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Analysis on Knowledge Innovation Efficiency of Agricultural Sci-tech Journal Community: Perspective of Knowledge Communication

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Abstract. As a key content of the development of agricultural science and technology disciplines, the construction of the journal community has a strong practical significance in carrying out research on its knowledge innovation effectiveness. The effectiveness of knowledge innovation in the community of agricultural sci-tech journals was evaluated by using the non-parametric DEA-Tobit two-step model combined with the "Citation Report of Chinese Sci-tech Journals (Expanded Edition)", and the factors that affect the efficiency of the knowledge innovation in the journal community were argued. The conclusions are as follows: (1) Overall, the achievement of knowledge innovation in the community of agricultural sci-tech journals still has 34.4% of optimization space. The low efficiency of pure technology has a big impact. (2) There are large differences in the journal community, among which "Beijing Agriculture" "Higher Agricultural Education", such as "Quality and Safety of Agro-Products", "Journal of Agricultural Sciences", "China Agricultural Technology Extension", "Chinese Journal of Agrometeorology", and other 12 journals have relatively stable knowledge innovation efficiency. In addition, the technical efficiency, pure technical efficiency, and scale efficiency value are all 1. (3) The academic quality of journal papers is an important factor in the efficiency of journal community knowledge innovation. "The duration of the publication" and "The economic status of the region where the journal is located" are also positive factors affecting the efficiency of knowledge innovation in journals of agricultural science and technology. The variables such as "The degree of cooperation in journals", "The degree of journal globalization" and "The distribution of journal dissertation institutions" have limited impact on the efficiency of the journal community's knowledge innovation. In addition, due to the weak timeliness of agricultural science and technology literature, the author's utilization of "Citation half-life" as a measure of the degree of novelty of the use of the literature as a whole affects the performance and expectations of knowledge exchange.

Key-words: Journal community, agricultural sci-tech, knowledge innovation, knowledge dissemination, technical efficiency.

1. Introduction

As a social group with common academic ideals and behavioral goals, the academic community has played an enormous role in prospering academic and service innovations and is an important indicator of the strength of the country's cultural soft power. The range covered can be as large as academic organizations worldwide, or related disciplines, or as small as a research collaboration team in a specific research direction. Internal members of these organizations must follow a common paradigm and accept the same value standards. They have regular and thoroughly professional and ideological exchanges, and they are scientists' groups that generate knowledge [1]. Therefore, it is not difficult to discover that the basic function of the "academic community" is knowledge production and knowledge dissemination. Academic journals, as the current more novel social organization form of "academic community", can be represented as a community of research scholars, a journal platform community, an academic achievement community, an editorial academic community, an academic normative community, and an academic evaluation community[2]. The role of production, knowledge representation and knowledge dissemination applications and academic evaluation is more prominent. In fact, the active role of the journal community has been widely recognized. For example, the gradual promotion of the "backup policy" of the American Social Sciences Journal not only promotes the formation of a more organic academic research community in the U.S. social sciences but also promotes the development of U.S. social sciences [3]. Other scholars in China have also expressed "Building a journal community, which can enhance the service function and evaluation function of the journal, and can also play an active role in constructing the academic community." [4]. Focusing on research related to knowledge innovation in the academic journal community, in terms of current status analysis, research findings [5], China's current "recognition of journals" mechanism blindly advocates the core journal system based on "scientific metrology" transplanted from the West, resulting in the break between the "recognition of journals" and the "recognition of community", resulting in the failure of China's academic knowledge production drive mechanism. After that, with the help of the analysis of core journal articles in the field of journalism in past years, it has been found that the knowledge production of Chinese advertising has not yet formed a real scientific community, but it cannot be denied that the construction of advertising knowledge production science community has a certain basis and conditions, and shows a good growth and trend [6]. To this end, it is suggested that academic journals, as the morphological orientation of the scientific community, not only consider the object orientation of the carrier of knowledge transmission but also regard it as the subject of the promotion of knowledge growth [7]. Related research also talked about how to use new ideas and new technologies to build Chinese academic communication platforms with international influence, and then participate in and even lead the reconstruction of the international academic communication order, which is a realistic and urgent task [8]. As for the influence of journal publishing model on knowledge innovation, the priority digital publication of academic journals is considered to be related to the dissemination and growth speed of scientific knowledge. It is a groundbreaking work with revolutionary significance in the construction of scientific knowledge [9]. In the evaluation of the journal community, the study clarified the status of the journal in academic evaluation. The evaluation that the academic evaluation should return

to the academic community has basically become the consensus of the academic community, and the evaluation by the representatives of the academic community based on "public opinion" and accepting supervision is the only way to solve [10]. The most appropriate platform for expressing "public opinions" and monitoring is currently academic journals. In addition, evaluation bodies, as one of the key influencing factors for authoritative journal evaluation results, should present multiple trends, with particular emphasis on academic communities. The regression of readers and editors [11], in fact, the existing CSSCI selection criteria cannot fully and truly reflect the influence of legal journals, and even have an adverse effect on the knowledge production of law. As an important amendment, the law journals, as the degree of mutual citations can reflect the influence of various legal journals in the field of law on knowledge production [12]. Academic journals and academic communities have multiple interactions in the production of academic knowledge, knowledge diffusion, and knowledge evaluation. Specifically, the relevant research on the production and dissemination of knowledge in the journal community is slightly insufficient. By introducing the Index H and the Index G, The 22,961 tourism core academic papers collected in 2003-2016 are academic evaluations of the tourism academic community for the full sample [13]. In addition, a small amount of quantitative research focuses on the analysis of the "knowledge exchange efficiency of journals", among which non-parametric economic mathematical models have been established. For example, the DEA-Tobit two-step method [14], the stochastic frontier analysis method SFA estimation [15] and the Super-SBM model application [16], in addition to the method of journal citation network analysis [17], The research paradigm of "Journal Knowledge Exchange Efficiency Evaluation" will be followed, but unlike previous studies, taking into account the differences in disciplines, this paper uses the "Chinese Journal Citation Report (Provide Edition)" as a source of data, which is consistent with the classification of journals. Considering the coherence of data, 87 sample journals classified in agricultural science and technology (based on the category of C01 journals) were selected. Points do quantitative analysis on agricultural science and technology journals community knowledge innovation performance. As we all know, agriculture, as a basic and strategic industry, is the priority area for the implementation of China's innovation-driven development strategy. Through modernization and technological innovation, modern agricultural development will effectively serve the overall state of modernization of the country. This reality has stimulated the field of agricultural science and technology. The research boom is more focused on the evolution of the fundamental principles of agricultural science and technology than on past research. This research focuses on the exploration, production, dissemination and innovation of agricultural science and technology related academic knowledge, and clarifies the current domestic The journal publication Agricultural science and technology knowledge innovation effectiveness and key influencing factors, related research not only gave birth to the formation of a new academic community, but also will provide some guidance on the sustainable development of agricultural science and technology research. Therefore, with the help of the citation data of the academic journal community in this hot field, the study of its knowledge innovation performance has certain realistic representation, and it also expects to provide some references for the development and deepening of related theories driven by agricultural innovation.

2. Research Methods and Index Selection

2.1. Research Methods

This research is based on the perspective of dissemination of academic knowledge, utilizing the citation reports from Chinese agricultural science journals and the usage of DEA to evaluate the effectiveness of community knowledge innovation in Chinese agricultural science and technology journals. It serves as an important carrier for knowledge exchange and learning innovation, and journal citations and sources are in imperfectly competitive markets. It is difficult to achieve the best scale under government, government, and fiscal constraints. Therefore, in the field of non-parametric economic mathematical model construction, Afriat, Fare, Grosskopf, and Logan, as well as Banker, Charnes, and Cooper, etc., have actively expanded the use of VRS in the DEA model [18]. VRS can measure technical efficiency without affecting the scale change, and the estimated result is more in line with the actual situation. Therefore, the VRS model is used in the evaluation of the knowledge innovation efficiency of agricultural science journals based on the journal citation report. In addition, because of specific evaluation of the performance of the journal community knowledge innovation, in order to achieve a specific academic output, it is easier to control the academic input variable, so scholars are also more inclined to use the method in the input-oriented model.

$$\begin{cases} \min\limits_{\theta,\lambda} \theta^k \\ s.t. \theta^k x_{n,k} \geq x_{n,k}\lambda_k \\ y_{m,k}\lambda_k \geq y_{m,k} \\ \lambda_k \geq 0 (k = 1, 2, \ldots, 87) \\ \sum_{k=1}^{87} \lambda_k = 1 \end{cases} \tag{1}$$

In formula (1), a total of 87 DMUs are involved in the formula. Each DMU has n inputs and m outputs, and for the first DMU, column $x_{n,k},\ y_{m,k}$, represent the academic input and academic output of the agricultural science journal community. That is, the $N \times 1$ input matrix $x_{n,k}$ and the $M \times 1$ output matrix S represent k inputs and outputs of a DMU. λ_k is the weighting factor of the first n input and m output. θ^k is the relative efficiency of the DMU, which is located in the [0, 1] range [19]. The efficiency is higher closer to 1, also, defining $x \geq 0$, $y \geq 0$and $n = 2,\ m = 6$.

In order to clarify the influencing factors and degree of knowledge innovation effectiveness of the agricultural science and technology journal community, the DEA-Tobit two-step method was used in the study. This method is based on the evaluation of the knowledge innovation effectiveness of the aforementioned agricultural science and technology journal community and then utilizes the efficiency value as a dependent variable to do a regression on various influencing factors. The regression equation coefficient and direction can be practiced to judge the degree and direction of performance impact. The standard form of this method is:

$$\begin{aligned} Y_i^* &= \beta X_i + \varepsilon \\ Y_i &= Y_i^*,\ if\ Y_i^* > 0 \\ Y_i &= 0,\ if\ Y_i^* \leq 0 \end{aligned} \tag{2}$$

As above, Y_i^* is the dependent variable vector, Y_i is the efficiency vector, X_i is the independent variable vector, β is the correlation coefficient vector, in addition, it is also defined as $\varepsilon_i \sim N(0, \delta^2)$, $Y_i^* \sim N(0, \delta^2)$.

2.2. Data and Index Selection Instructions

In order to meet the DEA method usage conditions as much as possible based on the scientific requirements of index design, the selection of research indicators mainly comes from the 2017 edition of "China Science and Technology Journal Citation Report (Expanded Edition)". This report can be used to quantitatively analyze and scientifically evaluate the academic characteristics of journals. Disciplinary status can objectively reflect the development trends and laws of the periodic community knowledge innovation. In the selected journals that specifically selected the effectiveness of knowledge innovation, the following treatment was done: There are 99 titles of journals in the 2017 edition of the "Citation Report of Chinese Sci-tech Journals (Expanded Edition)" were classified in the agricultural science and technology category (the journals were classified as agricultural comprehensive, code C01). And there are defaults on the "expanding impact factors" and other key indicators in 7 publications such as "Rural Scientific Eriment", "Nong Jia Ke Ji" and "Nong Chun Xin Ji Shu", "Rural Science and Technology" and "Chinese Rural Science and Technology". "Frontiers of Agricultural Science and Engineering (English Version)" and other five publications have defaulted on key indicators such as "average number of citations" and "expanded subject impact indicators", and comprehensively consider the consistency of journal statistics classification, data consistency, and research data availability. It finally selects 87 of them.

The analysis assumes that all the journals being evaluated have the same luck in their operations. On this basis, the academic input and output indicators for the evaluation of the effectiveness of knowledge innovation in the community of agricultural science and technology journals should ensure a high degree of relevance, and satisfy: the input and output elements are the same and both are positive. Secondly, the indicators reflect the major innovations in the process of journal community knowledge. Thirdly, different academic input and output indicators have different dimensions. Finally, considering the scientificity, rationality, and completeness of the indicators, the evaluation index system chosen in this paper is shown in Table 1:

Table 1. Academic "input" and "output" index for knowledge innovation performance in the community of agricultural sci-tech journals

Index Classification	Academic Input Index		Academic Output Index					
Index	Source Amount of Documents	Average Citations	Per Article Cited Frequency	Extended Impact Factor	Extended Index H	Diffusion Factors	Expanding Disciplinary Impact Index	Extended Citation
Dimensions	Articles	Articles	Times/ Articles	-	-	-	-	Books
Minimum	43	0	0.11	0.06	2	6.92	0.13	47
Maximum	4775	63.8	33.3	6.12	21	57.91	0.79	2640
Average	727.01	13.45	6.293	0.717	6.989	28.727	0.534	508.8
Standard Deviation	986.57	11.326	6.139	0.758	3.029	11.617	0.163	383.155

Notes: After the decimal point, the value is rounded off and three places are reserved as much as possible. (The same below)

Among them, the index of academic input for the community of agricultural science and technology journals selected the source literature (Articles) and the average number of citations (Articles). These two variables reflect the unification of the absolute quantity and the relative quantity. The source document volume is interpreted as the total number of papers published in the current year, which is the source of the citation data of statistical journals, reflecting the breadth of academic investment in evaluating journals. The average number of citations refers to the number of references cited by each paper, which can reflect the depth of investment in the evaluation of academic journals to some extent.

Output indicators cover the number of articles cited times (Times/Articles), extended impact factors, extended Index H, Diffusion Factors, Expanding Disciplinary Impact Index, and Extended Citation, among which articles are cited as frequency extensions of total cited frequencies. The ratio of source documents shows the extent to which evaluation journals are used and valued. The extended impact factor and expanded Index H are fair indicators of current academic journals' academic output levels and influence. Both of these indicators can reflect agricultural science and technology. The depth of the academic output of knowledge innovation in the journal community; the specific meaning of the diffusion factor index is the number of journals involved in each journal 100 times cited in the year of the journal, indicating the scope of the journal's total number of times it has been cited. The extended discipline impact index refers to the discipline. The number of internal citations to the journal accounted for the total number of journals. In addition, the extended citations refer to the number of cited citations, reflecting the scope of the journal being used. These three indicators reflect the knowledge of scientific journals to varying degrees and the breadth of innovative academic output.

In general, the choice of efficiency factors that affect the journal community's knowledge innovation in research needs to take into account various factors within and outside the journal community's knowledge exchange, including the academic quality of the journal itself, the novelty of the journal's literature, the degree of cooperation in journals, and the degree of journal globalization. Journal dissertation agencies and regional distribution, publication time, etc. are internal factors, and external factors must consider the economic conditions of the region where the journal is located. Considering the appeals of index design features, the rationality of indicators, and data availability in the Citation Report, the following variables are selected. (1) Journal Academic Quality. The journal paper is the main carrier of knowledge innovation, and its academic quality determines the efficiency of knowledge innovation. This paper selects "fund paper ratio", that is, the ratio of all fund-funded papers to all papers. (2) The novelty of the literature is used by the author. The current knowledge exchange is changing with each passing day. Many journal papers pursue the pursuit of academic frontier innovation as the main driving force, emphasizing the novelty of the papers, which is also an important aspect of the quality of journals. In the text, we utilize the reference half-life to represent. (3) Degree of cooperation in the journal. As an important means for the academic community to disseminate academic consensus, the dissertation has great significance in the discovery of new technologies and new knowledge and the subsequent knowledge innovation. This article is characterized by the average number of authors of journal papers. (4) The degree of journal globalization. The internationalization of knowledge innovation has become an important trend in the current development of journals. It is an important aspect of measuring the influence of journals. This paper selects the "overseas paper ratio" to represent. (5) The distribution of journal paper institutions, which can measure the coverage and dissemination of journal paper knowledge. The influence is also the performance of the internal quality of journal papers. It is expressed in terms of "institutional

distribution number" in the text. (6) The time of running the journals, the time of academic journals carrying the changes of the times and the innovation of the concept of running journals are the accumulation of journal quality. The "period of publication" in the article is represented by the length of time between the publication of the journal and the time of 2016. (7) The economic status of the region in which the journal is located. In general, the exchange and dissemination of knowledge in the journal community as a manifestation of regional cultural soft power has a positive correlation with the economic conditions in the region. This article uses the economic status (GDP) of the region in which the journal was published.

Table 2. Prediction of the assignment of factors, statistics and influence directions

Explanation Variables	Assignment Description	Minimum	Maximum	Average	Standard Deviation	Prediction direction
Quality of academic journals	The ratio of "funds to papers", roughly papers funded by various types of funds account for the ratio of all papers	0.01	1	0.558	0.378	+
The novelty of the literature used by authors	Citation half-life	3.39	40.57	7.588	4.488	-
The degree of cooperation in journals	The average number of authors of journal articles(one)	1.20	6.27	3.556	1.603	+
The degree of journal globalization	"Overseas Paper Ratio" selection	0	0.15	0.012	0.025	+
Institutional distribution of journal articles	Using "institution distribution number" to represent(one)	12	3729	542.26	753.762	+
The duration of the publication	It is characterized by the length of the journal publication (unit: year)	6	69	35.954	14.523	+
The economic status of the region where the journal is located	The economic status (GDP) of the region is indicated by in which the journal was issued (unit: 100 million Yuan)	258.78	27466.15	10947	8930.911	+

Notes: Statistical values of the influencing factors in the table are listed on the 2017 Citation Report of Sci-tech Journals. The fund paper ratio, citation half-life, average authors, overseas paper ratios, and institutional distribution figures are all from the journal citation reports. The place of publication is from the China Knowledge Network or the VIP Journal Network. The economic status of the region where the journal is located comes from the "Statistical Bulletin of China National Economic and Social Development 2016".

Tables 1 and 2 list the inputs and outputs of the knowledge-innovation efficiency of the agricultural S&T journal community and the explanatory notes and statistical values of the influencing factors. It is found that in the journal community knowledge innovation, the amount of academic literature, such as the number of sources of the different journals, the average number of citations, etc. The number of academic publications such as expanded quotations, diffusion factors, and averaged citations were all more pronounced, which was influenced by the academic ecology of journal community knowledge innovation, journal management models, and random disturbance factors. Among the factors affecting the effectiveness of journal community knowledge innovation, the statistical results show that due to the characteristics of regional agricultural development and discipline evolution, the distribution of agricultural science journals is widely distributed, with the exception of Hong Kong, Macao, and Taiwan (the same below), 31 provinces in China, The autonomous regions and municipalities directly under the Central Government all involved, but in general, the locations of northern cities are many. For example, 19 agricultural science and technology journals are published in Beijing, 4 are in Changchun, and Harbin, Shenyang, and Zhengzhou have 3 in each. In addition, most of the regions are provincial capitals (including capitals and municipalities directly under the Central Government) or key cities in the provinces, and the economic base for the publication is relatively good, but

at the same time, the total economic output varies greatly among the regions. Among them, the publication city of "Shanghai Academy of Agricultural Scitech" in Shanghai. The economic situation in the region was best at 2,496.651 billion Yuan in 2016. The location of "Chinese Journal of Tropical Agriculture" is in Zhangzhou, Hainan Province, was the lowest with only 25.878 billion Yuan. Broadly, the average number of institutions reached 542.26, among which the number of institutions for the publication of "Anhui Agriculture" in Hefei was as high as 3,729, and the number of "Tibet Journal of Agricultural Sciences" sources reached at least 12. The periodicity of the journals of agricultural science and technology were relatively long. The publication period is 35.954 years. The "Science and Technology of Tianjin Agriculture and Forestry" has the longest running time. As of 2016, it has been 69 years old. "Hubei Agricultural Sciences" and "Shaanxi Journal of Agricultural Science" were all in 1955. The latest issue of the "Journal of Agricultural Catastrophology" and "Nong Jia Ke Ji (Late Edition)" journals were published in Hefei and Chongqing respectively in 2011. Currently the Chinese agricultural science and technology journals are published mainly in Chinese and "Journal of Integrative Agriculture (English Version)", "Agricultural Science & Technology (English Version)", "Frontiers of Agricultural Science and Engineering (English Version)" and other 3 pure English magazines, Papers also showed a trend of co-operative to accelerate the trend, the number of papers were published as 3556, but at the same time international agricultural journals lagging behind the average of all samples journal papers overseas than only 1.2%.

3. Empirical Analysis of the Performance Measurement of Knowledge Innovation in the Community of Agricultural Sci-tech Journals

3.1. Measurement of Knowledge Innovation Performance of Journal Community

This paper uses DEAP2.1 software to measure the community knowledge innovation in agricultural science journals. The analysis results show that the average technical efficiency of the 87 journals measured is 0.656, the average pure technical efficiency is 0.793, and the average scale efficiency is 0.835 when comprehensively considering management inefficiencies, environmental factors, and random interference. Therefore, if the current level of academic input is maintained, there is still 34.4% of optimization space for the achievement of knowledge innovation in the community of agricultural sci-tech journals, while the pure technical efficiency and scale efficiency have 21.7% and 16.5% of the optimization space respectively, and the performance of the journal community knowledge innovation. Due to the fact that the efficiency of pure technology is not high, the increase in the efficiency of scale is also an important way to improve the efficiency of knowledge innovation in the community of agricultural science and technology journals. See Table 3. In addition, "Beijing Agriculture", "Higher Agricultural Education", "Ancient and Modern Agriculture", "Quality and Safety of Agro-Products", "Nong Cun Shi Yong Ji Shu", "Journal of Agricultural Sciences", "Science and Technology of Tianjin Agriculture and Forestry", "Tibet Journal of Agricultural Sciences", "New Agriculture", "Yunnan Agricultural Science and Technology", "China Agricultural Technology Extension" and "Chinese Journal of Agrometeorology" have a relatively stable knowledge innovation efficiency in 12 journals, and all of them have a technical efficiency, pure technical efficiency, and scale efficiency value of 1.

Table 3. The average technical efficiency of various types of knowledge innovation in the community of agricultural sci-tech journals

	Overall Efficiency		
Type of Efficiency	Technical Efficiency	Pure Technical Efficiency	Scale Efficiency
Average	0.656	0.793	0.835

Table 4 shows the distribution of knowledge efficiency in the community knowledge innovation technology of agricultural science journals. Among the 87 evaluated sample journals, the overall performance level has a large room for improvement. There are 21 technical efficiency values below 0.5, accounting for 24.138% of the total number of journals. In addition, there are more samples with technical efficiency values in the range of 0.5-0.8, accounting for 41.379% of the total, and there are 30 technical efficiency values higher than 0.8, accounting for 34.483% of the total number of journals, of which the knowledge innovation of 12 journals such as "Higher Agricultural Education", "Quality and Safety of Agro-Products" "New Agriculture", and "Chinese Journal of Agrometeorology" are technically effective.

Table 4. Interval distribution of technical efficiency values of knowledge innovation in the community of agricultural science journals

Technical efficiency values	<0.4	0.4-0.5	0.5-0.6	0.6-0.7	0.7-0.8	0.8-0.9	0.9-1
Quantity	14	7	15	12	9	11	19
Proportion (%)	16.092	8.046	17.241	13.793	10.345	12.644	21.839

Tables 5 and 6 are the pure technical efficiency and scale efficiency distribution of the knowledge innovation of the agricultural science and technology journals, respectively. The pure technical efficiency distribution shows that the share is 0.8-1 in the range, the proportion is 58.621%, and the overall performance is good. In this interval, pure technology has appeared effectively 36 times, such as "Scientia Agricultura Sinica", "Chinese Journal of Eco-Agriculture", "Journal of Agricultural Science and Technology" and "Chinese Journal of Agrometeorology" and other agricultural science and technology important publications, at the same time the efficiency value of less than 0.6 The number of times was 16 and it was 18.391% of the total number of journals evaluated.

Table 5. Interval distribution of technical efficiency values of knowledge innovation in the community of agricultural science journals

Pure Technical Efficiency	<0.4	0.4-0.5	0.5-0.6	0.6-07	0.7-0.8	0.8-0.9	0.9-1
Quantity	10	4	2	7	13	11	40
Proportion (%)	11.494	4.598	2.299	8.046	14.943	12.644	45.977

In terms of the scale efficiency distribution of the journal community knowledge innovation, only 11.494% of the total number of cases falls within the range of ¡0.6, and the proportions of 0.6-0.7 and 0.7-0.8 respectively account for 9.195% and 12.644% of the total. Among them, "Agricultural Science & Technology(English Version)","Modern Agricultural Science and Technology" and "Agriculture of Henan", of which 3 journal knowledge innovation scale efficiency values are both below 0.4, while "Heilongjiang Agricultural Sciences", "Jiangsu Agricultural Sciences", "Journal of Agricultural", "Bulletin of Agricultural Science and Technology", "Agriculture and Technology", "Modern Agricultural Science and Technology" and "Chinese Agricultural Science Bulletin" have a relatively low level of knowledge innovation efficiency in the seven journals. In addition, the ratios of 0.8-0.9 and 0.9-1 are 17.241% and 49.425%, respectively. Thirteen journals such as "Quality and Safety of Agro-Products", "Chinese Journal of Agrometeorology", "Journal of Agricultural Biotechnology" and "Tibet Journal of Agricultural Sciences" are valid for scale technology.

Table 6. Interval distribution of the scale efficiency of knowledge innovation in the community of agricultural science journals

Scale Efficiency Values	<0.5	0.5-0.6	0.6-0.7	0.7-0.8	0.8-0.9	0.9-1
Quantity	3	7	8	11	15	43
Proportion (%)	3.448	8.046	9.195	12.644	17.241	49.425

3.2. Tobit Regression Results

To further clarify the factors affecting the performance of the knowledge innovation in the community of agricultural science and technology journals, the efficiency of the DEA measure was used as the dependent variable, and the academic quality of journals, the degree of novelty of the author's use of the literature, and journals were used with the help of the EVIEWS 9.0 software package. The degree of co-operation, the level of internationalization of journals, the distribution of journal dissertations, the length of journals, and the economic status of the location of the publication were taken as independent variables. Regression analysis was performed, while the results are shown in Table 7.

Table 7. Interval distribution of the scale efficiency of knowledge innovation in the community of agricultural science journals

Influencing Factors	Model 1 (Technical efficiency is the dependent variable)	Model 2 (Pure technical efficiency is the dependent variable)	Model 3 (Scale efficiency is the dependent variable)
C	0.4234*** (2.5812)	0.7078*** (3.582)	0.6364*** (3.9246)
Quality of Academic Journals	0.1671 (0.7622)	0.5528** (2.0933)	-0.396* (-1.8269)
The novelty of the literature used by authors	0.0045 (0.8074)	-0.0026 (-0.3924)	0.0092* (1.6633)
The degree of cooperation in journals	-0.0145 (-0.38)	-0.0792* (-1.7227)	0.0748** (1.9835)
The degree of journal globalization	-1.2131 (-1.0506)	-1.9128 (-1.3752)	0.5496 (0.4814)
Institutional distribution of journal articles	-9.78E-05** (-2.0665)	2.16E-05 (0.378)	-0.0001*** (-2.7033)
The duration of the publication	0.0034 (1.4823)	0.0018 (0.6507)	0.001 (0.4321)
The economic status of the region where the journal is located	1.28E-06 (0.3678	-2.37E-06 (-0.5639)	5.45E-06* (1.5782)
Likelihood	17.5931	10.5172	18.0262

Notes: The four digits after the decimal point is retained have been rounded up, some of the data are in scientific notation; the Z statistic is in parentheses, and the corresponding levels for *, **, and *** are 10%, 5%, respectively. 1%. Intercept terms are positive and significant at the 1% level.

According to the empirical results of Tobit's regression model 1, model 2, and model 3, firstly, the higher the academic quality of a journal is, the higher its periodic community knowledge innovation performance is. The higher the "fund paper ratio" is, the better the knowledge production and exchange will be. Diffusion, in which the purely technical efficiency is statistically significant at the 5% level, at the same time it should also be noted that it has a significant negative impact on the scale of knowledge innovation efficiency, indicating that simply increasing the "ratio of funds" is academic in terms of agricultural technology journals. The role of influence may be saturated. Accelerating the construction of journals is more critical than the mode of running journals. Secondly, from the perspective of journal cooperation and internationalization on the negative effects of the pure technical efficiency of journal knowledge exchange, it is important for current knowledge exchange. Trends, along with the increasing degree of journal cooperation and the internationalization of journals, the overall performance of knowledge exchange in Chinese agricultural science and technology journals has not been simultaneously improved. This may be affected by the implementation of the "go global" strategy in journals management and management. The current reality is that the agricultural science and technology journals still cooperate with their authors. The globalization of the publication is also lagging behind, which can be seen from the average 1.2% "overseas paper ratio" of sample journals. Then only in view of the wide distribution of journal dissertation institutions, this situation did not bring about an increase in the efficiency of journal knowledge exchange and the technical efficiency

coefficient passed the 5% level of significant test, which is different from the study hypothesis. The possible reason is that currently, the coverage of agricultural science and technology journals and their academic influence are still insufficient. Journals brands need to be upgraded. The audience for corresponding journal articles must be further increased. Thirdly, the time and the economic status of the regions where the journals are located have an overall effect on the efficiency of journal knowledge exchange. The positive impact is generally the same as the expected direction. Generally speaking, the location of journals for agricultural science and technology is mostly provincial capitals (including Beijing) or economic provinces of each province, but it should also be noted that the contents and forms of the journals reflect obvious geographical areas. Sexual and professional, statistical analysis found that agricultural science and technology journals are distributed in 31 provinces, autonomous regions, and municipalities directly under the central government, but are relatively concentrated in the northern regions. For example, nine agricultural science and technology journals publish in Beijing and four are in Changchun, Harbin, There are 3 books in Shenyang, Zhengzhou, etc., and 5 regional agricultural science journals account for 25% of the total number of sample journals. In the end, the author's use of "Citation half-life" as a measure of the degree of novelty of the literature on the performance of knowledge exchange as a whole is opposite to the expected direction. The possible reason is that the basic principles of agricultural science and technology and technology are used as weak-time-effective knowledge. Value can be maintained for a long time, so its influence on expectations of knowledge innovation is different from expectations.

4. Conclusions

Through the analysis of citation reports of Chinese sci-tech journals over the years, this paper focuses on the evaluation of the effectiveness of knowledge innovation in the community of agricultural sci-tech journals. It also demonstrates and studies the factors that influence the effectiveness of journal community knowledge innovation. The conclusions are as follows: (1) In general, the agricultural science and technology journal community There is still 34.4% of optimization space for knowledge innovation performance, and the high efficiency of pure technology has a large impact. (2) Otherwise, "Beijing Agriculture" "Higher Agricultural Education"", such as "Quality and Safety of Agro-Products", "Journal of Agricultural Sciences", "China Agricultural Technology Extension", "Chinese Journal of Agrometeorology" and other 12 journals have a relatively stable knowledge innovation efficiency. In addition, the technical efficiency, pure technical efficiency, and scale efficiency value are all 1. (3) The academic quality of journal articles is an important influence factor of the journal community's knowledge innovation effectiveness. "The duration of the publication" and "The economic status of the region where the journal is located" are also positive factors that affect the efficiency of knowledge innovation in agricultural science and technology journals, and the variables such as "The degree of cooperation in journals", "The degree of journal globalization", and "The distribution of journal dissertation institutions" have a limited bearing on the impact of innovation effectiveness in knowledge of journal communities. In addition, given to the weak timeliness of agricultural sci-tech literature, the utilization of "Citation half-life" as a measure of the degree of novelty of the use of the literature as a whole affects the performance and expectations of knowledge exchange.

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