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Private Transfer Payments, Inequality, and Poverty: From the Perspective of Households

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Abstract: Private transfer of wealth is a ubiquitous phenomenon in both urban and rural areas of China. This paper took an inflow private transfer payment as the research object and used the China Household Finance Survey data to analyze the impact of inward private transfer payment (IPTP) on social welfare and family welfare. According to the result of logit regression, we found the following: there is an age at which households are least likely to receive private transfer payments; families with living partners (including married and cohabiting couples) are more likely to receive private transfer payments; the worse the health of householders, the more likely they are to receive private transfer payments; rural households are more likely to have IPTPs than urban households. From the perspective of social welfare, the IPTP has seemingly decreased social inequality, especially in the case of rural areas. However, the counterfactual analysis finds that IPTP increases inequality. Analysis from three aspects of income, consumption, and family poverty level finds that IPTP not only subsidizes the family income directly but also promotes increases in family income indirectly. It also stimulates family consumption expenditure, with an increment of approximately 5000 yuan. Although it increased household income, as well as consumption expenditure, IPTP did not have a significant impact on the poverty level of Chinese households. On the whole, the existence of IPTP does not improve social welfare but improves family welfare. At the same time, IPTP has no significant effect on the reduction of family poverty.

Keywords: private transfer; income inequality; consumption expenditure; poverty

1. Introduction

The phenomenon of private transfer payments is prevalent in developing countries, and is used as an imperfect social security system to counterbalance the drawbacks of the capital market. Private transfers between families are important institutional arrangements in developing countries [1]. As the largest developing country, this is also the case for China. Recent research has been carried out in Latin America and other countries or areas. Those countries are small, especially compared to China population-wise. We think it is of great significance to study the phenomenon in China, although most work has been carried out in Latin America. Firstly, China is the largest developing country in the whole world and it has the largest population. Secondly, China is a very special country. It has a long history, resulting in distinct characteristics, making it an outstanding country among the developing countries. Thirdly, compared with other developing countries, private transfers in China are more common because Chinese society is a relationship-based society, considering families, friendships, colleagues, superiors, subordinates, etc. The social and economic network is close and complicated. Besides, there are some other reasons that make the issue valuable. However, relevant studies carried out in China are scarce. Private transfer payments are a widespread phenomenon of wealth transfer among Chinese families [2], which has an important impact on the quality of life of the people. To a certain extent, it affects the distribution of family income [3], which in turn affects income inequality. In the

countryside, private transfer payment is the main financial support resource for children to form a family and start a career, and for the care of parents in old age. In urban areas, despite wages for employed children, and retirement pensions and pension insurance for parents, the high cost of living in cities means private transfer payments still play an important role in guaranteeing the quality of people's lives.

Since the reform and opening-up, China's economy has experienced long-term and high-speed development; the total economic volume has continued to rise, and people's living standards have been constantly improving. However, the rapid development has also brought a series of problems, such as the widening gap between the rich and the poor, serious environmental pollution, and a low utilization rate of resources. Among those, the widening gap between the rich and the poor is the result of the deepening inequality of family income. In the process of China's economic development, the driving force of development is mainly in the cities, and a large amount of the rural population migrates to cities, while their household registration is still in the countryside, which leads to continuing remittances. Private remittance has become a relatively important source of funds in rural areas, accounting for approximately 17% of the total income of a rural household (China Household Finance Survey (CHFS) 2013). This is reflected in many aspects, such as the improvement in the rural living conditions, the education of rural children, the health of rural residents, the improvements in rural consumption levels, and the reduction of rural poverty. In rural areas, private transfer payments mainly come from migrant workers—most of whom come from lower and middle-income families. Therefore, private transfer payments should improve the income level of the lower-income families and change inequality to some extent. In urban areas, private transfer payments mostly come from parents' subsidies for a series of expenses, such as living expenses, purchasing a house, and renting an apartment, so that wealth can be transferred from generation to generation. This intergenerational transmission of wealth may narrow the income gap between households and improve the situation with respect to the income inequality of urban households, but it may also make the rich become richer and deepen inequality. Research on this issue will help us understand how private transfer payments affect people's living standards and the distribution and flow of social wealth, to provide support to alleviate the widening income gap and reduce social poverty.

In the context of Chinese society, newly formed families usually receive a sum of money from their parents and elders as a transitional fund for the transition from new-born families to self-reliance, which is a typical private transfer payment flowing downward between generations. When parents lose their laboring abilities in old age, they may need their children's families to provide some pension expenses, such as living expenses and medical expenses, which are private transfer payments flowing upward between generations. Xie (2014, 2015) described China's upward mobility of private transfer payments and studied the impact of the upward mobility of inter-generational private transfer payments on poverty vulnerability [2,4]. It was found that the magnitude of inter-generational upward flowing private transfer payments is increasing, but private transfer payments have no significant impact on the vulnerability to chronic poverty and temporary poverty. For a family, private transfer payments can be divided into two types: inflow and outflow. An inward private transfer payment (IPTP) refers to when the family is the recipient of private transfer payment; i.e., has private transfer income. An outflow private transfer payment refers to when the family is the provider of a private transfer payment, and the family has private transfer expenditure. It is more common to classify private transfer payments into inflow and outflow types than to classify private transfer payments into intergenerational upward and intergenerational downward flows. The latter style focuses mainly on private transfer payments between parents and children, while the former includes all the private transfer payment networks that occur. This paper focuses on the impact of IPTP on family welfare and social welfare.

Through the case study of China, we found that IPTP increases inequality, which is in accordance with Barham and Boucher (1998), Xie (2010), and Niu (2014). From the perspective of the household, IPTP increases the total income and stimulates family consumption. In that way, IPTP improves

people's living conditions and is beneficial to the country's economy. However, IPTP does not have a poverty reduction effect in Chinese households.

The following contents are arranged as follows: the second part is the literature review; the third part is data and methods, which introduces the sources of data used in this paper, summarizes the variables used in the study, analyses the impact of IPTP on income inequality, and the estimation methods used in subsequent empirical research; the fourth part is the empirical results: first, logit regression estimation is displayed, and then the income effects, consumption effects, and poverty effects of family IPTPs through the propensity score matching (PSM) method are discussed; the fifth part is the counterfactual analysis using the Heckman two-step method; the sixth part and the seventh part are the mechanistic analysis and the research summary of this paper, respectively.

2. Literature Review

Most of the existing international literature focuses on the impact of international transfer payments (remittances) on the economy and society of the countries of origin of migrants. Most of the empirical studies are based on data from developing areas, such as Latin America. To our knowledge, there is no specific study on private transfer payments in China. Adams and Page (2005) used household survey data from 71 developing countries to analyze the impact of remittances on poverty [5]. After solving the possible endogeneity of remittances through the instrumental variable method, it was found that the poverty rate would decrease by 3.5% for every 10% increase in per capita remittances in developing countries. Acosta, Caldern, Fajnzylber, and Lopez (2008) supplemented and improved Adams' research [6]. First, regression analysis using a large amount of international panel data showed that remittances increased incomes, reduced inequality, and alleviated poverty in Latin American and Caribbean countries. The effect of poverty reduction was mainly achieved by increasing the per capita incomes of the recipient countries of remittances. Then, using household survey data from 10 Latin American and Caribbean countries and using the two-stage Heckman model as a case study, it was found that the poverty reduction and inequality reduction of remittances vary greatly among different Latin American countries. Portes (2009) explored the impact of migrant remittances on income distribution based on panel data of 46 countries from 1970 to 2000 [7]. It was found that the impact of remittances on income distribution was non-monotonous, and the impact of remittances was strongest in low-income countries. Besides, remittances reduce inequality because their impact is mainly reflected in the poor and negatively correlated with the income of the rich. Beyene (2014) used Ethiopia's 2004 Urban Family Survey to study the impact of remittances on poverty and inequality [8]. It was found that remittances had a significant poverty reduction effect, but did not change inequality. As remittances are caused by international migrants, Barham and Boucher (1998) constructed the counter proposal of no immigrants by simulating the possible family incomes of migrants and compared them with the observed distribution of income containing remittances to test the net effect of migration and remittances on income distribution [9]. For the family sample in Bluefields, Nicaragua, immigration and remittances increase income inequality compared with the counter facts of no immigration. McKenzie and Rapoport (2007) took Mexico as an example to study the relationship between network effect, dynamic migration, and inequality [10]. They demonstrated the non-linear impact of wealth on migration theoretically and empirically. They empirically tested the inverted U-shaped relationship between migration and inequality and found that the overall impact of migration was to reduce inequality across communities with relatively high levels of past migration. Gerardi and Tsai (2014) identified the crowding-out effects of public transfers on the incidence and level of private transfers by exploiting a policy experiment, the introduction of a large social security program in Chinese Taiwan [11].

In terms of consumption and investment, Cox-Edwards and Ureta (2003) tested the determinants of school attendance with a proportional hazard model based on household survey data in El Salvador, and found that remittances had a large significant effect on school retention, and families with remittances tended to invest in children's education, even though parents had low levels of schooling [12].

When Bachmann and Boes (2014) estimated the impact of external financial support on students' labor supply during higher education, they drew a similar conclusion: private transfer payments reduced students' working hours and increased their learning time [13]. Similarly, using nationally representative household data, Adams and Cucuecha (2010b) studied the effects of Guatemala's domestic transfer payments and international transfer payments from the United States on household marginal expenditure behavior through the two-stage Heckman model and instrumental variable method [14]. They found that households with transfer income invested more in education and housing than households without transfer income, rather than consumer products.

Private transfer payments are a common phenomenon in China's urban and rural areas. Therefore, there are some studies related to private transfer payments in Chinese literature, mostly on its effect. Compared with other countries, China is deeply influenced by the traditional Confucian culture that advocates kinship, merit, self-cultivation, and moral rationality. And its central ideas are forgiveness, loyalty, filial piety, guilt, courage, benevolence, righteousness, propriety, wisdom, and faith, among which filial piety is closely related to private transfer payments. Private transfer payments play an important role in income redistribution. Lu et al. (2018) studied the impact of China's transfer payment system on reducing income inequality and found that China's current transfer payment system had a good "precise poverty alleviation" effect, which is conducive to the balanced growth of residents' incomes [15]. Zhu (2018) studied the motivations of private transfer payments by using the rural minimum living standard policy as a natural experiment and found that private transfer payments were mainly motivated by exchange [16]. Xie (2010) studied the impact of private transfer payments on rural poverty and inequality through counterfactual analysis and found that private transfer payments reduced rural poverty effectively, but increased rural inequality [17]. Xie (2013a, 2013b) used the China Health and Nutrition Survey (CHNS) data to study the impact of transfer payments on income inequality in China [18,19]. The results showed that private transfer payments played a positive role in reducing income inequality, while public transfer payments contributed little to regulating income inequality. Private transfer payments contributed much more to reducing poverty than public transfer payments and a public transfer payment appears pro-rich. Niu (2014) used data from the CHNS to study the welfare effects of private transfer payments on poverty rates and welfare changes in urban and rural households [20]. Using PSM counterfactual analysis method, the study concluded that private transfer payments have not effectively reduced the poverty level in urban and rural areas. What is worse, private transfer payments have increased income inequality in urban areas.

To facilitate comparative analysis, the main conclusions of relevant literature are listed in Table 1. It shows that private transfer payments are a hot issue of general concern to the international communities, not only in China but also in all developing countries, especially in rural areas. However, for different countries or regions, different periods, and different analytical methods, the quantitative results are different, and the conclusions are still controversial, so further research is needed. Although there have been some studies on the phenomenon of private transfer payments in China, as far as we know, there is no literature that classifies private transfer payments into inflow type and outflow types from the perspective of family. No literature systematically studied the impact of inflow type of private transfer payment on family income inequality and social poverty. This paper will make efforts and contributions in these aspects.

Table 1. Comparison of typical research relevant to private transfer payments.

Author(s)	Area	Theme	Conclusion	
			Inequality Effect	Poverty Effect
Adams& Page (2005)	71 developing countries	International remittances		more international remittances, lower poverty
Acosta et al. (2008)	Latin American and Caribbean countries	international remittances	reduced inequality	reduced poverty
Portes (2009)	46 countries	international remittances	reduced inequality	
Beyene(2014)	Ethiopia	international remittances	does not change	significant reduction
Barham& Boucher (1998)	Bluefields, Nicaragua	migration and remittances	increased inequality	
Mckenzie& Rapoport (2007)	Mexico	migration and remittances	inverse U-shaped relationship	
Lu (2018)	China	transfer payment system	decreased inequality	has precise poverty alleviation effect
Xie (2010)	rural China	private transfer payment	increased inequality	decreased poverty
Xie (2013)	China	private transfer payment	decreased inequality	reduced poverty
Niu (2014)	China	private transfer payment	increased inequality	didn't reduce poverty effectively

3. Data and Methodology

3.1. Data

The data used in this paper were from China Household Finance Survey Database (CHFS) in 2013, which mainly contains four categories of information; namely, demographic characteristics, assets and liabilities, insurance and security, expenditure, and income. There were 28,141 samples of families, including 8932 rural households and 19,209 urban households, covering 29 provinces (autonomous regions and municipalities directly under the central government). According to the key variable h1001 involved in the research, one outlier in Equation (8) and 17 missing values were removed, and according to the key variable PTI (private transfer income), one outlier (h1001 = 0 and h1003c = 5000) was deleted. The sample size used in this paper was 28,122, which is a large sample. The information loss caused by removing the 19 samples mentioned above can be neglected. Of the 28,122 families, 13,861 (49.29%) had IPTPs, and 14,261 (50.71%) had no IPTPs. In families with IPTPs, the average proportion of transferred income from parents of both the spouses in their total transfer income is 59.64%. Table 2 gives descriptive statistics of the relevant variables used in this study. The unit of variables referring to income is yuan and the period of time is the year.

Table 2. Summary statistics of variables used in the study.

Variable	Definition	Mean	S.D.	Min	Max	Observation
h1001	= 1 if get more than 100 yuan in cash or non-cash income from non-family members; = 0 otherwise	0.49	0.50	0	1	28,122
h1002a	income from parents	3506.24	15,907.69	0	500,000	3049
h1002b	income from parents-in-law	2439.63	11,016.57	0	265,000	2126
h1003c	income from other relatives except parents and parents-in-law	3498.5	9585.31	0	330,000	13,644
PTI	total private transfer income, = h1002a+h1002b+h1003c	4764.83	14,659.17	0.1	507,000	13,349
delta	= (h1002a+h1002b)/PTI	0.60	0.30	0.00	1	3496
total_income	total income, including wage income, agricultural income, industrial and commercial operating income, transfer income and investment income	63,362.04	141,138.40	−1,000,000	3,000,000	28,122
income	income excluding private transfer income, = total_income-PTI	61,100.26	139,806	−1,050,000	3,000,000	28,122
TE	private transfer expenditures for households with IPTP	4165.89	8852.63	0	300,000	13858
Netinflow	net inflow of households with IPTP	422.78	15,619.86	−290,000	489,000	13,858
gender	gender, = 1 for male; = 0 for female	0.53	0.50	0	1	28,121
age	age of head of household	50.28	14.89	17	113	28,122
marriage	marital status, = 1 if get married or cohabitation; = 0 otherwise	0.84	0.36	0	1	28,122
health	health condition, = 0 for not good; = 1 for general; = 2 for good; = 3 for better; = 4 for best	1.62	1.20	0	4	28,121
edu	schooling; from 0 to 8, correspond to those without schooling, elementary school, junior middle school, senior high school, polytechnic school/vocational high school, junior college, Bachelor's degree, Master's degree, Doctorate, respectively	2.45	1.73	0	8	28,122
job	employed, = 1 yes; = 0 no	0.62	0.48	0	1	28,122
size	number of family members	2.48	1.63	0	18	28,122
relative	number of relatives living in the same village or city	2.79	1.14	1	4	28,107
econo	regional economic development level, = 1 for west less developed provinces; = 2 for middle medium developed provinces; = 3 for east high developed provinces	2.23	0.80	1	3	28,122
rural	habitation, = 1 for countryside; = 0 for city	0.32	0.47	0	1	28,122

Note: For families with inward private transfer payments (IPTPs), if there was missing value of h1002a, h1002b, or h1003c for no corresponding item, the missing value was replaced by zero. For household samples without IPTP, PTI = 0. East: Beijing, Tianjin, Hebei, Liaoning, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, and Hainan; central: Shanxi, Jilin, Heilongjiang, Anhui, Jiangxi, Henan, Hubei, and Hunan; western: Inner Mongolia, Guangxi, Chongqing, Sichuan, Guizhou, Yunnan, Shaanxi, Gansu, Qinghai, and Ningxia.

3.2. Methodology

3.2.1. Inequality Decomposition

Taking Acosta et al (2008) for reference, it exemplifies the method of inequality decomposition and the counterfactual analysis in Section 5. According to Stark et al (1986), let y_k stand for component k of household income and y_T represent total household income, such that $y_T = \sum_{k=1}^K y_k$. The Gini coefficient of income component k is [21]

$$G_k = \frac{2Cov[y_k, F(y_k)]}{\mu_k} \quad (1)$$

where $F(y_k)$ is the cumulative distribution of income component k , and μ_k denotes mean income of component k . Let G_T represent the Gini coefficient of total income. According to the nature of covariance, there is

$$G_T = \frac{2Cov[y_T, F(y_T)]}{\mu_T} = \frac{2\sum_{k=1}^K Cov[y_k, F(y_k)]}{\mu_k} \cdot \frac{Cov[y_k, F(y_T)]}{Cov[y_k, F(y_k)]} \cdot \frac{\mu_k}{\mu_T} = \sum_{k=1}^K G_k R_k S_k \quad (2)$$

where S_k is the share of component k of household income in total household income and R_k is the Gini correlation of component k with total income $R_k = \frac{Cov[y_k, F(y_T)]}{Cov[y_k, F(y_k)]}$.

The relative effect of a marginal percentage change in component k upon inequality can be expressed as follows.

$$\frac{\partial G_T / \partial k}{G_T} = \frac{S_k G_k R_k}{G_T} - S_k \quad (3)$$

Thus, we can see whether an infinitesimal change in income k has equalizing effects depending on the share of the Gini correlation explained by income k and its share in the total income. If the former is smaller than the latter, it has equalizing effects because it makes the Gini coefficient of total income diminish.

3.2.2. Treatment Effect

To research the impact of IPTP on the welfare of Chinese families, all the samples were divided into two categories according to whether there was IPTP. Families with IPTP were used as the experimental group, while those without IPTP were used as the control group. For the experimental group, the treatment variable was $h1001 = 1$, and the control group's was $h1001 = 0$. y was used to represent family welfare variables, such as income, consumption, and poverty. The welfare variable of any family i is y_i , and y_i has two states y_{i0} and y_{i1} . When family i is in the experimental group, $y_i = y_{i1}$; otherwise, $y_i = y_{i0}$. Therefore, there is

$$y_i = h1001_i y_{i1} + (1 - h1001_i) y_{i0} = y_{i0} + (y_{i1} - y_{i0}) h1001_i \quad (4)$$

where $(y_{i1} - y_{i0})$ is the treatment effect of family i IPTP. Assuming that the sample is independently and identically distributed (i.i.d), whether family i has IPTP does not affect other families. For different families, the treatment effect of IPTP is likely to be different, so $(y_{i1} - y_{i0})$ is a random variable and its expectation is the average treatment effect of IPTP

$$ATE \equiv E(y_{i1} - y_{i0}) \quad (5)$$

Family i cannot be observed both in the experimental group and in the control group, so y_{i0} and y_{i1} cannot be observed at the same time. When family i was in the experimental group, y_{i1} was observed, but y_{i0} was not. The counterfactual result \hat{y}_{i0} could be obtained by observing the welfare variable y_{j0} of family j which was very similar to family i in the control group. Thus, the average treatment effect for the treated is

$$ATT \equiv E(y_{i1} - y_{i0} | h1001_i = 1) = E(y_{i1} - \hat{y}_{i0}) = E(y_{i1} - y_{j0}). \quad (6)$$

When family i was in the control group, y_{i0} could be observed, but y_{i1} could not. By observing the welfare variable y_{k1} of family k which is closest to family i in the experimental group, we could obtain the counterfactual result \hat{y}_{i1} . Then the average treatment effect of the control group is

$$ATU \equiv E(y_{i1} - y_{i0} | h1001_i = 0) = E(\hat{y}_{i1} - y_{i0}) = E(y_{k1} - y_{i0}). \quad (7)$$

Propensity score was used to match the family of the experimental group and the family of the control group. Propensity score reflected the probability of a family getting private transfer payments. If the family propensity score of an experimental group is equal to or very close to that of a control group, it can be considered that there is no selection bias between the experimental group and the control group. The head of a household is the representative of a family. His/her information represents the important characteristics of the family. Therefore, the factors we considered included gender, age, marital status, health status, education level, work, etc. These factors affect the possibility and amount of private transfer payments. Other characteristics of a family, such as the number of family members (reflecting household size), the location of the family, the household registration (reflecting the family living environment, social background, and economic development condition), also influence the probability of the family obtaining private transfer payments. However, whether families have IPTP does not affect the values of these variables. The most popular logit regression method was used to estimate propensity scores with family sample data. To make the form of the logit modeling more flexible, high order terms and cross terms of some variables were added to the model.

To retain as much information as possible, playback matching was performed when matching. To improve the robustness of the estimation results, a variety of matching methods were selected for comparative analysis when matching samples. Specific methods included k-nearest neighbor matching, caliper matching, kernel matching, local linear regression matching, spline matching, and Markov matching.

4. Empirical Study

4.1. Income Inequality

A preliminary analysis of the income inequality of all the households surveyed is shown in Table 3. The Gini coefficient measures the inequality of household income and was decomposed according to household income sources. The total household income was divided into two sources, private transfer income, and other income sources excluding transfer income. In column 3, the average proportion of private transfer income in total household income is 3.57% (we calculated the PTIs of households that did not receive private transfer payments to be 0, which is the average proportion of 28,122 households. If we consider families receiving private transfer payments only, the average proportion of private transfer income in total household income is 6.71%, which is the average proportion of 13,861 households. The details are not listed.) The share of private transfer income in total household income in rural areas is higher than that in urban areas. G_k is the Gini coefficient. The Gini coefficient of total household income is 0.6317, which is higher in rural areas (0.6419) than in urban areas (0.6039), indicating that the inequality in rural areas is higher than that in urban areas. From the Gini coefficient of different sources of income, private transfer income reduced the Gini coefficient of income in both the whole household sample and the sub-regional household sample. For the whole sample, the Gini coefficient decreased by 1.97% due to private transfer income. In rural and urban areas, Gini decreased by 2.79% and 1.93% respectively. From that, IPTP can reduce inequality, and the improvement degree of inequality in rural areas is greater than that in urban areas. The last column data in Table 3 also confirms this point. For the whole household samples, 1% change of PTI leads to 1.32% reduction of Gini coefficient. The results can be confirmed through the formula in the above inequality decomposition of the Methodology section.

Table 3. Gini decomposition of household income.

Area	Source	S_k	G_k	R_k	Share	% Change
The whole sample	income	0.9643	0.6444	0.9937	0.9775	0.0132
	PTI	0.0357	0.8658	0.4590	0.0225	−0.0132
	income_1	0.9911	0.6338	0.9978	0.9923	0.0012
	h1002_1	0.0089	0.9743	0.5635	0.0077	−0.0012
	Total income		0.6317			
Rural area	income	0.9588	0.6603	0.9934	0.9797	0.0210
	PTI	0.0412	0.8545	0.3693	0.0203	−0.0210
	income_1	0.9980	0.6427	0.9997	0.9990	0.0010
	h1002_1	0.0020	0.9827	0.3224	0.0010	−0.0010
	Total income		0.6419			
Urban area	income	0.9654	0.6158	0.9932	0.9777	0.0123
	PTI	0.0346	0.8647	0.4509	0.0223	−0.0123
	income_1	0.9897	0.6067	0.9974	0.9917	0.0020
	h1002_1	0.0103	0.9670	0.5037	0.0083	−0.0020
	Total income		0.6039			

Note: Share gives the proportion of each source of income in total inequality, and % Change gives the effect of 1% change in the corresponding source of income on inequality.

The total income can also be divided into intergenerational downward private transfer payment h1002_1 and income_1, which excludes intergenerational downward private transfer payment. Through such a division, we can see how parents' private property gifts to their children affect inequality. Gini decomposition shows that intergenerational downward flowing private transfer payments generally reduce the inequality of household income. However, its impact on urban areas is greater than in rural areas.

4.2. Logit Regression

A flexible logit model was used to estimate the propensity score of family samples in the experimental group and the control group. The independent variables and the high-order and cross-terms of some variables that entered the model were: gender, age and its square, marriage, health, edu (the educational level of the head of the household) and its square, job, size, econo (economy status), rural, and some of their interaction items, age*gender, age*edu, gender*edu, gender*marriage, econo*rural. The number of samples for which respondents happened to be the head of the household was 21,275, accounting for 75.65% of all the samples. Excluding a sample whose variable gender was missing, the sample size used in this part was 21,274. The results of logit regression using these household sample data are shown in Table 4.

According to the result of logit regression estimation, the coefficient of age is significantly negative and its second-order term coefficient is significantly positive, which indicates that the relationship between the age of the head of household and the probability of the family having IPTP is a “U” shape. There is an age at which the family has the lowest possibility of having IPTP. Before reaching this age, the probability of IPTP decreases gradually. After that age, the probability begins to rise. This is consistent with the fact that when the family is newly formed, the head of the household is generally young and household income is low, so there will almost certainly be IPTP; with the growth of the family, the income will gradually increase, and the economic situation tends to become stable; therefore, the possibility of IPTP gradually decreases. When the head of the household exceeds a certain age, the ability to work decreases and the income also decreases. For example, after reaching retirement age, the income remaining is only the basic pension provided by the retirement pension or pension insurance, and the possibility of IPTP begins to rise. The coefficient of the dummy variable of marital status is positive and significant, which indicates that household heads that have living partners (including married and cohabiting) are more likely to receive private transfer payments. Firstly, families with living partners spend more money and find it easy to get financial support from

their relatives. Secondly, families with living partners have more relatives and friends than those without living partners and have larger personal networks. Finally, families with living partners have more opportunities to obtain private transfer payments, such as marriage, childbirth, and other celebratory events. The variable health indicates physical condition, and its estimated coefficient is significantly negative, indicating that the worse the health of the head of the household, the more likely it is to have IPTP. Health reflects labor ability and medical expenditure. The worse it is, the lower the ability to obtain labor income, the more medical expenditure, the worse the family's economic situation, and the more likely there is an IPTP.

Table 4. Logit regression of propensity score.

h1001	Coefficient	S.E.	z	P > z
age	−0.0586	0.0071	−8.25	0.000
age ²	0.0007	0.0001	10.72	0.000
gender	−0.2450	0.1519	−1.61	0.107
marriage	0.1141	0.0562	2.03	0.042
health	−0.0327	0.0124	−2.64	0.008
edu	0.3011	0.0510	5.90	0.000
edu ²	−0.0166	0.0048	−3.48	0.001
size	0.0046	0.0094	0.49	0.626
job	0.0350	0.0362	0.97	0.334
rural	−0.2361	0.0888	−2.66	0.008
econo	−0.0638	0.0210	−3.04	0.002
age*gender	−0.0047	0.0021	−2.20	0.028
age*edu	−0.0035	0.0006	−5.89	0.000
gender*edu	0.0055	0.0179	0.31	0.759
gender*marriage	0.4123	0.0759	5.43	0.000
rural*econo	0.1268	0.0377	3.36	0.001
constant	1.0077	0.2306	4.37	0.000

Number of observations = 21274.

The variable edu indicates the educational level of the head of the household. Its coefficient is significantly positive, and the coefficient of its second-order is significantly negative. Thus, the educational level of the household head has an inverted U-shaped relationship with the probability of IPTP. With the improvement in the education level of the head of the household, the probability of IPTP increases. Private transfer payment shows characteristics of exchange motivation. After reaching a certain level of education, the probability begins to decline. The coefficient of registration variable rural is significantly negative, indicating that rural households are less likely to have IPTP than urban households, which may be mainly related to the fact that the economic pressure on urban households is much greater than that of rural households. The estimated coefficient of the variable econo is also significantly negative, which indicates that the less developed the region is, the greater the probability of family having IPTP. The probability in the western region is higher than that in the central region, and the probability in the central region is higher than that of families in the eastern region. This may be caused by the fact that in less developed areas, the social security system is more imperfect and the capital market is less developed. Thus, we know that the phenomenon of the private transfer payment is more common in less-developed areas. And it is an important supplement to the local social security system and capital market. The coefficient of age*gender is negative at the 5% significant level. Other cross-explanatory variables also have a significant impact on the probability, except for gender*edu. Those variables like size and job, whose parameters are not significant, were included in the model because they were always included in the previous studies and they should be considered for references to reality and economics.

4.3. Income Effect

According to the logit regression to estimate the family propensity score, the family samples were matched, and then the average treatment effect (ATE) was calculated according to the matched samples of the experimental group and the control group. Firstly, the ATE of IPTP on total income was calculated. Different matching methods, such as k-nearest neighbor matching, caliper matching, kernel matching, local linear regression matching, spline matching, and Markov matching were used to compare and analyze the calculated results. Among them, the ATE of k-nearest-neighbor matching may be different or even quite different for different values of K. In this paper, two common cases, $k = 1$ and $k = 4$, were studied. When $k = 1$, variables are "one-to-one matching." Spline matching uses cubic splines. Besides, we also carried out the most popular caliper inner nearest neighbor matching method, which combines k nearest neighbor matching and caliper matching. Different matching methods were used to compare the income differences between the experimental group and the control group. The results are shown in Table 5.

Table 5. Income average treatment effect (ATE) of inward private transfer payments (IPTPs).

Match Method	Samples	Experimental Group	Control Group	Difference	S.E.	T	z	P > z
	unmatched	67,954.72	60,135.24	7819.48	1923.85	4.06		
k-nearest neighbor matching: $k = 1$	ATT	67,956.80	66,630.75	1326.05	2717.80	0.49	0.47	0.637
	ATU	60,143.73	61,702.66	1558.94	2849.62		0.55	0.584
	ATE			1444.81	2207.97		0.65	0.513
k-nearest neighbor matching: $k = 4$	ATT	67,956.80	63,134.93	4821.87	2146.07	2.25		
	ATU	60,143.73	65,518.08	5374.35				
	ATE			5103.60				
Kernel matching	ATT	67,956.80	61,022.57	6934.23	1947.77	3.56		
	ATU	60,143.73	66,078.54	5934.81				
	ATE			6424.59				
Local linear regression matching	ATT	67,956.80	62,408.44	5548.37	2048.48	2.04	2.71	0.007
	ATU	60,143.73	66,609.47	6465.75	2070.20		3.12	0.002
	ATE			6016.18	1995.61		3.01	0.003
one-to-four matching in calipers	ATT	67,960.25	63,158.30	4801.95	2146.80	2.24		
	ATU	60,151.11	65,533.38	5382.27				
	ATE			5097.88				
Radius matching	ATT	67,960.25	61,547.34	6412.91	1905.08	3.27	3.37	0.001
	ATU	60,151.11	66,499.94	6348.83	1894.97		3.35	0.001
	ATE			6380.23	1870.75		3.41	0.001
Markov matching	ATT	67,954.72	60,808.65	7146.07	2064.45	3.46		
	ATU	60,135.24	65,743.60	5608.36	2074.81	2.70		
	ATE			6361.89	1929.34	3.30		
Spline matching	ATT			6237.22	1946.62		3.20	0.001
	ATU			6213.26	1976.18		3.14	0.002
	ATE			6225.00	1933.44		3.22	0.001

There were 21,274 families matched, including 10,425 in the experimental group and 10,849 in the control group. When using different matching methods to match the experimental group and the control group, the matching details were also different. When k-nearest neighbor matching (including $k = 1$ and $k = 4$), kernel matching and local linear regression matching were used, there were 21,271 family samples in the common range of values, including 10,424 in the experimental group and 10,847 in the control group. In the caliper one-to-four matching and radius matching, among all the observed values, four in the control group were not in the common range, and three in the experimental group were not in the common range, and the remaining 21,267 observations were in the common range. In Markov matching, 21,274 observations were all in the common range.

According to the results of different matching methods listed in Table 5, it can be seen that the ATE of k-nearest neighbor matching estimation is very sensitive to the value of k, and the estimation result at $k = 1$ is quite different from that at $k = 4$. When $k = 1$, for one-to-one matching, according to *t*-value, the estimated value of ATT is not significant (*t*-value of ATU and ATE is not reported); the standard

errors and p -values of the estimated results were obtained through the bootstrap method, and the estimated values of ATT, ATU, and ATE were not significant according to p -values. It can be seen that the results of one-to-one matching are not ideal, and the estimation errors of matching results based on only one family with the closest propensity score may be larger. When $k = 4$, the estimated result of ATT is 4821.870, and the corresponding t -value is 2.25 (greater than the critical value 1.96), which is significant at the level of 0.05 significance. Therefore, the k -nearest neighbor matching estimation is more reliable when $k = 4$.

The default kernel function and bandwidth were used in both kernel matching and local linear regression matching (the default bandwidth for kernel matching was 0.06 for quadratic kernel, and the default bandwidth for local linear regression matching was 0.8 for triple kernel.) In nuclear matching, the estimated value of ATT was 6934.232; T was 3.56, which is larger than the critical value of 2.58, so it was significant at the level of 0.01 significance; ATE was 6424.585. In local linear regression matching, the estimated value of ATE was 6016.177, which is not much different from the estimated value of kernel matching. The p -value shows that the estimated value was very significant. The ATE estimated by one-to-four matching in calipers was 5097.883, which is very close to k -nearest neighbor matching ($k = 4$). The ATEs estimated by radius matching, Markov matching (using heteroscedastic robust standard errors), and spline matching (using bootstrap method to calculate standard errors) are 6380.233, 6361.893, and 6225.002, respectively. According to the corresponding T or p -values, the estimated results of these three matching methods are very significant.

Based on the above results, it can be concluded that the IPTP can increase the total household income by an average of approximately 6000 yuan. Combined with the above, for families receiving private transfer payments, the statistical average of private transfer income is 4588.825, less than 6000, which shows that in addition to subsidizing families directly, IPTP can also indirectly promote family income. Therefore, from the perspective of income effect, IPTP increases family welfare and improves the family economic situation.

4.4. Consumption Effect

In addition to income, household consumption expenditure also largely reflects a family's living conditions. The following is a study of the impact of IPTP on household consumption expenditure. Household consumption expenditure includes food, water, electricity, fuel, property management, daily necessities, household services, local transportation, communications, cultural entertainment, clothing purchase, housing decoration, maintenance or expansion, heating, household durables, luxury goods, education and training, transportation and its components, tourism, visiting relatives, health care expenditure, etc. In CHFS, the statistical timeframe of food, water, electricity, fuel, property management fees, daily necessities, household services, local transportation fees, communication fees, cultural, and entertainment expenditure items is the month, while the statistical timeframe of other expenditures is the year. To unify the timeframe, the monthly data were converted into annual data, and then the household consumption expenditure was calculated by summing all items up. The PSM method was used to study the ATE of IPTP on household consumption expenditure. To ensure the robustness of the results, different matching methods were used to calculate ATE, and all the results were compared and analyzed. The estimated results of the ATE are shown in Table 6.

Table 6. Consumption ATE of IPTP.

Matching Method	Samples	Experimental Group	Control Group	Difference	S.E.	T	z	P > z
	unmatched	45,750.27	39,878.58	5871.69	796.91	7.37		
k-nearest neighbor matching: k = 1	ATT	45,754.59	40,611.00	5143.58	1070.88	5.06	4.80	0.000
	ATU	39,878.59	44,198.38	4319.79	1318.28		3.28	0.001
	ATE			4727.74	967.03		4.89	0.000
k-nearest neighbor matching: k = 4	ATT	45,754.59	40,505.54	5249.05	874.93	6.00		
	ATU	39,878.59	44,546.48	4667.89				
	ATE			4955.68				
one-to-four matching in calipers	ATT	45,764.71	40,511.15	5253.56	875.11	6.00		
	ATU	39,863.60	44,540.65	4677.05				
	ATE			4962.53				
Radius matching	ATT	45,764.71	40,351.29	5413.43	811.64	6.67		
	ATU	39,863.60	44,866.4639	5002.87				
	ATE			5206.17				
Kernel matching	ATT	45,754.59	40,263.24	5491.35	806.46	6.81		
	ATU	39,878.59	44,984.42	5105.84				
	ATE			5296.74				
Local linear regression matching	ATT	45,754.59	40,374.43	5380.16	739.88	5.30	7.27	0.000
	ATU	39,878.59	44,507.25	4628.66	846.93		5.47	0.000
	ATE			5000.81	758.21		6.60	0.000
Spline matching	ATT	45,754.59	40,472.59	5282.00	739.48		7.14	0.000
	ATU	39,878.59	44,758.67	4880.09	787.47		6.20	0.000
	ATE			5079.12	750.97		6.76	0.000
Markov matching	ATT	45,750.27	40,273.30	5476.97	754.73	7.26		
	ATU	39,878.58	44,480.37	4601.79	797.70	5.77		
	ATE			5035.18	726.80	6.93		

Because there are missing values in some household consumption expenditure variables, the observed values used in this part of matching were 19,810, of which 10,000 were in the control group and 9810 were in the experimental group. When K-nearest neighbor matching, kernel matching, local linear regression matching, and spline matching were used, 19,808 observations were in the common range, and one observation value was not in the common range, for in the experimental group and the control group respectively. When one-to-four matching within calipers and radius matching were carried out, three observations in the control group or four in the treatment group were not within the common range, and the others were within the common range. When the samples were matched through Markov matching, all the observations were within the common range. Taking k-nearest neighbor matching (k = 1) as an example, the matching results were tested. It was found that after matching, the standardization deviations of all variables were less than 10%, and the standardization deviations of most variables were greatly reduced. Moreover, all *t*-test results did not reject the hypothesis that there is no systematic difference between the experimental group and the control group, so the matching results balance the data well.

The average treatment effect of consumption expenditure calculated by different matching methods is different, but the results are not very different, around 5000. The *t*-value reported by PSM and the *p*-value calculated by the bootstrap method indicates that the corresponding ATT, ATU, and ATE are significant at the 1% level. It can be seen that familial IPTP increases household consumption expenditure, and the average increase in household consumption expenditure is approximately 5000 yuan. Therefore, IPTP has a positive effect on stimulating household consumption and increasing family welfare.

4.5. Poverty Effect

Foster, Green, and Thorbecke (FGT) (1984) gave the measurement of family poverty [22]:

$$P_{\alpha} = \int_0^z \left[\frac{z-x}{z} \right]^{\alpha} f(x) dx \quad (8)$$

where $\alpha \in \{0, 1, 2\}$ is the inequality aversion parameter, z is the poverty line, x is income, and f is the income density function. Drawing on FGT family poverty measurement method, the poverty degree of a family is measured by the proportion of the poverty-stricken population to the total population of the family:

$$poor = \frac{n - \frac{income}{line}}{n} \quad (9)$$

poor represents family poverty, *n* represents the family population, *income* is total family income, and *line* is the poverty line. The poverty line used in this paper is 2300 yuan per capita per year, which was determined by the Chinese central government according to China's actual condition in 2011.

Using the same matching method as above, this paper studies the impact of IPTP on poverty. The results are shown in Table 7. There were 19,374 observations in the matching. When using k-nearest neighbor matching, local linear regression matching, and spline matching, the experimental group and the control group each had one observation value which was not within the common range, while the other observations were within the common range. When using one-to-four matching within calipers and radius matching, each group had three observations that were not within the common range of values; when using kernel matching, the experimental group had two observations and the control group has three observations that were not within the common range of values; when using Markov matching, all the observations were within the common range of values. After testing, the results of matching well balanced the data. It can be concluded that there is no systematic difference between the experimental group and the control group.

Table 7. Poverty Effect of IPTP.

Match Method	Samples	Experimental Group	Control Group	Difference	S.E.	T	z	P > z
	unmatched	−14.29	−13.41	−0.878	0.530	−1.66		
k-nearest neighbor matching: k = 1	ATT	−14.29	−15.11	0.821	0.870	1.13	0.94	0.345
	ATU	−13.41	−14.25	−0.842	0.716		−1.18	0.240
	ATE			−0.030	0.626		−0.05	0.961
k-nearest neighbor matching: k = 4	ATT	−14.29	−14.42	0.135	0.567	0.24		
	ATU	−13.41	−13.87	−0.464				
	ATE			−0.172				
one-to-four matching in calipers	ATT	−14.29	−14.42	0.138	0.567	0.24		
	ATU	−13.41	−13.87	−0.461				
	ATE			−0.169				
Radius matching	ATT	−14.29	−13.96	−0.322	0.539	−0.60	−0.60	0.550
	ATU	−13.41	−13.77	−0.362	0.526		−0.69	0.492
	ATE			−0.342	0.523		−0.65	0.513
Kernel matching	ATT	−14.28	−13.71	−0.579	0.535	−1.08		
	ATU	−13.41	−13.50	−0.094				
	ATE			−0.330				
Local linear regression matching	ATT	−14.29	−14.92	0.636	0.728	0.87		
	ATU	−13.41	−14.22	−0.807				
	ATE			−0.103				
Spline matching	ATT	−14.29	−14.06	−0.227	0.556		−0.41	0.684
	ATU	−13.41	−13.77	−0.364	0.524		−0.70	0.487
	ATE			−0.297	0.532		−0.56	0.577
Markov matching	ATT	−14.29	−13.55	−0.734	0.562	−1.31		
	ATU	−13.41	−14.05	−0.642	0.611	−1.05		
	ATE			−0.687	0.545	−1.26		

According to the results of ATE in Table 7, the estimated values of ATE were different, or even quite different, with different matching methods. The ATE estimation of k-nearest neighbor matching ($k = 4$) is very close to that of one-to-four matching in calipers, approximately -0.17 ; the estimation results of radius matching and kernel matching are not very different, near -0.34 , but the T and P values show that the estimation results are not significant, and the results of other matching methods are also not significant. IPTP has no significant impact on the poverty level of households, which is

consistent with the results of the study on Chinese farmers in the Xie [23]. As a result, IPTP has not reduced household poverty.

5. Counterfactual Analysis

The above inequality decomposition implies the assumption that IPTP is an exogenous variable. If private transfer payment is not exogenous, it has a certain substitution for family income, such as family members reducing their labor due to receiving or foreseeable IPTP; then private transfer payments will affect family income. In that case, the above analysis results would be misleading. The non-transferable family income in the experimental group would not represent the family income in the absence of IPTP. If the IPTP reduces the motivation of family members to increase their income at work, the non-transfer income of the experimental group will be lower than the counterfactual income of the family. Therefore, estimating the impact of IPTP on inequality needs to consider the total household income in the counterfactual situation of the experimental group.

To estimate the total incomes of counterfactual households in the experimental group, the following equations were estimated using the family samples of the control group, referring to the practices of Acosta et al. (2008):

$$\log Y_i = \alpha + \beta X_i + \gamma H_i + \mu_i \quad (10)$$

where Y_i represents the non-private transfer income, which is the total family income for the control group; X_i is the family characteristic vector; H_i is the characteristics of household head; and μ_i is the income heterogeneity. The values of coefficients α , β , and γ in the Equation (7) can be estimated by using the observed data of the control group. Then the counterfactual income can be obtained from the estimated values of α , β , and γ and the observed values of X and H in the experimental group. The precondition of this method is that there is no essential difference between the control group and the experimental group. It is shown in the model that the μ_i is independent and identically distributed. If this condition is not satisfied, it means that for any family i , it is not random to enter the experimental group or the control group, thus there is a selection bias. To control the possible selection bias, the following models were set up, using the two-step estimation framework of Heckman (1979) for reference [24]

$$P_i = \alpha_1 + \beta_1 X_i + \gamma_1 H_i + \omega Z_i + \mu_i \quad (11)$$

$$\log Y_i = \alpha_2 + \beta_2 X_i + \gamma_2 H_i + \theta \lambda_i + \varepsilon_i \quad (12)$$

where Equation (8) is the selection equation P_i is the probability that family i enter the treatment group; (9) is the income equation for the control group.

First, the parameters of the selection Equation (8) were estimated. The observation values of P_i were only 0 and 1. When there was IPTP, the value was 1; otherwise 0. Z_i is the factor that affects P_i but has no direct impact on family income. The variable relative is used to express Z_i , "The number of relatives living in the same village or city with family i ," which can reflect the family's private social and economic network density to a certain extent and can be regarded as a proxy variable of family's private network. Generally speaking, the larger the family's network, the higher the probability of IPTP, but it has no direct impact on family income. The Probit analysis was used to estimate the probabilistic parameters in Equation (8). The estimated results are shown in Table 8.

Table 8. Parameters estimation results.

Variables	Equation (8)			Equation (9)	
	Probit	Probit_1	Probit_2	OLS	OLS_1
size	−0.0031	0.0001		0.1261 ***	0.1257 ***
econo	−0.0174 *	−0.0393 ***	−0.0393 ***	0.1591 ***	0.1609 ***
rural	0.0051	−0.1558 ***	−0.1543 ***	−0.3956 ***	−0.3943 ***
gender	−0.0598 ***	−0.3021 ***	−0.3045 ***	0.4175 ***	0.4467 ***
age	−0.0021 ***	−0.0427 ***	−0.0425 ***	0.0284 ***	0.0303 ***
marriage	0.0529 **	0.0690 **	0.0687 **	0.2841 ***	0.2821 ***
health	−0.0073	−0.0228 ***	−0.0226 ***	0.1092 ***	0.1102 ***
edu	0.0227 ***	0.1701 ***	0.1702 ***	0.2248 ***	0.1961 ***
job	−0.0338 *	0.0062		0.1201 ***	0.1187 ***
relative	0.0505 ***	0.0542 ***	0.0542 ***		
age2		0.0004 ***	0.0004 ***	−0.0002 **	−0.0002 ***
edu2		−0.0078 ***	−0.0076 ***	−0.0030	
agegender		−0.0002		−0.0065 ***	−0.0067 ***
ageedu		−0.0022 ***	−0.0022 ***	0.0012 **	0.0014 ***
genderedu		0.0020		0.0034	
gendermarriage		0.2783 ***	0.2786 ***	−0.1476 **	−0.1601 **
ruralecono		0.0769 ***	0.0768 ***	−0.0961 ***	−0.0978 ***
λ				0.7664 ***	0.8427 ***
constant	−0.0414	0.7415 ***	0.7443 ***	7.2330 ***	7.1565 ***
observations	28,105	28,105	28,105	13,406	13,406

Note: *, ** and *** indicate that the significance levels of the coefficient are 10%, 5% or 1% respectively.

In Table 8, the first column is the estimation coefficient of variables with family characteristics, household head characteristics, and Z. In the second column, some quadratic terms and cross-terms of explanatory variables were added in the Probit model. From the estimated result probit_1, we can see that the coefficients of variables size, job, and the interaction items age*gender and gender*edu are not significantly different from 0, so we can consider that they do not affect the explained variables. To make the model concise, these variables were removed, and then the Probit estimated. The result “probit_2” is shown in the third column.

In Equation (9), λ_i is inverse Mill's ratio, which is defined as:

$$\lambda_i = \frac{\phi(\alpha_1 + \beta_1 X_i + \gamma_1 H_i + \omega Z_i)}{1 - \Phi(\alpha_1 + \beta_1 X_i + \gamma_1 H_i + \omega Z_i)} \quad (13)$$

where $\phi(\cdot)$ and $\Phi(\cdot)$ are the density function and distribution function of standard normal distribution respectively. After controlling λ_i , the distribution of ε_i can be independent and identical. The family data of the control group are used to estimate Equation (9) parameters. The results are shown in Table 8. The coefficient of λ is very significant, which indicates that there is indeed a selection bias. If OLS estimation of income equation (7) is directly carried out, the estimator will not be consistent.

According to the parameter estimation of Equation (9), the counterfactual family income (impute_income) of the experimental group can be calculated by the observed values of family X, H, and λ . For the control group, income = total_income = impute_income. By calculating and comparing the Gini coefficients of these three kinds of income (Table 9), we can find that the income inequality of rural households is higher than that of urban households; if the family IPTP is exogenous, the IPTP reduces the income inequality of households. Considering the counterfactual situation that there was no IPTP in the experimental group, IPTP deepens the inequality of household income.

Table 9. Income inequality in the counterfactual situation.

	Gini		
	Realistic Total Income (Total_Income)	Income	Counterfactual Income (Impute_Income)
All samples	0.6317	0.6444	0.5380
rural	0.6419	0.6603	0.5552
urban	0.6039	0.6157	0.4914

For the experimental group, the net income effect of IPTP is total household income minus counterfactual income without IPTP (Table 10). On average, the basic conclusion that IPTP increases household income remains unchanged, but the net income effect is more obvious than that of the previous PSM method.

Table 10. Counterfactual income of the experimental group and the net income effect.

Variable	Observations	Mean	S.D.	Min	Max
impute_income	13,856	39,367.40	28,524.74	3736.84	254,579.80
total_income-impute_income	13,856	28,987.87	146,855.30	−1,048,048	2,977,205

Similarly, the net consumption effect is similar to the net income effect. The IPTP increases household consumption, but it is slightly different from the result of the PSM method.

6. Mechanism Analysis

Intuitively, private transfer payments can transfer wealth from wealthier families to poorer ones, with little reverse flow. Such a property transfer reduces higher income and subsidizes the lower-income, thus has a certain role in income redistribution, narrowing the income gap between the two families. From the perspective of the whole society, private transfer payments play a role in alleviating the widening gap between the rich and the poor and promoting the equalization of the income distribution. Therefore, IPTP can alleviate the inequality of family income and reduce the degree of social inequality. However, counterfactual analysis found that the IPTP deepens income inequality. The possible reasons are as follows. First, the network of private transfer payments is solidified. Generally speaking, the relationship between families with private transfer payments is relatively close, and the network of private transfer payments is simple and small, and the wealth gap between families is not big. The small scale of wealth flow does not reduce inequality. Second, as a means of wealth transfer, private transfer payment has a certain “income level solidification effect.” Take families at both ends of income distribution as examples: Families at the top of the income pyramid, whose IPTP scale is generally very large, can provide a substantial amount of money for investment or entrepreneurship. The private transfer payment network can maintain relatively stable at a high-income level. Therefore, most of the wealth in society is in the hands of a small number of people, and the rich get richer. For families at the bottom of the income distribution, the IPTP is also likely to be at the bottom of the distribution, with little impact on their income levels and no substantial impact. As a result, the gap between rich and poor has widened and inequality is deepened. To verify the reasons, we used PTI as the dependent variable and non-transferable income or counterfactual income as an explanatory variable to make regression analysis. The results are shown in Table 11. The estimated coefficient is significantly positive, indicating that the richer the household is, the more private transfer income is. Private transfer payment shows the characteristics of exchange motivation, which verifies the aforementioned mechanism of IPTP deepening income inequality.

Table 11. Mechanism regression analysis results.

Dependent Variable	PTI	Cost	Invest	g1014	Expenditure
Explanatory variables					
income	0.0115 ***				
impute_income		0.0689 ***			
PTI			0.0681	0.0697 ***	0.0818 ***
constant	3858.5410 ***	1879.4969 ***	9129.4224 ***	5378.8632 ***	1052.0598 ***
Observations	13,861	13,856	2954	9591	13,848

Legend: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

IPTP provides a sum of funds for families. It directly increases the total income of families. In addition, transferable income can also enable rural families to expand production, or help their families go out to find jobs, and enable urban families to invest and finance, or even support family members to start their businesses. Therefore, whether urban or rural households, IPTP can increase household income, which can either directly make the household improve their total income, or indirectly promote household income as an intermediate input. To verify this mechanism, for the rural households in the experimental group, the cost of agricultural production and operation (cost) was taken as the dependent variable and PTI as the main explanatory variable for regression analysis; for the urban households in the experimental group, investment in financial products (including bank financial products and other financial products), expressed by variable investments, was the dependent variable, and PTI was the main explanatory variable for regression analysis. The results are shown in Table 11. The estimated coefficients are positive. The estimated coefficients of rural households are not significant. The estimated coefficients of urban households are very significant. They can verify the mechanism of the above-mentioned IPTP increasing household income.

There are at least two mechanisms by which IPTP can increase household consumption expenditure. From the economic point of view, the IPTP increases family income and relaxes the family budget constraints, making the family budget set larger, thus enhancing the family's consumption capacity, and can increase family consumption expenditure. From the perspective of consumer psychology, the IPTP can achieve a certain stimulating effect on consumption. Taking durable household phones as an example, under certain budgetary constraints, consumers choose between a mobile phone that sells for 1000 yuan and a mobile phone that sells for 3000 yuan. Normally, the consumer's expenditure is 1000 yuan. But if consumers can get a private transfer income of 1000 yuan, they are likely to change their original choice and buy the latter. In that case, the consumption expenditure is 3000 yuan. Compared with the original consumption expenditure, the increase of 2000 yuan is caused by IPTP. For this reason, the household durable goods expenditure (g1014) was used as the dependent variable and PTI as the main explanatory variable in the experimental group. The results validated the above explanations.

Although the IPTP not only increases household income but also increases household consumption, it has no significant mitigation effect on household poverty. This may be because, first of all, for most families, the proportion of IPTP in total household income is very small, which is just a drop in the bucket for the poverty situation of the whole family and cannot have a substantial impact on the poverty level of the family; secondly, the IPTP of most families is directly converted into household consumption or transfer expenditure, and the impact on the family's economic situation is small and short; finally, the IPTP is a non-labor income, cannot be a stable source of income for families, often act as "unexpected income," and the change of family poverty relies mainly on stable income flow. With expenditure as the dependent variable and PTI as the key explanatory variable, the regression analysis shows that the coefficient of PTI is 1.0395 and very significant. The coefficient is very close to 1, which shows that household consumption expenditure and IPTP show a 1:1 growth, which verifies the conjecture that most of the aforementioned households' IPTPs directly transform into household consumption expenditure. Besides, as can be seen from the foregoing statistics, for families with IPTPs,

there are also private transfer expenditures of a similar scale, which reflects the courtesy exchanges between people under the influence of the traditional Chinese culture of “one should give as good as one gets.” The average net inflow of private transfer payments (Netinflow) per household after considering outflow private transfer payments is only several hundred yuan, which also explains why IPTP does not significantly improve the poverty situation of Chinese households in a statistical sense.

7. Conclusions

This paper took IPTP as the research object and used CHFS data to analyze the impact of IPTP on income inequality and social poverty. Statistical analysis shows that the proportion of private transfer income in the total household income of rural families is lower than that of urban families. Family income inequality analysis showed that the income inequality of rural households is more serious than that of urban areas. Because the living standards and consumption levels in urban areas are far higher than those in rural areas, only when household income reaches a certain level can they live in cities. That is to say, there is a threshold of household income, which is the floor level to meet the basic life needs in cities, and the urban household incomes are mostly above the threshold value. Moreover, the middle-income group in urban areas accounts for the vast majority. However, in rural areas, the income of poor families is very low, and the income of rich families may be very high, resulting in greater inequality than in urban areas. If IPTP is exogenous, it can reduce the inequality of both rural families and urban families, and the improvement in rural areas is greater than that of urban areas. This is because in rural areas, the lower family income, the more motivation to work in cities, so as to increase the income of poor families. Considering the possible endogeneity of IPTP, counterfactual analysis shows that IPTP increases family income inequality. From the perspective of the human network, every family has its own private transfer payment network. Private transfer payment has a strong correlation with the family income level in the network. According to the hierarchical distribution of family income levels, the hierarchical distribution of private transfer payment can be obtained. Private transfer payments can create more wealth in high-income family networks, while in low-income family networks, private transfer payments are also at a low level, which plays a very limited role. One result of this is that the rich get richer, while the poor are still at a low-income level, thus widening the gap between the rich and the poor and aggravating inequality.

From the analysis of income, consumption, and household poverty, we found that the IPTP not only directly subsidizes the total household income but also indirectly promotes the increase of household income. At the same time, IPTPs also stimulate household consumption and increase household consumption expenditure. Although IPTPs increase household income and consumption expenditure, they have no significant impact on the poverty level of Chinese households. On the whole, the objective existence of IPTPs still has a positive significance. Firstly, IPTPs improve people's living standards from two aspects: Increasing the total family income and rising household consumption expenditure. Secondly, although the IPTP may deepen the inequality of household income, it makes the rich richer by promoting the income growth of high-income families, thus widening the income gap. For low-income families, although there is no significant improvement, it does not make the poor poorer.

Based on the findings of this study, we can draw the following policy implications about improving income inequality and reducing social poverty. First, people should try their best to maintain the “exogeneity” of IPTP and reduce its substitution for household income. The study finds that if the IPTP is exogenous, it can reduce the income inequality of both urban and rural households. Therefore, urban and rural residents should be encouraged not to reduce their production and work time even if they have IPTP, so that IPTP is independent of family income expectations. Second, be good at making use of IPTP to invest or reproduce. At present, IPTPs have not significantly alleviated the poverty levels of families. The main reason is that for most families, the IPTP has directly transformed into household consumption expenditure and has not played a greater role. Third, the government should encourage urban and rural residents to strive to develop stable sources of income and become rich

through hard work. IPTP is often an “unexpected gift.” To get rid of poverty and become rich, people should rely on their own efforts to increase family income, instead of expecting other people’s private gifts. Just as Chinese President Xi Jinping said, “Happiness comes from struggle.”

In future research, we can focus on more details, such as who remits, and how much, if the data permits it. Remittances are always related to migration closely. In this paper, we did not differentiate the remittances according to their sources. We can also research remittances together with population migration in a further study. Different migration routes lead to different remittances styles. We could also conduct research on how different styles of migration and remittances affect income distribution and poverty.

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