption types. On the other hand, though land transfer affects income, the marginal income change is not obvious. Therefore, the marginal effect of land transfer in and transfer out on the consumption diversity of higher-income households is not obvious, too.

For rural households with lower income, on the one hand, the impact of land transfer on income is more obvious. Specifically, households who transfer their land out can obtain rental income, and it is conducive to alleviating budget constraints, providing conditions for their expansion of consumption types. Besides, non-agricultural employment after land transfer can obtain more consumption opportunities, thus increasing the possibility of diversified consumption. On the other hand, farmers who have transferred others land in need to invest funds in agricultural operations. Therefore, under certain conditions of income, the proportion of household consumption reduces, and the household consumption diversity decrease. Therefore, this study proposes the following research hypotheses:

Hypothesis 3. *Compared with higher-income households, the promotion effect of land transfer out on consumption diversity is more obvious for lower-income households.*

Hypothesis 4. *Compared with higher-income households, the inhibitory effect of land transfer in on consumption diversity is more pronounced for lower-income households.*

3. Methodology

3.1. Baseline Model

In order to evaluate the impact of land transfer on the household consumption diversity of rural households, this study took the consumption diversity as the dependent variable and the land transfer as the independent variable to construct a base regression model (1):

$$Diversity_i = \beta_0 + \beta_1 Transfer_i + \gamma Controls + \varepsilon_i \quad (1)$$

where subscript i represented different households. $Diversity_i$ denoted consumption diversity, measured by the Simpson index and Shannon index. $Transfer_i$ referred to household land transfer decisions, including transfer in and transfer out, respectively. $Controls$ was a set of control variables, mainly including property information, population information and other characteristics of households. Besides, provincial fixed effects were also included. β_0, β_1, γ were parameters to be estimated, and ε_i was a random disturbance item.

3.2. Discussion on Endogeneity

There may be endogeneity problems caused by reverse causality and selection bias between farmers' household land transfer behavior and household consumption diversity. Firstly, after the farm households transfer their land out, they will obtain rents, and choose to engage in non-farm employment, which will, directly and indirectly, increase their household income and consumption diversity. Secondly, households with higher consumption diversity tend to have better economic conditions. As the profit of agricultural production is relatively low, they are more likely to engage in non-farm employment, and more likely to transfer their land out. In addition, since a household's land transfer decisions will consider factors such as family assets, population, and employment, the decision-making behavior based on family characteristics will lead to the self-selection bias, further increasing the estimation bias of the model (1).

In order to overcome the above endogeneity problems, this study constructed the propensity score matching (PSM) method and instrument variable (IV) estimation to discuss the endogeneity to further ensure the reliability of the results.

3.2.1. Propensity Score Matching (PSM)

The farmer's land transfer decision is the result of the choice of household resource endowment, which will be affected by non-random factors. If the OLS estimator (1) was directly used, there would be a bias due to the problem of sample self-selection. In order to alleviate the bias of the estimation results, this study used the PSM method to overcome the endogeneity problem caused by sample self-selection [48–50].

$$\underbrace{E(y_{1i}|D_i = 1) - E(y_{0i}|D_i = 0)}_{ATT} = \underbrace{E(y_{1i}|D_i = 1) - E(y_{0i}|D_i = 1)}_{ATE} + \underbrace{E(y_{0i}|D_i = 1) - E(y_{0i}|D_i = 0)}_{Selection\ Bias} \quad (2)$$

The PSM method makes the observation data as close to the random experimental data as possible by matching resampling, which effectively avoids the selection bias caused by self-selection, and also includes multiple covariates including family and household head characteristics as much as possible to avoid missing variables. In this study, we used *Income, Population, Child share, Off – farm, Head educ* and *Head politics* as covariates. The problem of endogeneity was solved by the following steps [51]. First, we selected the covariate set X according to the factors that affected the family land transfer decision, and used the Probit model to calculate the propensity score $p(x) = Pr(D_i = 1|X)$, and then in the future, the sample of farmer households participating in the land transfer was matched with households with similar characteristics to those participating in the transfer, and one or more farmer households that have not participated in the transfer were matched to the households participating in farmland transfer. PSM is needed to satisfy the conditional independent $Y_0 \perp D | p(x)$ and the common support assumption ($0 < p(x) < 1$). Under the Conditional Independence Assumption (CIA), we calculated the Average Treatment Effect on Treated (ATT): $E(y_{1i}|D_i = 1, p(x)) - E(y_{0i}|D_i = x, p(x))$.

3.2.2. Instrument Variable (IV)

In this study, when examining the impact of farmland transfer on farmer household consumption, it might be that farmers with higher household income and higher consumption levels were more inclined to choose farmland transfer. Consequently, the OLS estimation would be biased.

$$Diversity_i = \beta_0 + \beta_1 Transfer_i + \gamma Controls + \varepsilon_i \quad (3)$$

$$Transfer_i = z_0 + z_1 Village_Transfer_i + \mu_i \quad (4)$$

In order to alleviate the possible endogeneity problem of the variables related to land transfer, it was necessary to select instrumental variables. According to the existing research ideas, the higher the degree of land transfer in the village, the greater the opportunity for farmers to lease land from the village, and the degree of land transfer at the village level does not directly affect the consumption of households. Therefore, this study attempted to use "Village-level farmland transfer out degree" as an instrumental variable for the endogenous variable farmland transfer out and use "Village-level farmland transfer in degree" as an instrumental variable for the endogenous variable farmland transfer in.

The higher the degree of land transfer at the village level, the greater the opportunity for individual farmers to transfer farmland, but the transfer of farmland at the village level did not directly affect the consumption structure of individual farmers. *Village_Transfer_i* was an appropriate instrumental variable.

3.3. Data

This study used data came from the China Family Panel Studies (CFPS) conducted by the Institute of Social Science Survey (ISSS) of Peking University in Beijing, China. The CFPS was designed to construct a nationally representative micro-dataset to collect

household economic, as well as non-economic information, including individual, family, and community three levels in contemporary China. The latest data covered 31 provinces (autonomous regions and municipalities directly under the Central Government). In addition to household demographic characteristics, income and expenditure, assets and liabilities, and the characteristics of household heads, and the land transfer decision were also included. Based on the rural sample (rural areas were defined according to the NBS Urban-Rural Division Code) in the household economic database in 2018, this study defined the household head according to the financial respondent and further matched the household head information in the personal database. In order to ensure the validity of the data, samples with serious missing values were excluded, and 4644 households were finally retained as the research objects.

3.3.1. Consumption Diversity

The Simpson index and Shannon index (sometimes called the Shannon–Wiener index or Shannon–Weaver index) are often used to measure diversity. The previous studies also used it to investigate income and farm diversification [52–54]. Compared to the Shannon index, the Simpson index takes a value between 0 and 1, making the results easier to interpret for social science research [30,55]. Therefore, this study mainly measured the consumption diversity based on the Simpson index, and the Shannon index was used for the robustness test. The Simpson index was calculated as follows:

$$Simpson_i = 1 - \sum_{s=1}^M p_{i,s}^2 \quad (5)$$

where subscript i referred to household; s was the consumption expenditure of a specific category; M denoted the total number of consumption categories, according to the classification standard of the National Bureau of Statistics of China, the consumption expenditure was divided into eight categories such as food, clothing, housing, equipment and daily necessities, transportation and communication, culture, education and entertainment, medical care, and others; $p_{i,s}$ was the proportion of the specific expenditure s to the household total expenditure. The value range of the Simpson index is $[0, (1 - 1/M)]$, the lower limit of 0 means that the household allocates all the budget to a certain consumption category, and the upper limit $(1 - 1/M)$ means that the household consumption is distributed evenly in M categories. As a result, the higher the number of household consumption categories and the more balanced the distribution of consumption categories, the higher the Simpson index. In other words, the higher the value of the Simpson index, the more diversified the household consumption.

3.3.2. Land Transfer

In this study, land transfer was defined as a binary variable. According to the questions related to land transfer in the CFPS questionnaires [56], “In the past 12 months, did your family transfer in any other land from other people or the village collective?”, if the answer was “yes”, it meant that there was land transfer in, and the key variable *Transfer in* equaled 1; otherwise the value was 0. Similarly, according to “In the past 12 months, did your family transfer out any of the collectively distributed land?”, if the answer was “yes”, indicating that there was land transfer out, the value of *Transfer out* was 1; otherwise, the value was 0.

3.3.3. Instrumental Variables

When using the instrumental variable (IV) method to solve the endogeneity problem, we adopt village-level land transfer as an instrumental variable for the endogenous variable of family-level. Specifically, we calculated the proportion of households who have transferred land in and the proportion of households who have transferred their land out as the value of variable *Village transfer in rate* and *Village transfer out rate*, respectively.

3.3.4. Control Variables

In order to accurately identify the effect of land transfer on consumption diversity, this study further controlled for characteristics at the household and household head levels. In terms of household characteristics, the economic and demographic characteristics variables were included, such as logarithm of total household net income (*Income*), family size (*Population*), the proportion of member younger than 16 years old (*Child share*), off-farm employment (*Off – farm*) [57]. For household head characteristics, marital status (*Head marriage*), health (*Head health*), years of education (*Head edu*), and political attitudes (*Head politics*) were taken into consideration [58]. In addition, provincial fixed effects were also taken into consideration.

Table 1 reported the definition and descriptive statistics of the above variables. The variables included in this study could be divided into five categories: household consumption diversity, household land transfer, household population and property characteristics, head characteristics, and village-level land transfer. In terms of consumption diversity, the average consumption diversity of households in the sample measured by the Simpson index was 0.66, and the average consumption diversity measured by the Shannon index was 1.39. In terms of land transfer, the households who have transferred their land out accounted for 12% of the analyzed sample, and the households who have transferred land in accounted for 17%.

Table 1. Data definition and descriptive statistics.

Variables	Definition	Mean	Std. Dev.	Min	Max
Panel A: Consumption diversity (N = 4644)					
Simpson index	Household consumption diversity measured by Simpson index	0.660	0.140	0.000	1.000
Shannon index	Household consumption diversity measured by Shannon index	1.390	0.320	0.000	2.010
Panel B: Household land transfer (N = 4644)					
Transfer in	1 if transfer in land, 0 otherwise	0.170	0.380	0.000	1.000
Transfer out	1 if transfer out land, 0 otherwise	0.120	0.330	0.000	1.000
Panel C: Household characteristics (N = 4644)					
Income	The logarithm of household net income	10.490	1.050	6.550	14.290
Population	The logarithm of household population	1.010	0.500	0.000	2.200
Child share	The proportion of younger than 16	0.070	0.130	0.000	0.670
Off-farm	1 if off-farm employment, 0 otherwise	0.530	0.500	0.000	1.000
Panel D: Household Head characteristics (N = 4644)					
Head marriage	1 if head married, 0 otherwise	0.860	0.350	0.000	1.000
Head health	1 if head health, 0 otherwise	0.630	0.480	0.000	1.000
Head educ	Years of education	3.290	3.280	0.000	16.000
Head politics	1 if head care about politics, 0 otherwise	0.650	0.480	0.000	1.000
Panel E: Village-level land transfer (N = 4644)					
Village transfer in rate	Transfer in rate of the villages	0.170	0.170	0.000	1.000
Village transfer out rate	Transfer out rate of the villages	0.120	0.130	0.000	1.000

Note: Std. Dev. refers to standard deviation.

Table 2 showed the differences in the mean of the selected variables of land transfer in and transfer out households. In terms of household consumption characteristics, the consumption diversity measured by the Simpson index of households transferring land in was 0.64, which was significantly lower than that of households not participating in land transfer by 2 percentage points. The Shannon index represented the same result. This meant that transferring land in might inhibit the diversity of household consumption. At the same time, the consumption diversity of land transfer out households was 2 percentage points higher than that of not transfer out households, which meant that transferring land out might promote the diversity of household consumption. Control variables for both household characteristics and household head characteristics were also included in the discussion. Compared with not transfer in households, families who transferred land in had higher family assets, smaller family sizes, better cultural atmospheres, and the head of households were always younger, and more likely to be unmarried. However, the net

income was slightly lower and the householder was in poorer health. The young labor force structure, coupled with high attention to the policy, such families had a strong incentive to transfer land in for large-scale management. Additionally, compared with not transfer out households, families who transferred their land out had higher family assets and income, larger family sizes and a higher proportion of householders who were married. Such families had multiple sources of income, so they tended to transfer their land out. On the whole, the characteristics of household consumption, household characters and household head characteristics were consistent with reality, which indicated that the analyzed sample in this study was reliable. Besides, the obvious contrast between the two kinds of family characteristics meant that there might be endogeneity problems caused by self-selection and reverse causality, which provided a basis for the identification strategy in this study.

Table 2. The characteristic differences among households.

Variables	Transfer in (N = 794)	Not Transfer in (N = 3850)	Mean Diff. (Yes-No)	Transfer ut (N = 573)	Not Transfer out (N = 4071)	Mean Diff. (Yes-No)
Simpson index	0.640	0.660	−0.020 ***	0.680	0.660	0.020 ***
Shannon index	1.350	1.400	−0.050 ***	1.440	1.390	0.050 ***
Income	10.500	10.490	0.010	10.670	10.470	0.200 ***
Population	0.880	1.030	−0.150 ***	1.090	0.990	0.100 ***
Child share	0.050	0.070	−0.020 ***	0.090	0.070	0.020 ***
Off-farm	0.510	0.530	−0.020	0.510	0.530	−0.020
Head marriage	0.760	0.880	−0.120 ***	0.930	0.850	0.080 ***
Head health	0.600	0.630	−0.030 **	0.640	0.630	0.010
Head educ	3.330	3.280	0.050	3.190	3.310	0.120
Head politics	0.660	0.640	0.020	0.650	0.650	0.000

Note: The significance level of 1% and 5% are denoted by *** and **, respectively, and the difference values were compared by the *t*-test.

4. Results

4.1. OLS estimation

Table 3 showed the parameter estimation results based on model (1). Columns A–C and columns D–F were the estimated results of land transfer in and land transfer out, respectively. To be specific, columns A and D did not add any control variables; columns B and E added control variables; columns C and F further controlled provincial fixed effects. Columns A–C represented *ceteris paribus*, families who have transferred land in, having significant negative effects on the household consumption diversity. Compared with the families who have not transferred land in, the consumption diversity of these families fell by 0.023; even after controlling household characteristics, household head characteristics and provincial fixed effect, the negative influence was still 0.015. The above results imply that the participation of land transfer in has a significant inhibitory effect on consumption diversity, which verifies hypothesis 1. Columns D–F were the estimated results of households with land transfer out or not. When the control variables were not included, the coefficient of *Transfer out* was 0.020. After the inclusion of control variables and provincial fixed effect, the households who have participated in land transfer out increased their consumption diversity by 0.016 on average compared with households who have not transferred land out. The above results show that land transfer out has a positive effect on consumption diversity, indicating that hypothesis 2 is valid.

Table 3. OLS estimation.

	A	B	C	D	E	F
Transfer in	−0.023 *** (0.0057)	−0.017 *** (0.0055)	−0.015 *** (0.0056)	-	-	-
Transfer out	-	-	-	0.020 *** (0.0060)	0.014 ** (0.0059)	0.016 *** (0.0058)
Income	-	0.006 ** (0.0025)	0.010 *** (0.0027)	-	0.005 ** (0.0026)	0.009 *** (0.0027)
Population	-	0.030 *** (0.0047)	0.023 *** (0.0048)	-	0.031 *** (0.0047)	0.024 *** (0.0048)
Child share	-	0.069 *** (0.0150)	0.079 *** (0.0151)	-	0.070 *** (0.0149)	0.079 *** (0.0151)
Off-farm	-	0.013 *** (0.0043)	0.010 ** (0.0044)	-	0.014 *** (0.0044)	0.010 ** (0.0044)
Head marriage	-	0.004 (0.0067)	0.004 (0.0067)	-	0.006 (0.0067)	0.005 (0.0067)
Head health	-	0.003 (0.0043)	−0.0004 (0.0043)	-	0.004 (0.0043)	−0.0002 (0.0043)
Head educ	-	0.003 *** (0.0006)	0.003 *** (0.0007)	-	0.003 *** (0.0007)	0.003 *** (0.0007)
Head politics	-	0.010 ** (0.0044)	0.009 ** (0.0044)	-	0.010 ** (0.0044)	0.009 * (0.0044)
Constant	0.665 *** (0.0022)	0.538 *** (0.0240)	0.467 *** (0.0799)	0.658 *** (0.00219)	0.538 *** (0.0241)	0.472 *** (0.0801)
Province FE	N	N	Y	N	N	Y
Obs.	4644	4644	4644	4644	4644	4644
Adjusted R ²	0.004	0.048	0.062	0.002	0.047	0.062

Note: robust standard error is included in parentheses, and the significance level of 1%, 5%, and 10% are denoted by ***, ** and *, respectively.

4.2. Discussion on Endogeneity

4.2.1. PSM Estimation Result

Factors affecting family land transfer decisions were selected as covariables from two levels of household and household head characteristics. To be specific, the household level included *Income*, *Population*, *Child share* and *Off – farm*, while the household head level mainly considered *Head educ* and *Head politics*. We believe that householders who care about current affairs are more likely to be influenced by propaganda reports on land transfer policies, thus encouraging land transfer behaviors. In this study, 1:1 nearest neighbor matching (NN) was adopted.

Figures 1 and 2 showed the kernel density of propensity scores before and after matching the two types of land transfer behaviors, respectively. The horizontal axis represented the propensity score and the vertical axis represents the density value. By comparing the two figures, it could be found that the kernel density curves of the treatment group and control group before matching were significantly different, while the kernel density equation curves of the two groups were much closer after the matching. This change indicates that the observable feature differences between the two groups are significantly reduced after matching, and the matching effect is good.

Columns A–B of Table 4 reported the estimated results of PSM. The empirical results showed that after correcting the self-selection bias of household land transfer by using the PSM method, land transfer had a significant inhibitory effect on household consumption diversity, and the estimated average treatment effect was 0.023. Column B listed the estimated results of households with land transfer out. Land transfer out has a significant positive impact on the diversity of household consumption and promotes households to increase the diversity of consumption. The estimated average treatment effect was 0.019, higher than the result shown in column F of Table 3. In conclusion, after considering the endogenous problem caused by sample self-selection, farmland entry will inhibit household consumption diversity, while farmland transfer will promote household consumption diversity. The estimated results are consistent with the theoretical analysis, which verifies hypothesis 1 and 2.

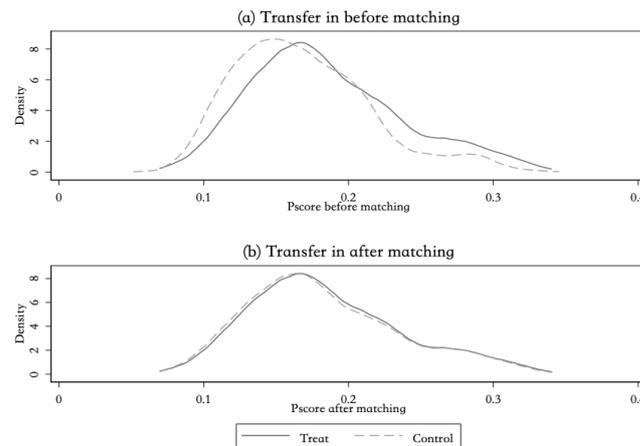


Figure 1. Common support assumption test for transferring-in land density distribution of p-scores before and after matching. (a) Transferring in before matching; (b) Transferring in after matching.

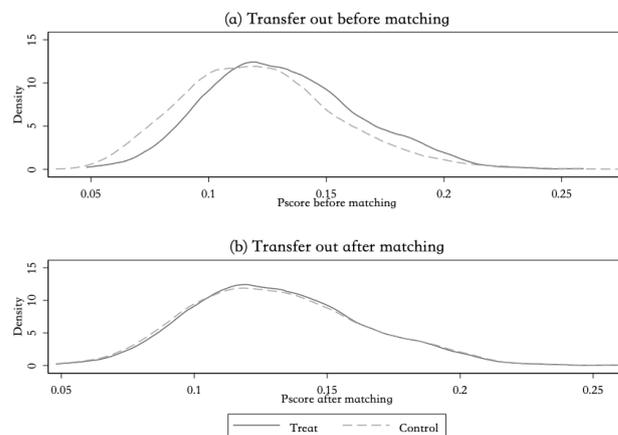


Figure 2. Common support assumption test for transferring-out land density distribution of p-scores before and after matching. (a) Transferring out before matching; (b) Transferring out after matching.

Table 4. PSM estimation result.

	A	B
Transfer in	−0.023 *** (0.0073)	
Transfer out		0.019 ** (0.0086)
Constant	0.548 *** (0.0415)	0.602 *** (0.0556)
Controls	Y	Y
Obs.	1459	1074
Adjusted R ²	0.055	0.064

Note: robust standard error is included in parentheses, and the significance level of 1% and 5% are denoted by *** and **, respectively.

4.2.2. IV Estimation Result

Considering that there may be reverse causality between land transfer and household consumption behavior, that is, households with better economic conditions tend to transfer land out for non-agricultural reasons, transferring their land out can also obtain rental income and non-agricultural employment income, so as to improve the consumption diversity. Therefore, this study chose the village-level land transfer rate as the instrumental variable. On the one hand, the village-level land transfer rate affects the decision-making

of household land transfer. On the other hand, the village-level land transfer rate reflects the active degree of the village-level land market and has a strong exogenous effect on household consumption behavior. It will not directly affect the consumption diversity of the household. It is a reasonable instrumental variable. The validity test results of the instrumental variables were shown in Table 5. Firstly, there was a significant positive correlation between the village-level land transfer rate and household land transfer decision-making, indicating that the instrumental variables met the correlation hypothesis and verified the logic of our design of the instrumental variables. At the same time, both LM statistics and F statistics rejected the null hypothesis, which indicated that the instrumental variables constructed in this study were reasonable.

Table 5. 2SLS estimation result.

	A	B
Transfer in	−0.028 ** (0.0133)	-
Transfer out	-	0.044 *** (0.0153)
Constant	0.438 *** (0.0793)	0.450 *** (0.0798)
Controls	Y	Y
Province FE	Y	Y
Obs.	4644	4644
Adjusted R ²	0.056	0.052
Village transfer in rate	0.998 ***	-
Village transfer out rate	-	0.994 ***
Kleibergen-Paap rk LM statistic	369.630 ***	228.953 ***
Crag-Donald Wald F statistic	1014.110	673.374

Note: robust standard error is included in parentheses, and the significance level of 1% and 5% are denoted by *** and **, respectively.

The results of 2SLS estimation using instrumental variables were also reported in Table 5. According to the estimated results, land transfer in had a significant negative impact on household consumption diversity, indicating that land transfer in would inhibit household consumption diversity. Meanwhile, the estimated coefficient of land transfer out was significant, and still positive, indicating that land transfer out had a potential enhancement effect on household consumption diversity.

It can be seen from the above model estimation results that the estimated results of IV and PSM models are consistent with those of the baseline model, indicating that after overcoming the possible endogeneity, the effects of land transfer in and transfer out on consumption diversity are in line with expectations.

4.3. Robustness Test

In view of the heterogeneity of household consumption characteristics, this study further used the Shannon–Weiner Index to measure consumption diversity for the robustness test. The Shannon index was calculated as follows:

$$Shannon_i = - \sum_{s=1}^M p_s \ln(p_s) \quad (6)$$

where subscript i referred to the household; M denoted the total number of consumption categories; p_s was the proportion of the specific expenditure s to the household total expenditure. The value range of the Shannon index is $(0, \ln M)$. The lowest limit of 0 means that the household allocates all the budget to a certain consumption category. Moreover, the Shannon index reaches its maximum $\ln M$ when a household has two or more consumption categories and allocates its budget equally to each category. As the number of household

consumption categories increases, so does the Shannon index. In another word, a higher number of Shannon indexes means more diversity in household consumption.

The estimated results using the Shannon–Weiner Index were shown in Table 6. Land transfer in has a significant inhibitory effect on the diversity of household consumption, and land transfer out has a significant promoting effect on the diversity of household consumption, which is consistent with the conclusions of the previous research.

Table 6. Shannon index.

	A	B	C	D	E	F	G	H
	OLS	OLS	OLS	PSM	OLS	OLS	OLS	PSM
Transfer in	−0.055 *** (0.0128)	−0.036 *** (0.0123)	−0.034 *** (0.0124)	−0.050 *** (0.0162)	-	-	-	-
Transfer out	-	-	-	-	0.055 *** (0.0137)	0.038 *** (0.0132)	0.042 *** (0.0131)	0.045 ** (0.0189)
Constant	1.404 *** (0.0050)	0.958 *** (0.0526)	0.851 *** (0.1830)	1.004 *** (0.0906)	1.387 *** (0.0050)	0.960 *** (0.0528)	0.863 *** (0.1830)	1.136 *** (0.1220)
Controls	N	Y	Y	Y	N	Y	Y	Y
Province FE	N	N	Y	N	N	N	Y	N
Obs.	4644	4644	4644	1459	4644	4644	4644	1074
Adjusted R ²	0.004	0.087	0.102	0.093	0.003	0.086	0.102	0.094

Note: robust standard error is included in parentheses, and the significance level of 1% and 5% are denoted by *** and **, respectively.

4.4. Heterogeneous Effects

Income and consumption environment are the key factors affecting household consumption. According to the National Bureau of Statistics of China, the per capita disposable income of rural residents was 13,066 yuan in 2018. Based on this income standard, this study divides the households in the sample into two groups. The households whose per capita disposable income was higher than 13,066 yuan were in the above-average income group, and others were in the below-average income group. Higher-income households face smaller budget constraints and already have rich and diverse consumption types. As the marginal propensity to consume is low, the rental income obtained from land transfer has less impact on their consumption diversity. For households below the average income level, their consumption demand is restricted by budget constraints, so they allocate more funds to subsistence consumption such as food and clothing, reduce the consumption of transportation and communication, cultural entertainment and medical care, and restrain their demand for high-tech and high-quality products. According to the estimated results of Table 7, the income from land transfer is more significant for the lower-income group.

Table 7. Heterogeneous effects of household income.

	A	B	C	D
	Below Group	Above Group	Below Group	Above Group
Transfer in	−0.014 ** (0.0073)	−0.014 (0.0084)	-	-
Transfer out	-	-	0.022 *** (0.0075)	0.006 (0.0092)
Constant	0.448 *** (0.0588)	0.450 *** (0.1090)	0.437 *** (0.0569)	0.455 *** (0.1100)
Controls	Y	Y	Y	Y
Province FE	Y	Y	Y	Y
Obs.	2790	1854	2790	1854
Adjusted R ²	0.070	0.074	0.071	0.073

Note: robust standard error is included in parentheses, and the significance level of 1% and 5% are denoted by *** and **, respectively.

5. Discussion

The healthy development of the land transfer market is of great significance for improving allocative efficiency and agricultural productivity. Unleashing the vitality of rural consumption and promoting the upgrading of consumption is also of great significance for high-quality economic development at the present stage. There have been a series of studies based on land transfer, especially related to agricultural production efficiency, labor mobility, and income growth [34,41,45]. However, the existing literature has only paid little attention to the relationship between land transfer and rural household consumption [59]. Although some scholars have tried to explore their relationship, they mainly focus on the impact of land transfer on household consumption expenditure or consumption structure [40,60]. Most studies show that land transfer increases the total consumption expenditure by increasing household income, reducing the proportion of basic consumption such as food, and increasing the proportion of development consumption and enjoyment consumption [35,40,42]. Such studies have not yet turned their perspective to relevant studies on consumption diversity. In the background of people's living standards gradually improving, consumption upgrading is the general trend. Behind consumption upgrading, market segmentation is becoming more and more obvious. Personalized and diversified consumption will become the mainstream of current consumption growth. Therefore, it is of practical significance to start from the perspective of consumption diversity.

Land transfer has a direct or indirect effect on household income and the consumption environment. At the same time, income and consumption environment are the key factors for households' decision-making of consumption. Therefore, rural households should rationally allocate land resources and consider land transfer decisions to maximize the possibility of increasing family income. Besides, more attention should be paid to the improvement of the productivity of participating in the transfer of land into households, and subsidies should be provided to alleviate the pressure on household cash flow. To release the vitality of rural consumption, how to optimize the rural consumption environment is also worth thinking about.

This study further focused on the heterogeneous effects of land transfer on households with different incomes. The consumption potential of lower-income households is greater than higher-income households. In order to open up the "two veins" of consumption in rural areas and deeply stimulate the rural sinking market, it is necessary to steadily promote land transfer to increase farmers' incomes, perfect the rural social security system and avoid one-size-fits-all policies and focus on tapping the potential of low-income households typically.

6. Conclusions and Policy Implications

6.1. Conclusions

Based on the data of CFPS 2018, this study investigated the effects of land transfer and rural household consumption diversity by using the OLS estimation method. The empirical conclusions were as follows: (1) after controlling household-level characteristics and provincial fixed effect, the households who have participated in land transfer in decreased their consumption diversity by 0.015 on average, while the household who have transferred their land out increased their consumption diversity by 0.016 on average; (2) this study further used PSM and IV methods, and replaced the Simpson index with the Shannon index to measure consumption diversity. The results were consistent with the baseline regression results; (3) land transfer in and transfer out had different effects on household consumption diversity; (4) compared with the higher-income households, both the promotion effect of land transfer out and the inhibitory effect of land transfer in on consumption diversity were more obvious for lower-income households.

6.2. Policy Implications

The findings from this study led to several important policy implications. In the realistic scenario, small farmers always have problems such as the small scale of agricultural operations and the serious fragmentation of cultivated land, and it is difficult to realize the optimal allocation of resources in many aspects such as labor and capital. Therefore, a small-scale operation often leads to the low agricultural production efficiency of small farmers and slow growth of agricultural income. Government should further promote the transfer of rural land and promote moderate scale management, and relevant policies should be appropriately tilted towards low-income families. As we can see, a large number of young and middle-aged rural labor force has left the country, and rural development has encountered new bottlenecks, making it difficult to effectively activate the rural consumer market. Based on these, the government should improve infrastructure and strengthen the weak link in rural consumption; pay attention to the needs of farmers and develop consumer goods in line with rural preferences and accelerate industrial upgrading, attract workers back to their hometowns to start businesses and find jobs, and raise rural household incomes.

Limitations still exist in this study. First, because of the limited space, this study fails to describe consumption comprehensively, but only focuses on the diversity of consumption. Second, the cross-section data we used cannot capture the lag effect of land transfer on consumption diversity.

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