Poverty analysis based on Eviews - A Case Study of Shanxi Qinyuan

Yuqi Luo[1], Shuang Zhou[2]

[1]Statistic Institute, Shanxi University of Finance and Economics, Wucheng Road, Taiyuan, China

[2]Institute of Cultural Communication, Shanxi University of Finance and Economics, Wucheng Road, Taiyuan, China

Keywords: Poverty, Least squares estimation, Regional vulnerability, Eviews.

Abstract: Poverty is a big problem that cannot be ignored in the process of social and economic development in China. In recent years, the Chinese government has successively put forward policies such as precise poverty alleviation and gradual poverty alleviation. As one of the key provinces for poverty alleviation in China, Shanxi Province is imperative for poverty alleviation. To accurately alleviate poverty, we first need to understand the causes of poverty. Therefore, this paper takes Qingyuan County of Shanxi Province as an example to analyze the causes of poverty in the area (earthquake, typhoon, pests, soil erosion, physical condition, industrial resource use), using least squares estimation and multiple linear regression models. Explain the causes of poverty among residents and make targeted recommendations.

1. Introduction

Poverty is a worldwide issue. [1] Since the reform and opening up, China's poverty alleviation and development undertaking have achieved remarkable achievements, and initially formed the world model of anti-poverty in the world. However, there are still more than 70 million poor people and 128,000 poor villages in rural areas of China. [2] Since 2013, China has established a precise poverty alleviation policy system with a comprehensive well-off goal, which has realized the transformation from poverty to quality, aiming at accurate identification, precise assistance, precise management and accurate assessment. Ensure that the poor under the current poverty standards by 2020 are all out of poverty. [3]

Shanxi is one of the key provinces for poverty alleviation in China. Nearly half of the counties in the province are poverty-stricken counties, and most of the poverty-stricken areas are located in the Taihang Mountains and Lvliang Mountain, where the natural conditions are poor. Qingyuan County is located in the southeast of Taiyuan City, the capital of Shanxi Province, in the northwest of Changzhi City. The geographical coordinates are 111°58'30″~112°32'30″ east longitude, 36°20'20″~37°0'42″ north latitude, 45km wide from east to west, 74km from north to south, with a total land area of 2554 km2. The county has a total of 5,553 households with 12,505 people and one poverty-stricken village.

2. Analysis of investigation results of causes of poverty

According to the results of the calibration template data analysis, this paper believes that the center ray of the light must pass through the rotation center of Computed Tomography, and the center of rotation is inside the medium ellipse. Based on the knowledge of geometric principle, Radon transform theory and X-ray attenuation law, this paper obtains the calibration results of the distance between the detector unit of Computed Tomography, the 180 directions of X-ray and the position of the rotation center.

Accurate poverty alleviation. To be precise, compare the causes. One of the priorities of precision poverty alleviation is to accurately analyze the causes of poverty in various regions. Based on the investigation and analysis, we summarize the following causes of poverty:

2.1 Ecological and environmental factors lead to poverty

In some rural poverty-stricken areas, the emergence of poverty is related to the deterioration of the regional ecological environment and the protection policies implemented to protect the ecology. Because traditional agriculture has a greater degree of dependence on natural resources, the income and living standards of farmers' residents are closely related to the ecological environment in which they live. With the over-exploitation of human beings and climate change, the ecological environment in some areas is in a state of deteriorating crisis. For example, desertification, salinization, serious soil erosion and groundwater level decline in some areas have directly weakened. The production and living base of local farmers has resulted in a number of rural poor.

2.2 Unbalanced social and economic development lead to poverty

Changes in the ecological environment may lead to the emergence of poor people, and changes in the socio-economic environment may also lead to the emergence of poor people. In the process of rapid socio-economic transformation and development, there is an unbalanced problem in the allocation of development opportunities between regions and social groups. Regional and social groups that have fewer opportunities for development are actually in poverty-stricken areas. The formation mechanism of poverty related to uneven development is mainly the imbalance of development opportunities, mainly human development. In the process of continuous improvement in the level of social and economic development, the development opportunities of people from different regions, different groups and different strata also need to be relatively balanced growth, so as to avoid poverty problems related to uneven development.

2.3 Sudden individual events lead to poverty

If the problem of structural poverty is a regional and local problem, special individual poverty is an occasional and individual problem. In any social system, there will be individual differences. Some individuals fall into poverty due to various special reasons, such as the lack of special circumstances such as the lack of labor, disease, and sudden changes in the family.

2.4 Long-term low incomes lead to poverty

The impact of income distribution on poverty is mainly reflected in two aspects: unfair distribution of the industry and changes in distribution factors. The unfair distribution of the industry is reflected in both the wage and the income outside the wage. In the financial and insurance industries, not only the wage income is high, but also the income outside the wages; the foreign-related units and some joint-stock enterprises can provide high-paying benefits for the employees; The income from forestry, animal husbandry, fishery and water conservancy industries is relatively low, which causes some employees and their family members to become low-income groups and live in poverty. Second, property ownership, capital, and technology as new factors enter the distribution field, which will inevitably further widen the income gap of residents. Although capital and technology as the entry into the distribution field are the requirements of the time and the need for competition and development, they are created within a certain period of time. Wealth is always certain. The capital and technology people have a sharp expansion effect, and the share shared by those who earn income by labor is naturally reduced, and the gap between rich and poor is widening.

2.5 Improper uses of resources lead to poverty

Qingyuan County has rich mineral resources and complete varieties; the dominant mineral resources are obvious; however, there are many problems in resource development and utilization. 1. The structure of the mining industry and the structure of mineral products is unreasonable. 2. The development of mineral resources is extensive, the technology is backward, and the resource recovery rate is low. 3. The environmental pollution caused by mining development is relatively serious. In particular, the loss of groundwater resources caused by coal mining and the problem of land ripping have already had a certain impact on the sustainable development of the recruitment

economy and the people's living environment. 4. The exploration and development of mineral resources are lagging behind.

3. Multiple linear regression model

Under the analysis of the above reasons, according to the geographical location and living conditions of Qingyuan County, this paper divides the factors affecting poverty into two categories:

Natural factors: earthquake, typhoon, pests and diseases, soil erosion

Human factors: physical condition, industrial resource use

In this paper, earthquakes, typhoons, pests and diseases, soil erosion, physical conditions, and industrial resources use are set to dummy variables, and the per capita income of rural households is used as the dependent variable to return with eviews:

Table 1: Definition of dependent and dummy variables

	Income (y)	Earthquake (x1)	Typhoon (x2)	Pests and diseases (x3)	Soil erosion (x4)	Physical condition (x5)	Industrial resource use (x6)
2016	12167.18	0	1	1	1	0	1
2015	11402.60	0	0	0	1	1	0
2014	10767.80	0	0	1	0	0	0
2013	9679.30	1	0	0	0	1	1
2012	8203.71	0	0	1	0	1	1
2011	6396.55	0	0	0	0	0	0
2010	5667.44	0	0	0	0	1	1
2009	4244.10	0	0	0	1	0	1
2008	4097.24	0	0	1	1	0	0
2007	3665.66	0	0	1	1	1	0

0 represents earthquake, typhoon, pests and diseases, soil erosion has not occurred, physical condition is not good, industrial resources are used unreasonably, and 1 represents the opposite.

After Eviews is calculated, the following regression table is obtained:

Table 2: Least Squares Estimation

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8720.412	3179.256	2.742910	0.0712
X1	-2003.533	4834.665	0.414410	0.7064
X2	9403.463	5731.485	1.640668	0.1994
X3	-878.4283	2865.743	-0.306527	0.7792
X4	-2540.833	2865.743	-0.886623	0.4406
X5	1492.788	2865.743	0.520908	0.6384
X6	2537.433	3179.256	-0.798122	0.4831
R-squared	0.517287	Mean dependent var		7629.158
Adjusted R-squared	-0.448139	S.D. dependent var		3235.683
S.E. of regression	3893.777	Akaike info criterion		19.56817
Sum squared resid	45484509	Schwarz criterion		19.77998
Log likelihood	-90.84087	Hannan-Quinn criter.		19.33582
F-statistic	0.535812	Durbin-Watson stat		1.162860
Prob(F-statistic)	0.763873			

Based on the standardization of residents' income as the dependent variable, a multivariate regression model was established with the earthquake, typhoon, pests and diseases, soil erosion, physical condition and industrial resources as independent variables. The model is:

$$\hat{y} = 8720.41 - 2003.53x_1 + 9403.46x_2 - 878.43x_3 + 2540.83x_4 + 1492.78x_5 + 2537.43x_6$$

(3179.25) (4834.66) (5731.48) (2865.74) (2865.74) (2865.74) (3179.25)

$$R^2 = 0.517 \qquad N = 10$$

We found that if the dummy variables are used to directly explain the income of the residents. The standard error is too large. In order to improve the model, we perform multivariate linear regression analysis on the logarithm of resident income Y.

Table 3: The least squares estimate of the logarithm

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.064612	0.441715	20.52142	0.0003
X1	-0.238914	0.671711	0.355679	0.7456
X2	1.276040	0.796313	1.602436	0.2074
X3	-0.152111	0.398156	-0.382038	0.7279
X4	-0.452999	0.398156	-1.137741	0.3379
X5	0.203264	0.398156	0.510513	0.6449
X6	0.329045	0.441715	-0.744926	0.5104
R-squared	0.529907	Mean dependent var		8.850662
Adjusted R-squared	-0.410279	S.D. dependent var		0.455549
S.E. of regression	0.540988	Akaike info criterion		1.805187
Sum squared resid	0.878003	Schwarz criterion		2.016997
Log likelihood	-2.025936	Hannan-Quinn criter.		1.572833
F-statistic	0.563619	Durbin-Watson stat		1.192167
Prob(F-statistic)	0.748202			

Taking the logarithm and standardizing the income of residents as the dependent variable, a multivariate regression model was established with the earthquake, typhoon, pest and disease, soil erosion, physical condition and industrial resources as independent variables. The model is:

$$\log(\hat{y}) = 9.06 - 0.23x_1 + 1.27x_2 - 0.15x_3 - 0.45x_4 + 0.20x_5 + 0.33x_6$$

(0.44) (0.67) (0.79) (0.39) (0.39) (0.39) (0.44)

$$R^2 = 0.529 \qquad N = 10$$

Model analysis shows that if the earthquake occurs, the income of residents will be reduced by 23%; if soil erosion occurs, the income of residents will be reduced by 45%; on the contrary, if the family members are in good health, the income of residents will increase by 20%; if the use of mineral resources is reasonable, then Residents' income increased by 33%.

4. Conclusions and recommendations

4.1 Strengthen ecological protection measures to reduce natural disasters and soil erosion

Qingyuan County belongs to the Loess Plateau Region. The geographic unit belongs to the main vein of the Taiyue Mountain System in the western uplift area of the Qinshui Basin. The northwestern uplift is low in the southeast, the hills are undulating, and the mountains and hills account for the total. 95.7% of the area, only 4.3% of river valleys and terraces, coupled with the dry climate, are extremely unfavorable for people's production and life, and cannot use the climate to improve the environment. Therefore, it is necessary to strengthen ecological protection and reduce unfavorable factors.

4.2 Pay attention to the rational use of industrial resources

Qingyuan County is rich in resources. There are more than 600 varieties of more than 100 families of wild, irrigated and herbaceous plants. It is rich in fungus products such as fungus, mushroom, day lily and walnut, and Astragalus, Codonopsis, Bupleurum and Forsythia. And other herbs. Wild animals include wolves, leopards, mountain pigs, and goats. Forest resources and pasture

resources are also abundant, and the most prominent is coal resources. It should promote the rational use of resources and increase the quality of minerals. The development of mineral resources cannot be at the expense of the environment. At the same time, it is possible to develop local characteristic industries that help the poor to get rid of poverty and create a number of roads to get rich.

4.3 Improve the rural health care system

The causes of poverty in many poor households are mainly due to lack of labor, illness, and disability. Therefore, it is necessary to take the government as the leading factor, fully implement the basic medical and health security system covering the poor, and further strengthen its construction, and steadily promote grassroots public health services. Equalize, build a disability relief system, and constantly improve the social security system of poor villages.

References

[1] Xiaopeng Liu, Xiaofang Su, Yajuan Wang. Research on Spatial Poverty and Its Enlightenment to the Study of Poverty Geography in China [J]. Arid Area Geography, 2014. 37(1): 144-151.

[2] Guanghui Mo. Accurate Poverty Alleviation: Endogenous Change and Governance Breakthrough in China's Poverty Alleviation Development Model [J]. Socialism with Chinese Characteristics, 2016(2): 73-77.

[3] Jieyong Wang, Yansui Liu, Yangfen Chen. An empirical study of the influence of rural hollowing degree on the cause: based on the survey data of villages in Shandong Province [J]. Journal of Natural Resources, 2013, 28(1): 10-18.

[4] Ravallion, M.2015. "Toward Better Global Poverty Measures." Working Paper 417. Washington DC: Center for Global Development.

[5] Jim Yong Kim:Poverty and Shared Prosperity 2016:Taking on inequality

[6] Abramovsky, Laura, Orazio Attanasio, Kai Barron, Pedro Carneiro, and George Stoye.2014. "Challenges to Promoting Social Inclusion of the Extreme Poor: Evidence from a Large Scale Experiment in Colombia." IFS Working Paper W14133, Institute for Fiscal Studies, London.

[7] Alkire,S. and Foster,J.E. ,"Counting and Multidimensional Poverty Measures", OPHI Working Paper 7, Oxford Poverty and Human Development Initiative, University of Oxford, 2007.