

LETTER TO THE EDITOR**Spatial Eco-Efficiency Measurement of Agriculture Based on Knowledge Management**Hui Wu¹, Xuming Shangguan^{2*}¹School of Finance and Economics, Xinyang Agriculture and Forestry University, Xinyang 464000, China²School of Business, Xinyang Normal University, Xinyang 464000, China

*Email: xmshangguan@163.com

In order to improve the allocation efficiency of knowledge resources in industrial technological innovation, the theory design of utility, niche and knowledge management is integrated. Based on the coordination model of industrial technological innovation based on the ecological evolution of knowledge transfer, the knowledge input of members under Nash equilibrium and Pareto equilibrium is analyzed by combining qualitative and numerical examples, and the generation of stock knowledge, incremental knowledge and alliance knowledge is revealed, evolution mechanism of state relations. The research shows that incremental knowledge, knowledge transfer capability coefficient and knowledge transfer willingness coefficient have great influence on the evolution equilibrium and input-output utility of knowledge transfer among members. By taking incremental knowledge as the core driving force, coordinating the three kinds of knowledge transfer capability coefficient and willingness coefficient in alliance, building interdependent knowledge symbiosis relationship is conducive to promoting the orderly growth of knowledge and improving industry. The Efficiency of Knowledge Resource Allocation in Technological Innovation to Promote the Effectiveness of Members and Alliances.

Ecological garden; Green space structure; Detection; State.

1 INTRODUCTION

Industrial technology innovation alliance is an important carrier for the implementation of national innovation strategy. The construction and development of industrial technology innovation alliance is helpful to integrate industrial technology innovation resources, guide innovation elements to gather to enterprises, form a complete technological innovation chain, and improve the ability of industrial technology innovation. It is an effective way to enhance the core competitiveness of industry. Through the transfer and integration of organizational resources within the alliance, the alliance members can provide much-needed resources such as capital, technology, talent, information and knowledge for industrial technological innovation, so as to improve the ability of industrial technological innovation. Therefore, resource transfer and coordination has become one of the key links in the operation of industrial technological innovation.

In the process of cooperation of industrial technological innovation alliance, knowledge is one of the most important resources of alliance coordination, and knowledge transfer has become the key link for alliance

members to obtain competitive advantage. From the perspective of knowledge management, different from the coordination of general tangible resources, knowledge resources, as an important factor of production in industrial technological innovation, will form ecological relations within individual members and among alliance members in the production process. Its knowledge nature, evolution, equilibrium and other aspects show the following characteristics: (1) Industrial technological innovation is committed to promoting the technological development and promotion of the whole industry; (2) Alliance uses Specialization Division of Labor and Cooperation to realize Cross-organizational Resource allocation; (3) Give full play to the advantages of cross-organization knowledge resource allocation. Therefore, to study the mechanism of knowledge transfer and its influence on knowledge input and output, and to explore how to improve the efficiency of knowledge resource allocation, has become a problem of high theoretical research and application value in promoting the development of industrial technological innovation alliance.

Xiangfei Yang, Gu Du, Mengna Li Parnell published an article entitled “Environmental Study of Purchasing Strategy Based on Supply Disruption via Option Contracts for Agricultural Supply Chain” on Issue 107 of Ekoloji in 2019. From the practical and academic point of view, this paper focuses on agricultural supply chain management and points out that procurement strategy has long plagued the purchasers. This paper studies the supply interruption risk faced by supermarket purchasing. Suppose a two-level option agricultural supply chain consisting of agricultural cooperatives and supermarkets. Through numerical examples, the performance of different procurement strategies under supply interruption is compared (Khdary et al. 2018).

(Hou and Yao. 2018) proposed that in order to explore the influence of rural labor transfer on agricultural production under environmental constraints, based on the data of inter-provincial panel data from 1978 to 2016 in China, the super-efficient SBM model was used to measure the agricultural ecological efficiency. On the basis of STIRPAT model, the spatial panel econometric model and panel threshold regression model are established to explore the spatial spillover effects and threshold characteristics of the impact of rural labor transfer on agricultural ecological efficiency. This paper suggests that the formulation of agricultural production policy must take into account the spatial dependence and heterogeneity between regions, combine with the present situation of rural labor structure changes in the region, strengthen the cooperation and exchange of agricultural production between regions, and strengthen the cooperation and exchange between regions, and with the agricultural ecology. Coordination of food security; In view of the above problems, this paper proposes a spatial econometric study of agricultural ecological efficiency based on knowledge management.

2 IDEA DESCRIPTION

In the existing research on knowledge transfer in alliance, knowledge is regarded as an overall variable, and knowledge is rarely divided into dimensions, and the interaction mechanism of multiple kinds of knowledge in alliance is discussed (Liu et al. 2017).

The existing research mainly adopts game theory, empirical research and other methods, although some scholars begin to pay attention to knowledge transfer from the ecological point of view, rarely combined with the industry-oriented characteristics of industrial technological innovation alliance knowledge input. The niche of different knowledge in ecosystem was analyzed, and the ecological evolution of knowledge transfer was studied (Ma et al. 2018).

However, based on the analysis of the characteristics of the knowledge nature, evolution and equilibrium of the industrial technology innovation alliance, it is not difficult to find that the input knowledge of the industrial

technology innovation alliance has a certain industrial orientation, value and exiguousness, and various knowledge from different dimensions will form different levels and interrelated ecological relations, and its knowledge transfer will show a polymorphic evolutionary characteristics. Inter-organizational knowledge resource allocation efficiency has a great impact, and even forms a low-efficiency evolutionary equilibrium (Liu et al. 2018). However, the existing research has not yet combined this new feature to coordinate the decision-making of the main bodies, and failed to give full play to the advantages of specialized division of labor and cooperation of knowledge resources and release the synergistic multiplier effect. There are still “gaps” in this area, and it is necessary to carry out in-depth analysis. Based on the above analysis, this paper explores and reveals the relationship and evolution process of knowledge transfer among members of industrial technological innovation alliance from the perspective of ecology, combining with the characteristics of industry-oriented ecological evolution of knowledge in industrial technological innovation alliance, which is expected to provide theoretical reference for optimizing the allocation of knowledge resources in industrial technological innovation alliance (Ren et al. 2010).

3 RESULTS

According to the definition of industrial technological innovation alliance, this paper establishes that the members of the alliance are composed of scientific research institutes, universities and enterprises. In order to break through the common and key technologies before product competition, the alliance spontaneously establishes industrial technological innovation alliance with complementary advantages, sharing risks and sharing benefits. According to the difference of division of labor among members of the alliance, the alliance is divided into application development and basic research, the former is mainly undertaken by enterprises (set as x_1), The latter is mainly undertaken by universities and research institutes (set as x_2) (As shown in figure 1).

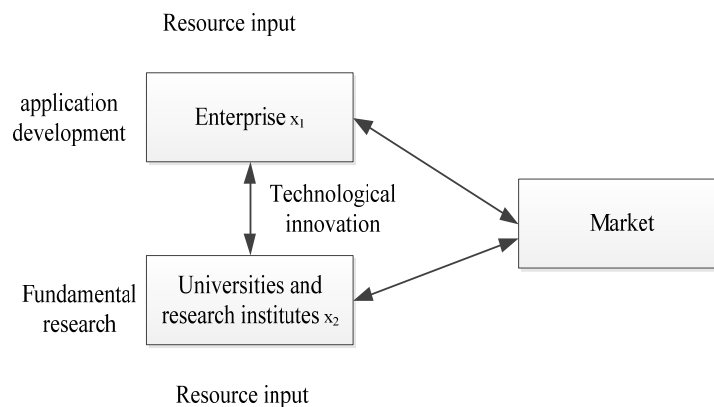


Fig. 1 traditional technological innovation

4 DISCUSSION

The input knowledge of industrial technology innovation alliance has certain industry orientation, and the ecological evolution of knowledge transfer is an important feature of knowledge management in the alliance. In this paper, the coordination model of industrial technology innovation based on the ecological evolution of knowledge transfer is designed by integrating utility theory, knowledge management and niche theory. The qualitative and numerical examples are analyzed to analyze the impact of knowledge transfer on innovation profits.

The following conclusions can be drawn:

Based on the theories of knowledge management and niche, this paper divides the knowledge in alliance into stock knowledge, incremental knowledge and alliance knowledge, designs an industrial technological innovation coordination model based on the ecological evolution of knowledge transfer, reveals the mechanism of knowledge transfer in industrial technological innovation alliance, expands a new perspective of knowledge transfer research, and makes the knowledge transfer of Alliance enter a deeper understanding;

Aiming at the ecological evolution characteristics of knowledge transfer in industrial technology innovation alliance, the knowledge input-output utility model based on improved Cobb-Douglas function and the knowledge transfer ecological relationship model based on improved Lotka-Volterra are constructed. The traditional input-output profit model is grafted with Lotka-Volterra model, and the traditional input-output utility model function modeling method is extended.

Based on the mechanism of knowledge transfer in industrial technology innovation alliance, by constructing interdependent ecological relationship, it can effectively promote knowledge transfer and internalization among alliance members, reduce the input of individual members and alliance knowledge, and provide theoretical support for the alliance to improve the efficiency of knowledge resource allocation.

The data extraction stability of this algorithm is higher, because this paper classifies and summarizes the operations in the spatial source database of agricultural ecological efficiency in the process of data extraction, and then realizes incremental data extraction, which improves the extraction efficiency of the algorithm.

5 CONCLUSIONS

The research process and conclusion of this paper have certain enlightening effect on optimizing the allocation efficiency of knowledge resources across organizations and promoting the development of industrial technological innovation.

This paper compares and analyses the effectiveness of knowledge input-output under centralized decision-making and decentralized decision-making, and finds that centralized decision-making is conducive to integrating more knowledge resources of members of industrial technology innovation alliance.

Considering that the input knowledge of industrial technological innovation alliance has a certain industrial orientation, the alliance should coordinate the stock knowledge, incremental knowledge and the coefficient of transfer intention in alliance knowledge, and adjust the niche relationship of the three types of knowledge. Give full play to the link between incremental knowledge and stock knowledge and alliance knowledge, so as to optimize the efficiency of knowledge resource allocation across organizations.

It is the key of building knowledge ecosystem to strengthen the recognition and transfer ability of knowledge and stock knowledge. Therefore, the members of the Alliance should improve their own knowledge transfer capacity coefficient, improve the level of knowledge transfer and absorption ability, promote the orderly transfer and flow of knowledge within the alliance, realize the efficient balance of knowledge transfer and promote the internalization of knowledge.

Based on the improved Cobb-Douglas function, this paper establishes the knowledge input-output utility model and the knowledge transfer ecological relationship model based on Lotka-Volterra model. The next step is how to combine the specific industrial technological innovation alliance, consider the individual characteristics and value of the stock knowledge and incremental knowledge, and put forward the strategy of promoting the knowledge input of alliance and achieving the "satisfactory" utility, the focus of further research in the future.

ACKNOWLEDGEMENTS

The work was supported by Henan Social Science Planning Project (No. 2017BJJ052); Humanities and Social Sciences Project of Henan Education Department (No. 2019-ZDJH-288); Key Scientific Research Projects of Higher Education Institutions in Henan Province (No. 19A790019); Training Plan for Young Backbone Teachers in Colleges and Universities in Henan (No. 2017GGJS103).

REFERENCES

- Hou MY, Yao SB. (2018) Spatial spillover effects and threshold characteristics of rural labor transfer on agricultural eco-efficiency in China. *Resources Science* 40 (12):149-160.
- Khdary NH, Ghanem MA, Abdesalam ME, Al-Garadah MM (2018) Sequestration of co₂ using cu nanoparticles supported on spherical and rod-shape mesoporous silica. *Journal of Saudi Chemical Society* 22 (3):343-351.
- Liu BL, Zhang C, Wang H, et al. (2017) An Empirical Study on the Development of Regional Circular Economy Based on Ecological Efficiency: A Case Study of Jiangsu Province. *Meteorological & Environmental Research* (5):78-86.
- Liu R, Wang D, Zhang L, et al. (2019) Can green financial development promote regional ecological efficiency? A case study of China. *Natural Hazards* 95 (1-2):325-341.
- Ma X, Li Y, Zhang X, et al. (2018) Research on the ecological efficiency of the Yangtze River Delta region in China from the perspective of sustainable development of the economy-energy-environment (3E) system. *Environmental Science & Pollution Research* 25 (29):29192-29207.
- Ren ZG, Zhu ZP, Zhang LZ, et al. (2010) Dynamic recycling of storage space in circulating queue. *Automation & Instrumentation* (6):42-44.

