

The Game Analysis of the Large Business and Farmers under the Background of the Rural Land Circulation

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Abstract. To promote the coordinated development, accelerate the realization of integration of urban and rural labor, achieve 2020 fully completed a well-off society in an all-round way, the full implementation of the rural regions, the implementation of the land management rights transfer policy, help to solve the rural area land fragmentation, abandonment of the arable land is serious, the small scale of operation. Implementation of the appropriate scale of rural land resources transfer, to improve the quality of life of farmers, reduce the number of rural surplus labor force has played a positive role in promoting. Based on the game between the two main bodies, the farmers and large farming operations research and analysis to realize the rational circulation of rural land resources, making to maximize the interests of both, and ultimately the formation of scale management of land. Finally, the government as the "invisible hand" in the market need to strengthen macro-control, improve the price mechanism, set up the transfer sides reasonable interests sharing mechanism, so as to guide the farmers and agricultural users between land transfer smoothly.

Introduction

In recent years, China's urbanization level and industrialization level has been significantly improved. At the same time, agricultural management mode, farmer income structure and crop planting patterns have taken place in the significant changes. Land as a kind of non renewable scarce resources, in the rural areas to engage in the operation of the scale of the phenomenon is increasingly common. However, at present, our country's land contract management transfer rate is low, and not to achieve the rational allocation of land resources, resulting in a waste of land resources. In addition, China's most rural areas, farmers and agriculture showing fragmentation, the traditional development mode and mostly ordinary farmers, agricultural large less, which restricted the land scale management of agriculture and intensive management, is not conducive to the realization of agricultural modernization, restricted the fully completed by 2020, a well-off society in an all-round way of the pace.

The Current Situation and Influencing Factors of Rural Land Contractual Management Right in China

Farmers' Awareness of Land Circulation Is Low

Most farmers' awareness of the land circulation is low, thus reducing the enthusiasm of farmers' land circulation, resulting in low land turnover rate. Since ancient times, land

resources is the foundation of the survival of farmers, they are not willing to give up their own land resources, worried about the land transfer will give their lives to bring serious consequences. Low efficiency of land circulation restricted the agricultural modernization, scale, intensive development, as a result of the land fragmentation and the traditional operation problems [1].

Supply and Demand Information Asymmetry of Land Circulation, Lack of Standardized Land Circulation Mechanism

The contractor and the employer the information asymmetry between supply and demand, the contractor and the employer most is through the introduction of acquaintances, relatives and friends to obtain information on land supply and demand, the lack of effective information exchange, resulting in the transfer of land development is lagging behind, there has been serious abandonment of land [2] the parts of our country. In the process of land transfer, the government should improve the mechanism of land transfer and information exchange, so that information exchange, so as to improve the land transfer rate.

The Value of Agricultural Land Use Is Low

Under the background of economic new normal, the right to the contracted management of land circulation rate is too low is a kind of inevitable phenomenon under the background of the real economy, because of the agricultural added value is low, and the land used for agricultural production and economic benefits low and land transfer will not bring high income flow. Therefore, the farmers to change the characteristics of this property require a decline of [3]. Low value of agricultural land resources is the fundamental reason for the low land turnover rate; improve the land transfer rate, first of all to enhance the value of land resources and people's awareness of the scale of production.

Two Dimensional Model of Interest in Rural Land Transfer

Game theory, also known as countermeasures, is to study the strategy and behavior of rational decision makers (participants) and the theory of equilibrium results. The existence of Nash equilibrium in either game, that is, any gamble chess strategy combination of the party on the other side of game strategy combination is the best strategy, therefore reaches a new equilibrium. [4]

Rural land circulation is a game between the transferor and the transferee of the two, under constraint conditions, only into and the transferor to reach an agreement on the transfer of land utility analysis, land to flow smoothly. In this paper, through the perspective of game analysis of the transfer of rural land transfer and transfer to the two party between the decision-making action, which is transferred out of the ordinary farmers, into a large agricultural business, as follows:

The land is not good or bad, all the land resources to see as a homogeneous product.

In the process of land transfer, the transfer and the transfer side are rational economic people, are pursuing the maximization of their own interests.

The transferor gains including land rent R ; after the land transfer in other industries the opportunity return E_1 ; transferring land should pay the transaction cost is C_1 ; I_1 stands the opportunity cost of land transfer; land of the transferor θ coefficient ($0 < \theta < 1$) refers to the transferor under not transfer their land, the land management to

obtain the income accounted for the proportion of total revenue; the transferor's final payment function] ΔY_s ; wherein, $R > 0$; $E_1 > 0$; $C_1 > 0$; $I_1 > 0$; $0 < \theta < 1$.

Transferee acquired through land management of the expected return of I_2 ; into the land transaction cost C_2 ; circulation of land in the process of opportunity cost of E_2 ; land rent R ; land on the transfer coefficient λ , that is, into the Party expected operating land revenue accounted for in other industries to obtain the total income proportion; the transferee of the final payment function ΔY_d ; wherein, $R > 0$; $E_2 > 0$; $C_2 > 0$; $I_2 > 0$; $0 < \lambda < 1$.

Based on the above assumptions, the game model of the two parties in the land transfer is constructed as shown in table 1:

Table 1. Two sides game model of land circulation.

		transferee	
		turn into	not turn into
transferor	turn out	$R+E_1-(C_1+\theta I_1), \lambda I_2-C_2-R-E_2$	0,0
	not turn out	0,0	$\theta I_1, E_2$

For the model as the transferor and the transferee of the ordinary farmers and large farming operations if and only if $R+E_1-(C_1+\theta I_1) > \theta I_1$; when $I_2-C_2-R-E_2 > E_2$, the land can be smoothly as scheduled transfer. At this time, under the constraint condition, the game equilibrium is both (transferred, transferred, or $(R+E_1-(C_1+\theta I_1), I_2-C_2-R-E_2)$).

When land good points and ordinary farmers willing to roll out land, so land outflow price P , land outflow before operating earnings for the S , land to bring into the side of utility for U , into the land scale management cost C , good parameters is P_1, S_1, U_1, C_1 , the parameters of the were P_2, S_2, U_2, C_2 , and $P_1 > P_2, S_1, S_2, U_1, U_2, C_1, C_2$. The game between the ordinary farmers (the transferring party) and the large agricultural business (transfer) is shown in Table 2 and 3:

Table 2. Two sides game model of excellent land circulation.

fine land		transferee	
		turn into	not turn into
transferor	turn out	$P_1-S_1, U_1-P_1-C_1$	0,0
	not turn out	0,0	$S_1, 0$

Table 3. The two sides game model of bad land.

Bad land		transferee	
		turn into	not turn into
transferor	turn out	$P_2-S_2, U_2-P_2-C_2$	0,0
	not turn out	0,0	$S_2, 0$

In the complete but imperfect information dynamic game, no matter into big business is good or bad, need in ordinary farmers and agricultural big business is expected to yield greater than 0 under the premise to achieve the transfer of land, by comparing interests principle is used to formulate the farmland flow into the strategy, so as to achieve the Nash equilibrium. Today, China's land transfer market is not perfect; there is a phenomenon of information asymmetry between the transfer and the transfer side, hindering the normal circulation of the land. Based on this, the government, as the "visible hand" should and perfect the land transfer mechanism to guide, improve the information exchange system, the transferee and transferor can exchange information, promote the rural land resources and fast circulation.

Promote the circulation of rural land; help to form the scale of land management. The ordinary farmers have a small piece of land transfer to large farming operations in the hands, helps to promote agricultural modernization, improve the efficiency of agricultural production, so as to enhance the level of urbanization, to speed up the construction of new countryside, the comprehensive built well-off society has injected new impetus. To achieve the scale of agriculture, solve the land fragmentation problems of rural land circulation, we should first start. According to the theory of production, the production and operation of land can be divided into three stages, as shown in figure 1.

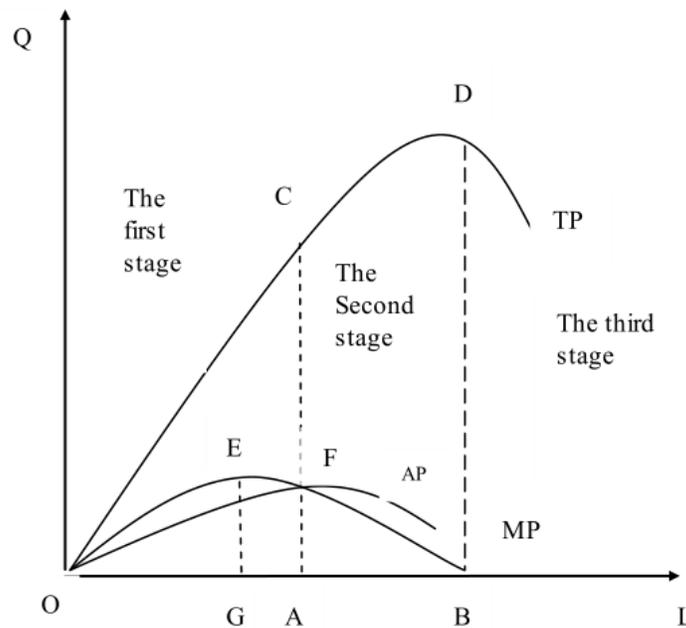


Figure 1. The 3 stages of land production and operation.

In the first stage of land production and operation, the total output of TP is increasing, the average yield of AP is increasing, and the marginal production is increased by MP to G, which appears in the G to B stage. At point F, the average yield (AP) reached maximum value, produced in the first stage, compared with the same amount of capital, land input quantity is obviously insufficient, at this time, expand the scale of the investment in land, production will continues to increase. The amount of land input should be increased at least until A point, otherwise the capital cannot be fully utilized.

In the second stage of the production of land production and operation, the number of inputs of land increased from A to B. At this point, the average yield AP began to decline, the marginal production continued to decline, but the marginal production is still greater than 0,. In the A to the B phase, to continue to increase the number of land inputs can increase the total output, but the rate of increase in the rate of decline in the B point, the total output reached the maximum value, at this point, the marginal yield of MP is 0.

The third stage in the production of land management, total output of TP, the average yield of AP and marginal yield MP appeared a decreasing trend. At this time, the increase in land investment will only make the yield decrease, negative return. The fundamental reason is that the land resources of excess.

In the three stage of the production, the scale of the land in the second stage is the best option. In this stage, the farmers will receive a more significant income. In reality, the

small plots of land for the general farmers will help to achieve the effect of the second stage, and expand the scale of agricultural business, so as to reach the best stage of production. At the same time, the land transfer is the optimal strategy of agricultural management and ordinary farmers, namely Nash equilibrium; the two sides have realized their own interests to maximize. At the same time, the implementation of land management rights transfer system in rural areas to promote the coordinated development of the three, is conducive to boosting the process of agricultural modernization, accelerate the realization of a well-off society in an all-round way.

Conclusions and Outlook

Conclusions

Based on the game analysis of the general farmers and agricultural management major, it is found that whether the land is able to transfer depends on whether the income of the agricultural management major and the ordinary peasant household is maximized. Only the expected return to the transfer and the transfer of the land before the land transfer has been improved, the land transfer can be carried out smoothly as scheduled. Land "good" and "poor" does not affect the transfer of land, "good" and "poor" can be used in different purposes to the rational allocation of land resources, thereby promoting the transfer of land. For ordinary farmers, the traditional small-scale agricultural production cannot bring them high efficiency, low cost economic benefits. In terms of agricultural management, through the land transfer to expand the scale of agricultural production, so as to form the scale of operation, can effectively expand their profits, improve agricultural productivity. At the same time, the land circulation between large farming operations and ordinary farmers must under the guidance of the government's positive role, both symmetric information exchanges, in order to make the two sides are willing to accept the transfer of land, so as to realize the two sides to maximize profits, to reach the Nash equilibrium.

Outlook

Increase publicity efforts to improve farmers' awareness of the circulation of land management rights. At present, many farmers are still skeptical about the land transfer system, the concept of land management rights transfer system is not clear enough, resulting in a sustained low land turnover. In order to popularize the circulation system of the land management right, the government should strengthen the farmers' land circulation ideology and protect the legitimate interests of the farmers' land transfer, which is the primary prerequisite for the realization of land circulation.

Improve the rural social security system, eliminating the worries of farmers. Land is the resources upon which the survival of farmers is the most basic life safeguard, the farmer's income to a large extent on the dependence on land resources due to the rural social security system is not perfect, and the majority of farmers have not formed the consciousness of land circulation. Only by establishing and improving the social security system in rural areas, rural land security is weakening, take in order to change the protective measures, improve the social security system, which will give the rural land management rights transfer bring greater activity space.

The government should be an external force to ensure the smooth circulation of agricultural land. It should strengthen supervision and management and standardize the market operation through various means such as law, economy, finance, and promote

the rational and orderly transfer of agricultural land. At the same time, the government should implement the information exchange system to realize the symmetry of the supply and demand information of both sides of the land circulation, to avoid or reduce the emergence of the third party intermediary trade barriers. The government can establish the rural land circulation cooperation Station in the town to update the information of land circulation in real time, and guide the land supply and demand of land supply and demand in order to complete the land circulation. At the same time, it should also regulate and improve the land transfer mechanism to ensure that the transfer side and the transfer side from the land transfer to get practical benefits and benefits.

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References

- [1] Zhang Ying, Deng Tenglin. Analysis on the circulation of rural land management rights. *technology and life*, 2010, (11): 202.
- [2] Liu Lijun. Comparative study on the performance of rural land transfer mode. Beijing: China Economic Publishing House, 2011, 49-55.
- [3] Zhang Yangwu, Yu Fang, Lu Peng. Rural land contracted management right circulation status: an interpretation. *Economic Research Journal*, 2006, (5): 52-55.
- [4] Xie Shiyu. *Economic game theory*. Shanghai: Fudan University Press, 2002, 40-43.