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THE EFFECT OF VILLAGE HEADMAN'S LEVEL OF EDUCATION ON FARMERS' INCOME: EMPIRICAL STUDY BASED ON CFPS

Abstract

To increase farmers' income, one of the most critical factors is enhancing the quality of the team in the village. The government of China implements many initiatives to encourage college students to work in villages. However, their effect needs to be further discussed. This study aims to examine two hypotheses: (1) village headsmen with high education levels can effectively promote the growth of farmers' income, and (2) highly educated village headsmen increase farmers' income by improving rural governance. After theoretically analyzing the influence of village headsmen with high education levels on the farmers' income and exploring the mechanisms of increasing it, the data from *China Family Plan Studies 2014* is used to empirically test the hypotheses. Building econometric models, regression analysis, mediation mechanism analysis, and heterogeneity assessment are applied. Research results indicate that village headsmen with high education levels can effectively facilitate the increase in farmers' income by

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improving rural governance. Additionally, the effect of the village headman's education level on farmers' income is mitigated by the regional location of the village and the experience of the village headsman. In the eastern part of China, the effect is more significant than in the west and the center of the country. Unsurprisingly, village headmen with more experience can achieve greater results than those with little or none. Our study extends previous works by providing empirical analysis of the theoretical conclusions. The conclusions of this study have implications on how the government can focus their efforts to encourage highly educated people to work in the village.

Key Words:

headman's level of education; farmer's income; village governance; effect mechanism.

JEL: H83, R50, R58.

6 tables, 4 formulae, 17 references.

Literature Review

Ways of increasing farmers' income have always garnered attention among academic and policy circles. In 2005, China implemented a new rural construction policy to increase farmers' income and develop the rural economy. However, the per capita disposable income of urban residents in 2015 was still 2.7 times that of rural residents, indicating a sizeable urban-rural income gap.

Several factors are known to affect the result. One of the important drivers is the shortage of management talent in rural areas. To enhance the quality of the team in the village, since 2006, China has begun to formulate and promote a policy that encourages college students to work in the countryside. College students were selected as the headmen of the villages. According to the *2015 China College Student Village Officials Development Report*, by the end of 2014, there

were more than 180,000 college students as village officials working in villages (Hu, 2015). How did this affect the in-come of local farmers? What is the mechanism of the influence? These questions have been studied by various scholars over the years.

Traditional literature focuses on the factors affecting the income level of farmers from three aspects: characteristics of the farmer's family (e.g., farmers' education, marital status, health, etc.), environment (local policies, culture, natural resources, and other social and geographical environment factors), and agricultural structure.

Zhou and Zhu (2003) conducted empirical research on the rural macro data of 29 provinces from 1989 to 1995, finding that education had a significant promoting effect on farmers' income. Based on the data of the China Nutrition Survey in 1993, Wei (2004) found that health had a significant impact on rural labor participation and non-agricultural employment opportunities, and thus had a significant impact on farmers' household income.

Biagini et al. (2020) used dynamic modeling based on a micro-data panel of Italian farms for the period 2008–2014 to find that CAP (Common Agricultural Policy) played an important role in enhancing farm income. The use of agricultural technology can significantly increase the total income of rural households (Zhou & Yu, 2011), but this income-increasing effect will end once the technology becomes more widely used and the whole industry makes technological progress (Liu J. & Liu H., 2004). Geographical environment factors such as agricultural resources, terrain, and geographical location also significantly affect farmers' income (Wan & Zhou, 2005).

Finally, the management structure. In recent years, with the rise of rural revitalization, the non-agricultural economy has developed rapidly, and the proportion of non-agricultural employment of rural labor has begun to increase, and self-employment and employment have become an important part of rural households' income (Cui & Chen, 2000).

More academics have recently started to focus on the critical function of village cadres in the expansion of rural household income and rural economic development. Village leaders are both important subjects and the most important managers of rural grassroots organizations, who take on the roles of village administration, which is the foundation of Chinese local governance. Studies have shown that the education level of village leaders has a significant impact on the increase in household income and non-agricultural income. R. Zhao and A. He (2016) conducted an empirical study using survey data from the China Family Income Project of 2002 and discovered that village civil servants' higher education background and enterprise management experience had a significant role in promoting farmers' income because these officials were better able to provide the village with good agricultural support services and had closer communication with the higher-level government. Additionally, they discovered that village officials

chosen through popular democracy had a stronger impact on farmers' incomes. The knowledge of village leaders can effectively promote the income growth of farmers, but it has no significant impact on the reduction of the poverty rate, according to Gao and Bi (2009) and their analysis of panel data from the rural fixed observation of the Ministry of Agriculture.

The above literature shows that the education level of village headsmen has a significant impact on farmers' income both theoretically and empirically. However, there are still some shortcomings to these studies. On the one hand, the existing literature mainly focuses on the effect of unilateral factors on farmers' income, and few studies on the influence mechanism. On the other hand, the existing literature mainly uses macro data to conduct empirical analysis on the impact of village leaders' education level on farmers' income or conducts small-sample case analysis and qualitative research-based speculative analysis.

Compared with the existing research, the contributions of this paper are as follows. Firstly, it uses China Family Panel Studies (CFPS) data of 2014, and the database encompasses a large sample from the village level. Secondly, it presents the mechanism that reveals the influence of village leaders' education level on farmers' income through an intermediary variable of rural governance; the heterogeneity of this effect is also discussed. Therefore, this study further contributes to the existing empirical evidence on the factors that influence farmers' income.

Problem Statement

The effect of highly educated village leaders on farmers' income may be multifaceted. First of all, highly educated village officials have higher cultural awareness of advanced ideological concepts, can allocate well, and utilize village public resources so as to better invest village's public assets in the economic development of said village (Oi, 1989).

Secondly, with the encouragement and preferential policy support of national policies, highly educated village headsmen are more likely to start businesses through the development of rural-characteristic industry projects, increasing the possibility of obtaining investment for villages, which is conducive to improving the income level of farmers. In order to better develop the rural economy, China has implemented the policy of attracting college graduate to act as village officials. According to the 2015 report on the development of college student village officials in China, more than 20,000 college-educated village officials had set up more than 17,000 business projects and run or jointly run more than 4,300 professional cooperatives as of 2014. More than 220,000 jobs had been created.

Finally, village officials with higher education have richer knowledge, and conducting various education and training activities in the local area can improve the cul-

tural awareness of villagers and broaden their worldview, thus helping villagers to explore more market information and market opportunities, promote farmers' participation in non-agricultural employment and entrepreneurship, and thus increase their income level. Based on this, this paper tests the following hypothesis: *highly educated village headsmen can effectively help to increase farmers' income* (H1).

There are many ways in which highly educated village officials could affect farmers' income, but this paper focuses on such village leaders improving rural governance. Rural areas have long been a weak link in China's economic development. In the early days of the founding of the People's Republic of China, in order to support the development of cities and industries, national policies enabled the flow of rural resources to cities. Domestic urbanization and industrialization have developed to a certain extent, and the city has begun to feed the countryside. Since then, the country has started to pay more attention to rural economic development. However, the element of human resources plays an extremely important role in the process of rural economic development. One of the main reasons for the backward development of the rural economy is the low level of rural governance. Therefore, improving its quality is vital to increasing farmers' income. The highly educated village officials could be the linchpin in this. Thus, this paper puts forward the following hypothesis: *highly educated village officials increase farmers' income by improving rural governance* (H2).

Methodology

The data used in this paper are derived from the *2014 China Family Panel Studies* (CFPS) report. CFPS is a nationwide large-scale sample survey project, organized and implemented by the Chinese Social Science Survey Center of Peking University. It covers the eastern, central, and western parts of China. After deleting the entries with missing data, we narrowed the sample to 260 villages, covering 124 county-level administrative regions in 24 provincial administrative regions, such as Fujian, Jiangsu, Guangdong, and so on.

The dependent variable is Farmer's income (FI). FI represents the per capita disposable income (CNY) of the village. The data are derived from the answers to the CFPS's question «Last year, the net income per capita in your village was ____1... 1,000,000 yuan». For the purpose of this study, the data is the logarithm of the average income of farmers in the village.

The first independent variable is the level of the headman's education (EDU). The variable EDU is binary and virtual; it is used to measure the data. If the headman of a village has attained college education or more, the value is 1; otherwise, the value is 0. The second independent variable is EDU*EP, that is, the variable of EDU multiplied by the experience of the headman. If the headman of the village has working experience, the value is 1; otherwise, the value is 0.

In order to study the impact of village leaders' education level on farmers' income, other factors affecting farmers' income should be controlled. Considering the availability of data, the variables TP, WP, DS, WG, and LD were selected as control variables; they are explained in Table 1.

Table 2 summarizes the main statistical descriptors for all the variables used in estimation.

Table 1

Description of the variables used in the analysis

Variables	Label	Description of variables
Famer's income(log)	FI	Average disposable income in the village
Level of the headman's education	EDU	Whether went to college (yes=1, no=0)
Total population(log)	TP	The entire population living in the village
Working outside rate	WR	The proportion of the labor force working outside of the village among the total labor force
Distance	DS	Distance between the village council office and downtown (km)
Wage(log)	WG	Construction technician's daily wage
Land area(log)	LD	Average land area in the village
Public service spending (log)	PS	Expenditure on public services (e.g., roads, water, electricity, gas, sewerage, etc.)
Experience of the headman	EP	Whether the headman has experience (yes=1, no=0)

Table 2

Summary of the variables used in the study

Variable	N	Mean	SD	Max	Min
FI	260	8.454	0.870	10.71	5.011
EDU	260	0.192	0.395	1	0
TP	260	7.573	0.811	10.66	5.347
WR	260	37.59	22.48	90	0
DS	260	47.33	37.37	180	0
WG	260	180.1	56.74	400	70
LD	260	7.468	1.152	10.89	1.099
PS	150	1.917	2.251	9.210	-3.912
EP	260	0.604	0.490	1	0

Research Results

This research employs multiple regression analysis to examine the relationship between village headman's education and farmers' income and to pinpoint the mechanism underlying that relationship. The following two econometric models are used:

$$FI_i = \alpha_0 + \alpha_1 EDU_i + \alpha_2 CV_i + \varepsilon_i \quad (1)$$

$$FI_i - \beta_0 + \beta_1 EDU_i + \beta_2 EP_i + \beta_3 EDU_i * EP_i + \beta_4 CV_i + \varepsilon_i \quad (2)$$

In model (1), FI_i is the per capita income of farmers in the *i* village. EDU_i symbolizes the degree of education acquired by the *i* village's leader. If α_1 is significantly positive, there is a significant positive correlation between the income of farmers and the education level of village leaders; this correlation increases as the village headman's education level increases. Accordingly, the farmer's income declines in a direct relationship to the village headsman's education level. CV_i is the control variable that affects farmers' income. ε_i represents random error.

In model (2), EP_i refers to the working experience of the village official in the *i* village. β_3 reflects the adjustment to the effect of the village headman's education level on farmers' income. If β_3 is significantly positive, the work experience of the village's leader can enhance the influence of the education level on the farmers' income. The other variables in model (2) have the same meaning as model (1).

This study likewise makes use of the intermediary effect model (Wen & Ye, 2014) and employs the stepwise regression approach to evaluate the mechanism through which the village leaders' educational attainment influences Chinese farmers' income. The constructed regression models are shown below:

$$PS_i - \gamma_0 + \gamma_1 EDU_i + \gamma_2 CV_i + \varepsilon_i \quad (3)$$

$$FI_i = \delta_0 + \delta_1 EDU + \delta_2 PS_i + \delta_3 CV_i + \varepsilon_i \quad (4)$$

PS is the intermediary variable in the model (3). Coefficient γ_1 of the model (3) is the impact of the independent variable *EDU* on the intermediary variable *PS*. The coefficient δ_2 of the model (4) represents the effect of the intermediary variable *PS* on farmer income *FI* when the impact of the independent variable *EDU* is taken into account. The coefficient δ_1 represents the direct effect of the independent variable *EDU* on the dependent variable *FI* when controlling the influence of the intermediary variable PS. The intermediation impact is significant when γ_1, δ_1, and δ_2 are all significant.

The multicollinearity test of the variables is conducted with the aid of the Stata14.0 software. The results show that there is no multicollinearity between

variables because the variance inflation factor (VIF) of the independent variables is less than 3. First, the regression analysis is performed according to econometric model 1, using farmers' income (FI) as the dependent variable, and the education level of the village headman as the independent variable. Second, regression analysis is performed using model 2, where the headman's education level (EDU) is the dependent variable and the independent variable is the interaction term EDU*EP. The outcomes of both regression analyses are shown in Table 3.

Table 3

Impact of village headman's education level on farmer's income

	Model 1	Model 2
EDU	0.346***	
	(2.682)	
EDU*EP		0.374***
		(2.747)
TP	0.345***	0.356***
	(5.540)	(5.557)
WR	-0.001	-0.002
	(-0.461)	(-0.632)
DS	-0.001	-0.001
	(-1.021)	(-0.861)
WG	0.000	0.001
	(0.427)	(0.610)
LD	-0.067	-0.069
	(-1.335)	(-1.419)
_cons	6.298***	6.231***
	(11.470)	(11.236)
N	260	260
r2	0.144	0.139

Note: Significance codes for P-values: ***≤ 0.01; **≤ 0.05; *≤ 0.10. Robust standard errors in round brackets.

The regression estimation results of Model 1 demonstrate that, at a significance level of 1%, village leaders' educational backgrounds can positively influence farmers' income, supporting the expectation of Hypothesis 1 that village headsmen with higher educational backgrounds can help to improve farmers' income.

The coefficient of the interaction term (EDU*EP), which represents the village headsman's degree of education (EDU) and work experience (EP), is statistically positive at the 1% level, according to the regression estimation findings of Model 2. This implies that the impact of the headman's educational background on farmers' income might be enhanced by the working experience of said village headsman. This may be due to the difficulty of fully utilizing their abilities without job experience if they simply have a high education degree. Working in the country should place more emphasis on practice than theory. The only way village administrators can increase farmers' income is by applying knowledge to deal with tasks through hands-on experience.

The village's total population (TP) coefficient is significantly positive. This may be driven by the fact that the growth in the average income of farmers is greatly impacted by the labor force, particularly the young and middle-aged labor force, which is the primary factor in promoting the development of the village economy. The average land area in the village (LD) is not statistically significant, indicating that increasing the input of traditional production factors represented by cultivated land is not ideal for increasing farmers' income. The proportion of the labor force working outside of the village among the total labor force (WR), the distance between the village committee office and downtown (DS), and the Construction technician's daily wage (WG) do not have a statistically significant impact on the farmer's income.

Influence mechanism analysis

How does the level of education of the headman affect the revenue of the farmer? What mechanism is it? The primary means by which highly educated village officials influence farmers' income is through raising the bar for rural governance. Cui and Xiao (2022) used the 2017 data from the CRHPS (China Rural Household Panel Survey) database for empirical research and assessed the degree of rural governance from two perspectives: service supply and democratic management. They found that village officials who are college graduates can advance rural governance in China. Our paper uses the service supply level to gauge the level of rural governance based on the research of Luo et al. (2021) and Xu et al. (2015). The public service expenditures (PS) represent the service supply.

Higher educated village officials have more distinct perspectives and information, and they are also better able to adapt to change, whether it be learning cutting-edge production management techniques or comprehending the higher government's agricultural and rural development strategy. This indicates that they have greater benefits compared to the headmen who received only secondary education, which could help to advance the growth of rural industries, widen sales channels, and so on. In summary, the level of rural government efficiency is significantly influenced by the village leaders. Their acceptance and utilization of

outside knowledge improves with higher educational attainment, which also boosts the village's economic standing and inevitably leads to an increase in farmers' income.

This study uses empirical analysis to examine whether the aforementioned influencing mechanism actually exists. The variable PS (Public Service Expenditure), which comes from the CHPS database, is used as a substitute for the level of rural government. This variable was also added to the regression analysis of the econometric models (3) and (4). Table 4 presents the results of the regression estimation.

Table 4

The intermediary mechanism estimate of rural governance to farmers' income

	(1)	(2)
	PS	FI
PS		0.102***
		(2.831)
EDU	0.349*	0.149**
	(1.886)	(2.274)
CV	Yes	Yes
N	150	150
r2	0.074	0.172

Note: Significance codes for P-values: ***≤ 0.01; **≤ 0.05; *≤ 0.10. Robust standard errors in round brackets.

As can be seen from Table 4, village headsmen with higher education can significantly affect farmers' income by improving rural governance mechanisms. The EDU coefficient is significantly positive at the 10% level, according to the regression results in column (1) of Table 2, which indicates that highly educated village leaders significantly improve the standard of rural governance. The coefficient of the PS is considerably positive at the 5% level, while the coefficient of EDU is significantly positive at the 1% level, according to the regression results in column (2). This implies that the level of rural government positively and significantly affects the farmer's income. The education level of village headsmen (EDU) still has a positive and significant impact on farmers' incomes after controlling for the impact of this intermediate variable (PS). To put it briefly, the γ_1, δ_1, and δ_2 mentioned in Model (3) and (4) are all significant. This demonstrates that the mediational impact of the rural governance level (PS) may be verified. This is

consistent with hypothesis 2. Thus, the higher the education level, the more conducive it is to improving the level of rural governance, and the higher the level of rural governance, the more conducive it is to promoting rural economic development, and consequently increasing farmers' income.

Heterogeneity discussion

The estimation results of grouped regression based on the location factors of the Eastern, Central, and Western regions are displayed in columns (1), (2), and (3) in Table 5. The findings show that village headsmen' education levels can significantly increase farmers' income by 5%, but that this effect is not significant for village leaders in the central and western regions. The following factors could be the causes.

Table 5

Estimation results of the subsample models: East, Central, West

	(1)	(2)	(3)
	East	Central	West
EDU	0.169**	0.076	0.060
	(2.120)	(0.583)	(0.744)
TP	0.180	0.159	0.388***
	(1.514)	(1.161)	(3.906)
WR	-0.002	-0.002	0.001
	(-0.718)	(-0.487)	(0.225)
DS	0.000	-0.004	-0.003
	(0.181)	(-1.142)	(-1.650)
WG	0.002	0.003	-0.004*
	(1.514)	(1.405)	(-1.903)
LD	-0.025	-0.043	-0.055
	(-0.380)	(-0.393)	(-0.759)
_cons	6.633***	6.948***	6.278***
	(6.251)	(7.504)	(7.225)
N	117	74	69
r2	0.110	0.105	0.291

Notes: Significance codes for P-values: ***≤ 0.01; **≤ 0.05; *≤ 0.10. Robust standard errors in round brackets.

The eastern region is an economically developed region that has essentially achieved the merger of urban and rural areas, and its consumer concept and knowledge of rights are at a very advanced level (Liang & Wang, 2019). Higher-educated village headsmen have more plentiful working resources, greater zeal, and initiative, and are better equipped to increase farmers' income by integrating economic resources in villages with a solid economic base. Additionally, the eastern region benefits from more robust financial resources and has the ability to integrate village development into the government administrative system (Zhang 2020), which helps the highly educated village leaders to obtain even more financial resources and thereby increase farmers' income. However, the relative scarcity of government funding and the low degree of economic development in the central and western regions pose limitations. Even if the highly educated village headsman could raise the town's degree of economic development, the aforementioned restrictions would prevent him from making the best of his capacity.

The estimation outcomes of the regression grouping according to whether the village headsman has work experience are displayed in columns (1) and (2) of Table 6.

Table 6

Estimation results of the subsample models: Experience and No_experience

	(1)	(2)
	ex	no_ex
EDU	0.257***	0.021
	(3.657)	(0.280)
TP	0.297***	0.410***
	(2.920)	(4.484)
WR	-0.002	0.001
	(-0.630)	(0.152)
DS	-0.002	-0.000
	(-0.993)	(-0.026)
WG	0.001	0.001
	(0.465)	(0.793)
LD	-0.094	0.011
	(-1.344)	(0.154)
_cons	6.018***	4.952***
	(7.439)	(5.837)
N	157	103
r2	0.167	0.176

Note: Significance codes for P-values: ***≤ 0.01; **≤ 0.05; *≤ 0.10. Robust standard errors in round brackets.

The findings show that, at a level of 1%, the education level of a village headsman with job experience has significant consequences on farmers' income, whereas a village leader without work experience has no meaningful effect. There is a possible explanation for this. Even if the village headsman has a high degree of education, it may be challenging for them to comprehend the rural job if they have no previous work experience. Without some experience, it might be difficult to deal with the pertinent issues of rural government as there are so many complex and mutable factors to better advance the village's economy, culture, and other elements, and afterward to advance the rise in farmer income.

Conclusions

Since the establishment of New China, growth of the rural economy was set as an important priority. Numerous measures have been implemented, particularly in recent years, to support it. For instance, the university-graduate village official policy has been adopted as part of attracting rural talents in order to raise the educational level of village headsmen.

This research investigated the relationship between the education level of village headsmen and farmers' incomes and the mechanism underlying that relationship using empirical analysis of large-scale household survey data from the 2014 CFPS. The results indicate that the household income of farmers is significantly positively impacted by the education level of village leaders. Highly educated village officials have contributed significantly and favorably to raising farmers' incomes and advancing rural economic development.

Furthermore, the study delved into the underlying mechanisms through which headmen's education influences farmer's income. It was found that this impact is attained via strengthening rural government. Finally, this study confirmed that the geographical context and personal experience of the village headsman both have an impact on how a well-educated village leader influences farmers' income. That is, the education level of village headsmen has a greater impact on rural households' income in eastern villages and in those with experienced village officials.

This study has several policy implications based on the aforementioned conclusions. First, encouraging highly educated individuals to lead communities and contribute to rural areas is beneficial to rural development. This approach is in line with what the nation and the farmers want, and it ought to be continued. Second, the cooperation of farmers and village leaders should be supported in order to expand the agricultural economy, and highly educated individuals should be encouraged to settle in rural areas to take advantage of the benefits they offer. For instance, rural areas offer better working conditions for village leaders, a bet-

ter residence system, and opportunities for their family to pursue education and employment, and so on. Third, as many highly educated individuals as possible should be chosen to lead villages in the eastern region to raise the income of farmers more effectively. The combination of the traits of college graduates and those of the village should be given importance, and we should make every effort to choose college graduates with strong organizational and mobilization skills and majors that are closely related to rural economic development as village officials. Fifth, village officials who are college graduates should have access to professional development training in order to create a new rural collective economy. They should be assisted in developing a village collective economy of asset management and agricultural services based on local conditions.

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