




RESEARCH ON INFLUENCING FACTORS OF RURAL ENDOGENOUS DEVELOPMENT ABILITY BASED ON TOBIT MODEL

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Abstract: *Cultivating and digging the endogenous power of rural development is the basis of sustainable rural development. The article sets explanatory variables from the perspective of social network structure theory, and constructs a Tobit multiple regression empirical model that affect rural endogenous ability. The study found that the amount of social structural holes, the strength of weak ties, the role of village committees, and the quality of village cadres have a significant positive effect on the improvement of rural endogenous capabilities. Accordingly, it is recommended that Henan region creates market opportunities for various types of elites to serve the rural revitalization ; fully explore and use weak ties to fight for more resources for the rural revitalization ; further strengthen the collective economy, strengthen the village collective administrative power from the perspective of legislation, and optimize the control of the collective power of the village ; the formation of a cultural psychological structure that is conducive to the endogenous development of the village .*

Keywords: *Endogenous ability, Relationship network, Structural hole.*

1. INTRODUCTION

The 19th National Congress of the Communist Party of China proposed „implementing the strategy of rural revitalization”, „adhering to the priority to agricultural and rural development”, and striving to build a rural society into a society of „prosperous industry, ecological liability, rural civilization, effective governance, and affluent life”. However, for a long time, China’s implementation of the strategy of giving priority to industrial development has resulted in the massive loss of rural social factors and structural imbalances. Rural areas have shown trends such as hollow rural areas, aging farming, non-agricultural factors, part-time farmers, and sideline agriculture. Progress is faced with problems such as the lack of resources and environmental constraints, the shortage of young and middle-aged labor, and the high cost and high risks of agricultural production, which has caused serious challenges to the endogenous development and self-circulation of rural society.

Rural revitalization needs to follow the path and laws of rural economic transformation, and implement the four major driving forces of institutional innovation, technological progress, market reform, and productivity investment (Zhang,2018, p.1-6). The core path can be summarized as: six organic components of urbanization collaborative promotion strategy, rural land reform and rural governance reform strategy, rural education revitalization, industrial revital-

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ization and cultural revitalization strategy (Chen,2018, p.55-62). Some scholars believe that rural revitalization should explore endogenous paths that meet China's national conditions and farmers , requirements, and insist on developing from exogenous development to endogenous development Transformation (Zhang, 2018, p. 56-63,157-158;). In the American pastoral economy, agriculture depends on the rural economy far more than the rural economy depends on agriculture. European rural development has a similar pattern, gradually integrating leisure, ecological services, agricultural production and other functions (Hall C,2004, p.211-225).

Scholars have conducted extensive research on the subject, focus, driving force and implementation path of pastoral revitalization, but there is the absence of empirical research on the endogenous power system of rural revitalization. To this end, based on the theory of social network structure, this article uses the field survey data of rural areas in Henan Province and the previous research results to build an evaluation model of rural endogenous ability and multiple regression models that affect its endogenous ability. Network structures elements, to explore the mechanism of rural endogenous development capacity improvement.

2. METHODOLOGY

In this paper, the endogenous capacity index of the village is calculated based on the data onto the previous survey and research, and its value range is between [0,1]. Restrict dependent variable model. The characteristic of this model is that the model contains two parts. One is the selection equation model that represents the constraint condition; another is the equation model of a continuous variable that satisfies the constraint condition (Chen, 2017, p. 1-14). This model is a linear probability model proposed by economist Tobin when studying the demand for durable consumer goods. According to its general form, the regression model of this article is set as:

$$y_i^* = \alpha_0 + \sum_{i=1}^n \alpha_i x_i + \xi_i$$
$$y_i = y_i^* \quad \text{if } 0 < y_i^* \leq 1$$
$$y_i = 0 \quad \text{if } y_i^* < 0$$
$$y_i = 1 \quad \text{if } y_i^* > 1$$

Among them, y_i^* is the potential endogenous rural endogenous capacity index; y_i is the actual capacity index value of the i village; x_i is the vector of factors affecting the endogenous capacity of the village; α_i is the regression parameter vector; ξ_i is an independent random disturbance term; $i = 1, 2, \dots, N$; $\xi_i \sim N(0, \delta^2)$ is random disturbance term.

3. RESULTS AND DISCUSSION

3.1. Analysis and research hypothesis from the perspective of social network structure theory

The theory of social network (relationship) structures to believe that society is a group of multiple social actors and their relationships. The network structure is composed of nodes and bonds. Nodes are the connection points of various relationships, resources, and the cost of developing and maintain ties. In this paper, from the perspective of social network theory, six hypotheses are put forward to verify the factors that affect the endogenous development ability of rural areas.

- Hypothesis 1: The greater the density of rural social networks, the stronger the endogenous ability of rural revitalization.
- Hypothesis 2: The greater the strength of weak bonds between the rural social network structure, the stronger the endogenous ability of rural revitalization.
- Hypothesis 3: The larger the scale of the network of actors, the stronger the endogenous ability of rural revitalization
- Hypothesis 4: The more structural holes in rural social networks, the stronger the endogenous development capacity of rural revitalization.
- Hypothesis 5: The psychological structure of rural culture has a significant impact on rural endogenous ability
- Hypothesis 6: Rural social network power control structure has a significant impact on the endogenous ability of rural revitalization

3.2. Variable selection and descriptive statistics

The rural social network power structure can be divided into administrative power, interest power and family identity power control. Among them, the lawful power control granted by the state is measured by the appeal to the village committee and the family economic strength of the main village cadres. The exercise in its administrative powers in a fair, fair and equitable manner, the authority on legal power will be strengthened, and it will have a huge appeal to the rural social network, which is the key attraction for the formation of rural development and endogenous cadres' development capabilities; the more universal development path in rural areas, the key variable in rural society to measure capable people is their family economic strength. If the village cadre's ability to create wealth is not concentrated, it is difficult to imagine his ability to lead the majority of villagers to develop together. Benefit power is measured by the types of collective resources that the village cooperative can control. Generally speaking, the more resources the village collective can control, the more capable it is to provide a material guarantee for the development of various causes of the village. The family identification power is determined by whether the village conducts family gatherings and whether each family has an ancestral hall. The family's gathering and ancestral hall can further strengthen the clan power and improve the family's identity, which will have a strong influence on the operation of rural social networks. Statistics show that the village committees of the sample villages have a good appeal to the villagers, the main village cadres have average family economic strength; the village collective can control fewer types of resources; 38.73% of the villages often have family gatherings, and 18.31% of the villages there is a clan ancestral hall.

Table 1. The meaning of the main variables and their descriptive statistics.

Variable selection and definition	Mean	Std.	Min.	Max.
Network density				
Farmer self-organization (quantity)	4.458	4.040	0	30
Cadres of committees (number)	10.101	7.8801	2	84
Weak bond strength				
Social donation (money)	36.828	167.979	0	2000
Government project acquisition (Scoring 1-5 on ease)	2.934	0.980	1	5
Structure hole				
Business organization (quantity)	2.962	3.772	0	35
Average life of the company (years)	5.342	6.108	0	50
Network scale				

Variable selection and definition	Mean	Std.	Min.	Max.
Rural population size (number)	2125.143	1557.951	150	10000
Self-organized scale (number of people)	48.094	95.272	0	1280
Executive power				
Village committee appeal (graded according to appeal 1-5)	3.6764	0.757	1	5
Cadre family economic strength (money)	3.1644	1.701	1	9
Interest control				
Collective control (calculated by the number of types of control resources)	1.430	0.815	0	4
Family power control				
Does the family often meet? (Yes = 1, No = 0)	0.387	0.488	0	1
Whether there is an ancestral temple (Yes = 1, No = 0)	0.183	0.387	0	1
Village culture				
Culture of filial piety (scored on a scale of 1-5)	4.298	0.831	1	5
Traditional customs (scored on a scale of 1-5)	3.822	0.832	1	5
Control variable				
Village cadre age				
30 years and below = 1, 31-40 years = 2, 41-50 years = 3, 51-60 years = 4, 61 years and above = 5	2.843	1.023	1	5
Village cadre gender (male = 1, female = 0)	0.772	0.420	0	1
Village cadre education				
9 years and below=1, 10-13 years=2,1 4 -15years=3, 16 years and above=4	2.174	0.942	1	4

Note: All indicators scored on a scale of 1-5 is all positive values, that is, the easier it is to think, the stronger the appeal, the higher the recognition, the higher the score; the type of collective production control includes collectively-owned farmland, Forest land, construction land, minerals, reservoirs, enterprises, real estate, machinery and equipment, and tourism resources.

3.3. Estimated results

This article uses Stata16.0 software to build a multiple Tobit regression model. In order to ensure the accuracy and stability of the model prediction, multiple collinearity tests were performed on each explanatory variable, each independent variable was linearly regressed with other variables, and then the variance expansion factor of each variable was calculated, of which the maximum value is 1.35, the minimum is 1.06, the mean is 1.14, and the Tolerance of all variables are greater than 0.6. It indicates that all variables have passed the multi collinearity test. In this paper, the forced comprehensive entry method is used to introduce the set explanatory variables into the equation for regression to construct model 1 (total model), and then stepwise regression method (stepwise) is used to obtain model 2 ; in order to resist the influence of specific values, all models is robust The standard error returns. The regression results (see Table 2):

Table 2. Estimated results of the impact of rural social network structure on rural endogenous capacity

	Model 1			Model 2		
	Coef.	Robust Std.Err	P> t	Coef.	Robust Std.Err	P> t
Network density						
Farmer self-organization	-0.00035	0.0005	0.4630			
Village cadres	-0.00008	0.0002	0.6630			
Weak bond strength						
Social donations	0.00002	0.0000	0.0160	0.00002	7.32E-06	0.002
Get government projects	0.00565	0.0026	0.0300	0.00622	0.00282	0.028
Structure hole						
Village Enterprise	0.00159	0.0008	0.0490	0.00169	0.00081	0.038
Business life	0.00104	0.0004	0.0050	0.00091	0.00040	0.022
Network scale						
rural population	0.00000	0.0000	0.4410			
Self-organizing scale	-0.00001	0.0000	0.5820			
Executive power						
Village committee appeal	0.00721	0.0033	0.0280	0.00807	0.003352	0.016
Cadre family financial resources	-0.00179	0.0013	con			
Interest power control						
Collectively controlled assets	-0.00645	0.0026	0.0140	-0.00577	0.00252	0.022
Family power control						
Does the family often meet	-0.00198	0.0043	0.6450			
Whether there is an ancestral temple	0.00569	0.0056	0.3080			
Village culture						
culture of filial piety	-0.00561	0.0039	0.1530			
traditional customs	0.00252	0.0023	0.2660			
Control variable						
Cadre age	0.00436	0.0019	0.0250	0.00344	0.00171	0.044
Cadre gender	-0.00070	0.0068	0.9180			
Cadre education	0.00941	0.0027	0.0010	0.00805	0.00257	0.002
Cons.	-0.01522	0.0236	0.5190	-0.03993	0.01861	0.033

3.4. The results of the influence of the strength of weak bonds between rural social networks

Whether in Model 1 or Model 2, the two variables that measure the strength of the weak bond are statistically significant at 5%, and have a positive effect on the endogenous improvement in rural revitalization. From the coefficient value, the marginal effect of winning government project support far greater than obtaining social donations, hypothesis 2 is verified. It shows that the new information carried by weak ties can provide rich resource support for rural revitalization.

3.5. Results of the impact on rural social network structure holes

Structural holes mean that there are potential opportunities for profit. The empirical results show that the two variables reflecting the structural hole has a significant positive effect on the endogenous ability of rural revitalization, and the impact on the enterprise's life span reach a statistically significant level of 1%, and the amount of enterprises in the village is significant at the statistical level of 5% from the coefficient value, the marginal effect of the enterprise's life span are greater than that of the number of enterprises. Hypothesis 4 is verified. This shows that fully digging the structural holes in the rural social network, creating potential profit opportuni-

ties for operators, attracting more entrepreneurial elites to fill the structural holes, and creating more economic entities in the countryside, is to promote the prosperity of rural industries and achieve rural fundamental measures to revitalize endogenous development.

3.6. The results of the impact of the density and scale of rural social network

It can be seen from model 1 that the four variables that reflect the density and scale of the network structure have not passed the significance test, but from the perspective of the impact direction, the impact direction of the two variables of the network density is not consistent with hypothesis 1, which shows the number of key nodes and organizations in the social network is the minor aspect that affects development. The major factor is capabilities and qualities of key node personnel and organizations. The influence direction of the two variables of network sizes is consistent with hypothesis 3, which shows to a certain extent that a sufficient population size is the human capital basis of rural revitalization.

3.7. The impact of village culture and power control structure

The two variables that measure the village culture have not passed the significance test. Among the variables of power structure, the role of village committees representing administrative power is significant at the 5% statistical level, which has a positive effect on the endogenous ability of rural revitalization, but the family economic strength of village cadres has not passed the significance test. Village collective assets that measure collective interests also pass the significance test of the 5% level, but have a negative effect. Namely, the more the types of collective assets are, they are not conducive to rural revitalization. The two variables of family identification have not passed the significance test, but the direction of influence is positive. This shows to a certain extent that carrying out family identification activities can improve the synergy of rural revitalization. When the development of rural undertakings is more in line with family interests, the control of family identification power will have a positive impact on the endogenous development of the village.

In addition, the age and cultural level of the cadres in the control variables have passed the 5% significance test, and both have a positive effect, namely, the older age and higher cultural level of the village cadres, which is more helpful for the ability of rural endogenous development. However, the gender of the cadres is failed the test.

4. CONCLUSION

Based on the previous research results, the endogenous ability index of 426 rural areas in Henan Province was calculated. On this basis, the endogenous ability index is invoked as the explanatory variable to build a Tobit regression model that affects the rural endogenous ability. Through the model, the influence of rural social network structures density, weak bond strength, scale, structural hole and power structure of rural endogenous ability were analyzed.

The study found that the village-level collective economic capacity is the most important indicator to measure the endogenous capacity of the village, with a weight of 57.42%, followed by the villagers ,political participation capacity and credit protection capacity indicators, with weights of 16.24% and 14.33%, respectively, and social opportunities. The weight of capability and security assurance capability indicators is less than 10%. The average value of the endog-

enous ability index of the sample village is only 0.038, which reflect that endogenous ability of rural revitalization is generally insufficient for the stage of emergence.

Social donations and government project support obtained through weak ties have a positive effect on rural endogenous capabilities, so fully tapping and using weak ties to seek resource support is one of the viable paths for rural revitalization. There is a structural hole in the rural society that can be used. According to this, the more corporate investment attracted, the stronger endogenous ability of rural revitalization is. In the rural social network power control structure, strengthening the village collective administrative power control and giving full play to the role of the village committee has a significant positive effect on improving the endogenous development capacity of the village, but excessive control of interest power will have the opposite effect ; family although the influence of identity power is not significant, to a certain extent, enhancing family identity awareness will promote the endogenous development of the village. In addition, the population size, the number of self-organizations that reflect the density of rural social networks, and the filial piety culture and traditional customs that reflect the village culture is not the key factors that affect the rural endogenous ability, and the quality of the main village cadres has an impact on the rural endogenous ability have a positive impact.

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