

Study of Evaluation of the Effect of Women's Income Increase and Mechanism from the Perspective of Preventing the Return to Poverty

Bingqin Zhu

¹ School of History and Society, Xinjiang Normal University, Urumqi 830017, Xinjiang, China

² School of Business, Xinjiang Normal University, Urumqi 830017, Xinjiang, China

Abstract

Studying the effect of the precision poverty alleviation policy from a female perspective is of great significance for preventing the return to poverty after China's comprehensive poverty alleviation. This paper uses the Chinese Family Tracking Data (CFPS) to establish the four-period mixed cross-section data from 2014 to 2018 to conduct the double-difference-in-differences (DID) and mediation effects to test the effect of women's poverty eradication under the precision poverty alleviation policy as well as the validity of the transmission mechanism. The results of the study show that: the precise poverty alleviation policy has significantly increased the income of female groups, and its control group has increased by about 27.64% compared with the treatment group, which has passed the parallel trend and robustness test, and the effect of the policy is in an upward stage; the policy has the most significant effect on the poverty elimination of the female groups with elementary school and junior high school education; the transmission mechanism of the poverty elimination of the female groups under the precise poverty alleviation has a significant effect of the poverty elimination of the female groups in terms of the poverty elimination of the health, the network, and the education and culture. Among the transmission mechanisms for poverty alleviation, health, Internet, education and culture have significant effects, while financial poverty alleviation has no significant effect. Accordingly, relevant policy recommendations were made.

Keywords

Women's Poverty Eradication; Transmission Mechanisms; Policy Effects; Double-difference Approach.

1. Introduction

Over the past 40 years of reform and opening up, 750 million Chinese people have been successfully lifted out of poverty, contributing more than 70 percent of the world's population and achieving the poverty reduction goals of the United Nations 2030 Agenda for Sustainable Development 10 years ahead of schedule. Achieving comprehensive poverty alleviation does not mean the end of poverty alleviation, as the 14th Five-Year Plan and the vision of basically realizing socialist modernization by 2035 suggest that "more obvious and substantial progress will be made in the comprehensive development of human beings and in the common prosperity of all people." At the same time, precision poverty alleviation is an important conclusion drawn from China's many years of experience in poverty alleviation, and is an important decision in the transition of poverty alleviation from "blood transfusion" to "blood-creation." 2015 saw the official launch of precision poverty alleviation, which is being implemented through the "transfer payment" program. "transfer payments" and "expenditure exemptions" as the main means of poverty alleviation, to achieve six precise objectives of poverty alleviation, precise project arrangements, precise use of funds, precise measures to

households, precise assignment of people according to villages, and precise poverty elimination results, and to achieve outstanding results, and to realize total poverty elimination by 2020. However, poverty alleviation work should be more sustained and precise in this critical period to prevent the return of poverty, and the next work is to stabilize the effectiveness of poverty alleviation. At the same time, it is to further realize the quality of life out of poverty and realize the "quality" out of poverty.

How to stabilize the effects of poverty alleviation is a matter of concern. At the present stage, attention is being paid to the concepts of "female impoverishment" and "male domination of the household, female domination of the family", which are also being explored in greater depth in the new era of poverty alleviation, because women are usually unable to work and generate income because they are caring for their families, and women in rural areas, in particular, have become vulnerable among poor households because their husbands are working outside the home. In particular, rural women, whose husbands work outside the home, have been feminized in agriculture and have become a vulnerable group among poor households, and their poverty alleviation is still at the stage of "blood transfusion", which makes them a key link in stabilizing the effect of poverty alleviation. At the same time, women's poverty alleviation can play an intergenerational poverty alleviation impact, because children in the family are more carefully influenced by their mothers, and women's poverty alleviation can be an educational model for the next generation, for example, Nie Changhong et al. (2020) showed that women's poverty alleviation can interrupt intergenerational transmission, and promote the happiness and harmony of the family[1]; Liang Wenfeng (2018) believes that women's poverty alleviation can be more effective in the precision of poverty alleviation, and it is also of positive significance in the rural revitalization strategy[2,3]. Therefore, it is necessary to study and analyze the effectiveness of women's poverty alleviation under the policy of precise poverty alleviation, which can provide a reference for further stabilizing the performance of poverty alleviation. This paper studies the following questions: Is the effect of women's poverty alleviation under the precise poverty alleviation policy significant, and can it improve the income of women groups? What is the status of the policy effect? Is there any heterogeneity in the effect of the policy on female groups? What is the transmission mechanism through which the policy effect takes effect? The above questions will be answered theoretically by combing the current system and literature, and then tested empirically.

2. Literature Review and Theoretical Hypotheses

Based on the domestic and international literature combing, scholars on poverty alleviation research mainly focus on the following aspects, according to the research time and poverty alleviation work progress classification: from the broad sense of poverty alleviation research have: Laurell A C and Wences M I (1994) that the government compensatory programs will be through structural adjustment due to unemployment and wage decline caused by poverty alleviation exacerbation, and did not improve the status quo of poverty[4]; Loayza N V and Raddatz C (2010) from a two-sector theoretical model, elucidated the mechanism by which the sectoral composition of growth and the associated labor intensity affects workers' wages and thus poverty alleviation, i.e., there is an impact of the scale and composition of economic growth on poverty alleviation[5]; Coxhead I A and Warr P G (2012) analyzed the economic effects of technological advances in agriculture and overall technological advances on poverty alleviation and found the most significant changes in poverty welfare. The impact of the impact found that the most important factor on the change of poverty welfare is the impact of factor price allocation, rather than reflected in the price of the impact, and proposed that there is an impact of trade openness on poverty benefits, but did not explain in detail[6]; Otte J et al. (2012) analyzed from the economic and political perspectives of the livestock industry policy

contributes to the global poverty reduction efforts, and proposes measures for sustainable development[7].

Scholars from the specific channels of poverty eradication are: Croes R and Vanegas M (2008) through cointegration, Granger causality test, showed that tourism can help Nicaragua's resource allocation towards tourism, balanced economic development to achieve large-scale poverty reduction[8]; Ogun T P (2010) through structural vector autoregression methodology to analyze the results show that large-scale investment in urban infrastructure can largely reduce poverty in urban areas[9]; Malatji M I and Mtapuri O (2014) Tourism as a vehicle for poverty reduction is an important way, but the system is simple tourism to provide employment there are fragile "employment structure", the formation of non-governmental organizations such as trade unions can provide workers with a variety of employment opportunities, the formation of non-governmental organizations such as trade unions. The formation of non-governmental organizations such as trade unions can provide workers with training in various employment skills and create employment opportunities, contributing to the long-term effectiveness of poverty alleviation[10]; Phommavong S et al. (2014) through the study of poverty alleviation through tourism in Laos found that religious beliefs indirectly affect the imbalance of male-female labor force distribution of poverty alleviation through tourism, and discrimination against females reduces the effectiveness of women's poverty alleviation[11].

Domestic scholars from the perspective of precision poverty alleviation include: Lin Guangyi (2016) showed that rural e-commerce poverty alleviation is a supplement to the battle against poverty, and there is a significant effect on rural poverty alleviation[12]; C et al. (2018) used Songjiagou village in Fuping County, Hebei Province, China, as an example to conduct a study and found that the innovation of land policy can promote the effect of precision poverty alleviation, but further policy implementation may face the dilemmas of labor, capital and land issues[13]; Guo Zhiyuan et al. (2019) argued that precision poverty alleviation is the foundation and prerequisite for rural revitalization in rural areas, and that precision poverty alleviation implements precise initiatives by fine-tuning the analysis of factors that hinder poverty eradication[14]; Wang Liyong et al. (2019) showed that precision poverty alleviation can effectively increase per capita household income by using the DID methodology and robust empirical evidence, and that the policy is more effective in areas with high incidence of poverty, and is more Sustainability. At the same time, the policy effect is in a "U" shape, which is more beneficial to the middle-income group[15]; Bian Junjie et al. (2019) empirically analyzed through the propensity matching score (PSM) that poverty alleviation can effectively increase the residents' expenditure on housing and education, but the effect on other expenditures is very small[16]; Li Yushan et al. (2020) showed that industrial poverty alleviation can effectively increase the per capita income of households through clear definition of the poverty rate. analysis shows that industrial poverty alleviation can effectively improve the vitality vulnerability of poor households and realize the effect of poverty eradication by clarifying the mode of vitality and willingness to get rich[17]; Li Fanghua et al. (2020) empirically analyze the theory of precision poverty alleviation using precise breakpoint regression, which shows that precision poverty alleviation can effectively improve the labor supply and income in poor areas, and that male acceptance of the policy effect is better than that of females, while the policy effect of females is still in the potential optimization stage and there is heterogeneity in the policy effects[18]; Jia Haiyan (2020) argues that health and poverty have a mutually reinforcing effect, and that health inequality and economic inequality are direct factors leading to the cycle of poverty, so sound medical resources in impoverished areas and upgrading of medical care are the perfect for precision poverty alleviation[19].

Further studies from the female perspective of precision poverty alleviation include Kyeyune G and Goldey P (1999) who analyzed women's poverty and survival strategies in Uganda using

both qualitative and quantitative analytical methods, and showed that there is heterogeneity among disadvantaged groups of women, and that policy makers ignoring this heterogeneity reduces the poverty alleviation effect of policies[20]; Mahmood S et al. (2014) argued that microfinance for women entrepreneurs can solve the problem of entrepreneurial capital and achieve significant results, and at the same time, it can promote the family out of poverty[21]; Lai Li (2017) argued that the early precision poverty alleviation included women out of poverty in the policy, but the effect of the policy has a "discriminatory" nature, so in order to truly achieve women out of poverty, it is necessary to incorporate gender equality into the policy is the key. The key is to incorporate gender equality into the policy[22]; Hoa D T et al. (2019) found that ethnic minority women broke through cultural barriers, developed livelihoods with microfinance, realized poverty alleviation, and started commercial production through a survey of 950 Vietnamese families in 2018[23]; Nie Changhong et al. (2019) believe that women's poverty alleviation is the key to winning the war against poverty, and compare women's poverty alleviation policies of many countries, and combined with China's national conditions, the policy should be more effective. China's national conditions, the policy should be more precise to enhance women's employment willingness, and to solve the pressure of family care[24].

Studies from the heterogeneity of poverty alleviation policies on poor groups include: Gao Xiong (2014) argues that knowledge poverty is the main source of material and spiritual poverty, and it is only by enhancing their knowledge education that they can improve the effect of poverty eradication[25]; Yuan Liping et al. (2019) argues that poverty alleviation through education is a key path to block the transmission of poverty between generations[26]; Yan Wei et al. (2019) empirically analyze that poverty alleviation through education under precise poverty alleviation can effectively reduce individual poverty incidence, and there is heterogeneity of policy effects on different educational groups[27]. Based on the research and theories of the above scholars, the following hypotheses are proposed:

Hypothesis 1: Precision poverty alleviation policies are effective in raising women's income and promoting women's development by utilizing the policy effects from different channels of precision poverty alleviation;

Hypothesis 2: There are differences in knowledge structure and cognition due to differences in educational qualifications, leading to heterogeneity of policy effects across different groups of women with different educational qualifications.

To summarize, both at home and abroad have attached great importance to the work of poverty alleviation, and scholars have made meaningful contributions to the study of the role of the government in poverty alleviation, the path of poverty alleviation, precision poverty alleviation, women's poverty alleviation, poverty alleviation policy heterogeneity and other different areas of research. The research results of the above scholars are very rich, but there are fewer studies that empirically test the concept of poverty alleviation and its policy effects from the perspective of women's groups, therefore, this paper takes this as an entry point, and will empirically test hypotheses 1 and 2 from the women's perspective on the effects of the precision poverty alleviation policy in terms of the heterogeneity and the transmission mechanism from the theoretical basis.

The marginal contributions of this paper are the following three points: first, it is an empirical test of the effect of the precision poverty alleviation policy from the female perspective; second, it utilizes the use of the Chinese Family Tracking Data (CFPS) data with a sufficiently large sample size and a wide coverage, which is more illustrative of the problem; the empirical level carries out a static and dynamic validation of the LCA, and the results of the robust test at the empirical level are more precise.

The following is organized as follows: Part III is the research design; Part IV is the empirical analysis; and Part V is the conclusions and policy recommendations.

3. Research Design

3.1. Modeling

Precision poverty alleviation policy can be regarded as a natural experiment, so double differencing can be used to estimate the impact of precision poverty alleviation policy on the effect of women's poverty alleviation. The double difference method can test whether there is a significant difference in the actual annual income of women in the treatment group and the control group before and after the implementation of the precision poverty alleviation policy to test the effect of the implementation of the precision poverty alleviation policy while controlling for the same relevant factors, and the model is constructed as follows:

$$Y_{it} = \beta_0 + \beta_1 DID_{it} + \beta_2 control_{it} + \eta_i + \gamma_t + \varepsilon_{it} \quad (1)$$

Where Y_{it} is the explanatory variable measuring the real annual income of women, with women's is real annual income to take the natural logarithm of the representation; $DID_{it} = \text{treatment}_i \times \text{time}_t$, in the model as the core explanatory variables, if individual i received a government subsidy during the sample period, then $\text{treatment}_i = 1$, otherwise $\text{treatment}_i = 0$; when $t \geq 2016$, $\text{time}_t = 1$, otherwise $\text{time}_t = 0$. In the paper, the treatment group is female individuals who receive government subsidies, and the control group is other female individuals who do not receive government subsidies, and the subscripts i and t in the model denote the individual and the year, respectively; $control_{it}$ refers to the control variable that affects female income, which varies with i and t ; and η_i refers to the control of the individual factor that does not vary with time, but that affects female income, which is denoted as an individual fixed effect; γ_t is the time factor that controls for changes over time that affect female income, denoted as a period effect; ε_{it} is the error term. In order to avoid the problem of estimation bias due to serial correlation and heteroskedasticity in the model, the model results are treated with robust standard errors of individual clustering, and individual and period effects are controlled. The effect of women's poverty alleviation under the precise poverty alleviation policy is represented by the coefficient β_1 , if β_1 is significantly positive, the policy is effective.

3.2. Data Sources

The data in this paper comes from the China Family Panel Studies(CFPS), which is implemented by the China Center for Social Science Research of Peking University, with a sample of 25 provinces, municipalities and autonomous regions. By tracking and collecting data at the individual, family and community levels, the data reflects the changes in China's society, economy, demography, education and health, and more importantly, provides a source of data for public policy research and analysis. It also provides a source of data for public policy research and analysis. In this paper, we use the data from the perspective of the impact of precision poverty alleviation policy on women's income utility, construct the mixed cross-section data for the three periods of 2014, 2016 and 2018 , and exclude the missing and unavailable data according to the data availability and consistency, with the sample size of 12,589. The mixed cross-section data can provide a large number of samples to achieve a more accurate estimation of the effect of the amount of the cross-section data for the different years can be mixed together to better analyze the impact of the policy on women's income and the impact of the policy on women's income. Mixed cross-section data provides a large sample size

for more precise estimation of effects, and mixing cross-section data from different years allows for a better analysis of the impact of a policy.

3.3. Description of Variables

(1) Explained variable: the logarithmic value of the actual annual income of individual women was chosen to represent it. Since most of these women's incomes are zero, in order to be able to take the natural logarithm to reduce the heteroscedasticity of the model estimation, the variable is added 1 and then the logarithmic value is taken. At the same time, women's real income was calculated at constant 2010 prices.

(2) Core explanatory variable: the interaction term DIDit ($DIDit = treatment_i \times time_t$) in the double-difference method model of precision poverty alleviation policy. Drawing on Liu Zhao et al. (2020), the government subsidies of residents in the CFPS data are uniformly attributed to government subsidies, and government subsidies in precision poverty alleviation are mainly derived from financial special funds for poverty alleviation, so in this paper, whether or not to accept government subsidies is used as a measure of precision poverty alleviation policy, so the value of females who have accepted government subsidies here is taken to be 1 [28]. In 2014, the State Poverty Alleviation Office (SPA0) issued the "Establishment of Precision Poverty Alleviation Work Mechanism Implementation Program" in 2014, taking into account the lag between policy release, implementation and effectiveness, 2016 is taken as the policy onset period, so $treatment_i$ and $time_t$ refer to the group and time dummy variables of accepting the policy implementation, respectively; for those who accept the government subsidy, $treatment_i = 1$, or else take 0; when $t \geq 2016$, $time_t = 1$, or else take 0; $treatment_i \times time_t = 1$ indicates female individuals who received government subsidies under the Precision Poverty Reduction Policy.

(3) Control variables: in order to improve the accuracy of the model estimation, in addition to the precision poverty alleviation policy will affect the individual income of women, there are other factors that lead to individual differences, which lead to the impact of the policy outside the policy, therefore, these exogenous factors should be controlled. According to the relevant factors affecting individuals, the control variables selected from the individual level and the family level: urban and rural (countryc); age (age); highest education (educ); nature of work (job); whether to use a cell phone (mobile); physical health (health); and the size of the family population (familyc).

(4) Other variables: Based on the characteristics of the female group, such as the need to take care of their families and their low mobility, the following poverty alleviation policies, namely, health alleviation, network poverty alleviation, financial poverty alleviation and cultural and educational poverty alleviation, which are more likely to benefit them, were selected to verify the transmission mechanism of poverty alleviation and its effectiveness. Doctlevel is chosen to indicate the improvement of women's life by local medical construction and medical technology upgrading, so as to ensure the health level of women's groups in order to better employ and carry out business activities, and thus increase the income of women's groups, and to empirically test the effectiveness of health poverty alleviation in precise poverty alleviation policies; whether to use the mobile network is chosen to indicate whether women's groups use the network for employment, shopping, sales, and marketing, and whether they use the network for business. Groups through the network employment, shopping, sales and other channels to enhance their employment and income channels, the majority of women can be through the network platform to do micro-business, network stores, network sales and other more convenient channels to achieve employment and income generation, especially in the era of the network "with goods" information, the use of the mobile network for the need to take care of the family of low mobility of the female population, and this is a choice. In particular, the use of mobile networks is a choice for female groups with low mobility who need to take care of their families, and this is used to empirically test the effectiveness of Internet poverty

alleviation in poverty alleviation; whether bankpay is selected to indicate whether female groups are able to use bankpay as a means of purchasing agricultural products, employment, and entrepreneurial capital, and to promote their motivation in employment and entrepreneurship, so as to empirically test whether financial poverty alleviation is effective in poverty alleviation from the popularization of bankpay among females; Literature and education expenditure (literpay) is chosen to indicate that female groups can improve their personal knowledge and skills by increasing their expenditure on culture and education to achieve the effect of poverty alleviation, and learning knowledge and technology and then realizing them can improve the income and quality of life of female groups in a more comprehensive way, so as to empirically verify whether literacy and education poverty alleviation is effective in poverty alleviation, and since there is a value of 0 in the variable, the value is added 1 and then taken as the value of the variable. As there is a value 0 for this variable, add 1 to the variable and then take the logarithmic value to deal with it.

The model of this paper empirically all variables are statistically described as follows:

Table 1. Descriptive statistics of variables

variable name	Variable Meaning	sample size	average value	standard error	minimum value	maximum values
lnY	Real Annual Income of Female Individuals	12589	5.7251	4.9293	0	13.1224
countryc	0 = rural; 1 = urban	12589	0.4990	0.5000	0	1
age	(a person's) age	12589	40.0675	13.2441	16	84
educ	0 = illiterate/semi-literate; 1 = elementary school; 2 = secondary school; 3=High school and below; 4=Bachelor's degree	12589	1.9106	1.3709	0	4
marr	0 = unmarried; 1 = married	12589	0.8326	0.3733	0	1
job	0 = agricultural; 1 = non-agricultural	12589	0.6154	0.4865	0	1
Mobile	0 = no cell phone use; 1 = cell phone use	12589	0.8832	0.3211	0	1
surfnet	0 = no network; 1 = use network	12589	0.4781	0.4995	0	1
health	0=unhealthy; 1=fair; 2=more healthy; 3 = very healthy; 4 = very healthy	12589	2.1187	1.2589	0	4
familyc	Family size	12589	4.3248	1.9319	1	17
doctlevel	0=very bad; 1=bad; 2=fair; 3=good; 4=very good	12589	2.4412	0.7529	0	4
lnliterpay	Expenditures on culture and recreation/year	12589	2.1210	2.9451	0	11.0021
bankpay	0=No; 1=Yes	12589	0.0821	0.2745	0	1

4. Analysis of Empirical Results

The analysis of empirical results on the effect of women's poverty alleviation under the precise poverty alleviation policy is divided into four parts: using the double difference method (DID) to estimate the effect of the precise poverty alleviation policy on women's real income from a static perspective; conducting the parallel trend test and the PSM-DID robustness test to rule

out the bias of the estimation results caused by the omitted variables; estimating the effect of the precise poverty alleviation on women's real income from a dynamic perspective based on the PSM-DID; and further discussing and analyzing the heterogeneity effect of the policy effect. impacts; and further discuss and analyze the heterogeneity effects of policy effects.

4.1. Benchmark Regression of Policy Effects

The benchmark regression validates the combined effect of women's poverty eradication under the Precision Support Policy from a static perspective to test Hypothesis 1. The double-difference method is used to estimate equation (1), and the estimation results are shown in Table 2. Among them, column (1) did not add control variables, column (2) added two people control variables, control variables are denoted by control, and control is used to denote control variables in all model regressions below. The results show that there is a significant positive causal effect between the precision poverty alleviation policy and women's income, i.e., precision poverty alleviation can significantly increase women's income level. Specifically, in column (1) where no control variable is added, precision poverty alleviation significantly increases the treatment group by about 170.94% compared to the control group, and this result may be influenced by other factors. Therefore, with the inclusion of control variables to exclude the influence of other variables, in column (2), the treatment group significantly improves by about 27.64% compared to the control group, which is obviously lower than that in column (1), but it is still a positive driving force, and this result is consistent with the results of the robustness empirical test below.

Table 2. Benchmark regression

variant	Logarithmic value of women's annual income: lnY	
	(1)	(2)
DID	1.7094***	0.2764**
treatment	-3.3055***	-0.4294***
time	3.0267***	1.6045***
control	yes	yes
cons	5.7115***	1.5604***
F-value	1905.20	2821.08
sample size	12589	12589
R ²	0.2701	0.5896

Note: * represents at 10% significance level, ** represents at 5% significance level, *** represents at 1% significance level.

4.2. Parallel Trend Tests for Policy Effects

In the previous double difference method (DID) empirical evidence shows that there is a significant positive causal relationship between the precise poverty alleviation policy on women's poverty alleviation, which can effectively enhance the income of female groups, but the conclusion may still be biased due to the influence of omitted variables, in order to further verify the accuracy of the policy effect, a parallel trend test was conducted for the explanatory variable (women's real annual income: lnY) as in (a) in Fig. 1 and, at the same time, refer to Zhou Yulong et al. (2018) after controlling for year fixed effects parallel trend test of residual means as (b) in Figure 1[29]. Parallel trend test specific analysis: according to Figure (a), before and after the implementation of the 2016 precision poverty alleviation policy, before 2016, it can be found that the treatment group and the control group maintain more or less the same trend, and after 2016, the female income of the treatment group rises abruptly, and constantly draws the gap between the treatment group and the control group; according to Figure (b), it can be found that the trend of the regression residuals is also in the 2016 precision According

to Figure (b), it can be found that the change trend of the regression residuals is also significantly different before and after poverty alleviation in 2016, before 2016, the change trend of the residuals remains relatively consistent, and after 2016, the change trend of the residuals is significantly closer, narrowing the gap between the residuals of the treatment group and the control group. According to the results of the parallel trend test above, the conclusion that the precise poverty alleviation policy has a significant positive causal relationship on women's poverty alleviation and can effectively improve the income of the female group is reliable.

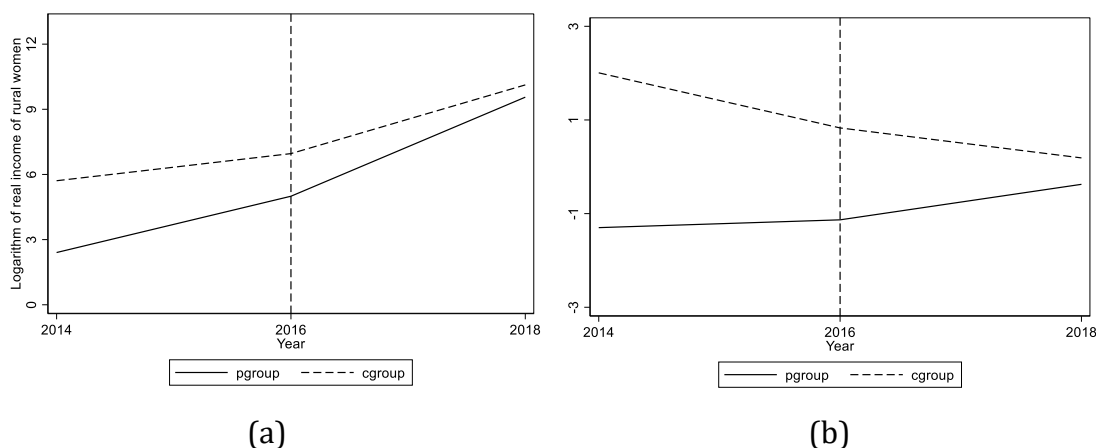


Figure 1. Parallel trend test

4.3. Empirical Tests of the Robustness of Policy Effects

To further ensure the robustness of the benchmark regression results of the DID above, the PSM-DID method is utilized to empirically test the effect of women's poverty eradication under the precise poverty alleviation policy. Specifically, in order to ensure the comparability of the empirical results, the control variables in the previous DID are utilized to conduct Logit regression to predict the probability of each individual being subsidized by the government under the Precision Poverty Alleviation Policy, and then the propensity-matching scoring methods of nearest-neighbor matching, radius-matching, and kernel-matching are used to match the Precision Poverty Alleviation Sample Groups that have been subsidized by the government (the Treatment Groups) with the appropriate control groups, to reduce the significant difference in the implementation of the Precision Poverty Alleviation Policy significant difference before the shock, in order to maximize the precision poverty alleviation policy implementation in the presence of self-selection bias that leads to endogeneity problems. And on the basis of the above, the net effect of precision poverty alleviation policy implementation on women's income is identified using the double difference method (DID). In summary, it can be seen that the combination of propensity to match score and double difference method (PSM-DID) can maximize the bias problem caused by observable control variables, time-varying and non-time-varying unobservable variables, so the combination of the above two methods can more accurately identify the policy effects and enhance the reliability and robustness of the conclusions. Before conducting the robust analysis, according to Vandenberghe and Robin (2004)[30], the study shows that the matched estimation results coefficients using the above three methods are relatively consistent. The empirical results are shown in columns (1)-(3) of Table 3, where the estimation results of radius matching, kernel matching, and nearest-neighbor matching, respectively, are about 26.77%, 27.64%, and 27.64%, which are consistent with the estimation results of the benchmark regression of the DID, and further indicate that the precision poverty alleviation policy has a significant positive effect on the women's escape from poverty, so that the income of the women who are subjected

to precision poverty alleviation (treatment group) is 27.64% higher than the income of females not affected by the policy (control group). Also attached is Figure 2, which shows the difference between the propensity to match scores control variables after matching Figure (a), (b) and (c) indicate radius matching, kernel matching, and near-neighbor matching, respectively. The results show that matching was able to reduce the significance of variable differences after matching.

Table 3. PSM-DID robustness tests

variant	Logarithm of real annual income for women: lnY			
	(1)	(2)	(3)	(4)
	radius match	nuclear matching	nearest neighbor matching	radius match
DID	0.2677**	0.2764**	0.2764**	
DID ₂₀₁₆				0.4070**
DID ₂₀₁₈				2.6312***
Treatment	-0.4243***	-0.4294***	0.4294***	0.4258***
Time	1.6095***	1.6045***	1.6045***	1.6528***
control	yes	yes	yes	yes
F-value	2618.09	2821.08	2821.08	3983.09
sample size	12570	12589	12589	12589
R ²	0.5925	0.5896	0.5896	0.8271

Note: * represents at 10% significance level, ** represents at 5% significance level, *** represents at 1% significance level.

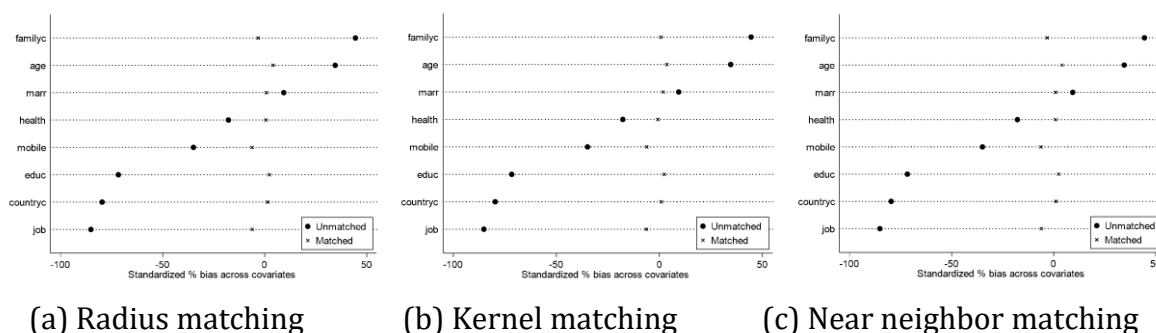


Figure 2. Plot of differences before and after propensity score matching control variables

4.4. Empirical Analysis of the Dynamics of Policy Effects

Further analyzing the future development trend of the policy effect of precise poverty alleviation on women's poverty eradication can provide guiding significance for the implementation of future policies, and can provide a reference for the policy to provide timely stop-loss or strike while the iron is hot. Therefore, on the basis of the above static perspective empirical evidence of the existence of a significant positive effect of precision poverty alleviation policy on women's poverty eradication, from a dynamic perspective to further test and analyze the policy effect of precision poverty alleviation, as shown in column (4) of Table 3, the estimated coefficients of the policy effect DID₂₀₁₆, DID₂₀₁₈ are 0.4076 and 2.6313 respectively, with the estimated coefficients significantly positive, of which the policy effect of precision poverty alleviation in 2018 is much larger than that in 2016, i.e., the policy effect is much larger than that of 2016, that is, the effect of precise poverty alleviation policy on women's poverty eradication is in an upward stage, contributing to the prevention of returning to poverty after reaching poverty eradication in 2020, and it can continue to increase the strength of precise poverty alleviation on women's poverty eradication, and continue to play the marginal incremental effect of the policy.

4.5. Heterogeneity Analysis of Policy Effects

The difference in educational level means that there is heterogeneity in knowledge structure and cognition, which will lead to differences in the effects of the poverty alleviation policy on different individuals. Analyzing from the theoretical perspective, is it that the higher the education the more efficient the use of resources for precise poverty alleviation, and the more significant its policy effect? This will be an empirical test of hypothesis 2. Therefore, it is necessary to conduct heterogeneity analysis for the benchmark regression above, here the heterogeneity effect is to categorize all the samples in terms of academic qualifications for empirical analysis, and the results are shown in columns (1)-(5) of Table 4. The estimated coefficients of the policy effect in columns (2) and (3) are significantly positive, 0.7252 and 0.4571 respectively, i.e., the poverty alleviation effect of the precise poverty alleviation policy on women with primary and junior middle school educational attainment is significantly positive, and among them, the poverty alleviation effect is greater for the female group with primary educational attainment. The estimated coefficients of the policy effects in columns (1), (4) and (5) are all insignificant. The specific reasons for the above results are as follows: women with high school education and above are educated and learned enough to find jobs and generate income, so the effect of the precise poverty alleviation policy on them is very small or even non-existent, not only that, they will put more energy into their jobs to improve their income; while the group of females with junior high school education and below are more likely to drop out of school because of family constraints and primitive poverty, which suggests that the policy effect on poverty alleviation is greater. On the other hand, women with junior middle school education and below, they are more likely to drop out of school due to family constraints and primitive poverty, which indicates that the economic environment around them is worse, showing a negative Matthew effect, so they are more in need of subsidies, and they pay more attention to the resources of precise poverty alleviation, and they will further explore the potential benefits of the resources they can obtain, so the effect of precise poverty alleviation on their poverty alleviation is significant. Among them, the effect of poverty alleviation on illiterate and semi-illiterate female groups is not significant, which is related to their limited access to information and utilization of resources, because they may not know how to read and write, let alone how to select the policy information that matches their own from a large amount of policy information, as well as their inner inferiority complex and dislike of trouble, and other factors have caused the policy resources to pass them by. To summarize, there is significant variability in the effect of the precision poverty alleviation policy on the survival of women with different educational levels in escaping poverty.

Table 4. Heterogeneity analysis of policy effects

variant	Illiterate/semi-literate	secondary schools	middle school	High school and below	undergraduate (adjective)
	(1)	(2)	(3)	(4)	(5)
DID	0.1865	0.7252**	0.4571**	-0.3937	0.0884
treatment	-0.3741**	-0.2830	-0.3826**	0.0296	-0.5750**
time	1.4536***	3.6208***	1.7086***	1.6128***	0.9458***
cons	2.0794***	1.4112**	2.2367***	1.2775	2.1017*
control	yes	yes	yes	yes	yes
F-value	267.21	497.47	465.94	114.83	17.58
sample size	2839	1697	3945	1890	2172
R ²	0.5179	0.5887	0.4318	0.3286	0.1178

Note: * represents at 10% significance level, ** represents at 5% significance level, *** represents at 1% significance level.

4.6. Testing the Transmission Mechanism of Policy Effects

It has been verified above that the precise poverty alleviation policy can significantly improve women's poverty situation and raise their income. Therefore, in order that the precise poverty alleviation policy can more accurately formulate precise poverty alleviation strategies for the poor targets, and that more efficiently promoting women's poverty alleviation in deep poverty alleviation is the key to preventing the return to poverty, here we will empirically verify health poverty alleviation, network poverty alleviation, financial poverty alleviation and education poverty alleviation in the precise poverty alleviation policy transmission mechanism, and at the same time, it is a further verification of Hypothesis 1. Drawing on the mediation effect model test of Mackinnon D P et al. (2002)[31] and Wen Zhonglin et al. (2004)[32], the following model is constructed on the basis of the benchmark regression of policy effects:

$$\ln Y_{it} = \beta_0 + \beta_1 DID_{it} + \beta_2 control_{it} + \eta_i + \gamma_t + \varepsilon_{it} \tag{2}$$

$$M_{it} = \alpha_0 + \alpha_1 DID_{it} + \alpha_2 control_{it} + \eta_i + \gamma_t + \varepsilon_{it} \tag{3}$$

$$\ln Y_{it} = \lambda_0 + \lambda_1 DID_{it} + \lambda_2 M_{it} + \lambda_3 control_{it} + \eta_i + \gamma_t + \varepsilon_{it} \tag{4}$$

Among them, M_{it} refers to the mediating variables, specifically: health poverty alleviation (doctlevel), network poverty alleviation (surfnet), financial poverty alleviation (bankpay), literacy poverty alleviation (literpay); according to the mediation effect model, β_1 refers to the total effect of the policy, λ_1 refers to the direct effect, and α_1, λ_1 refers to the indirect effect of the mediating variables. Since β_1 has been verified to be significant above, according to the mediation effect test steps, it can be seen that if λ_1 and λ_2 are both significant, there is a mediation effect. According to the mediation effect model regression results Table 5 columns (1)-(5), where column (1) is the baseline regression and columns (2)-(4) are the mediation effect regression, according to the coefficient estimation shows that λ_1 and λ_2 are both significant, i.e., there are mediation effects in all of them, and all of the mediating variables are able to affect the effect of poverty alleviation for women through policies. Specifically, the coefficients of the variables of health poverty alleviation, network poverty alleviation and education poverty alleviation are significantly positive, indicating that the precise poverty alleviation policy has a significant positive effect on women's poverty alleviation through these transmission mechanisms; the coefficient of the variable of financial poverty alleviation is significantly negative, that is, the transmission mechanism of financial poverty alleviation has a negative impact on women's poverty alleviation, and women's loans increase the pressure of repayment, and they don't see any financial return in the short term, so their income will be further reduced under the pressure of repayment, and they will not have any financial return. At the same time, this may be related to the fact that the financial poverty alleviation mechanism is not perfect, and it is more difficult for women to take out loans, so the popularity of financial poverty alleviation among women is low. In order to further verify the robustness of the above mediation effect, here, the Sobel statistic is constructed to test the estimated coefficients of the mediating variables with the formula: $s_{\alpha_i \lambda_i} = \sqrt{\hat{\alpha}_i^2 S_{\lambda_i}^2 + \hat{\lambda}_i^2 S_{\alpha_i}^2}$, s is the standard error of the corresponding coefficients, and the test statistic $Z = \hat{\alpha}_i \hat{\lambda}_i / s_{\alpha_i \lambda_i}$, the Z statistic is used to calculate the coefficients of the corresponding mediating variables, and the results passed the test at the 5% level of significance, which indicates that the above mediation effect is robust.

Table 5. Testing the transmission mechanism of policy effects

variant	return to baseline	Healthy Poverty Reduction	Network for Poverty Alleviation	Financial poverty alleviation	Culture and Education for Poverty Alleviation
	(1)	(2)	(3)	(4)	(5)
Did	0.2764**	0.2842**	0.2483**	0.2680**	0.3256**
doctlevel	-	0.0981***	-	-	-
surfnct	-	-	0.7683***	-	-
bankpay	-	-	-	-0.3328**	-
lnliterpay	-	-	-	-	0.0729***
Treatment	-0.4294***	-0.4329***	-0.3979***	-0.4198***	-0.3949***
Time	1.6045***	1.5908***	1.4500***	1.6181***	1.5408***
control	be	be	be	be	be
cons	1.5604***	1.3394***	1.1443***	1.5807***	1.5821***
F-value	2821.08	2585.95	2608.88	2593.87	2600.41
sample size	12589	12589	12589	12589	12589
R ²	0.5896	0.5898	0.5921	0.5899	0.5911

Note: * represents at 10% significance level, ** represents at 5% significance level, *** represents at 1% significance level.

5. Conclusion and Recommendations for Countermeasures

Testing the effect of precise poverty alleviation policies from the female perspective is the key to deep poverty alleviation, providing empirical references for preventing the return of poverty after full poverty alleviation in 2020, and stabilizing the results of full poverty alleviation. Accordingly, this paper uses the Chinese Family Tracking Data (CFPS) to construct three periods of mixed cross-section data for 2014, 2016 and 2018 to test the effect of precision poverty alleviation policies from the perspective of women's poverty alleviation by double-difference-in-differences (DID), mediated-effects model. The results of the study show that, firstly, there is a significant positive effect of the precise poverty alleviation policy on women's poverty alleviation, which can effectively increase the income of the female group, and the actual annual income of the female group who received the precise poverty alleviation subsidy policy increased by about 27.64% compared with those who did not receive the policy. At the same time, the effect of the precise poverty alleviation policy on women's poverty alleviation is in the rising stage; second, the effect of the precise poverty alleviation policy on women's poverty alleviation is heterogeneous, with significant effects on women's poverty alleviation for women's groups with elementary school and junior middle school education, and insignificant effects for women's groups with illiteracy, semi-literacy, and senior middle school education or higher education; third, the precise poverty alleviation has a significant positive effect on women's poverty alleviation through the health poverty alleviation, network poverty alleviation, and education poverty alleviation transmission mechanism, while the financial poverty alleviation transmission mechanism has significant positive effects on women's poverty alleviation. Third, there is a significant positive effect on women's poverty alleviation through the transmission mechanisms of health poverty alleviation, network poverty alleviation and literacy poverty alleviation, while there is a negative effect on financial poverty alleviation. Therefore, based on the above research conclusions, the following suggestions are made to further improve the effects and mechanisms of women's poverty alleviation under the precise poverty alleviation policy:

First, since the policy of precise poverty alleviation has a significant positive effect on women's poverty eradication and income enhancement, and at the same time, the effect of this policy is in an upward phase, the policy of precise poverty alleviation can be tilted in favor of women, and resources and funds related to women's poverty eradication should be increased, so as to further explore the potential benefits of the policy, and to enhance the effect of poverty alleviation as a whole, so as to achieve the overall implementation of the concept of poverty eradication and precise poverty alleviation for the entire population.

Secondly, precise poverty alleviation policies should be implemented in accordance with the differences in the knowledge structures and perceptions of the female population, so that policies can be implemented according to the needs of each individual. Female groups with primary and junior high school education have had a remarkable effect on poverty alleviation and can continue to do so, while female groups with high school education and above are able to find suitable jobs according to their own strengths, and women in these groups should be encouraged from the point of view of encouraging policies to encourage them to take up employment and start their own businesses, and so on. Among them, more attention should be paid to illiterate and semi-illiterate female groups, who are in the corner of the precision policy, not enjoying the policy, and it is difficult for them to find a job through themselves. Therefore, these groups are the important targets of in-depth poverty alleviation, and in accordance with their characteristics, relevant talents should be assigned to investigate and inquire about their academic qualifications, and communicate with them at home, so as to enable them to understand the main information of the policy, and teach them how to participate in the policy of poverty alleviation. It is only through precise poverty alleviation that the full effect of the policy can be realized.

Thirdly, according to the diverse transmission mechanisms of precise poverty alleviation, that is, the effects of specific poverty alleviation channels of precise poverty alleviation policies. The channels for poverty alleviation through health, the Internet and culture and education should continue to explore the marginal benefits of their policies. Specifically, from the perspective of poverty alleviation through health, more women's health clinics should be set up in villages and towns, relevant departments should be opened, medical equipment should be increased, gynecological personnel should be brought in, and publicity should be conducted on women's health, which will raise their health awareness, increase their access to medical care, and raise their incomes by promoting employment and entrepreneurship through investment in human capital; from the perspective of poverty alleviation through the network, most women's groups, due to their families, are unable to migrate, which prevents them from working. From the perspective of poverty alleviation through the network, most female groups are unable to move because of family reasons, which hinders them from working, so through the network platform to motivate them to create income by doing micro-businesses, online sales, etc., especially rural female groups, through the network entrepreneurship sales of agricultural products is to solve the problem of sales channels and increase income; from the perspective of poverty alleviation through education and culture, female groups can participate in vocational skills training to enhance employment and entrepreneurship, for example: rural women can improve cultivation skills and increase the output of agricultural products through the training of agricultural planting. For example, rural women can improve their farming skills through agricultural cultivation training, increasing the quantity and quality of agricultural output. From the perspective of financial poverty alleviation, the financial lending mechanism for women is not sound enough, and its popularity among women is still very low, thus failing to be effective. Therefore, the financial institutions' lending mechanism for women should be improved and expanded to be more inclusive. On the other hand, women should be encouraged to take an active part in microcredit to solve the problem of capital financing if they have the resources and capacity to start their own businesses.

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