

**Analysis and Countermeasures on Paradox of “Poverty Caused by Education”
under the Background of Rural Revitalization**

**—Based on the Study of the Poor Population in X County in Southern Shaanxi
Province**

Jiixin Niu¹ Bin Zhou¹ Dongpin Hou²

¹ College of Marxism, Xi’an University of Science and Technology, Xi’an 710054, China; zhoub@xust.edu.cn(Z.B.);727359138@qq.com(N.-J.X.); Tel.: +86-29-8558-3029

² Library, Xi’an University of Science and Technology, Xi’an 710054, China;1178805808@qq.com

Corresponding: 727359138@qq.com; zhoub@xust.edu.cn; 1178805808@qq.com

Abstract: The sample data are used from *Shaanxi Statistical Yearbook* (1999-2018) and poverty population in X County of Southern Shaanxi in 2018. By using Eviews and Excel, this report focuses on analyzing the relationship between education investment and economic growth, education for poverty population, per capita income and poverty caused by education in X county, which can explain reasons for the phenomenon of poverty caused by education. The countermeasures are proposed to solve the phenomenon of poverty caused by education, including establishing scientific education view, correctly understanding education investment and benefit, and improving the aid mechanism for poor students to realize the effective connect among poverty alleviation through education, accurate poverty alleviation and rural revitalization.

Key words: rural revitalization; poverty caused by education; economic development

1. Introduction

According to China Statistical Yearbook 2018, China’s agricultural population in 2017 was 57.661 (10,000), accounting for 41.48% of the total population^①. Therefore, the problem of agricultural and rural peasants is a fundamental issue related to

^① China Statistical Yearbook—2018 <http://www.stats.gov.cn/tjsj/ndsj/2018/indexch.htm>

China's economic development and people's lives. The Central Committee Document No. 1 in 2018 put forward the overall views on the implementation of the strategy of rural revitalization.^[1] The central document No.1 in 2019 has point out that the implementation of the strategy of rural revitalization is the general master of the work of "agriculture, countryside and farmers" .^[2] The State Council Government Work Report in 2019 emphasizes that we should strengthen the integration of poverty alleviation and rural revitalization to ensure that the goal of poverty alleviation and poverty alleviation can be achieved as scheduled by 2020.^[3] The report of the Nineteenth National Congress pointed out that the contradiction between people's growing need for a better life and unbalanced and inadequate development is the main contradiction at the present stage in China . Especially under the dual structure, the imbalance of human capital development in rural areas needs to be solved urgently. As the core element of human capital, education is an important way to develop human capital. In his book *Investing in People* (2017), Theodore Schultz argues that human capital is valuable and acquired; education and training are the main investment factors of population quality that have increased through appropriate investment. Such investments aim at improving the quality of the population, which can greatly contribute to economic prosperity and increase the welfare of the poor. The improvement of population quality is largely due to more education. The more investment in education is, the higher the efficiency of labor production is ^[4]. At present, there is also a discussion of "poverty caused by education" in current society like education investment for a long time, high costs and low benefits, especially increasing the economic burden of poor families and the difficulty of poverty alleviation. Is the paradox of "poverty caused by education" valid? If so, how to crack it? If not, how to explain this phenomenon? The emphasis of rural rejuvenation is the rejuvenation of talents, and education is the basis of the rejuvenation of talents. In this report, the paradox of "poverty caused by education" is analyzed through empirical research, which is of great significance to the implementation of the strategy of rural revitalization.

2 Literature review

The domestic and foreign studies have differences in the relationship between education and poverty. In foreign countries, the related study mainly focuses on the problem of “poverty alleviation through education”, but seldom the problem of “poverty caused by education”. Domestic issues have broadly involved “poverty alleviation through education” and “poverty caused by education”.

On the issue of “poverty caused by education”, scholars mainly start from four aspects: the connotation of poverty caused by education, the impact of poverty caused by education, the causes of poverty caused by education, and the countermeasures of poverty caused by education. However, there are some differences in research perspectives: (1) in the regional perspective, the causes, mechanism and coping strategies of the phenomenon of “poverty caused by education” in China are analyzed from the whole and minority areas (southern Guizhou, Enshi, Yanbian) ^[5]; (2) from economic perspective, phenomenon of poverty caused by education is analyzed in low-income families from the perspective of education investment income, phenomenon of poverty caused by education is discussed from education cost, education fee and family education investment ^{[6][7]}, “Economic Budget Line” is introduced to analyze the “poverty caused by education” mechanism of unit families ^[8]; (3) from other perspectives, the vulnerability factors leading to “poverty caused by education” is analyzed from the perspective of vulnerability theory, and corresponding policy recommendations are put forward ^{[9][10]}, the predicament and countermeasure of “poverty caused by education” from the perspective of values ^[11], the relationship between educational spillover effect and educational poverty is analyzed from the perspective of externality ^[12], the “poverty caused by education” is analyzed from the sociological perspective ^[13]. To sum up, although existing studies have analyzed the problem of “poverty caused by education” from different perspectives, most of them remain in the phase of phenomenal description. Essential issues are seldom discussed and empirical analysis is involved, but there is no study on the poor population in the whole county at present.

Based on the existing research results and the theory of human capital, Eviews software is employed to analyze the relation between education investment and rural residents income through the data of rural residents' per capita net income, cultural, educational and entertainment expenditure, transportation and communication expenditure, medical and health expenditure in *the statistical yearbook of Shaanxi Province* from 1999 to 2018. This report uses the sample data of poverty-stricken population in X County of southern Shaanxi province in 2018. Excel software is employed to analyze the basic situation of 42308 poverty population in this county. The empirical analysis is done according to education level, per capita income and the proportion of poverty caused by education.

2 Empirical analysis

2.1 The relationship between education investment and rural residents' income

2.1.1 Data sources

The sample interval is selected from 1999 to 2018. The data come from *Shaanxi Statistical Yearbook* in the past ten years. The per capita net income of rural residents, expenditure on culture, education and entertainment, expenditure on transportation and communication, and expenditure on health care reflect farmers' income (Y), education investment (X1), migration investment (X2) and health investment (X3), respectively. In order to eliminate the impact of inflation, GDP deflator is used to process the data. The GDP deflation index is used to eliminate the inflationary effects of per capita net income, education investment, health investment and migration investment of Chinese farmers from 1999 to 2018. Eviews 9.0 was used as analysis tool to carry out unit root, co-integration test and regression analysis.

2.1.2 Empirical test

(1) Unit root test

Unit root test mainly tests the stationarity of selected data to ensure the validity of the model. The logarithm is selected for per capita net income Y and education

investment X1, health investment X2 and migration investment X3. The time series of INY, INX1, INX2 and INX3 are tested by the unit root (ADF) test method, which is shown in Table 1.

Table 1

Variable	(C , T , K)	T statistic	P value	D-W value	conclusion
DDLNY	(C , T , 1)	-7.960162	0.0001	1.935030	II (2)
DDLNX1	(no , no , 1)	-4.330785	0.0003	2.040793	II (2)
DDLNX2	(no , no , 1)	-5.310570	0.0000	2.054945	II (2)
DDLNX3	(no , no , 1)	-3.665762	0.0012	1.974443	II (2)

Note: D represents first-order difference of variables; in(C , T , K), C represents intercept term, T represents time trend term, K represents lag order.

In Table 1, all variables are second-order difference II(2) stationary time series by unit root test. All four variables are second-order single-integer variables, which satisfy the condition of cointegration test.

(2) Cointegration test

The results of cointegration test are shown in Table 2.

Table 2

Test method	Johansen Cointegration test	
	Trace Statistic	λ -max (Max-Eigen Statistic)
	49.65568	27.38743
5% (0.05Critical Value)	40.17493	24.15921

In table 2, Trace Statistic value is 49.65568 and λ -max of Max-Eigen Statistic value is 27.38743, which is over 5% significance level threshold respectively (0.05Critical Value) 40.17493 and 24.15921. Therefore, dependent variable INY and independent variable INX1, INX2, INX3 has the cointegration relationship. There is a long-term stable relationship between farmers' income and investment in education,

health and migration.

2.1.3 Regression analysis and conclusion

Through ADF test, it is found that the original time series of each variable is not stationary and only after the second-order difference can it show stationarity.

Variables are second-order monolithic sequences, on which a regression model can be established for analysis. The theoretical form of the model can be estimated as:

$$\ln Y = \alpha + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3$$

In the above formula, α —intercept constant, β_1 、 β_2 、 β_3 —regression coefficient

OLS is employed for regression analysis to $\ln Y$ and $\ln X_1$ 、 $\ln X_2$ 、 $\ln X_3$, and the estimated results of the regression model are shown in Table 3.

Table 3

	Estimated value	T statistic	P value
α	2.176	11.52	0.0000
β_1	0.498	6.23	0.0213
β_2	0.289	2.64	0.0101
β_3	0.093	1.53	0.0006

From the estimation results of the model, it can be seen that the parameters in the model have passed the saliency test at the 5% saliency level, so the parameters in the model are significant.

In addition, the goodness of fit $R^2 = 0.9897$ can also be calculated, which shows that the overall interpretation of the equation is higher, and thus the expression of the equation can be written as follows:

$$\ln Y = 2.176 + 0.498 \ln X_1 + 0.289 \ln X_2 + 0.093 \ln X_3$$

$$(11.52) \quad (6.23) \quad (2.64) \quad (1.53)$$

$$R^2 = 0.9897 \quad DW = 2.039 \quad (\text{Numbers in parentheses represent t-statistics}$$

corresponding to parameter estimates)

From the above analysis, it can be seen that in the sample interval of 1999-2018, there is a long-term equilibrium relationship between farmers' income and their investment in education, migration and health in Shaanxi Province. In the long run,

these three kinds of investment are positively correlated with farmers' income, which proves the theory of human capital investment. Among them, contribution rate of education investment gets the highest, while health and migration investment is less.

2.2 The Situation of Education, Per Capita Income and Poverty Caused by Education of Poverty Population in X County

2.2.1 Education Situation of Poverty Population in X County

Based on the data of all the poverty population in X County of Shaanxi Province in 2018, the total sample population is 42308, which can be divided into two categories: school students and non-school students. Non-school students includes illiterate, semi-illiterate, primary, junior, high school, junior college and above, which get a total of 36,634, accounting for 86.6% of the total population, as shown in the following table.

Table 1 Education Level of Poverty Population of Non-School Students

Education level	Illiteracy or semi-illiteracy	Primary school	Junior school	Senior school	Junior College	Bachelor degree or above
Number	4878	16337	12812	1655	798	154
The ratio of non-school students	13.3%	44.6%	35%	4.5%	2.2%	0.4%

Students in school include preschool education, primary school, junior middle school, secondary vocational school, senior high school, junior college, undergraduate course and above, which get a total of 5674 students, accounting for 13.4% of the total poverty population, as shown in the table below.

Table 2 Education Situation of the Poverty Population in Schools

Education stage	Preschool education	Primary school	Junior school	Secondary vocational school	Senior school	junior college	undergraduate course and above
Number	612	1659	1385	267	836	236	679
The ratio of school students	10.8%	29.2%	24.4%	4.7%	14.7%	4.2%	12%

The educational level of poor non-school students in X County is mainly concentrated in primary and junior middle schools, accounting for nearly 80% of the total non-school students. The poverty population of school students is also mainly concentrated in primary and junior middle schools, accounting for more than 50% of the total poverty population of school students. It is worth noting that the poverty population of undergraduates and above accounts for 12% of the total poverty population of school students. However, the poverty population of vocational education (secondary and higher vocational schools) only accounts for less than 9% of the total poverty population of school students

2.2.2 Per capita Income of Poverty Population in X County

Table 3 Per Capita Income of Poverty Population with Different Education Levels for Non-school Students (Yuan)

Education stage	Illiteracy or semi-illiteracy	Primary school	Junior school	Senior school	Junior College	Bachelor degree or above
Number	4878	16337	12812	1655	798	154
Proportion	13.3%	44.6%	35%	4.5%	2.2%	0.4%
Per capita income	5715.84	5835.38	5931.50	5827.12	6338.55	5584.81

It can be seen from table 3 that on the whole, with the increase of education level,

the per capita income also increases. However, the poor with high school, undergraduate and above education level do not follow this trend. The per capita income of the poverty population with high school education is 5827.12 yuan, which is lower than that of the poverty population with primary, junior and tertiary education. The main reason is that poor people with high school education can not enjoy the preferential policy of “two exemptions and one subsidy” at the stage of compulsory education. Most of the expenses for their schooling are borne by their families, and after graduation, they lack certain hardworking spirit and social experience compared with primary and secondary school graduates. Compared with secondary vocational education graduates, they lack certain vocational and technical advantages. Compared with graduates of higher education, they lack educational background advantages, so they can only work in the labor market with low technical content and low salary. Poor people with undergraduate education have the lowest per capita income. The main reasons are that the poor quality of basic education in poverty areas is low and rural students inevitably lag behind urban students in the competition of college entrance examination. They can only choose general colleges or private colleges with high fees. However, the graduates of these universities are at a disadvantage in the employment market. They get fewer jobs with high pay. In addition, some college students from poor families face the pressure to repay their student loans after graduation. Therefore, it is impossible to feed the family back for a long time. Some college students are reluctant to return to their original place of employment after graduation. Parents prefer to settle down in big cities because of face and other reasons. However, the resulting expenditure on marriage and housing is transferred to the whole family, which reduces the increase of family per capita income. Poor people with college education have shorter years of study, lower tuition fees and belong to higher vocational education. They have a certain advantage in the employment market, so their per capita income is the highest among all groups. The increase of education level is accompanied by the increase of per capita income, but the per capita income of high school, undergraduate and above education level does not follow this trend. There are complex reasons of government, society, family and individual, so it cannot

explain the existence of the phenomenon of “poverty caused by education”.

Table 4 Per Capita Income of Poor Population of Non-school Students, School Students (Yuan)

	All non-school students	All students in school
Per capita income	5867.93	5431.18
Number	36622	5687

It can be seen from table 4, the per capita income of the poor non-school students is 5867.93 yuan. The per capita income of the poor students in school is 5431.18 yuan, which is lower than that of the poor non-school students. In the poor families of school students, their children go to school, which not only reduces the family labor force, but also pays a certain amount of education expenses. Moreover, during the last semester, it was impossible to obtain income because there was a time lag between education investment and income.

Table 5 Per Capita Income of School Students at Different Stages (Yuan)

School situation	Preschool	Primary school	Junior high school	Secondary vocational school	Senior school	Junior College	Bachelor degree or above
Per capita income	5528.45	5386.06	5365.04	5834.70	5457.29	5425.94	5509.24
Number	612	1659	1385	267	836	236	679
Proportion	10.8%	29.2%	24.4%	4.7%	14.7%	4.2%	12%

It can be seen from table 4 and table 5, the per capita income of the poor non-school students is 5867.93 yuan. The per capita income of the poor students in school is 5431.18 yuan, which is lower than that of the poor non-school students. In the poor families of school students, their children go to school, which not only reduces the family labor force, but also pays a certain amount of education expenses. Moreover, during the last semester, it was impossible to obtain income because there was a time lag between education investment and income. In addition, the per capita

income of poor students in secondary vocational schools is second only to that of non-poor students, which is much higher than that of poor students in other stages. The reasons for this phenomenon include two aspects. On the one hand, the traditional concepts influence rural families which still have the educational concept of “promotion and prosperity”, and the most important way to achieve this goal is “college entrance examination”. Therefore, secondary vocational schools with vocational and technical training as the main goal are objectively neglected or even despised. Such schools have fewer students. On the other hand, with the implementation of the national strategy of poverty alleviation and rural revitalization, the importance of vocational education has been further enhanced, and the degree and breadth of support for students in such schools have been strengthened, which indirectly reduces the financial burden of families. At the same time, secondary vocational schools, which focus on training technical talents and practice, can participate in family production activities through what they have learned during the last semester and bring certain economic benefits to families.

2.2.3 The Situation of Poverty Caused by Education of Poverty Population in X County

Table 6 Proportion of non-school students with different educational levels suffering from poverty due to study

Education stage	Illiteracy or semi-illiteracy	Primary school	Junior school	Senior school	Junior College	Bachelor degree or above
Proportion of Poverty Caused by School	1.9%	3.7%	7.8%	17.9%	30.9%	37.8%

It can be seen from table 6 that the proportion of poverty population who are not in school increases with the increase of their educational level. This phenomenon can be analyzed from two aspects.

First of all, for the poor rural families, the process of education investment and return are not synchronized, which exists a time difference. This time difference increases with the increase of years of education. Therefore, the higher the proportion of poverty caused by education becomes with the increase of years of education. From the perspective of educational function, educational function can be divided into two major functions: individual development and social development. Individual function of education includes individual socialization and individualized function. Social function of education includes political, economic, cultural and cultural creation function of education ^[14]. Statistical data only consider the economic function of education but neglect the other functions of individual and social development of education, resulting in the phenomenon of “poverty caused by education”.

Table 7 Proportion of Poor Students at Different Stages Due to Learning

Education stage	Preschool	Primary school	Junior school	Secondary vocational school	Senior school	Junior College	Bachelor degree or above
Proportion of Poverty Caused by School	1.1%	3.8%	7%	12.6%	18.2%	20.1%	37.2%

It can be seen from table7 that for all the poor students in school, with the increase of years of education, the proportion of poverty caused by education has gradually increased. From the current situation, the children of poor families go to school not only to increase the financial burden of their families, but also to increase the probability of poverty in their families. This is mainly due to the higher opportunity cost of children’s schooling, which includes the decrease of labor force income caused by schooling, the cost caused by accompanying parents, and the opportunity cost caused by the inability to participate in productive labor to obtain corresponding income due to schooling. These opportunity costs lead families to

poverty. Finally, the phenomenon of “poverty caused by education” emerges.

In summary, in the current period, children’s schooling increases the economic burden of poor families and the difficulty of poverty alleviation, leading to short-term “poverty caused by education” phenomenon. But in the long run, education investment is positively correlated with family income. With the improvement of education level, family income gradually increases, and ultimately produces “education poverty alleviation” effect.

3 Conclusion and Suggestion

3.1 Conclusion

In the sample interval of 1999-2018, there is a long-term equilibrium relationship between farmers’ income and their investment in education, migration and health Shaanxi Province. These three kinds of investments are positively correlated with farmers’ income. Especially the education investment has the highest contribution rate while the health and migration investment is small.

Through the analysis of education, per capita income and the proportion of poverty caused by education in X County, southern Shaanxi Province, it is found that the per capita income of poverty-stricken people increases with the increase of educational level. However, the per capita income of poverty students in schools is generally lower than that of non-poverty students. As for the poverty school students, with the increase of educational years and the increase of educational level, the proportion of poverty caused by education has gradually increased.

In summary, in the current period, children’s schooling increases the economic burden of poor families and the difficulty of poverty alleviation, leading to short-term “poverty caused by education” phenomenon. But in the long run, education investment is positively correlated with family income. With the improvement of education level, family income gradually increases, and ultimately produces “education poverty alleviation” effect.

3.2 Suggestion

In order to strengthen the integration of poverty alleviation and rural revitalization and the effective implementation of the strategy of rural revitalization, the following suggestions are proposed to provide reference for policy makers:

First of all, the uneven distribution of educational resources is the external cause of “poverty caused by education”. It is necessary to optimize the allocation of educational resources from the aspects of balanced allocation of urban and rural educational resources, raise the subsidy standard of non-compulsory education funds, and emphasize the development of vocational education.

Secondly, the backward concept of education is the internal cause of “poverty caused by education”. It should be establish the scientific education concept from a comprehensive understanding of the educational function, to change the values of “leaving the farmer” and “attaching importance to general education rather than vocational education”.

Thirdly, the deviation of education expenditure-income is the economic cause of “poverty caused by education”. It is very important to correct understand education investment and income including correct understanding of the long-term nature of education investment process, the externality and incremental nature of education investment income, and rational selection of education investment forms.

At last, lack of support mechanism for poor students is the institutional reason for “poverty caused by education””. To improve the support mechanism for poor students, we should improve the system of grants and loans for rural students, improve the employment support system, and build an entrepreneurship support platform.

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