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The Impact of Collective Forestland Tenure Reform on Rural Household Income: The Background of Rural Households' Divergence

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Abstract: As the direct subject of collective forestland tenure reform, increasing farmers' income is an important goal of collective forestland tenure reform and the key to sustainable management of forest resources. Based on the survey data of 1276 rural households in 18 counties in 9 provinces, we construct a theoretical analysis framework of the impact of collective forestland tenure reform on household income from the perspective of rural household differentiation and elucidate the mechanism of the effect of collective forestland tenure reform on household income in the context of the rural household differentiation. The results of the empirical analysis show that, firstly, the collective forestland tenure reform significantly increases the total income, forestry income, and off-farm income of rural households, but the effect of income increase differs significantly among different groups of rural households with different income levels, showing the characteristic of "benefitting the rich more than the poor". Secondly, as rural household differentiation deepens, there is a moderating effect of rural household differentiation in the income-raising effect of collective forestland tenure reform, i.e., collective forestland tenure reform has a stronger marginal effect on the forestry income of shallowly differentiated rural households and a weaker marginal effect on their off-farm income compared to deeply differentiated rural households. Finally, the income increase effect of collective forestland tenure reform shows significant situational dependence in both forestland operation scale and human capital endowment. The income-raising effect of collective forestland tenure reform is stronger for forestry income of large operation scale farmers, while it is stronger for off-farm income of small operation scale farmers; the income-raising effect of collective forestland tenure reform is stronger for farmers with high quantity and quality human capital endowment than for farmers with low quantity and quality human capital endowment. Therefore, this paper attempts to provide a policy adjustment idea to deepen the policies related to collective forestland tenure reform by starting from the farmer differentiation side.

Keywords: collective forestland tenure reform; rural household income; rural household differentiation; incentive effect; regulation effect

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1. Introduction

After more than 40 years of market-oriented reform and development, particularly marked by the most recent reform of the collective forestland tenure reform initiated in 2003 to clarify the objective of clarifying tenure, it has hampered the mobility of rural labor between urban and rural areas, which has become the new goal of China's forestry policy. At this point, improving the rural factor market and supporting farmer income generation is a crucial institutional reform. In accordance with the findings of the ninth forest resources inventory, the productivity level of collective forestland is low, equaling just 49% of the productivity of state-owned forestland, and its contribution to farmers'

income is less than 2%. What needs to be carefully focused on in order to increase farmers' income is which portion of their revenue needs to be improved through the building of the collective forestland system. The current social environment in China's rural areas is further characterized by an increase in off-farm employment opportunities between urban and rural areas, which has increased the degree of pluriactivity in rural households. This is due to the development of industrialization and urbanization.

The majority opinion is that the collective forestland tenure reform has a considerable effect on farmers' income. The tenure incentive hypothesis, for instance, contends that a sound tenure system configuration can improve the input of labor, capital, and other elements [1], which is one of the primary driving forces determining the growth of farmers' income [2]. Lack of secure tenure over forestland can lower expected agricultural income from managing it and prevent farmers from increasing their income through forestry [3]. Through laws and procedures including "subdivision of mountains to families" and "confirming and issuing certificates," the collective forestland tenure reform sought to clarify tenure enhances the expected income from managing forestland, multiplies and optimizes the input structure of farmers' production components, finally enhances forestry output acknowledges, and protects the forestland tenure earned by farmers from the legal level [4]. As a result, it benefits farmers' forestry revenue [5,6]. From many angles, including the regional distribution of forestland resources and farmers' perceptions of forestland tenure, some academics have also confirmed the large differential impact of collective forestland tenure reform on farmers' forestry revenue [7,8].

The income-increasing impact of collective forestland tenure reform, according to some academics, is not clear [9]. The explanation is that the collective forestland tenure reform strengthens the security tenure of farmers to forestland and lowers the likelihood of land loss. On the one hand, the collective forestland tenure reform has raised the forestland price. For farmers that sold forestland at a cheap price prior to the change for an unknown cause, the revenue from this reform is restricted [10]. As a result, farmers' forestry production input is reduced [11] and forestry income is not necessarily increased [12,13]. On the other hand, the collective forestland tenure reform can effectively encourage farmers to allocate production factors to off-farm sectors and stimulate the growth of farmers' off-farm income [14]. Other academics contend that the attempt to reconstruct forestland tenure, which at its core focuses on "allocating forests to families," did not meet the initial purpose of "raising farmers' income" but instead had the unintended result of "farmers losing their forests" [15].

In addition, some scholars have focused on the issue of rural household fragmentation from the perspective of collective forestland tenure reform on the allocation of rural labor. North believed that an effective land tenure system is the prerequisite for the off-farm migration of the rural labor [16]. Due to the increased risk of losing their land, farmers are less likely to migrate to other off-farm sectors [17], making it more difficult for them to leave their rural homelands [18]. Relevant studies show that after the collective forestland tenure reform, farmers' labor input in off-farm sectors has increased [19], but some scholars believe that the collective forestland tenure reform has enhanced farmers' confidence in engaging in forest activities, and the allocation of the forestry labor has increased, while the allocation of the off-farm labor has decreased [20].

Rural household differentiation is a common phenomenon in the process of rural social and economic development in China at this stage, and it is also the inevitable result of the accelerated process of urbanization. *The Green Paper on Population and Labor: China's Population and Labor Report No. 22*, published by the Chinese Academy of Social Sciences, predicts that China's urbanization rate will enter a relatively stable development phase after 2035, with a peak probability of occurring between 75% and 80%.

The relocation of rural forestland resources and the need for more rural laborers would eventually differentiate farmers' economic and political positions, leading to notable variations in their reliance on forestland. Thus, farmers have different tenure preferences for the arrangement of the forestland tenure system. Given that rural households are not

homogenous groupings, variances in income sources, and role differentiation in the forestry production process could lead to a deviation from the policy objectives of forestry reform, necessitating the answers to the following questions. What is the impact of deepening household differentiation on rural households' income? The existing literature has not explored this problem. Therefore, from the perspective of farmers' differentiation, combined with the characteristics of households' forestland resource endowment, human capital, natural environment, and market factors. This paper answers this key question: what is the impact of collective forestland tenure reform on the family income of different types?

In the early stages of rural reform, the cracking of institutional barriers causes the original homogeneous farmers to gradually differ as the development environment changes. Due to the increased mobility of rural factor resources between urban and rural areas and industries, off-farm employment income has become an important component of rural household income. At the same time, differences in market participation and technology levels are important causes of differences in the allocation of factors in forestry production and management, as well as off-farm employment, resulting in significant differences in rural household employment patterns and income structures. Through the cycle of household accumulation, the differences gradually divide rural households. As a result, how to make the new system design has a prominent effect on the differentiation of heterogeneous households is an unavoidable key problem in the process of changing the development mode of the forestry industry, improving system construction, and policymaking of increasing households' income. A systematic analysis of the direction of improving and developing China's collective forestland tenure reform policy to increase farmer' incomes in the context of households' differentiation has theoretical and practical significance in this regard.

2. Theoretical Basis and Research Hypothesis

2.1. The Impact of Collective Forestland Tenure Reform on Rural Household Income

The combination of direct and indirect consequences is what determines how the collective forestland tenure reform will affect households' income. On the one hand, collective forestland tenure reform can strengthen households' preference for the control of forestland and stimulate their enthusiasm for forestry production. First of all, collective forestland tenure reform helps to enhance the security intensity of forestland tenure. Stable and comprehensive forestland tenure promote social stability and asset appreciation. The comprehensive definition of forestland tenure enables households to fully benefit from forestland investment, internalize the externality of forestry, and then improve households' investment enthusiasm [21]. These interventions can increase land productivity, increase farmer's income, and deter unsustainable practices [22]. Previous research has found that unstable tenure causes households to have low long-term expectations for the plots they use and have a negative impact on households' investment incentives [23]. Adjusting the forestry production structure and factor input intensity not only lowers the risk of forestland being expropriated or occupied by the government, other institutions, or people, and increases the intensity of households' personalized tenure attributes of forestland, but it also encourages households to fully utilize their comparative advantages in forestry production and decreases the factor price differences between different production departments. Some researchers use the Tobit and Cragg models to examine the impact of households on labor and financial inputs in forestry. The findings show that improving forestland use and disposal tenure have a significant impact on households' forestry investment, whereas improving beneficiary tenure has no significant impact on households' forestry investment [24]. Secondly, the main goal of the collective forestland tenure reform is to increase the domestic supply of timber by improving the quality and productivity of forestland and giving people a reason to invest in forestland by giving them a secure tenure. In fact, it has been found that the collective forestland tenure reform makes rural households more likely to invest in forestland [25]. By strengthening the temporal and spatial attributes of forestland, the collective forestland tenure reform ensures the liberalization of forest tenure

transaction and factor allocation, promotes the expansion of forestland production scale and the intensification of forestry production, and then improves the performance level of forestry production. Finally, the collective forestland tenure reform alleviates the financing constraints faced in forestry production and increases the profit space of forestry through the supporting policies of forest tenure mortgage loans. On the other hand, collective forestland tenure reform frees up labor for the protection of forestland tenure, effectively increasing the off-farm supply of rural labor, which means it effectively increases the labor supply of rural labor in off-farm sectors such as industry-based secondary industries and service-based tertiary industries. That has encouraged rural labor to shift to off-farm sectors with comparative pay advantages, promoting the improvement of rural households' ability to engage in part-time work, which in turn has an incentive effect on rural households' off-farm employment income.

Hypothesis 1. *Controlling for other factors, collective forestland tenure reform has a positive incentive effect on rural households' forestry income, off-farm income, and total income.*

2.2. The Impact of Households' Differentiation on Households' Income

In order to maximize household utility, households are a particular economic unit made up of forestry producers and off-farm producers. A study showed that the adoption of forestland owner management actions is closely correlated with traditional personal characteristics (financial goals and tenure acreage) [26]. Family characteristics have a significant impact on the distribution of the family labor. A stronger family social network and a higher level of education for the head of the household will usually result in more off-farm employment opportunities for family members [27]. Households have a diverse range of pluriactivity capabilities since forestry production and off-farm production are paid differently in comparison. In off-farm employment, households with significant competitive advantages have stronger benefits. The degree of off-farm employment or pluriactivity of households will be further improved if they can obtain higher off-farm income from off-farm migration with higher comparative compensation. In addition, the researchers investigated the determinants of household decisions on forestland transfers. They discovered that off-farm employment had both negative and positive effects on rent-in and rent-out decisions [28]. As a result, deeply differentiated households will be more willing to continue increasing the input of the off-farm labor, which will lead to a decrease in the available supply of forestry labor.

Some research also indicates that the higher the education level of the household head, the lower the forest productivity. This could be due to the fact that households with a greater level of education favored off-farm pursuits over forestland cultivation [21]. As a result, the greater the degree of differentiation among households, the greater the off-farm income and the lower the forestry income. Due to the lack of comparative advantage of off-farm employment or the high opportunity cost of labor off-farm migration, shallow differentiated households tend to invest less in off-farm labor. At the same time, given their comparative advantage in forestry production and high reliance on forestry, it is their best option to increase forestry income by optimizing the allocation structure and efficiency of household production factors in forestry, so that the gap between forestry comparative remuneration and off-farm employment comparative remuneration gradually narrows or even closes, and then forms a virtuous circle of mutual feedback between forestry input and forestry output. Due to the influence of their own human capital endowment and family structure, pluriactivity households' general choice is to maintain their original part-time level and forestry production structure.

Hypothesis 2. *Controlling other factors, households' differentiation has a significant positive effect on total household income and has positive effects on households' off-farm income, but has negative effects on forestry income.*

2.3. The Moderating Role of Household Differentiation in the Impact of Collective Forestland Tenure Reform on Household Income

Households along different paths of differentiation will inevitably choose to expand their factor mobility in order to obtain higher household income as a result of collective forestland tenure reform policies due to the different objective functions and constraints faced by heterogeneous households. According to some studies, household social factors (i.e., household characteristics) can be used to predict households' propensity to invest in forestry or to respond to public policies and programs. Budget and labor restrictions, for instance, have been noted as crucial variables in deciding the usage of inputs in forestry [24]. According to research, Chinese female household heads play a more important role in NTFP production and forest management than men. Low-income households are more willing to invest in NTFP, because they rely more on agricultural income. In China, minority households are frequently low-income and reliant on NTFP production [29]. The degree of household differentiation varies in theory, as does the share of forestry income in total household income, and thus household perceptions and demands for forestry reform. Forestry income contributes significantly to the total household income of shallowly differentiated households. Households will devote the majority of their household labor to the forestry sector at this time, regardless of whether their forestland tenure is stable or not. The greater their expectation of the stability of forestland tenure, the greater the incentive to increase forestry returns through additional capital and labor inputs. Meanwhile, collective forestland tenure reform breaks down institutional barriers to off-farm employment of surplus rural labor, and shallowly divided households can allocate part of their household labor to the off-farm sector, which can have a greater impact on their off-farm income.

Therefore, the incentive effect of collective forestland tenure reform on the income of shallowly divided households is stronger than that of deeply divided households. For deeply divided households, the level of development of households in the off-farm sector is much higher than that of the forestry sector, and the income from off-farm employment is much higher than that from forestry operations. The incentive effect of collective forestland tenure reform on the income of deeply divided households is slightly weaker than that of shallowly divided households. However, if they face the risk of losing their forestland during the transfer of household labor due to unstable forestland ownership, the constraint of unstable forestland ownership on the off-farm migration of household labor is reduced to a limited extent. Off-farm employment is a double-edged sword with contradictory effects on the demand and supply sides of forestland transactions. Policymakers should be aware of this paradox, especially given the negative impact on forestland rent-in. Institutional reform, as opposed to off-farm employment, may be a more feasible and effective tool for promoting forestland lease [30]. Thus, collective forestland tenure reform can still have a positive effect on the deeply divided households' household income.

Hypothesis 3. *Household differentiation has a negative moderating role in the effect of collective forestland tenure reform on household income. Namely, the positive marginal effect of collective forestland tenure reform on forestry income and off-farm income is stronger for shallowly divided households than for deeply divided households.*

3. Research Design

3.1. Data Sources

The data used in this paper come from a survey conducted by the research team of the Center for Economic Development of the State Forestry and Grassland Administration on *Policy Issues Related to the Reform of Collective Forest tenure System in China* in 18 counties in 9 provinces across China. To ensure the representativeness of the data, a stratified random sampling method was used, taking into account the characteristics of geographical distribution, economic development, forestland resources distribution, and the reform of the collective forestland tenure system. Each county randomly selects 3 townships,

each township randomly selects 3 administrative villages, and each administrative village randomly selects 15 households, which is representative of the whole country. The survey information of rural households included basic demographics and characteristics, land structure, land production and sales, labor allocation, household income and consumption, social security and insurance, credit situation, and subjective attitudes about forestry policies, etc. The data were collated to form a total of 1276 rural households survey data for 10 time points from 2003, 2007, to 2015. Using the price index of rural production materials and the consumer price index of rural residents, the data information of relevant variables was converted to constant 1994 prices.

3.2. Variable Selection and Descriptive Statistics

1. Explanatory variables: According to the income sources of rural households, this paper uses two indicators of forestry income and off-farm income of rural households as the representational variables to measure the rural households' income, and on this basis, the indicator of the total income of rural households is used as the net effect to measure the sum effect of forestry income and off-farm income.
2. Core explanatory variable: Collective forestland tenure reform. The primary goal of the collective forestland tenure reform is to clarify tenure through the issuance of certificates, as well as to provide households with tenure through institutional design and legal protection. As a result, this paper employs a dummy variable to characterize collective forestland tenure reform: whether households have obtained forestland tenure certificates. If the households have obtained a forestland tenure certificate, the dummy variable is set to 1, otherwise it is set to 0.
3. Grouping variable: Rural household differentiation. In the previous section, this paper uses the occupational differentiation of rural households as a characterization variable to measure the rural household differentiation. The delineation criteria refer to the study of Zhaoxu et al. [31], which classifies rural households, pluriactivity households, and off-farm rural households according to the proportion of off-farm employment in household labor allocation and assigns values of 1–3 as ordered dummy variables. The increase of assignment means the increase of the proportion of off-farm employment in the allocation of the household labor, implying a deepening of household differentiation.
4. Control variables: Considering other factors that may affect households' income. This paper summarizes the control variables into six categories: first, forestland characteristic variables. Second, family characteristic variables. This involves indicators of the household population; Third, production input variables. This involves whether there are off-farm workers in forestry capital, forestry labor, family labor, and the proportion index of the off-farm labor in the family labor. Fourth, household head characteristic variables. This involves the age, gender, health status, years of education, and whether the head of household is a cadre. Fifth, village-level characteristic variables. This involves three indicators: whether the road is hardened, whether the village is in a mountainous area, and the distance from the market. Sixth, market characteristic variables. This involves two indexes: forest product price index and labor price index. Table 1 shows the definition, assignment, and statistical description of the main variables in this model.

Table 1. Definition, assignment, and statistical description of the main variables.

Variable	Variable Description	Total	
		Mean	Standard Error
Dependent variable			
TI	Total income (yuan)	24,893.3	34,647.51
FI	Forestry income (yuan)	2861.44	9585.169
OL	Off-farm income (yuan)	14,084.85	19,438.93
Core explanatory variable			
FR	The collective forestland tenure reform (Yes = 1; No = 0)	0.6162	0.4863
Grouping variables			
FD	Households' differentiation (rural households = 1; pluriactivity households = 2; off-farm rural households = 3)	2.0287	0.7315
Control variable			
LPI	Labor price index (%)	1.0619	0.1840
FPI	Forest products Price index (%)	1.0595	0.1689
FA	Forestland area (mu)	38.3976	73.1380
FC	Forestry capital (yuan)	622.6112	3045.0000
FL	Forestry labor (person/day)	31.9945	65.6863
WOA	Whether or not the family have off-farm labor (Yes = 1; No = 0)	0.6923	0.4616
POA	Proportion of off-farm labor in household labor (%)	0.4914	0.3740
A	Age (year)	52.1450	11.0257
G	Gender (Men = 1; Women = 0)	0.9694	0.1721
H	Health (Yes = 1; No = 0)	0.8951	0.3064
E	Education level (year)	7.3187	2.8496
WCA	Whether or not head of household a cadre (Yes = 1; No = 0)	0.2428	0.4288
HP	Household population (person)	3.9328	1.5076
WPH	Whether or not the pavement is hardened (Yes = 1; No = 0)	0.7674	0.4225
WMA	Whether or not mountainous area (Yes = 1; No = 0)	0.5580	0.4966
DFC	Distance from the county (Kilometer)	35.4196	31.3447

3.3. Empirical Test Model

This paper focuses on the impact of collective forestland tenure reform on households' income under the background of households' differentiation. Therefore, it is necessary to establish the causal relationship between collective forestland tenure reform, households' differentiation, and households' income change. First of all, we need to clarify the impact of collective forestland tenure reform on households' income. Therefore, Hypothesis 1 will be tested by the OLS model. OLS model is short for ordinary least square. Under the condition that the error terms are equal variance and uncorrelated, ordinary least squares estimation is a linear unbiased estimate of the minimum variance of the regression parameters. The model is set as follows:

$$Y_{it} = \gamma_0 + \gamma_1 DT_{it} + \gamma_2 Controls'_{it} + \mu_i + \varepsilon_{it}$$

where DT_{it} denotes collective forestland tenure reform variables, and Y_{it} denotes rural household income variables, which are total household income, forestry income, and off-farm income, respectively. $Controls'_{it}$ denotes the transpose of the vector-matrix composed of control variables, where i denotes individual household head and t represents time variables. μ_i is annual fixed effects, and ε_i is a random disturbance term.

Second, based on the analysis of the impact of collective forestland tenure reform on rural household income, this paper tests Hypothesis 2 to explore the impact of rural households' differentiation on rural household income, with the model as follows.

$$Y_{it} = \beta_0 + \beta_1 Occup_{it} + \beta_2 Controls'_{it} + \mu_i + \varepsilon_{it}$$

Among them, $Occup_{it}$ denotes the rural household differentiation variable, while other variables are defined as above. Finally, based on the analysis of the impact of collective

forestland tenure reform and rural household differentiation on rural household income, it is necessary to include collective forestland tenure reform, rural household differentiation, and rural household income in a unified analytical framework to test Hypothesis 3 and explore the impact of collective forestland tenure reform on rural household income under the background of rural household differentiation, and the model is set as follows.

$$Y_{it} = \theta_0 + \theta_1 DT_{it} + \theta_2 Occup_{it} + \theta_3 DT_{it} * Occup_{it} + \theta_4 Controls'_{it} + \mu_i + \varepsilon_i$$

where $DT_{it} * Occup_{it}$ denotes the interaction term between collective forestland tenure reform and rural household differentiation, and other variables are defined as above.

4. Empirical Results and Analysis

Based on the above analysis, this paper uses Stata 16.0 statistical software for econometric analysis and uses the stepwise regression method to explore the impact of collective forestland tenure reform on households' income under the background of households' differentiation, so as to determine the model basis for subsequent analysis.

4.1. Benchmark Model

4.1.1. Impact of Collective Forestland Tenure Reform on Households' Income

The estimated results of the impact of collective forestland tenure reform on households' income are shown in Table 2 model (1)–model (9). Model (1)–model (3) is the regression result obtained by taking the core explanatory variables and control variables as explanatory variables. We focus on the regression coefficient of collective forestland tenure reform variables here. Collective forestland tenure reform has a significant positive impact on households' forestry income and off-farm income at the statistical level of 1%. From the aggregate net effect of forestry income and off-farm income, collective forestland tenure reform still has a positive impact on households' total income at the statistical level of 1%. Therefore, compared with the households without confirmed tenure, collective forestland tenure reform strengthens households' preference for forestland tenure and promotes the improvement of households' income by optimizing the allocation structure of family production factors, expanding their forestland production boundary, or stimulating the off-farm labor migration. It is consistent with the theoretical expectation, and Hypothesis 1 has been verified. Through the regression results of other control variables (model (7)–model (9)), it can be found that forestland area, forestry production cost, and forestry labor input have a significant positive effect on forestry income and a negative effect on off-farm income.

Table 2. Benchmark regression results.

Variable	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)	Model (7)	Model (8)	Model (9)
	TI	FI	OI	TI	FI	OI	TI	FI	OI
FR	0.0201 ***	0.1478 ***	0.0502 ***				0.0194 ***	0.1574 ***	0.0394 ***
	(0.0022)	(0.0162)	(0.0044)				(0.0022)	(0.0161)	(0.0037)
FD				0.0156 ***	−0.1981 ***	0.2306 ***	0.0150 ***	−0.2036 ***	0.2292 ***
				(0.0019)	(0.0138)	(0.0032)	(0.0018)	(0.0137)	(0.0032)
LPI	0.0087 ***	−0.0471 ***	0.0126 ***	0.0091 ***	−0.0596 ***	0.0082 ***	0.0083 ***	−0.0526 ***	0.0064 ***
	(0.0005)	(0.0040)	(0.0011)	(0.0005)	(0.0039)	(0.0009)	(0.0005)	(0.0040)	(0.0009)
FPI	0.0011	0.0399 ***	−0.0051 ***	0.0015 **	0.0468 ***	−0.0037 ***	0.0010	0.0422 ***	−0.0025 **
	(0.0007)	(0.0055)	(0.0015)	(0.0007)	(0.0055)	(0.0013)	(0.0007)	(0.0055)	(0.0013)

Table 2. *Cont.*

Variable	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)	Model (7)	Model (8)	Model (9)
	TI	FI	OI	TI	FI	OI	TI	FI	OI
FA	0.0006 ***	0.0087 ***	−0.0002	0.0008 ***	0.0100 ***	−0.0009 ***	0.0006 ***	0.0085 ***	−0.0005 *
	(0.0001)	(0.0011)	(0.0003)	(0.0001)	(0.0010)	(0.0002)	(0.0001)	(0.0011)	(0.0002)
FC	0.0142 ***	0.1867 ***	−0.0065 **	0.0162 ***	0.1795 ***	−0.0115 ***	0.0153 ***	0.1723 ***	−0.0097 ***
	(0.0014)	(0.0101)	(0.0027)	(0.0014)	(0.0101)	(0.0023)	(0.0014)	(0.0101)	(0.0023)
FL	0.0011 ***	0.0160 ***	−0.0001	0.0011 ***	0.0162 ***	−0.0004	0.0011 ***	0.0162 ***	−0.0004
	(0.0002)	(0.0013)	(0.0004)	(0.0002)	(0.0013)	(0.0003)	(0.0002)	(0.0013)	(0.0003)
WOA	0.7814 ***	−2.0579 ***	4.3214 ***	0.7856 ***	−2.3319 ***	4.1834 ***	0.7704 ***	−2.2080 ***	4.1524 ***
	(0.0432)	(0.3233)	(0.0876)	(0.0432)	(0.3217)	(0.0739)	(0.0431)	(0.3207)	(0.0737)
POA	0.4535 ***	−1.8919 ***	1.6163 ***	0.2707 ***	−0.5455	1.1537 ***	0.2730 ***	−0.5641	1.1491 ***
	(0.0538)	(0.4026)	(0.1091)	(0.0583)	(0.4337)	(0.0997)	(0.0581)	(0.4321)	(0.0992)
A	−0.0027 **	−0.0002	−0.0338 ***	−0.0030 ***	−0.0148 *	−0.0273 ***	−0.0021 **	−0.0076	−0.0255 ***
	(0.0011)	(0.0080)	(0.0022)	(0.0011)	(0.0079)	(0.0018)	(0.0011)	(0.0079)	(0.0018)
G	0.0295	0.8258 *	−0.2281 *	−0.0045	0.3806	0.2192 **	0.0003	0.4198	0.2290 **
	(0.0580)	(0.4339)	(0.1176)	(0.0581)	(0.4327)	(0.0994)	(0.0579)	(0.4311)	(0.0990)
H	0.1250 ***	0.2655	0.5727 ***	0.1556 ***	0.1901	0.0803	0.1574 ***	0.1751	0.0765
	(0.0359)	(0.2690)	(0.0729)	(0.0362)	(0.2694)	(0.0619)	(0.0361)	(0.2684)	(0.0616)
E	0.0349 ***	0.1511 ***	0.0101	0.0366 ***	0.1457 ***	0.0181 ***	0.0353 ***	0.1559 ***	0.0155 **
	(0.0038)	(0.0283)	(0.0077)	(0.0038)	(0.0281)	(0.0065)	(0.0038)	(0.0281)	(0.0064)
WCA	0.0250	1.0718 ***	0.0237	0.0385	1.1242 ***	0.0861 **	0.0276	1.0360 ***	0.0640
	(0.0238)	(0.1781)	(0.0482)	(0.0238)	(0.1770)	(0.0407)	(0.0237)	(0.1766)	(0.0406)
HP	0.1088 ***	0.1127 **	0.0013	0.1095 ***	0.0842	0.0204 *	0.1104 ***	0.0918 *	0.0223 *
	(0.0069)	(0.0516)	(0.0140)	(0.0069)	(0.0514)	(0.0118)	(0.0069)	(0.0512)	(0.0118)
WPH	0.2007 ***	0.4605 **	0.1791 ***	0.1986 ***	0.4871 ***	0.1484 ***	0.1987 ***	0.4876 ***	0.1486 ***
	(0.0245)	(0.1834)	(0.0497)	(0.0245)	(0.1825)	(0.0419)	(0.0244)	(0.1818)	(0.0418)
WMA	−0.0445 **	3.0183 ***	−0.0354	−0.0350	3.0842 ***	−0.0615 *	−0.0439 **	3.0114 ***	−0.0433
	(0.0215)	(0.1613)	(0.0437)	(0.0215)	(0.1603)	(0.0368)	(0.0215)	(0.1599)	(0.0367)
DFC	−0.0019 ***	−0.0095 ***	−0.0003	−0.0019 ***	−0.0086 ***	−0.0005	−0.0019 ***	−0.0088 ***	−0.0005
	(0.0003)	(0.0026)	(0.0007)	(0.0003)	(0.0026)	(0.0006)	(0.0003)	(0.0025)	(0.0006)
Annual fixed effect	Control	Control	Control	Control	Control	Control	Control	Control	Control
Cons	7.2724 ***	−6.3642 ***	1.6053 ***	7.0537 ***	−3.5868 ***	−1.6246 ***	7.0629 ***	−3.5123 ***	−1.6060 ***
	(0.1094)	(0.8190)	(0.2219)	(0.1125)	(0.8376)	(0.1925)	(0.1122)	(0.8345)	(0.1917)
N	12,760	12,760	12,760	12,760	12,760	12,760	12,760	12,760	12,760
R^2	0.291	0.161	0.572	0.290	0.169	0.695	0.294	0.176	0.698

Note: ***, **, and * are significant at the level of 1%, 5%, and 10%, respectively, and the values in brackets are standard errors.

Whether there are off-farm workers in the household labor and the proportion of off-farm workers in the household labor has a significant positive effect on off-farm income and a negative effect on forestry income. This is consistent with the empirical judgment that the income of different departments is determined by the number of production factors invested in the Department. The number of household population has a significant positive impact on households' total income, forestry income, and off-farm income, indicating that high human capital is an important factor affecting households' income levels. The forest products' price has a significant positive impact on forestry income, while having a significant negative impact on off-farm income, indicating that the increase in forest product price has narrowed the gap of factor price between departments and gradually increased the attraction of the forestry department to the rural surplus labor. Labor price has a negative impact on households' forestry income, while it has a significant positive impact on off-farm income. The possibility of households' increasing income decreases with the increase of the age of the household head, and the number of years of education has a positive impact on the possibility of households' income improvement, which is consistent with the fact that forestry departments and off-farm departments take household head's age and education level as one of the evaluation criteria of their ability to accept skill training.

4.1.2. Impact of Rural Household Differentiation on Rural Household Income

Model (4)–Model (6) are the regression results obtained by taking the grouping and control variables as explanatory variables, and we focus on the regression coefficients

of the rural household differentiation variables. Rural household differentiation has a negative effect on rural household forestry income at the 1% statistical level and a positive effect on off-farm income at the 1% statistical level. In terms of the summed net effect of forestry income and off-farm income, rural household differentiation still has a positive effect on total rural household income at the 1% statistical level. Thus, for the shallowly differentiated group of households, the higher dependence on forestland makes forestry income still remain a significant component of total household income, and the difference in factor prices between sectors is reduced through large-scale and intensive operation, which leads to higher forestry income. While the larger part-time capacity reduces the proportion of forestry income in the overall household income for the deeply differentiated set of households, the proportion of forestry income is enhanced through an increase in off-farm production. For the deeply divided group of households, the higher part-time capacity makes their forestry income a lower share of total household income. Additionally, they are increasingly dependent on receiving higher off-farm income through off-farm labor migration as a result of widening the comparative pay with forestry output, which is consistent with theoretical expectations and supports Hypothesis 2.

The benchmark model's robustness is discussed further below. First, an institutional mechanism for incentivized-constraint matching, tenure is a necessary prerequisite for driving rural households to improve their expected returns. From collective forestland tenure reform to a stable tenure institutional arrangement, it creates a de facto perceived reinforcement of tenure security and incentives for production motivation for rural households. Using the proportion of forestland ownership confirmation in the county as the collective forestland tenure reform characterization variable can effectively avoid the potential self-selection tendency in the pilot collective forestland tenure reform to some extent. The collective forestland tenure reform variables' coefficients are positive and statistically significant, indicating the completion of the matching "incentive-constraint". The tenure reform arrangement has enabled households to form trust in the collective forestland tenure reform policy and long-term stable business expectations. Second, as urbanization accelerates, the rural labor is gradually differentiating. This improves the collective forestland tenure reform mechanism from the policy level, provides a forestry-intensive and large-scale development mechanism for the locked rural labor, and eliminates the concerns of households about the tenure of rural forestland. Households' differentiation and forestry income have a negative correlation, while households' differentiation and off-farm income have a positive correlation, according to the empirical findings. Although the main object of collective forestland tenure reform is the shallow differentiation of households, the deep differentiation of households is still the beneficiary of the collective forestland tenure reform. Therefore, the conclusion is further verified. To begin, the proportion of households' primary industry income in total household income is used to replace the households' differentiation variables in model (7)–model (9) of Table 3. The regression coefficient of the proportion of primary industry in total household income to households' forestry income is positive, while it is negative for households' off-farm income, which is significant at the 1% level. It shows that the higher the proportion of households' income from the primary industry, the stronger the willingness of forestry management. That is, forestry income increases with the weakening of households' differentiation. Secondly, to replace households' differentiation variables in regression, the proportion of households' off-farm income in total household income is used. Households' forestry income is significantly impacted negatively by the proportion of off-farm income in total household income, while households' off-farm income is significantly impacted positively. It shows that the higher the households' off-farm income level, the lower the households' willingness to operate forestry, implying that off-farm income increases as households' differentiation deepens.

Table 3. Regression results of robustness test.

Variable	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)	Model (7)	Model (8)	Model (9)
	TI	FI	OI	TI	FI	OI	TI	FI	OI
FR	0.0413 ***	0.1838 ***	0.0716 ***	0.0220 ***	0.1607 ***	0.0390 ***	0.0192 ***	0.1616 ***	0.0335 ***
	(0.0026)	(0.0196)	(0.0045)	(0.0021)	(0.0160)	(0.0037)	(0.0022)	(0.0161)	(0.0034)
FD	0.0131 ***	−0.2096 ***	0.2261 ***	0.0861 ***	0.5918 ***	−0.5121 ***	0.0321 ***	−0.5033 ***	0.6078 ***
	(0.0018)	(0.0138)	(0.0031)	(0.0041)	(0.0304)	(0.0070)	(0.0043)	(0.0317)	(0.0068)
LPI	0.0059 ***	−0.0452 ***	0.0025 ***	0.0100 ***	−0.0558 ***	0.0051 ***	0.0083 ***	−0.0530 ***	0.0055 ***
	(0.0006)	(0.0042)	(0.0010)	(0.0005)	(0.0039)	(0.0009)	(0.0005)	(0.0039)	(0.0008)
FPI	0.0015 **	0.0465 ***	−0.0036 ***	0.0013 *	0.0412 ***	−0.0039 ***	0.0010	0.0414 ***	−0.0033 ***
	(0.0007)	(0.0055)	(0.0012)	(0.0007)	(0.0055)	(0.0013)	(0.0007)	(0.0055)	(0.0012)
FA	0.0006 ***	0.0092 ***	−0.0005 **	0.0005 ***	0.0084 ***	−0.0005 **	0.0006 ***	0.0086 ***	−0.0004 *
	(0.0001)	(0.0010)	(0.0002)	(0.0001)	(0.0010)	(0.0002)	(0.0001)	(0.0011)	(0.0002)
FC	0.0163 ***	0.1803 ***	−0.0118 ***	0.0107 ***	0.1627 ***	−0.0143 ***	0.0155 ***	0.1674 ***	−0.0168 ***
	(0.0013)	(0.0101)	(0.0023)	(0.0013)	(0.0101)	(0.0023)	(0.0014)	(0.0101)	(0.0022)
FL	0.0010 ***	0.0161 ***	−0.0004	0.0011 ***	0.0162 ***	−0.0003	0.0011 ***	0.0164 ***	−0.0006 **
	(0.0002)	(0.0013)	(0.0003)	(0.0002)	(0.0013)	(0.0003)	(0.0002)	(0.0013)	(0.0003)
WOA	0.7471 ***	−2.1605 ***	4.1166 ***	0.8006 ***	−2.1902 ***	4.2069 ***	0.7672 ***	−2.2808 ***	4.0523 ***
	(0.0429)	(0.3211)	(0.0733)	(0.0425)	(0.3187)	(0.0735)	(0.0431)	(0.3205)	(0.0687)
POA	0.3023 ***	−0.6861	1.0990 ***	0.9657 ***	−1.6290 ***	1.4302 ***	0.2605 ***	−1.1389 ***	2.0433 ***
	(0.0577)	(0.4325)	(0.0988)	(0.0581)	(0.4359)	(0.1006)	(0.0595)	(0.4419)	(0.0948)
A	−0.0004	−0.0033	−0.0228 ***	−0.0039 ***	−0.0088	−0.0263 ***	−0.0020 *	−0.0101	−0.0218 ***
	(0.0011)	(0.0080)	(0.0018)	(0.0010)	(0.0079)	(0.0018)	(0.0011)	(0.0079)	(0.0017)
G	0.0053	0.4240	0.2361 **	0.1040 *	0.3136	0.2151 **	0.0005	0.3543	0.3412 ***
	(0.0576)	(0.4313)	(0.0985)	(0.0571)	(0.4284)	(0.0989)	(0.0580)	(0.4307)	(0.0923)
H	0.1434 ***	0.2442	0.1013 *	0.0386	0.3284	0.0588	0.1555 ***	0.2135	0.0057
	(0.0358)	(0.2685)	(0.0613)	(0.0356)	(0.2668)	(0.0616)	(0.0361)	(0.2681)	(0.0575)
E	0.0325 ***	0.1638 ***	0.0110 *	0.0342 ***	0.1559 ***	0.0143 **	0.0352 ***	0.1549 ***	0.0147 **
	(0.0038)	(0.0281)	(0.0064)	(0.0037)	(0.0279)	(0.0064)	(0.0038)	(0.0280)	(0.0060)
WCA	0.0482 **	1.1677 ***	0.1030 **	0.0117	0.9810 ***	0.1024 **	0.0301	0.9914 ***	0.1209 ***
	(0.0236)	(0.1765)	(0.0403)	(0.0234)	(0.1755)	(0.0405)	(0.0238)	(0.1764)	(0.0378)
HP	0.1163 ***	0.1146 **	0.0322 ***	0.1050 ***	0.0861 *	0.0217 *	0.1107 ***	0.0831	0.0344 ***
	(0.0069)	(0.0513)	(0.0117)	(0.0068)	(0.0509)	(0.0117)	(0.0069)	(0.0512)	(0.0110)
WPH	0.1683 ***	0.3522 *	0.0959 **	0.1963 ***	0.4301 **	0.2054 ***	0.1989 ***	0.4888 ***	0.1450 ***
	(0.0244)	(0.1824)	(0.0417)	(0.0241)	(0.1807)	(0.0417)	(0.0244)	(0.1816)	(0.0389)
WMA	−0.0661 ***	2.9455 ***	−0.0075	−0.0413 *	3.0399 ***	0.0168	−0.0438 **	3.0086 ***	0.0472
	(0.0214)	(0.1605)	(0.0366)	(0.0212)	(0.1589)	(0.0367)	(0.0215)	(0.1597)	(0.0342)
DFC	−0.0021 ***	−0.0093 ***	−0.0008	−0.0018 ***	−0.0086 ***	−0.0005	−0.0019 ***	−0.0091 ***	−0.0003
	(0.0003)	(0.0025)	(0.0006)	(0.0003)	(0.0025)	(0.0006)	(0.0003)	(0.0025)	(0.0005)
Annual fixed effect	Control	Control	Control	Control	Control	Control	Control	Control	Control
Cons	7.1692 ***	−3.0727 ***	−1.4244 ***	6.6046 ***	−10.9539 ***	5.5765 ***	7.2125 ***	−5.4238 ***	0.4697 ***
	(0.1117)	(0.8366)	(0.1910)	(0.1120)	(0.8408)	(0.1940)	(0.1095)	(0.8132)	(0.1744)
N	12,760	12,760	12,760	12,760	12,760	12,760	12,760	12,760	12,760
R^2	0.303	0.175	0.701	0.315	0.186	0.699	0.294	0.178	0.737

Note: ***, **, and * are significant at the level of 1%, 5%, and 10%, respectively, and the values in brackets are standard errors.

4.2. The Impact of Collective Forestland Tenure Reform on Households' Income Gap

The above conclusions have proved that the reform of forestland tenure can effectively promote an increase in households' income. With the unbalanced development of rural society in China, it remains to be seen whether this effect of increasing income can narrow the gap between the rich and the poor. In this part, we first investigate whether the collective forestland tenure reform has a greater income-increasing effect on low-income households. Households in this study are classified as low-income if their income is less than the average of all households; otherwise, they are classified as high-income. Table A1 shows the income-increasing effect of collective forestland tenure reform on households with different incomes. The results show that the income-increasing effect of collective forestland tenure reform on low-income households is relatively stronger. Therefore, whether the strengthening of forestland tenure can promote the further differentiation of rural labor, it can narrow the income gap within rural society. Quantile regression is used in this paper to ensure the robustness of the research results. Table A2 displays the

regression results. The regression results in Table A3 further provide favorable support for the research conclusions in Table A1.

4.3. The Moderating Effect of Household Differentiation on Collective Forestland Tenure Reform on Households' Income

The interaction between collective forestland tenure reform and household differentiation is utilized to assess the moderating influence of household differentiation on the income of agricultural households affected by collective forestland tenure reform. If the interaction term has a significant impact on households' income, it confirms the regulatory effect of households' differentiation on the relationship between them, indicating that the impact of collective forestland tenure reform on households' income is moderated by households' differentiation. Table A3 shows that the regression coefficients of collective forestland tenure reform on households' total income, forestry income, and off-farm income have a significant negative impact at the statistical level of 1%, indicating that households' differentiation does have a "moderating effect" between them, which is consistent with the theoretical analysis and Hypothesis 3.

Furthermore, to investigate the income income-increasing effect of collective forestland tenure reform, this paper further divides households' differentiation into rural households, pluriactivity households, and off-farm households, and the test results are still stable (see Table A4). Collective forestland tenure reform has a significant positive effect on the total income, forestry income, and off-farm income of three types of households. For rural households, forestry income is the main source of their family income, with a low proportion of off-farm income. Forestland is an important means of production for their survival, so the impact of collective forestland tenure reform on rural households' forestry income is very limited by off-farm employment. Therefore, the incentive effect of collective forestland tenure reform on rural households' tenure is mainly reflected in forestry income. However, due to the low proportion of the off-farm income of rural households, some surplus labor released by collective forestland tenure reform is transferred to the off-farm sector, which makes the effect of increasing off-farm income more significant. For off-farm households, off-farm income is the main source of their family income.

Firstly, although the proportion of off-households' forestry income is small, the income increasing effect of collective forestland tenure reform is first reflected in the growth of forestry income. Thus, it can also have a positive effect on the growth of forestry income to a certain extent. Secondly, the instability of forestland tenure is an important factor affecting off-farm employment. The instability of forestland tenure may cause off-farm households to face the risk of "land loss" during the off-farm employment process, thereby discouraging off-farm participation. The collective forestland tenure reform reduces the risk of forestland being adjusted by strengthening the security and stability of forestland tenure and further motivates them to engage in off-farm employment. However, due to the characteristics of off-farm households' household income structure, the effect of collective forestland tenure reform on their income is weaker than that of rural households. Incomplete land tenure reduces rural off-farm employment, especially in forestland. To avoid losing forestland value, rural households choose diversified management methods [21]. So, both forestry income and off-farm income play an important role in household income. Therefore, the incentive effect of collective forestland tenure reform of pluriactivity households is reflected in both forestry income and off-farm income. Overall, it basically verifies the theoretical hypothesis that the positive marginal effect of collective forestland tenure reform on rural household income gradually decreases as rural household differentiation rises, further validating Hypothesis 3.

4.4. The Heterogeneous Effect of Collective Forestland Tenure Reform on Households' Income

The above confirms the income-increasing effect of collective forestland tenure reform. Then, for households with different forestland management scales, the input level of forestry production factors and the transfer degree of the off-farm labor are different. For households

with different human capital endowments, the forestry management intensity and off-farm employment ability promoted by collective forestland tenure reform are different. Both of which will lead to heterogeneous differences in the promotion of households' income by collective forestland tenure reform. Therefore, this part attempts to investigate the impact of collective forestland tenure reform on households' income from two aspects: forestland management scale and human capital endowment.

4.4.1. Heterogeneity of Forestland Management Scale

Ordinary households are defined in this study as those managing forestland at a scale below the average of all households. Table A5 reports the impact of collective forestland tenure reform on households' income under different groups. From the results, whether for ordinary households or large-scale households, the collective forestland tenure reform has a significant income-increasing effect. Most studies agree that the collective forestland tenure reform has made forestland tenure more stable, decreased the number of disputes over forest tenure, made it easier to transfer forest tenure, led to the creation of forestry cooperative organizations, and made the basic rural management system more stable [32]. In terms of total income, the effect of collective forestland tenure reform on increasing the income of ordinary households is greater than that of large-scale households, and the impact of households' differentiation on promoting total income growth is greater than that of large-scale households. In terms of itemized income, the effect of collective forestland tenure reform on the increase of forestry income of large-scale households is greater than that of ordinary households. Additionally, the effect of households' differentiation on the positive promotion of forestry income of large-scale households is weaker. The rate of growth of collective forestland tenure reform is faster than that of ordinary households. The effect of collective forestland tenure reform on the increase of off-farm income of ordinary households is greater than that of large-scale households, and the weakening effect of households' differentiation of ordinary households on the positive promotion of off-farm income growth of collective forestland tenure reform is higher than that of large-scale households. Fragmented forestland reduced ownership manufacturing incentives vary by region [29]. On the one hand, because of the benefits of forestland resource endowment, large-scale households can obtain higher marginal income by continuing to increase investment in forestry production factors, which strengthens the effect of collective forestland tenure reform on the growth of forestry income. Income raises a household's social standing and negotiating power in the community. As a result, families with relatively high earnings are better equipped to protect their forestland in the future and are more inclined to believe that their land is secure under high tenure [33]. Additionally, it is the reason why the weakening effect of households' differentiation on the increase of forestry income of large-scale households after collective forestland tenure reform is stronger. On the other hand, due to the relative disadvantage of forestland resource endowment, ordinary households are more likely to transfer part of the family surplus labor to off-farm industries after the forestland tenure is strengthened, which makes the collective forestland tenure reform play a greater role in promoting the off-farm employment of ordinary households. In general, households that concentrate on forestry production can increase their production margins by extending the volume of forestry production and so achieving economies of scale. As a result, they are open to renting forestland from other villagers' households. On the other hand, households who lease forestland can increase their off-farm revenue in addition to obtaining a consistent and sizable income from the leasing of forestland [27]. This may secure higher revenue for the household. As a result, it further demonstrates that ordinary households' differentiation has a stronger weakening effect on the positive promotion of off-farm income growth brought about by collective forestland tenure reform.

4.4.2. Heterogeneity of Human Capital Endowment

This study examines the heterogeneity of the income-generating effects of forestry reform under different human capital endowments, mainly in terms of both quantity and

quality of human capital. For this purpose, the quantity of labor and years of education are used as the variables characterizing the quantity and quality of human capital, respectively. The number of rural households' labor is divided into two groups: low and high quantity of human capital; the years of education are also divided in this way as low and high quality of human capital. Table A6 shows that whether in the high-quantity or high-quality group or in the low-quantity or low-quality group, collective forestland tenure reform has a significant income-increasing effect. However, the income-increasing effect of the collective forestland tenure reform on the households of the high-quantity group and the high-quality group is higher than that of the low-quantity group and the low-quality group. According to some researchers, the education of the head of the household plays a significant role, and households with higher levels of education tend to find more off-farm occupations [28]. Particularly, households with more educated members and larger families benefited from better opportunities, which led to more jobs both in their forests and in other places [14]. This demonstrates that, when compared to households with low-quantity and low-quality human capital endowment, households with high-quantity or high-quality human capital endowment find it easier to optimize the allocation of forestry production factors to increase forestry income or increase off-farm labor input to increase off-farm income, thereby improving the overall income level of families. This is why the differentiation of households with high-quantity or high-quality human capital endowment has a stronger weakening effect on the promotion of households' income by collective forestland tenure reform than distinguishing households with low-quantity and low-quality human capital endowment.

5. Discussion

Based on nationally representative rural family social survey data, this study focuses on the impact of collective forestland tenure reform on households' income and its mechanism from the perspective of households' differentiation. Collective forestland tenure reform can significantly promote the growth of households' forestry income and off-farm income, and then improve households' family economic performance overall, which is consistent with the conclusions of previous studies [6,13,34,35]. In fact, the income-increasing effect of the collective forestland tenure reform also highlights the distribution characteristics of "benefiting the poor more than the rich", which implies that the current policy of the Chinese government targets mainly low-income rural households.

This means that the current policy of the Chinese government targets mainly low-income rural households but does not target forestry reform to meet the interests of high-income rural households. This has, to a certain extent, strengthened the universality of the collective forestland tenure reform policy and households' income expectations for forestry production, which in turn has increased their incentives to invest in forestation and other forestry factors. For example, the forest cover rate was 18.21% in 2003 when the Chinese government piloted the collective forestland tenure reform policy, and it has increased to 22.96% as of the ninth China Forest Inventory (2014–2018). This is the most direct example. Therefore, the collective forestland tenure reform has, to a certain extent, overcome the predicament of serious damage to forestland resources due to indiscriminate logging that occurred in the 1980s during the *"three definitions" of forestry reform*. However, the employment structure of Chinese rural households at this stage has gradually diversified from homogeneous forestry production before the collective forestland tenure reform to a distribution pattern in which forestry production, part-time production, and off-farm employment. Additionally, part-time production has gradually become the main business mode of Chinese rural residents.

Some studies mainly analyze the differentiation phenomenon of households after the collective forestland tenure reform from the two differentiation structures of households' family labor. In order to realize the effect of tenure stimulating family income, households are first encouraged to invest more of their family labor into the forestry sector by increasing the expected income of forestry [36,37]. Second, by lowering households' danger of losing

their tenure and motivating them to devote more family work to the off-farm sector, the collective forestland tenure reform lowers the non-productive investment for the maintenance of forestland tenure [11,14,37]. These studies all share the trait of treating households as homogeneous groups, failing to clearly distinguish between the heterogeneous differentiation of households brought on by varying economic development stages and economic policies, and failing to escape the imprisoning fact that the research primarily uses homogeneous households as the object of study. Lock the types of household differentiation in advance before analyzing the regulatory impact of households' differentiation on the income increase of collective forestland tenure reform in order to analyze the heterogeneous impact of collective forestland tenure reform on the income increase of households with differentiation, whether it be the differentiation of households caused by the policy of collective forestland tenure reform or the differentiation of households caused by different economic development stages or other economic policies.

The promotion effect of the collective forestland tenure reform on households' income gradually reduced, and the influence of the various different types of households who have undergone the reform on income growth has grown more substantial than before. However, according to our findings, there are prominent phenomena of the solidification of the contradiction between man and land and the distortion of the relationship between man and land at present. Higher differentiated households, like off-farm households, essentially no longer rely on forestry production as a source of revenue. However, households' readiness to renounce their tenure under the forestland contract is unaffected by their ongoing differentiation in the urbanization process. The influence on exit decision, however, appears to be more related to households' psychological than actual dependence on the vernacular as evidenced by their propensity to hold onto their forest area and preserve the original forestry production and management mode. As a result, a situation where one is "leaving agriculture" but not "leaving the land" and where one is "entering the city" but not "abandoning the land" is created. The distinctive system in China might be to blame for this unforeseen result. The household registration system in China's cities has restrictions that make it difficult for migrants to become citizens and prevent them from enrolling in the city's social security system. There is a significant psychological dependence on "land" and a high degree of stickiness in rural China, where the social security system is relatively weak and poor. In this situation, rural households still favor owning forestland even though they work outside the farm. Additionally, as forestland tenures continue to advance, they become increasingly comparable to true tenures, allowing rural households to use them with greater safety as a social security measure to reduce the danger of unemployment.

In addition, the welfare improvement caused by the loss of forestland contract tenures is limited for households with a larger degree of differentiation, especially as urban land values rise, leaving them with a stronger expectation of appreciation for keeping their forestland tenure. Income from forestry operations serves as the primary source of income for households with little differentiation, such as rural households. Future investments by these households in forestland management scale and forestry production factors will gradually rise, mostly due to the fact that the comparative revenue from forestry production and operation is lower than that of off-farm employment. The secret to increasing their forestry management income is to take advantage of somewhat sized operations or work to develop fresh forestry management topics. The reduced forestry management income will progressively cause the households with lower differentiation to cut their forestry production factor inputs, or they may even decide to give up forestry operations altogether if the scope of their operations is not extended. The two aforementioned options could result in little or no future change to the current pattern of allocating forest acreage.

Therefore, the Chinese government faces a dilemma between developing urban and rural economies and cultivating new forestry operators. When changing the management mode of small-scale households by cultivating new forestry management subjects, policymakers should pay attention to the problem of rural land. When they employ the new urbanization plan to address the issue of rural labor shortage brought on by the exodus

of small-scale households, they should also take the issue of rural land into consideration. The rural land problem may bring additional unexpected costs to the collective forestland tenure reform. The main assets of rural households are labor and land. Therefore, policy intervention in either of these two aspects should be based on a cost–benefit analysis of both. How to balance the above difficulties is a major challenge for policymakers to deepen the collective forestland tenure reform.

6. Conclusions and Policy Implications

Based on the change in households' income from the perspective of households' differentiation, combined with the actual research situation, this paper puts forward the following suggestions on how to continuously promote the collective forestland tenure reform policy: firstly, the collective forestland tenure reform is conducive to increasing households' income and has a good households' income barrier, and the income increase effect of collective forestland tenure reform shows the characteristics of "benefiting the poor more than the rich". Therefore, in the follow-up policy promotion process, we should give more attention and support to low-income or low-differentiation households and families and actively guide them to develop in the direction of new forestry management subjects. However, as we deepen the policy of collective forestland tenure reform, we should pilot a policy of forestland exit at the same time. In this policy pilot, we should not only be based on the wishes of households, but also consider the heterogeneity of households, and design a differentiated forestland exit system according to their own conditions, so as to avoid a large number of households' land loss with low dependence on forestland.

Secondly, further clarify the ownership of forestland, promote and improve the right confirmation of forestland, realize the comprehensive coverage of the tenure confirmation and certification of forestland, and determine a relatively stable compensation mechanism to enable households to form a reasonable expectation of forestland value-added. The issue of unequal public services brought on by two-element segmentation is also resolved at the same time, as are the challenges households face when trying to settle in urban areas. The inability of peasants moving into cities to take advantage of amenities such as housing, pensions, public spaces, and social security will make them more anxious after losing their land and inhibit urbanization.

As a result, in addition to the forestland withdrawal system, reforms in the public sector, social security, and registered residence city should also be prioritized. Further releasing the benefits of the collective forestland tenure reform should be done while reducing administrative intervention and increasing policy clarity. Finally, actively cultivate township businesses, vigorously develop rural off-farm industries, and offer enough off-farm employment opportunities for the nearby rural labor migration. This will enable households who represent the general level of differentiation in China's rural labor structure to increase their income.

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Appendix A

Table A1. Income-increasing the effect of collective forestland tenure reform on households with different incomes—sub-sample regression.

Variable	Low Income Sample			High Income Sample		
	TI	FI	OI	TI	FI	OI
FR	0.0160 ***	0.2033 ***	0.0467 ***	0.0067 ***	0.0775 ***	0.0141 ***
	(0.0032)	(0.0224)	(0.0054)	(0.0015)	(0.0228)	(0.0042)
FD	0.0317 ***	−0.2710 ***	0.3123 ***	0.0089 ***	−0.1716 ***	0.1252 ***
	(0.0028)	(0.0198)	(0.0047)	(0.0013)	(0.0195)	(0.0037)
LPI	0.0043 ***	−0.0153 **	−0.0012	0.0080 ***	−0.0604 ***	0.0081 ***
	(0.0009)	(0.0063)	(0.0015)	(0.0003)	(0.0052)	(0.0010)
FPI	0.0025 **	0.0366 ***	−0.0011	0.0008 *	0.0483 ***	−0.0039 ***
	(0.0011)	(0.0080)	(0.0020)	(0.0005)	(0.0074)	(0.0014)
FA	0.0008 ***	0.0121 ***	−0.0001	0.0000	0.0060 ***	−0.0007 ***
	(0.0003)	(0.0018)	(0.0004)	(0.0001)	(0.0013)	(0.0002)
FC	0.0123 ***	0.1314 ***	0.0038	0.0030 ***	0.1715 ***	0.0021
	(0.0023)	(0.0158)	(0.0038)	(0.0008)	(0.0130)	(0.0024)
FL	0.0014 ***	0.0187 ***	−0.0009 *	0.0001	0.0139 ***	−0.0002
	(0.0003)	(0.0020)	(0.0005)	(0.0001)	(0.0017)	(0.0003)
WOA	0.7029 ***	−2.4712 ***	3.3886 ***	0.0490	−0.9352 *	4.4501 ***
	(0.0660)	(0.4606)	(0.1119)	(0.0312)	(0.4789)	(0.0890)
POA	0.0187	−1.2691 **	1.3592 ***	0.1558 ***	−1.6856 ***	0.2532 **
	(0.0904)	(0.6311)	(0.1534)	(0.0394)	(0.6043)	(0.1123)
A	−0.0098 ***	−0.0049	−0.0345 ***	−0.0026 ***	0.0182	−0.0132 ***
	(0.0016)	(0.0110)	(0.0027)	(0.0007)	(0.0115)	(0.0021)
G	0.0927	−0.0810	0.4199 ***	0.0166	1.5883 **	0.0207
	(0.0827)	(0.5777)	(0.1404)	(0.0417)	(0.6393)	(0.1188)
H	0.2292 ***	0.6565 *	0.0095	0.0234	0.3455	0.0934
	(0.0520)	(0.3628)	(0.0882)	(0.0259)	(0.3967)	(0.0737)
E	0.0078	0.1189 ***	0.0007	0.0128 ***	0.2614 ***	0.0111
	(0.0059)	(0.0412)	(0.0100)	(0.0025)	(0.0382)	(0.0071)
WCA	0.0212	1.3696 ***	0.0183	0.0249	0.7526 ***	0.1132 ***
	(0.0378)	(0.2641)	(0.0642)	(0.0152)	(0.2330)	(0.0433)
HP	0.0442 ***	0.1420 *	−0.0171	0.0556 ***	0.0748	0.0585 ***
	(0.0106)	(0.0741)	(0.0180)	(0.0048)	(0.0742)	(0.0138)
WPH	0.1861 ***	0.4235 *	0.1330 **	0.0469 ***	0.4275	0.0057
	(0.0358)	(0.2497)	(0.0607)	(0.0172)	(0.2634)	(0.0490)
WMA	−0.0866 ***	3.2684 ***	0.0739	−0.0122	2.7144 ***	−0.0748 *
	(0.0333)	(0.2324)	(0.0565)	(0.0141)	(0.2168)	(0.0403)
DFC	−0.0020 ***	−0.0101 ***	−0.0019 **	−0.0000	−0.0038	−0.0018 ***
	(0.0005)	(0.0036)	(0.0009)	(0.0002)	(0.0036)	(0.0007)
Annual fixed effect	Control	Control	Control	Control	Control	Control
Cons	6.8950 ***	−1.8096	−3.1854 ***	9.8400 ***	−1.6940	0.8961 ***
	(0.1682)	(1.1746)	(0.2854)	(0.0798)	(1.2235)	(0.2274)
N	6380	6380	6380	6380	6380	6380
R^2	0.172	0.147	0.683	0.133	0.189	0.665

Note: ***, **, and * are significant at the level of 1%, 5%, and 10%, respectively, and the values in brackets are standard errors.

Table A2. Income-increasing effect of collective forestland tenure reform on households with different incomes—quantile regression.

Variable	TI			FI			OI		
	Q25	Q50	Q75	Q25	Q50	Q75	Q25	Q50	Q75
FR	0.0143 ***	0.0125 ***	0.0086 ***	0.1406 ***	0.1064 ***	0.0953 ***	0.0745 ***	0.0254 ***	0.0189 ***
	(0.0020)	(0.0020)	(0.0019)	(0.0288)	(0.0225)	(0.0192)	(0.0131)	(0.0027)	(0.0022)
FD	0.0195 ***	0.0111 ***	0.0006	−0.1165 ***	−0.1075 ***	−0.1050 ***	0.1381 ***	0.1314 ***	0.1065 ***
	(0.0020)	(0.0017)	(0.0181)	(0.0022)	(0.0019)	(0.0019)	(0.0033)	(0.0038)	(0.0214)
LPI	0.0103 ***	0.0115 ***	0.0124 ***	−0.0052 ***	−0.0086 ***	−0.0090 ***	0.0054 ***	0.0103 ***	0.0116 ***
	(0.0005)	(0.0004)	(0.0005)	(0.0007)	(0.0006)	(0.0006)	(0.0005)	(0.0006)	(0.0006)

Table A2. *Cont.*

Variable	TI			FI			OI		
	Q25	Q50	Q75	Q25	Q50	Q75	Q25	Q50	Q75
FPI	0.0013 **	0.0010 *	0.0007	0.0023 **	0.0016 ***	0.0007	−0.0010 **	−0.0016 *	−0.0012 *
	(0.0007)	(0.0006)	(0.0008)	(0.0009)	(0.0006)	(0.0006)	(0.0004)	(0.0009)	(0.0007)
FA	0.0005 ***	0.0004 ***	0.0005 ***	0.0008 ***	0.0006 ***	0.0004 ***	−0.0004 ***	−0.0006 ***	−0.0005 ***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0001)
FC	0.0114 ***	0.0103 ***	0.0098 ***	0.0205 ***	0.0175 ***	0.0184 ***	−0.0034 ***	−0.0074 ***	−0.0070 ***
	(0.0012)	(0.0011)	(0.0011)	(0.0016)	(0.0013)	(0.0015)	(0.0008)	(0.0017)	(0.0013)
FL	0.0013 ***	0.0011 ***	0.0009 ***	0.0008 ***	0.0005 ***	0.0004 **	−0.0003 ***	−0.0003	−0.0007 ***
	(0.0002)	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0002)	(0.0001)	(0.0004)	(0.0002)
WOA	0.6731 ***	0.5021 ***	0.3327 ***	−1.4425 ***	−1.1655 ***	−0.9755 ***	6.9203 ***	2.7160 ***	1.3161 ***
	(0.0417)	(0.0383)	(0.0438)	(0.0510)	(0.0401)	(0.0494)	(0.0432)	(0.3081)	(0.0496)
POA	0.3921 ***	0.4088 ***	0.4811 ***	−0.6134 ***	−0.6170 ***	−0.5796 ***	0.1247 *	0.0002	0.3149 ***
	(0.0515)	(0.0523)	(0.0563)	(0.0756)	(0.0507)	(0.0693)	(0.0646)	(0.0793)	(0.0523)
A	−0.0016 *	−0.0006	−0.0035 ***	−0.0047 ***	0.0012	−0.0011	−0.0047 ***	−0.0103 ***	−0.0080 ***
	(0.0010)	(0.0009)	(0.0008)	(0.0013)	(0.0010)	(0.0012)	(0.0006)	(0.0014)	(0.0012)
G	0.0286	0.0021	0.1013 ***	0.2670 ***	0.1286 *	0.0512	0.0205	0.0121	0.0186
	(0.0466)	(0.0666)	(0.0366)	(0.0890)	(0.0712)	(0.0504)	(0.0306)	(0.0552)	(0.0557)
H	0.1168 ***	0.0495	0.0554 **	0.2260 ***	0.1745 ***	0.1238 ***	0.0643 ***	0.1150 **	0.0600 *
	(0.0345)	(0.0306)	(0.0275)	(0.0521)	(0.0365)	(0.0370)	(0.0228)	(0.0492)	(0.0356)
E	0.0326 ***	0.0379 ***	0.0349 ***	0.0188 ***	0.0302 ***	0.0319 ***	0.0132 ***	0.0277 ***	0.0345 ***
	(0.0038)	(0.0032)	(0.0027)	(0.0044)	(0.0037)	(0.0038)	(0.0028)	(0.0046)	(0.0040)
WCA	0.0075	0.0430 **	0.0488 **	0.0330	0.0103	0.0184	0.0210	−0.0147	0.0553 **
	(0.0220)	(0.0205)	(0.0204)	(0.0269)	(0.0193)	(0.0244)	(0.0144)	(0.0274)	(0.0279)
HP	0.1180 ***	0.1264 ***	0.1255 ***	0.1275 ***	0.1165 ***	0.1189 ***	0.0487 ***	0.0694 ***	0.0890 ***
	(0.0073)	(0.0064)	(0.0057)	(0.0078)	(0.0064)	(0.0074)	(0.0055)	(0.0082)	(0.0076)
WPH	0.1245 ***	0.1015 ***	0.1229 ***	0.0834 ***	0.0708 ***	0.0683 ***	0.0359 ***	0.1703 ***	0.0996 ***
	(0.0226)	(0.0203)	(0.0242)	(0.0262)	(0.0228)	(0.0215)	(0.0140)	(0.0267)	(0.0241)
WMA	−0.0291	−0.0340 **	−0.0135	0.0226	0.0542 ***	0.0272	−0.0221 *	−0.0002	−0.0296
	(0.0185)	(0.0166)	(0.0180)	(0.0273)	(0.0199)	(0.0230)	(0.0118)	(0.0231)	(0.0221)
DFC	−0.0023 ***	−0.0012 ***	−0.0009 ***	−0.0025 ***	−0.0019 ***	−0.0016 ***	−0.0010 ***	−0.0012 ***	−0.0013 ***
	(0.0003)	(0.0003)	(0.0003)	(0.0005)	(0.0004)	(0.0004)	(0.0002)	(0.0004)	(0.0003)
Annual fixed effect	Control	Control	Control	Control	Control	Control	Control	Control	Control
Cons	6.5385 ***	7.3183 ***	8.3511 ***	7.9224 ***	8.6186 ***	9.5660 ***	−2.0617 ***	1.9568 ***	3.9803 ***
	(0.1193)	(0.1131)	(0.0840)	(0.1402)	(0.1182)	(0.1199)	(0.0694)	(0.3620)	(0.1343)
N	12,760	12,760	12,760	12,760	12,760	12,760	12,760	12,760	12,760

Note: ***, **, and * are significant at the level of 1%, 5%, and 10%, respectively, and the values in brackets are standard errors.

Table A3. Regulatory mechanism of farmers' differentiation.

Variable	Model (1)	Model (2)	Model (3)
	TI	FI	OI
FR	0.0525 ***	0.1373 ***	0.1869 ***
	(0.0060)	(0.0145)	(0.0101)
FD	0.0252 ***	−0.2479 ***	0.2747 ***
	(0.0025)	(0.0187)	(0.0043)
FR × FD	−0.0166 ***	−0.0720 ***	−0.0739 ***
	(0.0028)	(0.0207)	(0.0047)
LPI	0.0084 ***	−0.0522 ***	0.0069 ***
	(0.0005)	(0.0040)	(0.0009)
FPI	0.0011	0.0417 ***	−0.0030 **
	(0.0007)	(0.0055)	(0.0012)
FA	0.0006 ***	0.0086 ***	0.0003
	(0.0001)	(0.0011)	(0.0002)
FC	0.0150 ***	0.1735 ***	−0.0085 ***
	(0.0014)	(0.0101)	(0.0023)
FL	0.0011 ***	0.0163 ***	−0.0004
	(0.0002)	(0.0013)	(0.0003)
WOA	0.7542 ***	−2.2784 ***	4.0802 ***
	(0.0431)	(0.3212)	(0.0731)
POA	0.2813 ***	−0.5280	−1.1120 ***
	(0.0580)	(0.4320)	(0.0983)

Table A3. *Cont.*

Variable	Model (1)	Model (2)	Model (3)
	TI	FI	OI
A	−0.0021 **	0.0078	−0.0253 ***
	(0.0011)	(0.0079)	(0.0018)
G	0.0037	0.4375	0.2109 **
	(0.0579)	(0.4310)	(0.0981)
H	0.1620 ***	0.1948	0.0563
	(0.0360)	(0.2683)	(0.0611)
E	0.0358 ***	0.1582 ***	0.0178 ***
	(0.0038)	(0.0281)	(0.0064)
WCA	0.0330	1.0127 ***	0.0880 **
	(0.0237)	(0.1766)	(0.0402)
HP	0.1113 ***	0.0877 *	0.0264 **
	(0.0069)	(0.0512)	(0.0117)
WPH	0.1936 ***	0.5096 ***	0.1260 ***
	(0.0244)	(0.1818)	(0.0414)
WMA	−0.0422 **	3.0039 ***	−0.0510
	(0.0215)	(0.1599)	(0.0364)
DFC	−0.0019 ***	−0.0090 ***	−0.0004
	(0.0003)	(0.0025)	(0.0006)
Annual fixed effect	Control	Control	Control
Cons	6.8615 ***	−2.6380 ***	−2.5034 ***
	(0.1170)	(0.8711)	(0.1983)
N	12,760	12,760	12,760
R^2	0.296	0.176	0.704

Note: ***, **, and * are significant at the level of 1%, 5%, and 10%, respectively, and the values in brackets are standard errors.

Table A4. Impact of collective forestland tenure reform on the income of farmers of different differentiation types.

Variable	Pure Rural Households			Pluriactivity Households			Off-Rural Households		
	TI	FI	OI	TI	FI	OI	TI	FI	OI
FR	0.4405 ***	0.2739 ***	0.1236 ***	0.0982 ***	0.1300 ***	0.0864 ***	0.0829 ***	0.0933 ***	0.0803 ***
	(0.0715)	(0.0312)	(0.0200)	(0.0181)	(0.0233)	(0.0239)	(0.0236)	(0.0317)	(0.0107)
LPI	0.0039 **	−0.0578 ***	0.0122 ***	0.0113 ***	−0.0616 ***	0.0115 ***	0.0112 ***	−0.0263 ***	0.0056 *
	(0.0020)	(0.0067)	(0.0005)	(0.0005)	(0.0060)	(0.0005)	(0.0005)	(0.0088)	(0.0030)
FPI	0.0009	0.0047	−0.0004	0.0012 **	0.0532 ***	0.0008	0.0008	0.0486 ***	−0.0018
	(0.0024)	(0.0122)	(0.0006)	(0.0006)	(0.0075)	(0.0009)	(0.0009)	(0.0109)	(0.0037)
FA	0.0011 **	0.0033	−0.0004 ***	0.0003 ***	0.0116 ***	−0.0005 ***	0.0005 ***	0.0074 ***	−0.0001
	(0.0005)	(0.0021)	(0.0001)	(0.0001)	(0.0015)	(0.0002)	(0.0002)	(0.0022)	(0.0007)
FC	0.0291 ***	0.1838 ***	−0.0074 ***	0.0117 ***	0.1425 ***	−0.0047 ***	0.0057 ***	0.1997 ***	−0.0154 **
	(0.0047)	(0.0190)	(0.0013)	(0.0011)	(0.0146)	(0.0015)	(0.0014)	(0.0208)	(0.0070)
FL	0.0011 **	0.0098 ***	−0.0011 ***	0.0010 ***	0.0209 ***	−0.0010 ***	0.0009 ***	0.0141 ***	0.0001
	(0.0004)	(0.0037)	(0.0002)	(0.0002)	(0.0020)	(0.0003)	(0.0003)	(0.0020)	(0.0007)
WOA	1.7754 ***	−1.6717	0.4568 ***	0.5709 ***	−1.0941 **	0.4391 ***	0.5654 ***	−2.8933 ***	6.6656 ***
	(0.1644)	(1.0615)	(0.0393)	(0.0356)	(0.4587)	(0.0815)	(0.0802)	(0.7298)	(0.2464)
POA	1.2029 ***	−1.3282	0.8727 ***	0.3235 ***	−0.9036	0.7864 ***	0.6428 ***	−0.9001	2.7952 ***
	(0.2986)	(1.0601)	(0.0472)	(0.0428)	(0.5508)	(0.0814)	(0.0801)	(1.3257)	(0.4476)
A	−0.0070 **	−0.0339 **	−0.0004	−0.0005	−0.0257 **	0.0018	−0.0021 *	0.0229	−0.0437 ***
	(0.0035)	(0.0159)	(0.0010)	(0.0009)	(0.0115)	(0.0012)	(0.0012)	(0.0154)	(0.0052)
G	0.3107	0.1816	0.2005 ***	0.1023 *	0.2243	0.1085 **	0.0964 *	0.6242	0.8596 ***
	(0.2112)	(0.6560)	(0.0622)	(0.0564)	(0.7263)	(0.0504)	(0.0496)	(0.9377)	(0.3166)
H	0.3882 ***	0.4283	0.0337	0.0645 **	0.8126 **	0.1515 ***	0.1662 ***	0.4337	0.3400 *
	(0.1326)	(0.4642)	(0.0345)	(0.0313)	(0.4035)	(0.0356)	(0.0351)	(0.5886)	(0.1988)
E	0.0282 **	0.1180 **	0.0404 ***	0.0416 ***	0.1666 ***	0.0329 ***	0.0318 ***	0.1246 **	0.0156
	(0.0132)	(0.0511)	(0.0035)	(0.0032)	(0.0410)	(0.0039)	(0.0039)	(0.0585)	(0.0198)

Table A4. *Cont.*

Variable	Pure Rural Households			Pluriactivity Households			Off-Rural Households		
	TI	FI	OI	TI	FI	OI	TI	FI	OI
WCA	0.0073	0.4872	0.0103	0.0462 **	1.3080 ***	0.0086	0.0084	1.0731 ***	0.2843 **
	(0.0801)	(0.3348)	(0.0219)	(0.0199)	(0.2562)	(0.0257)	(0.0253)	(0.3556)	(0.1201)
HP	0.0746 ***	0.2810 ***	0.1211 ***	0.1186 ***	0.0814	0.1370 ***	0.1398 ***	0.0647	−0.0108
	(0.0238)	(0.0982)	(0.0064)	(0.0058)	(0.0743)	(0.0075)	(0.0074)	(0.1057)	(0.0357)
WPH	0.4536 ***	0.3834	0.1059 ***	0.1101 ***	0.5924 **	0.0876 ***	0.0805 ***	0.5472	0.1098
	(0.0816)	(0.3575)	(0.0224)	(0.0203)	(0.2613)	(0.0274)	(0.0270)	(0.3621)	(0.1223)
WMA	−0.1225 *	2.1009 ***	−0.0084	−0.0142	2.9179 ***	−0.0057	0.0017	4.1989 ***	−0.2702 **
	(0.0719)	(0.3071)	(0.0199)	(0.0180)	(0.2320)	(0.0236)	(0.0232)	(0.3190)	(0.1077)
DFC	−0.0029 **	0.0033	−0.0022 ***	−0.0019 ***	−0.0111 ***	−0.0011 ***	−0.0012 ***	−0.0148 ***	0.0018
	(0.0011)	(0.0049)	(0.0003)	(0.0003)	(0.0037)	(0.0004)	(0.0004)	(0.0050)	(0.0017)
Annual fixed effect	Control	Control	Control	Control	Control	Control	Control	Control	Control
Cons	7.0400 ***	−12.8322 ***	6.7669 ***	7.6252 ***	−4.6669 ***	7.2585 ***	7.3424 ***	−5.7688 ***	−1.9224 ***
	(0.3743)	(1.5030)	(0.1076)	(0.0977)	(1.2575)	(0.1154)	(0.1136)	(1.6617)	(0.5611)
N	3236	3236	3236	5922	5922	5922	3602	3602	3602
R^2	0.150	0.137	0.451	0.424	0.178	0.431	0.435	0.210	0.404

Note: ***, **, and * are significant at the level of 1%, 5%, and 10%, respectively, and the values in brackets are standard errors.

Table A5. Impact of collective forestland tenure reform on household's income under different forest land management scale.

Variable	Ordinary Farmers			Scale Farmers		
	TI	FI	OI	TI	FI	OI
FR	0.0346 ***	0.0345 ***	0.2065 ***	0.0343 ***	0.0430 ***	0.1256 ***
	(0.0092)	(0.0126)	(0.0141)	(0.0083)	(0.0118)	(0.0161)
FD	0.0280 ***	−0.1252 ***	0.2830 ***	0.0141 ***	−0.1253 ***	0.2516 ***
	(0.0036)	(0.0049)	(0.0055)	(0.0037)	(0.0052)	(0.0072)
FR × FD	−0.0982 **	−0.0938 *	−0.0824 ***	−0.0110 ***	−0.1078 *	−0.0496 ***
	(0.0390)	(0.0548)	(0.0065)	(0.0042)	(0.0550)	(0.0076)
Control variable	Control	Control	Control	Control	Control	Control
Annual fixed effect	Control	Control	Control	Control	Control	Control
Cons	6.6298 ***	8.0328 ***	−2.9197 ***	7.3326 ***	8.6631 ***	−1.7875 ***
	(0.1768)	(0.2439)	(0.2725)	(0.1568)	(0.2210)	(0.3033)
N	6380	6380	6380	6380	6380	6380
R^2	0.304	0.275	0.730	0.280	0.325	0.671

Note: ***, **, and * are significant at the level of 1%, 5%, and 10%, respectively, and the values in brackets are standard errors.

Table A6. Impact of collective forestland tenure reform on households' income under different human capital endowments.

Variable	Low Human Capital Quantity of Farmers			High Human Capital Quantity of Farmers		
	TI	FI	OI	TI	FI	OI
FR	0.0387 ***	0.0394 ***	0.1578 ***	0.0640 ***	0.0623 ***	0.2012 ***
	(0.0081)	(0.0107)	(0.0137)	(0.0087)	(0.0124)	(0.0146)
FD	0.0248 ***	−0.1082 ***	0.2364 ***	0.0264 ***	−0.1367 ***	0.2993 ***
	(0.0034)	(0.0045)	(0.0058)	(0.0037)	(0.0053)	(0.0062)
FR × FD	−0.0101 ***	−0.0082 *	−0.0606 ***	−0.0223 ***	−0.0167 ***	−0.0792 ***
	(0.0037)	(0.0049)	(0.0063)	(0.0042)	(0.0060)	(0.0070)
Control variable	Control	Control	Control	Control	Control	Control
Annual fixed effect	Control	Control	Control	Control	Control	Control
Cons	7.6637 ***	8.7982 ***	−2.1113 ***	6.3453 ***	8.1770 ***	−2.6911 ***
	(0.1631)	(0.2162)	(0.2771)	(0.1799)	(0.2579)	(0.3017)
N	6380	6380	6380	6380	6380	6380
R^2	0.299	0.283	0.729	0.272	0.298	0.684

Table A6. *Cont.*

Variable	Low Human Capital Quantity of Farmers			High Human Capital Quantity of Farmers		
	TI	**FI**	**OI**	**TI**	**FI**	**OI**
FR	0.0486 ***	0.0369 ***	0.1303 ***	0.0554 ***	0.0633 ***	0.2332 ***
	(0.0083)	(0.0110)	(0.0141)	(0.0085)	(0.0124)	(0.0143)
FD	0.0234 ***	−0.1228 ***	0.2368 ***	0.0275 ***	−0.1237 ***	0.3011 ***
	(0.0034)	(0.0045)	(0.0061)	(0.0037)	(0.0054)	(0.0059)
FR × FD	−0.0144 ***	−0.0030 *	−0.0518 ***	−0.0183 ***	−0.0184 ***	−0.0924 ***
	(0.0039)	(0.0052)	(0.0065)	(0.0040)	(0.0057)	(0.0067)
Control variable	Control	Control	Control	Control	Control	Control
Annual fixed effect	Control	Control	Control	Control	Control	Control
Cons	7.2892 ***	8.3542 ***	−2.4783 ***	6.4372 ***	8.0821 ***	−2.6721 ***
	(0.1597)	(0.2123)	(0.3171)	(0.1926)	(0.2791)	(0.2750)
N	6380	6380	6380	6380	6380	6380
R^2	0.305	0.300	0.725	0.272	0.289	0.691

Note: *** and * are significant at the level of 1% and 10%, respectively, and the values in brackets are standard errors.

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