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Research on Performance Evaluation of Intellectual Property Operations in "Double-First-Class" Universities: Based on Dynamic Two-stage DEA Model

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Abstract: The construction of "Double-First-Class" universities is an important force of scientific and technological innovation in China, and its intellectual property operation performance has been widely concerned by the government, society and academia. Based on the data of the scientific and technological activities of 32 universities directly under the Ministry of Education, a dynamic two-stage DEA model is established to evaluate the operation performance of intellectual property rights in "Double-First-Class" universities. The results show that the efficiency of intellectual property creation and transformation in the construction of "Double-First-Class" universities is relatively high. At the end of this paper, some countermeasures and suggestions are put forward to improve the efficiency of intellectual property transformation.

Keywords: "Double-First-Class" universities; intellectual property rights; performance evaluation; DEA model

1 Introduction

With the advance of science and technology and economic development, intellectual property has gradually become an important support for world economic competition and scientific and technological innovation, as well as a strategic resource for national development and a core element of international competitiveness. In June 2008, China issued the Outline of the National Intellectual Property Strategy, which formally established the intellectual property strategy as the national strategy. The Outline proposed to build China into a country with high level of intellectual property creation, utilization, protection and management. The report of the 19th National Congress of the Communist Party of China clearly put forward that we should "advocate the culture of innovation, strengthen the creation, protection and application of intellectual property rights", and speed up the construction of an innovation-oriented country. The creation, management and transformation of intellectual property rights are the bridge from knowledge creation to productivity transformation. How to reasonably allocate effective resources to make them play a greater role has become an urgent problem to be solved.

Universities, with a strong faculty and research team, have extensive international exchanges and active academic ideas are an essential part of the national innovation system. It plays an important role in promoting national scientific and technological progress and social development. In particular, the construction of " Double-First-Class " universities, with their advantages in talent reserve and national investment, undertake multiple functions of education and training of talents, scientific research, social service, cultural heritage and so on, and become an important force in the transformation of scientific and technological achievements. According to statistics, there are 1,070 universities in China, including about 850,000 scientists and engineers, and about 360,000 personnel directly engaged in research and development. The number of invention patent authorization in universities in the past three years is about 150,000, with an average annual increase of more than 25%. In recent years, universities in China have seen an increase in patent-based intellectual property rights year by year, but the number of patents translated into productivity and economic benefits is still low[1]. How to change the low conversion rate of patent technology in universities is a difficult problem for the government and universities. The

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evaluation and analysis of the intellectual property operation performance of " Double-First-Class " universities will help to improve the level of intellectual property management and contribute to the construction of an innovative country.

In recent years, many scholars have studied the intellectual property work in universities. Chao Ji and Jianjun Xie [2] took the intellectual property management in universities as the research object, selected the index system, adopted the analytic hierarchy process and fuzzy evaluation method, established the evaluation model of intellectual property management in universities, and conducted empirical research on three universities in Zhejiang Province. Jisheng Huang[3] analyzed the current situation and existing problems of intellectual property transformation in universities in China, analyzed the factors restricting the transformation from the perspectives of universities and the government, and proposed countermeasures to promote the transformation of intellectual property in universities in China. Shuaiwei Zhou[4] analyzed the current situation and problems of patent application and transformation in universities in China, compared with the patent transformation mode in some developed countries abroad, and put forward relevant countermeasures to improve the efficiency of scientific research. Xiaodong Yuan et al.[5] analyzed the main factors affecting patent utilization in universities in China from four perspectives, including patent transaction, patent integration, patent litigation and patent marketization characteristics. The regression analysis results showed that the number of effective patents and patent integration ability owned by universities in China is positively correlated with the patent utilization rate of universities in China respectively, and the proportion of funding and the dependence of trading platform is negatively correlated with the patent utilization rate of universities in China respectively. On this basis, suggestions to promote the patent utilization of universities in China are proposed. Junrong Zhang[6], through the analysis of the evolution of the patent system in universities, found that in the design of the patent property right system with "Bayh-Dole Act" as the core, more attention was paid to the utilization capacity and efficiency of the patent, and promoted the creation and utilization of the patent in universities by increasing the incentive to inventors, guiding the innovation elements to concentrate on enterprises, optimizing the patent funding, etc., and put forward policy suggestions to promote the creation and utilization of the patent in universities in China.

2 Models and Methods

Data Envelopment Analysis (DEA) was proposed by Charnes et al. [7] in 1978 to extend the concept of engineering efficiency of single input and single output to the effectiveness evaluation of the same type of Decision-Making Units (DMU) with multiple inputs and outputs, which was mainly used to evaluate the relative effectiveness of "departments" with multiple inputs and outputs. The structure of production frontier can be determined by DEA method and model, so DEA can be regarded as a non-parametric statistical estimation method. Because there is no need to estimate parameters in advance, it has great advantages in avoiding dominant factors, simplifying algorithms and reducing errors. The most commonly used DEA models are CCR(constant return to scale) and BCC(variable return to scale) models. The two-stage efficiency problem of intellectual property creation and transformation studied in this paper exists the increasing or decreasing return to scale of DMU. Therefore, BCC model is adopted in this paper.

Suppose there are n Decision-Making Units, then the input and the output:

$$x_j = (x_{1j}, x_{2j}, \ldots, x_{nj})^T, j = 1, 2, \ldots, n$$

$$y_j = (x_{1j}, x_{2j}, \ldots, x_{yj})^T, j = 1, 2, \ldots, n$$

Where $x_j \in E^{\mathfrak{m}}, \quad y_j \in E^s, \quad x_j > 0, \quad y_j > 0 (j = 1, 2, \ldots, n)$. Then BCC model is

$$(D_{BCC}) \begin{cases} \min \theta = V_D \\ \text{s.t. } \sum_{j=1}^{n} x_j \lambda_j + s^- = \theta x_{j0} \\ \sum_{j=1}^{n} y_j \lambda_j - s^+ = y_{j0} \\ \sum_{j=1}^{n} \lambda_j = 1 \\ s^- \geq 0, s^+ \geq 0, \lambda_j \geq 0, j = 1, 2, \ldots, n \end{cases}$$

If any optimal solution $\lambda^0, \quad s^{-0}, \quad s^{+0}, \quad \theta^0$ of linear programming problems(D_{BCC})has(1)$\theta^0 = 1$, then Decision-Making Units j_0 is weak DEA efficient;(2)$\theta^0 = 1$, and $s^{-0} = 0, s^{+0} = 0$,then Decision-Making Units j_0 is DEA efficient. When non-Archimedean infinitesimal quantities are introduced, the following linear programming problems can

be obtained:

$$(\bar{D}_z)\begin{cases}\min\theta-\varepsilon\left(\hat{e}^T\,\mathrm{s}^-+\mathrm{e}^T\,\mathrm{s}^+\right)\\ \text{s.t. }\sum_{j=1}^{n}x_j\lambda_j+s^-=\theta x_{j0}\\ \sum_{j=1}^{n}y_j\lambda_j-s^+=y_{j0}\\ \sum_{j=1}^{n}\lambda_j=1\\ s^-\geq 0,s^+\geq 0,\lambda_j\geq 0,j=1,2,\ldots,n\end{cases}$$

Where $\hat{e}^T=(1,1,\ldots,1)\in E^m$,$e^T=(1,1,\ldots,1)\in E^s$.Let ε be an Archimedes infinitesimal quantity and the optimal solution to the linear programming problem$(\bar{D}_s)$areλ^0, s^{-0}, s^{+0}, θ°,then there are (1)$\theta^0=1$,then Decision-Making Units j_0 is weak DEA efficient;(2)$\theta^0=1$, and $s^{-0}=0,s^{+0}=0$,then Decision-Making Units j_0 is DEA efficient[8][9].

The traditional DEA model regards the entire production process as being carried out in a “black box” through which the input is converted into output. In fact, Shephard and Fare have studied dynamic production processes as early as 1970. In 1995, Fare et al. gave a dynamic DEA model, that is, the output at time t can be used as the input at time t+1. In this paper, intellectual property rights in universities are divided into two stages: the first stage is the creation stage, the second stage is the transformation stage, and a dynamic two-stage DEA model is constructed.

3 The Selection of Input-output Indicators and Data Sources

In this paper, intellectual property activities in universities are divided into two stages, and a two-stage dynamic DEA analysis model is established. The logical framework of this model is shown in Figure 1. The first stage is the creation of intellectual property rights. The R&D personnel, scientific and technological expenditure, the number of R&D projects, application of R&D results and the number of science and technology service projects of the 32 “Double-First-Class” universities directly under the Ministry of Education are selected as input variables, and the number of patent authorization, the number of scientific publications and the number of published academic papers are selected as output variables. The second stage is the intellectual property transformation stage. The number of patent authorization, the number of scientific publications and the number of published academic papers are selected as input variables, and the number of patent sales contracts, contract amount for patent sale, the number of technology transfer contracts and contract amount for technology transfer are selected as output variables. Considering that there is a certain time delay from input to output of scientific and technological innovation activities, and it needs a certain period to be effective. Based on the selection of relevant scholars on the lag time[10][11], this paper adopts the fixed delay of 1 year in stages and 2 years in the total stage to carry out the study. By referring to existing literatures and considering the availability of data, in the first stage, the input data is for 2017,the output data is for 2018,in the second stage ,the input data is for 2018,the output data is for 2019. The data in this paper are collected from the Statistical Data Collection of University Science and Technology Activities.

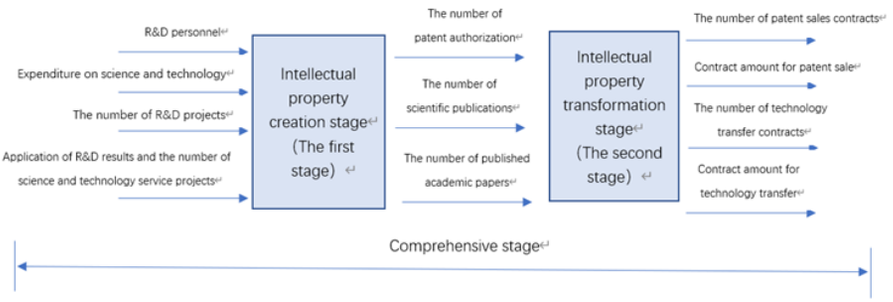

Figure 1: Two stage model of intellectual property efficiency evaluation in universities

First of all, Pearson correlation analysis is carried out on the co-tropism hypothesis of input variables and output variables of the two stages respectively. If input variables and output variables are positively correlated, DEA model can be used for efficiency analysis. Pearson correlation analysis results are shown in Table 1. Input variables and output variables of the two-stage DEA are positively correlated and significant, so DEA analysis can be performed.

Table 1: Pearson correlation analysis of input stage and output variables in two stages

The first stage					The second stage					
Input variables \ Output variables		The number of patent authorization	The number of scientific publications	The number of published academic papers	Input variables \ Output variables		The number of patent sales contracts	Contract amount for patent sale	The number of technology transfer contracts	Contract amount for technology transfer
R&D personnel	Pearson correlation	0.601**	0.464**	0.517**	The number of patent authorization	Pearson correlation	0.368*	0.708**	0.571**	0.550**
	Significance (bilateral)	0	0.007	0.002		Significance (bilateral)	0.039	0	0.001	0.001
	N	32	32	32		N	32	32	32	32
The number of R&D projects	Pearson correlation	0.791**	0.371*	0.704**	The number of scientific publications	Pearson correlation	0.561**	0.473**	0.365*	0.383*
	Significance (bilateral)	0	0.036	0		Significance (bilateral)	0.001	0.097	0.104	0.031
	N	32	32	32		N	32	32	32	32
Expenditure on science and technology	Pearson correlation	0.780**	0.506**	0.759**	The number of published academic papers	Pearson correlation	0.540**	0.620**	0.443*	0.440*
	Significance (bilateral)	0	0.003	0		Significance (bilateral)	0.001	0	0.011	0.012
	N	32	32	32		N	32	32	32	32
Application of R&D results and the number of science and technology service projects	Pearson correlation	0.628**	0.226	0.344						
	Significance (bilateral)	0	0.214	0.054						
	N	32	32	32						

**indicates significant correlation at 0.01 level (bilateral); * indicates significant correlation at 0.05 level (bilateral).

4 Results Analysis

4.1 Analysis of the first stage

This paper adopts the DEA input-oriented BCC model and uses DEAP2.1 software to obtain technical efficiency, pure technical efficiency, scale efficiency and scale reward of the 32 "Double-First-Class" universities directly under the Ministry of Education. As can be seen from Table 2, the average technical efficiency of intellectual property creation in the 32 "Double-First-Class" universities directly under the Ministry of Education is 0.925, the average pure technical efficiency is 0.957, and the average scale efficiency is 0.967. It shows that the creation efficiency of intellectual property in most universities is close to the frontier of production and keeps at a high level of creation. Peking University, Renmin University of China, Beijing Normal University, Nankai University, Tianjin University, Dalian University of Technology, Northeast University, Fudan University, Southeast University, Xiamen University, Shandong University, Ocean University of China, Central South University, South China University of Technology, Chongqing University, University of Electronic Science and Technology, Northwest Agricultural and Forestry University, Lanzhou University, etc. The technical efficiency of the 18 universities is 1, indicating that both intellectual property creation ability and management ability are at the forefront of production. The pure technical efficiency of Tsinghua University, Shanghai Jiao Tong University, Zhejiang University, Huazhong University of Science and Technology, Sichuan University is 1, and the scale efficiency is less than 1, indicating that the intellectual property creation ability of these universities is in the forefront of production, but the investment is insufficient and does not reach the optimal investment scale. The pure technical efficiency and scale efficiency of China Agricultural University, Jilin University, Tongji University, East China Normal University, Nanjing University, Wuhan University, Hunan University, Sun Yat-sen University and Xi 'an Jiaotong University are all less than 1, indicating that these universities need to strengthen intellectual property management and increase investment. Judging from the output, Jilin University, East China Normal University also need to increase investment in research and development personnel, Tongji University, East China Normal University, Nanjing University of Science and Technology lack of funds input, the research and development projects of China Agricultural University, East China Normal University and Xi 'an Jiaotong University are insufficient. The number of R&D application and science and technology service projects of Jilin University, Tongji University, Wuhan University, Hunan University, and Sun Yat-sen University is insufficient. From an output point of view, the output of Jilin University, Nanjing University, Wuhan University, and Sun Yat-sen University is insufficient. so it is necessary to strengthen the internal management, improve the level of intellectual property management, and increase the output of intellectual property.

4.2 Analysis of the second stage

As can be seen from Table 2, the average technical efficiency of intellectual property transformation in "Double-First-Class" construction universities directly under the Ministry of Education is 0.567, among which the average pure technical

efficiency is 0.612 and the average scale efficiency is 0.896. Indicates that the intellectual property rights conversion efficiency is not high, the consciousness and ability of intellectual property transformation in universities need to be further strengthened. There is still much room for improvement in the conversion of intellectual property in universities.

Among them, 11 universities, including Peking University, Renmin University of China, Tsinghua University, Nankai University, Tianjin University, Shanghai Jiao Tong University, Zhejiang University, Ocean University of China, South China University of Technology, Chongqing University and University of Electronic Science and Technology, have a technical efficiency of 1, which is in the forefront of intellectual property transformation production. The rest of the 21 universities pure technical efficiency and scale efficiency is less than 1, the intellectual property rights transformation ability is insufficient, the effect is not prominent. Wuhan University, Northwest Agriculture and Forestry University of Science and Technology need to strengthen the intensity of intellectual property rights transformation, increase the patent sale and transfer of technology. China Agricultural University, Beijing Normal University, Dalian University of Technology, Northeastern University, Jilin University, Fudan University, Tongji University, East China Normal University, Nanjing University, Southeast University, Xiamen University, Shandong University, Huazhong University of Science and Technology, Hunan University, Central South University, Sun Yat-sen University, Sichuan University, Xi 'an Jiaotong University, Lanzhou University need to increase conversion and provide supply. From the perspective of the transformation, stage investment is needed to further increase the intensity of intellectual property creation, improve the number of patent authorization, the number of scientific publications and the number of published academic papers.

Table 2: Performance "double top" colleges and universities directly under the Ministry of Education of intellectual property rights

School	The first stage				The second stage			
	Technical efficiency	Pure technical efficiency	Scale efficiency	Returns to scale	Technical efficiency	Pure technical efficiency	Scale efficiency	Returns to scale
Peking University	1.000	1.000	1.000	crs	1.000	1.000	1.000	crs
Renmin University of China	1.000	1.000	1.000	crs	1.000	1.000	1.000	crs
Tsinghua University	0.815	1.000	0.815	drs	1.000	1.000	1.000	crs
China Agricultural University	0.834	0.851	0.981	irs	0.427	0.434	0.984	irs
Beijing Normal University	1.000	1.000	1.000	crs	0.421	0.428	0.983	irs
Nankai University	1.000	1.000	1.000	crs	1.000	1.000	1.000	crs
Tianjin University	1.000	1.000	1.000	crs	1.000	1.000	1.000	crs
Dalian University of Technology	1.000	1.000	1.000	crs	0.168	0.171	0.985	drs
Northeastern University	1.000	1.000	1.000	crs	0.738	0.745	0.990	drs
Jilin University	0.946	0.949	0.997	drs	0.153	0.215	0.712	irs
Fudan University	1.000	1.000	1.000	crs	0.165	0.192	0.861	irs
Tongji University	0.880	0.939	0.937	drs	0.301	0.306	0.985	irs
Shanghai Jiaotong University	0.846	1.000	0.846	drs	1.000	1.000	1.000	crs
East China Normal University	0.806	0.848	0.950	irs	0.239	0.541	0.441	irs
Nanjing University	0.879	0.889	0.988	drs	0.202	0.253	0.799	irs
Southeast University	1.000	1.000	1.000	crs	0.148	0.169	0.877	irs
Zhejiang University	0.999	1.000	0.999	drs	1.000	1.000	1.000	crs
Xiamen University	1.000	1.000	1.000	crs	0.316	0.397	0.798	irs
Shandong University	1.000	1.000	1.000	crs	0.559	0.596	0.939	irs
Ocean University of China	1.000	1.000	1.000	crs	1.000	1.000	1.000	crs
Wuhan University	0.921	0.991	0.929	drs	0.259	0.287	0.900	irs
Huazhong University of Science and Technology	0.893	1.000	0.893	drs	0.370	0.371	0.999	crs
Hunan University	0.608	0.612	0.995	irs	0.215	0.245	0.877	irs
Central South University	1.000	1.000	1.000	crs	0.336	0.341	0.983	drs
Sun Yat-sen University	0.570	0.622	0.916	drs	0.311	0.312	0.996	irs
South China University of Technology	1.000	1.000	1.000	crs	1.000	1.000	1.000	crs
Chongqing University	1.000	1.000	1.000	crs	1.000	1.000	1.000	crs
Sichuan University	0.699	1.000	0.699	drs	0.628	0.631	0.996	drs
University of Electronic Science and Technology of China	1.000	1.000	1.000	crs	1.000	1.000	1.000	crs
Xi'an Jiaotong University	0.903	0.911	0.991	drs	0.847	0.848	0.999	irs
Northwest Agriculture and Forestry University	1.000	1.000	1.000	crs	0.046	0.172	0.265	irs
Lanzhou University	1.000	1.000	1.000	crs	0.293	0.924	0.317	irs
mean	0.925	0.957	0.967	-	0.567	0.612	0.896	-

4.3 The comprehensive analysis

From the first stage and the second stage, it can be found that the intellectual property creation efficiency and transformation efficiency of eight universities, including Peking University, Renmin University of China, Nankai University, Tianjin University, Ocean University of China, South China University of Technology, Chongqing University and University of Electronic Science and Technology, are all equal to 1, indicating that both the creation stage and the transformation stage of intellectual property rights are on the production frontier. There is still room for improvement.

This paper classifies the 32 universities directly under the Ministry of Education into eastern, central, and western regions according to their regions. The eastern region including Peking University, Renmin University of China, Tsinghua University, China Agricultural University, Beijing Normal University, Nankai University, Tianjin University, Dalian University of Technology, Northeastern University, Jilin University, Fudan University, Tongji University, Shanghai Jiao Tong University, East China Normal University, Nanjing University, Southeast University, Zhejiang University, Xiamen University, Shandong University, Ocean University of China, Sun Yat-sen University, South China University of Technology. The central region including Wuhan University, Hua Zhong University of Science and Technology, Hunan University, Central South University. The western region including Chongqing University, Sichuan University, University of Electronic Science and Technology, Xi 'an Jiaotong University, Northwest Agriculture and Forestry University of Science and Technology, Lanzhou University. The results show that the efficiency of the two stages in the central region is lower than that in the eastern region and the western region, especially in the intellectual property right transformation stage, universities in the central region still has great room to improve.

Table 3: Intellectual property operation performance of "Double-first-class" universities directly under the Ministry of Education in the eastern, central and western regions

region	The first stage			The second stage		
	technical efficiency	pure technical	scale efficiency	technical efficiency	pure technical	scale efficiency
Eastern Region	0.935	0.959	0.974	0.598	0.625	0.925
Central Region	0.856	0.901	0.954	0.295	0.311	0.94
West Region	0.934	0.985	0.948	0.636	0.763	0.736

5 Conclusions and Suggestions

The results show that the construction of "Double-First-Class" universities directly under the Ministry of Education of intellectual property creation is maintained at a high level, but the conversion efficiency is low. The average intellectual property conversion efficiency of "Double-First-Class" universities is only 0.567, indicating that cost a lot of manpower and material resources and financial resources of research is on the shelf, failing to give full play to the supporting role of universities in implementing innovation-driven development strategy. Universities should not blindly pursue the number of patent authorization, the number of scientific publications and the number of published academic papers, but should think about how to improve the level of management and incentive policy, encourage the transformation of intellectual property rights into economic and social benefits, enhance the contribution of universities to economic growth and social progress as a whole. Therefore, it is necessary for speeding up the industrialization of the intellectual property rights transfer mechanism to improve the ability and level of intellectual property in universities. To sum up, this paper argues that the country should begin from the whole layout, emphatically from the following aspects to promote intellectual property management in universities, to improve the contribution of intellectual property rights.

(a) Actively guide and increase the intensity of government science and technology service. First, the government should formulate scientific incentive policies to encourage universities to strengthen research and development in the urgently needed aspects of the national strategy and promote the transformation of scientific and technological achievements. Through the formulation of incentive policies, enterprises are encouraged to enhance the power of scientific and technological innovation, and enterprises are encouraged to actively connect with universities, seek for core technical support, and seek long-term and stable development, so as to further promote the scientific and technological innovation of universities. The government should coordinate financial institutions to create a favorable financial environment for the transformation of intellectual property rights. Relevant studies found that the transformation efficiency of university scientific and technological achievements is positively correlated with the degree of financial development. At present, China's financial development is far from enough to provide strong support for the transformation of intellectual property achievements in universities. The government should explore to set up intellectual property pilot funds, encourage

achievements of intellectual property rights, reduce the risk on the achievements of universities and enterprises, coordinate with financial departments to increase support, support enterprises to purchase the patent and other scientific and technological achievements, and give preferential loan policy in the process of transformation and cultivation.

(b) Establish a requirement-oriented intellectual property rights innovation mechanism. The conversion rate of intellectual property rights in many universities is not high, mainly because there are many innovative achievements, but they are far from the market demand. High-level research universities in our country can draw lessons from developed countries such as Germany. Application-oriented scientific and technological innovation activities start from the commission of the industry, intending to provide new technologies, new products and new services for the industry, and attaching importance to the transfer and transformation of scientific research achievements to the industry. The cooperation between research universities and industry can not only drive their innovation in science, technology and social technology services but also provide an effective way to combine university teaching and research. Universities should take the initiative, the scientific research workers of universities and scientific research institutes should go deep into the front line of society and enterprises, select research focus from production practice, meet the needs of enterprise innovation and development, and promote the research work of universities with demand as the guidance.

(c) Focus on win-win collaboration and build a platform for cooperation between industry, universities and research institutes. According to the needs of local economic development, local governments should hold industry, universities and research institutes cooperation exchange meetings and enterprise university talks to promote the docking between universities and enterprises, serve the social and economic development, solve the problem of information asymmetry between the demand side and the supply side, and improve the efficiency of intellectual property transfer. In the information age, the Internet in the transformation of intellectual property rights of universities should play a more important role. The state competent department of education, science and technology should establish a platform for the development, use and management of scientific and technological achievements on the Internet to build a bridge for the exchange and cooperation between universities and enterprises and promote the efficient combination of scientific research and production practice. In addition to the research projects entrusted by enterprises, the achievements of transforming scientific research obtained by universities should also be disclosed to the whole society on the platform, and the enterprises should invest in industrialization.

(d) Innovate the management model to create a favorable environment for university science and technology innovation. As research universities generally do not aim at making profits, they pay insufficient attention to the application and transformation of intellectual property, and the relevant assessment and incentive mechanism are not sound. The research shows that the general science and engineering research universities have a strong sense of intellectual property management, while liberal arts universities have a weak sense of intellectual property management. Many universities lay more stress on the number of scientific research papers, national fund projects and results, and pay less attention to the application and transformation of intellectual property rights. Therefore, universities should establish an incentive mechanism to encourage innovation and achievement transformation as the target, which will incorporate achievement creation and transfer into the evaluation and assessment system of researchers. In the distribution of intellectual property interests, we should attach importance to the legitimate interest demands of scientific researchers, fully mobilize the enthusiasm of scientific researchers, popularize the knowledge of intellectual property operation among scientific researchers, and establish the consciousness of patent transformation. As researchers are limited in time and energy and generally unable to bear the economic risks brought by operation, universities should set up special funds for transformation and intellectual property operation platform, and encourage teachers to entrust scientific research achievements to the operation platform, revitalize the achievements of intellectual property and achieve win-win cooperation.

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