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Research of Mechanism on the Impact of Local Governmental Competition on Farmland Conversion

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Abstract In the perspective of local governmental competition, the impact of local governmental competition on farmland conversion is analyzed in terms of political competition, factors competition and products competition, and the empirical analysis is conducted according to the provincial data from 2002 to 2007. The results show that the endowment of land resources correlates negatively with the scale of farmland conversion, and the population, the tendency of exceeding capital investment and the competition of research and development input correlate positively with the scale of farmland conversion. According to these research results, corresponding policies and countermeasures are put forward: we should overhaul the system of performance evaluation of local governmental officials; we should normalize the local governmental competitive behavior.

Key words Local governmental competition, Farmland, Farmland conversion, China

Farmland conversion refers to the process of land transformation from agricultural use into non-agricultural use. It is one main approach of increasing input of land factors for the economic development nowadays, and it provides guarantee for rapid economic development^[1]. Being that the agricultural land is irreplaceable natural resource, and it has economic value and social value of food security, ecological security and so on, so China's power of government interferes with directly the process of farmland conversion.

As for the mechanism research of farmland conversion, there are many theoretical analyses which research the problems in 4 perspectives: first, the analysis pays attention to the driving mechanism of farmland conversion in terms of theoretical framework^[2–3]; second, the analysis focuses on the relevant system of farmland conversion and discusses the appropriate system arrangement^[4–5]; third, the analysis focuses on the relations of the main body of interest of farmland conversion^[6–7]; fourth, the analysis conducts the analysis in the perspective of local governmental behavior^[8–9]. Since fiscal decentralization, the central government has adjusted the power of local governments to some extent, and the independent power of local government has been strengthened. Propelled by many factors, such as need of achievements in one's official career, financial pressure, and local interests, the competitive behavior of local government of China nowadays comes about and tends to be crystallized^[10], and the land transfer has been the important approach of attracting investments competition of local government^[11]. In the perspective of local governmental competition, on the basis of theoretical analysis, by establishing the econometric model of impacting factors of farmland conversion, we select 4 main relevant factors and use the provincial data from 2002 to 2007 so as to conduct stationary analysis on the impact of various factors on farmland conversion.

1 The analysis of the influence of the local government competition on farmland conversion

Since fiscal decentralization, the local government has been not simply the agent of the central government any more. Instead, its independent economic and administrative functions are coming into being. Under the system of performance evaluation, the local economic development has been put on the top agenda by all local governments. To promote local economic development, attracting foreign investment and supporting local businesses have become the necessary measures, which will inevitably result in the competition among local governments. Then, increasing capital investment and supplying cheap land become the main means of the competition. Therefore, local government competition has become a very important factor in the farmland conversion.

1.1 The cause and content of local government competition Local government competition refers to the competition among regional governments in respects such as investment environment, legal system and government efficiency, in order to provide public goods and to attract capital, technology and other production factors^[12]. Developing regional economy makes the local governments interrelate with each other, thereby competition is coming into being. Because the economic resources for developing economy have mobility and scarcity, while the competition is often reflected on technology, system and providing public goods. As an important indicator to test political achievements, the economy is also the embodiment of government and officials achievements. So, they compete not only for economic interests but for political interests. It becomes political competition for local government to strive for more preferential policies and resources from higher-level government, in order to establish "vanity projects" and to vigorously develop economy. Local government usually develops economy via the competitiveness of their products, which is

namely the competition in product markets. In factor market, they can achieve economic increase through attracting mobile elements to their own area. All the competitions in political market, factor market and product market are bound to affect the scale of land conversion.

1.2 The influence of local government competition on farmland conversion The influence of local government competition is mainly in political market, factor market and product market. Politically, "vanity projects" are established, and regional economy is developed rapidly. In factor market, competition is performed via lowering land prices, investment comparisons and improving the labor wage, all of which have an effect on the scale of farmland conversion. In product market, local government lowers farmland price and increases investment in R&D to decrease production cost. Therefore, the competitiveness of the region is improved.

1.2.1 Political competition and farmland conversion. The selection and appointment of officials of local government depend chiefly on central government. The local government officials

get reappointment and opportunity for promotion only by the support of central government. Local image and economic development are particularly important in the official achievement assessment carried out by the central government. To achieve their political target, local governments compete with each other, develop regional economy and establish image projects, none of which can be carried on without the support of farmland conversion. Firstly, farmland conversion can offer land vehicle for local non-agricultural industries, and the land value increase can provide capital source for local economic growth. Then, after the farmland conversion, public funding and foreign investment can be attracted to promote local economic development through a series of land policies. What's more, local performance work also relies on farmland conversion. Urban beautification is based on converted farmland while the income of farmland conversion can support the investment of the urban beautification. Besides, in order to expand investment, local government set up varieties of economic zones, and all of these image projects are based on farmland conversion.

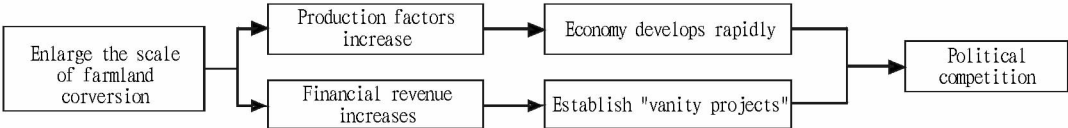


Fig.1 The impact of political competition on farmland conversion

1.2.2 The competition of factors and farmland conversion. The factor market competition of local government concentrates in the competition of labor forces, capital and land factors. The research analyzes the impacting mechanism of all factors on farmland conversion from 3 aspects. In the process of competition of local government, increasing the salary can increase the labor forces in the region. While after increasing labor forces in the region, it is bound to increase the land pressure, which needs adequate farmland conversion to satisfy the need of population increase.

Being that it is impacted by the mechanism of "voting by foot", the factors of capital, talents and technology flow into the administrative field of superior public service. In order to strengthen attraction of the region and increase income of the region, the local government is bound to vie on the input of public goods and service^[13]. The research of Qinduo and so on (2003) demonstrates that there is competitive tendency of investing among provinces, and the network effect of comparing

unrealistically among provinces regarding excessive investments causes the excessive competition among local governments, then influences the efficiency of resources allocation in local areas and results in the low efficiency of resources allocation^[14]. As far as land resources concerned, the low efficiency of allocation is bound to cause the farmland conversion in abundance.

Land, as a kind of production factor, has the function of changing investments, attracting investments, substituting investments and financing. The local government can attract more foreign investments by paring down the price of land market and other competitive ways^[15]. By taking advantage of preferential policies of land and decreasing land price, the land transfer, to some extent, plays the role of promoting the capital flow in the region. But it is established on the basis of the extensive use of land resources. The competition of attracting investments among local governments, to some extent, promotes the development of local economy, but it is at the expense of economic use value of land.

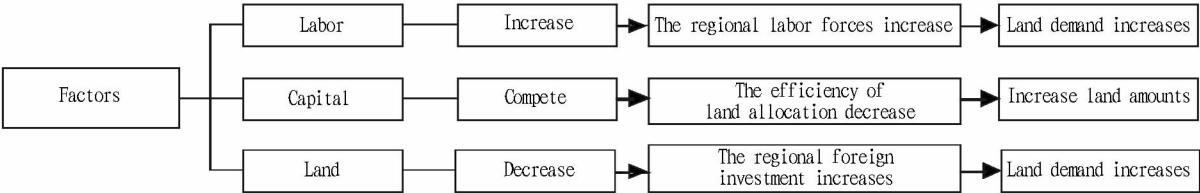


Fig.2 The factors of competition impacting on farmland conversion

1.2.3 The competition of products and farmland conversion. As for the products market competition of local government, it focuses on elevating the competitiveness of regional products,

and the local government can obtain greater competitiveness by decreasing the input of local factors and cost. For example, decreasing land price decreases the cost of local products, so

as to make the products have greater competitiveness, while the decrease of land price can increase the need of land use, and impact the scale of farmland conversion. In addition, the local government reinforces the input of research and development. On one hand, it increases the added value of local prod-

ucts; on the other hand, in comparison with land resources, the new technology and increasing input can increase the output rate of land, which elevates the level of local intensive land use and also impacts the scale of farmland conversion.

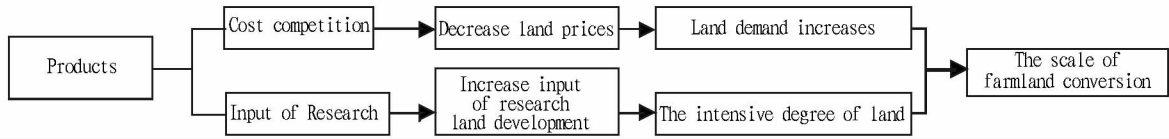


Fig.3 The product competition impacting on farmland conversion

2 The empirical analysis of impact of local governmental competition on farmland conversion

2.1 The model of measuring the impact of local governmental competition on farmland conversion

2.1.1 The econometric model. According to the preceding theoretical analysis, the research refers to the existing research achievements^[16], and selects the model of linear regression:

$$Y_{it} = \beta_0 + \beta_1 L_{it} + \beta_2 RK_{it} + \beta_3 KY_{it} + \beta_4 TR_{it} + \mu_{it} \quad (1)$$

In the formula, β_0 is constant; β_1 , β_2 , β_3 and β_4 are coefficients of variables of all impacting factors; μ_{it} is the random disturbance term; Y_{it} is the quantity of farmland conversion of province I in the year of t ; L_{it} is the variable of land resources endowment impacting farmland conversion of province I in the year of t ; RK_{it} is the population variable impacting farmland conversion of province I in the year of t ; KY_{it} is the competitive variable of input of research and development of farmland conversion of province I in the year of t ; TR_{it} is the excessive investing tendency of capital regarding farmland conversion of province I in the year of t .

2.1.2 The definition of all variables and data source

2.1.2.1 The variables choice of the scale of farmland conversion. In order to research the impact of local governmental competition on the scale of farmland conversion, we select the area of farmland occupied by annual construction in various regions in China. The data is from *The Statistical Yearbook of Land Resources of China* from 2003 to 2008^[17].

2.1.2.2 The general variables impacting the scale of farmland conversion. We select the general variables impacting the scale

of farmland conversion from supply and demand. In terms of supply factor, the stock of land resources of one region, to much extent, determines the quantity of farmland conversion in the region. If there are more profuse land resources, the degree of land resources in the region will be low, the tense degree of human-land relationship will moderate and more agricultural land can be transformed into non-agricultural land. In terms of need, along with the mushrooming population, elevated level of urbanization and the increasing urban population, it generates new pressure and needs more land so as to satisfy people's life need. We select the area of agricultural use land as the variable of land resources endowment, and the total population of all regions at the end of year as population variable, in order to conduct empirical analysis. The data is from *China Statistical Yearbook* from 2003 to 2008^[18].

2.1.2.3 Selection of variables of local governmental competition. As for the measure of local governmental competition, there is no unified index as yet. Consequently, according to the research of Qinduo and so on(2003)^[14], the research analyzes the tendency of excessive investing caused by competition among provinces. Specifically, we assume it as the difference of the investment of each province in the previous period and the average investment level of the region in the province, namely TK/TY of each province subtracting the first - period lag of average value of TK/TY in the region in the province. And then we standardize the mean value of national TK/TY . In terms of the input competition of research and development, the thesis conducts analysis by using R&D outlay and the data is from *China Statistical Yearbook* from 2003 to 2008.

Table 1 The selection and signification of variables of farmland conversion factors

Impacting factors	Variables	Signification of variables
General factors	The endowment of land resources	The area of agricultural use land of all areas
	Population	The total population of all areas at the end of years
The factors of local governmental competition	The tendency of exceeding capital investment	The tendency amount of exceeding capital investment of all areas
	The competition of research and development	The total investment of R&D of all areas

2.2 The model estimation and results By using model (1), China provincial data from 2002 to 2007, and EViews5.0 software, we conduct the empirical analysis. The effect of model regression is prominent and the estimated results can be seen in Table 2.

$R^2 = 0.980\ 893$, and the statistic of F is 2 375. 275, after

we adjust the model. From the results of estimation model, we can get the following 4 aspects:

Firstly, the impact of land resources endowment on the scale of farmland conversion is negative, and it is significant at the level of 1%, indicating that land resources decrease along with the expansion of farmland conversion.

Secondly, the impact of total population on the scale of farmland conversion is positive, and it is significant at the level of 1%, indicating that the increase of total amount can expand the scale of farmland conversion.

Thirdly, the impact of excessive investing tendency of local governmental capital on the scale of farmland conversion is positive, and it is significant at the level of 1%, indicating that if

Table 2 The model estimation result of the impacting factors of farmland conversion

Impacting factors	Variables of explanation	Coefficient
General factors	The endowment of land resources	−0.157 070 *** (−3.910 627)
	Population	0.961 979 *** (14.581 49)
The factors of local governmental competition	The tendency of exceeding capital investment	0.914 776 *** (5.473 299)
	The competition of research and development	0.092 047 ** (2.040 946)

Note: the number in bracket is *t* test value; *, **, *** is the statistical test significance of level 5%, level 1% respectively.

3 Conclusion and suggestions

3.1 Conclusion On the basis of the perspective of local governmental competition, the analytical framework of impacted farmland conversion is established. Specifically, we generalize the impacting factors of farmland conversion as general factors and local governmental competition factors. From political competition, factor competition and products competition, we discuss the impact of local governmental competition on the scale of farmland conversion. Based on these, we further analyze the mechanism of all factors impacting farmland conversion, in order to provide theoretical framework for empirical analysis.

The results of research show that the expansion of farmland conversion scale can result in the decrease of land resources and the increase of population can result in the increase of farmland conversion scale; in the light of the competitive factors of local government, in order to attain goals, the local governments compete unrealistically on investing, and conduct competition in order to attract more investments and obtain more interests by decreasing land prices and offering financial subsidy and so on, which expands obviously the scale of farmland conversion. But it threatens the food security and ecological safety. However, the existing performance assessment mechanism mainly takes the local economic status as indicator, which does not involve the food security and ecological safety; in the mean time, the statutes of normalizing the competition among local governments is not sound enough. All these are the problems which need to be solved as soon as possible.

3.2 Countermeasures and suggestions

3.2.1 Reform the performance assessment system of local governmental officials. We should establish a set of standard of scientific performance assessment. It should have economic indicators, and it should also have the social indicator and ecological indicator. The farmland protection, environmental quality, and intensive, high-efficiency and rational land use and so on, should be the indicators of performance assessment. Most important of all, we should change the appointment system from top to bottom into the voting system which combines the pattern of top-bottom and bottom-top, and exert fully the role of the masses in assessing officials' performance, so as to make the local government be responsible for the state and the masses.

3.2.2 Normalize the competitive behaviors of local government. The competitive behaviors of local governments, to

the investing competition of local government is more drastic, there is more quantity of farmland conversion.

Fourthly, the estimated results show that the impact of the input competition of research and development of local government on the scale of farmland conversion is positive, and it is significant at the level of 5%.

much extent, arise from the shortage of restriction mechanism of local governmental behavior. Considering the maximization of profit, the phenomenon of offering land illicitly and offering land at low price is mushrooming continuously. So, in order to normalize the behavior of local government in land management, we should implement sound law and enforce the law strictly. Under the normalization of law, we should reinforce the efforts of investigation and prosecution regarding the cases of illegal land use in all regions so as to guide the rational competition of local government.

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resources per capita in Shandong Province as standard, from 2002 to 2008, the bearing capacity index of the total amount of water resources in Liaocheng City, on the whole, undergoes the fluctuation of fall, rise, fall, rise, fall and rise, namely the tendency of annual change is different. The tendency of bearing capacity degree is contrary to that of the water resources, is in that along with the mushrooming of population, the annual change of precipitation and runoff can cause the different total amount of water resources of whole province. The lowest total

amount of water resources of Shandong Province in 2006 was 19.978 billion m³, and the most bearable population of Liaocheng City was 4.729 5 million, but the bearing capacity degree was 1.21. The practical population of Liaocheng City was overloaded critically. So in order to ensure the sustainable use of water resources, we should control the population quantity, and raise people's awareness of saving water and cherishing water resources.

Table 3 The relative bearing capacity of water resources in Liaocheng

Year	The total amount of water resources of Shandong Province ×10 ⁸ m ³	The total amount of water resources of Liaocheng City ×10 ⁸ m ³	The population of Shandong Province ×10 ⁴ people	The bearing capacity index ×10 ⁴ people	The population of Liaocheng City ×10 ⁴ people	The bearing pressure degree
2002	238.81	10.50	9 082	399.32	561.31	1.41
2003	489.69	10.50	9 125	195.66	563.76	2.88
2004	349.46	10.50	9 180	275.83	566.45	2.05
2005	415.86	10.50	9 248	233.50	569.50	2.44
2006	199.78	10.15	9 309	472.95	572.82	1.21
2007	387.11	10.15	9 367	245.60	580.75	2.36
2008	228.96	10.15	9 417	417.46	584.91	1.40

3 Conclusion

In the light of the dynamic curve of natural resources and population, or the single item index, there are acute contradiction between natural resources in Liaocheng City and the practical population in Liaocheng City. In the light of the developmental tendency from 1999 to 2008, the overall tendency of change curve of farmland area along with the population change in land resources descends, but it can bear the current population of Liaocheng City; although the curve of forest resources rises, it is far from bearing the current population of Liaocheng City; the situation of water resources is not so rosy, which contradicts the population acutely. So in order to know the contradiction between large population, and relatively scanty resources and low economic developmental level, we should strictly control the population amount, and raise people's awareness of protecting natural resources so as to realize the harmonious and sustainable development of population, resources and economy.

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