Study on the Influence of Social Factors on Economic Income Under the Theory of Regional Coordination

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Abstract: In the context of regional coordination, how to reasonably allocate the resources needed for the development of social aspects and economic aspects, such as education, communication, and transportation, has become an important link in achieving the goal of rural revitalization. Based on research data from Tibet-related areas in four provinces and Lhasa City in Tibet Autonomous Region, this paper empirically investigates the influence of social factors on economic income in ethnic areas using least squares regression and propensity matching score model (PSM). The results show that education and communication levels have a significant positive effect on farm household income in both Tibet and Tibet-related areas of the four provinces. Through Pearson correlation matrix analysis between Tibetan autonomous prefectures and representative cities in Tibet, it is found that there is a synergistic correlation between school-age children's schooling rate, road transportation development, and farm household income per capita in the two regions, which can promote joint development through a coordinated approach. Based on this, the article proposes to increase the investment and support for education in ethnic regions, further improve the construction of telecommunication and communication systems in ethnic regions, and establish a comprehensive and diversified regional synergy system.

1 INTRODUCTION

In recent years, the government has been paying more and more attention to the economic and social development of ethnic regions and has taken a series of policy actions to provide support and guarantee for the economic development and livelihood improvement of ethnic regions in China. With the in-depth implementation of various policies and guidelines dedicated to improving social development, ethnic areas have been improving in terms of education capability, communication level and transportation development, and the overall social development is getting better (Atasoy, 2013). In the period of transition from precise poverty alleviation to rural revitalization, the level of farm household income is still one of the indicators that needs to be focused on, which reflects the development of economic level in ethnic areas. At this stage, the influence of social factors on economy and the reasonable allocation of resources between the two have become one of the key concerns in ethnic areas. Based on this, an in-depth study of the influence of social factors on farm household income in ethnic regions is of great significance for regional development, and the performance of such influence under the theory of regional coordination is also a focus of our attention.

2 THEORY AND MECHANISM ANALYSIS

Firstly, social factors in ethnic areas can promote farmers' income increase by improving population quality, innovating production methods, enhancing production skills and enriching life experiences. Second, social factors in ethnic areas can promote farmers' income increase by accelerating information transfer and cultural exchange and further enriching the ways of income generation (Fleisher, 2009). Lack of knowledge and poor communication are important reasons limiting the development of ethnic areas. High-efficiency communication and developed transportation facilities will speed up the exchange and dissemination of knowledge and technology, which will help increase the economic

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income of households. Finally, social factors in ethnic areas can promote the increase of household economic income of farmers through inter-regional coordination and mutual synergy (Tokila, 2011). At the theoretical level, social factors in ethnic areas affect farm household income from the above three aspects, but the effect of their influence still needs to be tested empirically. In this paper, we will take the coordinated development of Tibet and Tibet-related regions in four provinces as the goal, analyze the influence of social factors in ethnic regions on farmers' household economic income through multiple regression and PSM models, explore the impact-related points that can be coordinated between Tibet and Tibet-related regions in four provinces, and further explore the path of coordinated and coordinated development of Tibetan society and economy in Tibet-related regions in four provinces (Chen, 2008).

3 DATA FOUNDATION AND MODEL BUILDING

3.1 Data Sources

The data used in this paper come from micro household data from field research in Tibetan-related areas in four provinces and Tibet, as well as macro data from the Sichuan Statistical Yearbook 2020, Qinghai Statistical Yearbook 2020, Gansu Statistical Yearbook 2020, Yunnan Statistical Yearbook 2020, and the 2020 National Economic and Social Development Statistical Bulletin of representative cities and Tibetan autonomous prefectures. Among them, the research data specifically include Hongyuan County, Ganzi County, Ruoerge County, Markang County, Dafu County, and Danba County in Tibet-related areas of Sichuan; Diebe County, Zhuoni County, and Xiahe County in Tibetan areas of Gansu; Deqin County, Shangri-La County, and Weixi County in Tibetan areas of Yunnan; GuiDe County and Duran County in Tibetan areas of Qinghai and Lhasa City in Tibet Autonomous Region. A total of 480 questionnaires were distributed in the survey in Tibet-related areas of the four provinces, with 454 valid questionnaires and an actual recovery rate of 94.58%; a total of 780 questionnaires were distributed in the survey in Lhasa, with 745 valid questionnaires and an actual recovery rate of 95.5% (Jiang, 2012).

3.2 Explanatory Variables

3.2.1 For Author/S of Only One Affiliation (Heading 3): To Change the Default, Adjust the Template as Follows

In this paper, the economic income of farm households was selected as the explanatory variable, and the raw data were standardized in order to eliminate the effects of differences in the average income levels of different villages and the measurement unit scale. The formula is:

$$a = \frac{a_i - \bar{a}_\iota}{s} \quad (1)$$

where, i denotes the states, a denotes the indicator to be standardized, denotes the mean of this indicator in Tibetan areas or Tibet-related areas in four provinces, and s denotes the standard deviation.

3.2.2 Core Explanatory Variables

In this paper, social factors related to farm households were selected as the core explanatory variables, firstly, telecommunication network situation included whether telecommunication was connected (1=connected, 0=not connected) and source of electricity (1=powered by national grid, 0=self-generated); education situation was selected as the core explanatory variable for education level (1=uneducated, 2=not attended school but could read and write, 3=graduated from elementary school, 4=graduated from junior high school, 5=general high school, 6= secondary school, vocational high school, 7=college undergraduate, 8=university undergraduate, 9=graduate and above), and transportation status was selected as the core explanatory variables (1=yes, 0=no).

3.2.3 Control variables

In this paper, health status (1=very bad, 2=bad, 3=fair, 4=good, 5=very good), ethnicity (1=Tibetan, 2=other), number of laborers, number of household yaks, employment status, and agricultural insurance coverage (1=insured, 2=uninsured) were selected as control variables.

3.3 Model Establishment

In order to avoid the problem of multicollinearity and eliminate the effects caused by differences in magnitudes, a multiple linear regression model (1) was established after standardizing some of the variables. Further, an OLS+ robust standard error model (2) was established to deal with the

heteroskedasticity of the model and make the model more robust. In addition, this paper also matches each household with no telecommunication network or no education with a propensity score for a household with telecommunication network or education, so that these two households are not identical only at the level of whether they have telecommunication network or education, and other variables are basically the same.

For the entire group of farmers, this net effect is called the average treatment effect (ATT) and is expressed as:

$$ATT=E(Y_1|D=1)-E(Y_0|D=1)=E(Y_1-Y_0|D=1) \quad (2)$$

where is the household economic income of the farmer with a better telecommunication network and is the household economic income of the farmer with a worse telecommunication network.

4 EMPIRICAL RESULTS AND ANALYSIS

4.1 Empirical Results and Analysis

In this paper, the effect of social development factors on household economic income was tested with farm household economic income as the dependent variable and household social characteristics factors as the independent variables, and the results are shown in Table 1. From model (1) and model (2), it can be seen that social characteristics such as telecommunication network status and education level significantly affect household economic income.

Comparing the empirical results of the four Tibetan provinces with those of Tibet, it is easy to find that, in terms of telecommunication, the economic income of farm households with telecommunication networks in villages in the four Tibetan provinces is significantly higher than those without telecommunication networks, while the higher the economic income of farm households with electricity sources in Tibet tends to be from the national grid, indicating that when farm households have telecommunication networks in their villages, their households can receive faster and more timely

Table 1: Empirical results.

Projects	Tibet-related areas in four provinces		Tibet	
Variables	Model (1)	Model (2)	Model (1)	Model (2)
	Standardized household economic income			
Telecom Network Situation	0.337	0.337**	0.396	0.396***
	(0.307)	(0.152)	(0.468)	(0.105)
Education level	0.178***	0.178***	0.144***	0.144***
	(0.054)	(0.060)	(0.045)	(0.052)
Road condition	0.431	0.431*	0.246	0.246
	(0.420)	(0.220)	(0.321)	(0.323)
Health status	0.200***	0.200***	-0.042	-0.042
	(0.058)	(0.049)	(0.086)	(0.087)
Ethnicity	0.104 (0.438)	0.104 (0.175)	-1.393* (0.742)	-1.393 (1.463)
Labor force and Employment	0.324*** (0.059)	0.324*** (0.066)	0.055* (0.029)	0.055 (0.034)
Total number of yaks	0.007***	0.007***	0.015***	0.015***
	(0.003)	(0.002)	(0.003)	(0.004)
Agricultural Insurance	-0.304***	-0.304**	-0.246**	-0.246**
	(0.117)	(0.129)	(0.120)	(0.117)

In particular, the national power supply is more efficient than the farmers' own power generation, so it is conducive to the production and living of the farmers' households, thus promoting the increase of their economic income. Therefore, Tibet and the Tibet-related regions in the four provinces can promote the overall economic development of the region by improving the level of telecommunication (especially the national electricity supply and the popularity of intelligent communication). As for education, both regions show a significant positive effect of education level on household economic income, indicating that both regions can further promote coordinated regional economic development by improving education services, enriching farmers and herdsmen's knowledge, and innovating production methods and efficiency while improving population quality. In terms of road construction, the road construction in the four Tibet-related provinces positively affects the economic income of farm households at a statistical level of 10%. On the one hand, the development of transportation will speed up the exchange and synergy among regions and drive the overall economic development of western ethnic regions, thus promoting the improvement of household economic income; on the other hand, the construction of roads will affect the labor force transfer to a certain extent, and the development of transportation will drive the outflow of labor, and its joint offset with the promotion effect brought by regional linkage shows positive influence, which will promote the house-hold economic income of farmers in a comprehensive way (Liu, 2021). This effect is not significant in Tibetan region, so Tibet can learn from the highlights of road construction in Tibet-related areas of four provinces to further improve road transportation service capacity, thus further increasing the economic income of local farm households.

4.2 Robustness Test

In order to ensure the scientificity of the research results, this paper adopts the method of replacing variables for robustness testing. Jing You et al. (2020) had used the indicator of years of education to measure the educational attainment of the research subjects in their study, so this paper will replace the educational attainment with years of education, i.e., the original categorical variables will be replaced by the specific length of years of education. After the OLS+ robustness standard error model regression, it was found that the significance levels and coefficient signs of the core explanatory variables remained basically unchanged, and social factors such as telecommunication network status and education level remained significant, indicating that the results were more robust, as shown in Table 2.

Table 2: Robustness test results.

	Tibet-related areas in four provinces	**Tibet**
	Family economic income	
Telecommunications Network Status	0.324**	0.399***
	(0.133)	(0.105)
Years of education	0.040**	0.050***
	(0.020)	(0.018)
Road condition	0.469**	0.265
	(0.224)	(0.319)
Health status	0.209***	0.042
	(0.048)	(0.088)
Ethnicity	0.139	-1.379
	(0.157)	(1.468)
Labor force and employment	0.326***	0.052
	(0.066)	(0.034)
Total number of yaks	0.007***	0.015***
	(0.002)	(0.004)
Agricultural Insurance	-0.284**	-0.247**
	(0.130)	(0.117)

4.3 Propensity Score Matching Model (PSM) Analysis of The Effect of Social Factors on Economic Income

The results of the propensity score matching model (PSM) analysis on social factors for income increase in Tibet and Tibet-related areas in four provinces using stata15.0 software can be obtained as shown in Table 3. In terms of telecommunication network, the average treatment effect ATT measured by the one-to-one matching method, caliper matching method, and kernel matching method in the four Tibetan provinces and Tibet are all significantly positive at the 1% level, which indicates that the development of communication business can significantly increase the economic income of farm households. In terms of education level, the average treatment effect ATT measured by the nuclear matching method in the four Tibetan provinces is significantly positive at the 10% level, and the results measured by the three methods in Tibet are significantly positive at the 5% level or more, which indicates that the development of education in the two regions can increase the economic income of farm households to a certain extent (Sun, 2016). Taking

Table 3: PSM Propensity Score Matching Table.

Variables	Area	Before and after matching	unmatched	matched	ATT	T
Telecommunications Network	Tibet-related areas in four provinces	One to One Matching	0.527	0.056	0.0432	3.75***
		Caliper Matching	0.527	0.110	0.0226	2.96***
		Nuclear Matching	0.527	0.097	0.0643	3.66***
	Tibet	One to One Matching	0.039	0.267	0.0107	3.48***
		Caliper Matching	0.039	0.014	0.0107	3.25***
		Nuclear Matching	0.039	0.008	0.0107	3.54***
Education level	Tibet-related areas in four provinces	One to One Matching	0.050	0.020	0.1172	-0.27
		Caliper Matching	0.050	0.002	0.1259	1.04
		Nuclear Matching	0.050	0.006	0.1172	1.64*
	Tibet	One to One Matching	0.032	0.008	0.2125	2.29**
		Caliper Matching	0.032	0.002	0.2192	2.59***
		Nuclear Matching	0.032	0.001	0.2125	2.51**
Roads	Tibet-related areas in four provinces	One to One Matching	0.119	0.075	0.1333	-0.61
		Caliper Matching	0.119	0.036	0.2343	-0.85
		Nuclear Matching	0.119	0.058	0.2165	-1.09
	Tibet	One to One Matching	0.057	0.020	-0.0383	-0.22
		Caliper Matching	0.057	0.003	-0.0383	-1.06
		Nuclear Matching	0.057	0.018	-0.0383	-0.71

the caliper matching method to test the development of telecommunication networks in Tibetan-related areas in four provinces as an example, the calculated mean treatment effect ATT= 0.0226 and is significantly positive at the 1% level of significance, indicating that the economic income of farm households receiving education in Tibetan-related areas in four provinces is 4.3% (i.e., 0.0226/ 0.527) higher than that of farm households not receiving education.

4.4 Correlation Analysis under Regional Synergy Theory

In order to study the regional synergistic correlation between Tibet-related areas in four provinces and Tibet, this paper adopts the Pearson correlation coefficient to measure the correlation between representative indicators of social and economic development in the two regions, which is calculated as follow:

$$r=\frac{N\sum x_i y_i-\sum x_i \sum y_i}{\sqrt{N\sum x_i^2-(\sum x_i)^2}\sqrt{N\sum y_i^2-(\sum y_i)^2}} \quad (3)$$

The correlation analysis shows that there is a strong positive correlation between the per capita disposable income of farming households in the four Tibetan-related provinces and the Tibet Autonomous Region and the schooling rate of school-age children, and there is a strong positive correlation between the road density in the four Tibetan-related provinces and the per capita disposable income of farming households in the Tibet Autonomous Region, so there is a certain connection between the economic and educational development of the two regions, especially in the stage of precise poverty alleviation. The concept of "helping the poor to help the wise" makes education in the two regions popular and synergistic, and in the future, we can combine more ethnic cultural characteristics to promote the synergistic development of education and culture in the two regions. At the same time, the analysis of the matrix results also reveals that although there is a positive correlation between the road density in the Tibet-related areas of the four provinces and the per capita disposable income of farm households in the Tibet Autonomous Region, the value of the correlation coefficient is not high enough, and the positive role that the synergy effect should play is not fully reflected, and the transportation development in the Tibet-related areas will, to a certain extent, drive the economic development of the surrounding areas and even the Tibetan region, thus increasing the per capita income

of farm households in Tibet (Su, 2016). In the future, the two regions can strengthen the synergistic linkage in transportation construction, and drive the synergistic economic progress of the two regions through the transportation development of Tibet-related areas.

5 CONCLUSION

Focusing on the development of ethnic regions, this study explores the influence of social factors on the economic income of farm households from an empirical perspective, based on micro research and macro yearbook data. The results of the study show that. (1) telecommunication network situation and education level have a significant positive impact on the economic income of farm households, and the results of PSM propensity score matching are higher in Tibet than in Tibet-related areas in four provinces. (2) The effect of road transportation situation on household economic income is not significant, and the results obtained in Tibetan-related areas in the four provinces are not significant. (3) There is a strong positive correlation between school-age children's enrollment rates in both regions, and there is a strong positive correlation between road density in Tibet-related regions and per capita disposable income of farm households in the Tibet Autonomous Region, and the two regions can strengthen synergistic links in education and transportation in the future. Based on the above analysis, this paper proposes the following recommendations: First, the state should continue to increase the investment and support for education in rural areas, especially ethnic areas. Second, local governments should further improve the construction of telecommunication and communication systems in ethnic areas to enhance the ability of farmers and herdsmen to increase their income. Third, grassroots management organizations should establish a comprehensive and diversified regional synergy system and strengthen the coordination and cooperation of Tibetan-related areas in the four provinces.

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