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Analysis of the factors influencing the transformation effect of scientific and technological achievements

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ABSTRACT

This paper mainly analyzes the key influencing factors of four subjects, such as scientific research institutes, enterprises, science and technology intermediaries, government in the process of transformation of scientific and technological achievements. On the basis of the existing literature, the main influencing factors of five subjects were summed up, the influence factors were sorted by Moody sequence Diagram method and Delphi method, and the countermeasures and suggestions were put forward according to the result of sequencing, to promote the transformation of scientific and technological achievements.

1. INTRODUCTION

In the rapid development of today's society, how to translate advanced scientific and technological achievements into productive forces is an important subject worthy of further study. Fischer and Vargar point out that the incentive mechanism for scientific research personnel is an important influence factor of the transformation effect of scientific and technological achievements, at the same time, if the promotion of High-tech enterprises to participate in the transformation of scientific and technological achievements, for scientific research activities to provide funds and market personnel support, and provide market demand-oriented consulting, will greatly promote the transformation of scientific and technological achievements. J. Schumpeter also pointed out that the incentive mechanism for scientific researchers will greatly affect the effect of the transformation of scientific and technological achievements in universities. In the comprehensive literature, most scholars are limited to the qualitative study of the factors influencing the transformation effect of sci-tech achievements, but there is no specific and clear classification.

2. INFLUENCING FACTORS

A. Influencing factors of scientific research institutes in the transformation of scientific and technological achievements

Some scholars believe that the main factors restricting scientific research institutions in the transformation of scientific and technological achievements are insufficient attributes of scientific and technological achievements, deviation of scientific research concepts of scientific research personnel, insufficient conversion of talents and imperfect transformation mechanism. The imperfect evaluation mechanism of scientific and technological achievements and the lack of market-oriented talents also affect the transformation of scientific and technological achievements of research institutes. The author concludes that the main factors restricting the research institutes are as follows: 1) The market

orientation of scientific research project is less than 2) the scientific and Technological achievements transformation Incentive mechanism is not perfect 3) the lack of understanding of the demand of the market by researchers is less than 4) compound scientific research personnel 5) The evaluation mechanism of scientific and technological achievements is not perfect 6) the scientific and technological achievements are not mature enough 7) lack of results conversion supporting technical equipment support 8) research institutes and enterprises cooperation is passable.

B. Analysis of influencing factors on enterprises in the transformation of scientific and technological achievements

Enterprises are the main demand of scientific and technological achievements, in the market economy system, enterprises in order to survive and development is the most urgent pursuit of scientific and technological achievements of the main body, but still a considerable number of enterprises do not realize the limitations of their own conditions. The author concludes that the main factors restricting the enterprise are as follows: 1) The restriction of enterprise management mechanism 2) the restriction of enterprise organization structure 3) The pilot stage research is not enough 4) the pilot stage investment is less than 5) the Enterprise and the Research institute is difficult to butt.

C. Analysis of influencing factors of science and technology intermediary institutions in the transformation of scientific and technological achievements

The intermediary of science and technology is the bridge between the Scientific Research Institute and the Enterprise, some scholars pointed out that China's science and technology intermediary industry is currently in the new stage of development, there are still many unfavorable factors affecting the transformation of scientific and technological achievements. The author sums up the main factors restricting the intermediary institutions of science and technology as follows: 1) The development of the technology intermediary industry is not perfect 2) the lack of a fair competitive environment 3) the public information in the intermediary industry of science and technology is not

in circulation 4) the level of science and technology intermediary service is not high.

D. Analysis of influencing factors on government in the transformation of scientific and technological achievements

The government is the macro-control of the transformation of scientific and technological achievements, and scholars point out that the current government's management behavior tends to be short term, and does not lead to the transformation of scientific and technological achievements into the long-term development of the road. The author thinks that the main factors restricting the government are as follows: 1) The related policies and regulations system is imperfect 2) The Science and Technology Achievement Transformation Incentive policy is not enough 3) the government's fiscal and tax policy is not in place 4) The government support strength is not enough 5) the science and technology intermediary organization management is insufficiency.

3.THE RANKING OF FACTORS INFLUENCING THE TRANSFORMATION EFFECT OF SCIENTIFIC AND TECHNOLOGICAL ACHIEVEMENTS IN RESEARCH INSTITUTES

In this paper, the moody sequence diagram method is used to sort the influencing factors, and the Delphi method is adopted when the influence factor 2 to 2 is compared. The investigation of 31 teachers and students is conducted, and the more controversial factors are investigated again, and finally the importance of influencing factors is compared with each other, and the result is applied to the next moody order diagram. Influencing factors of scientific research institutes' transformation in science and technology achievements are listed and numbered in tabular form, as shown in table 1 below.

Table 1. Influencing Factors Of Scientific Research Institutes

Number	Influencing factors
A	Insufficient market orientation of scientific research project
B	Imperfect transformation and incentive mechanism of scientific and technological achievements
C	Lack of understanding of market demand by researchers
D	Lack of complex research talents
E	The evaluation mechanism of scientific and technological achievements is not sound
F	Insufficient maturity of scientific and technological achievements
G	Lack of achievement transformation supporting technical equipment support
H	The cooperation between scientific research institutes and enterprises is not satisfactory

Constructs a blank initial order diagram based on the impact factor. Then the influence factors are compared. Based on the results of the questionnaire, we first compare factor A with the remaining 8 factors. As shown in "Fig. 1".

	A	B	C	D
A		1		
B	0			
C				
D				

Figure 1. Impact factor 2to2 comparison schematic.

Similarly, a comparison between factor A and other factors. And so on and so on to complete the remaining 7 factors and other factors compared to fill the entire sequence diagram. Finally, the row values are summed and juxtaposed to the right side of the order diagram, as shown in "Fig. 2" below.

	A	B	C	D	E	F	G	H	
A		0	1	1	1	0	1	1	5
B	1		1	1	1	0	1	1	6
C	0	0		1	0	0	1	1	3
D	0	0	0		1	0	1	0	2
E	0	0	1	0		0	1	0	2
F	1	1	1	1	1		1	1	7
G	0	0	0	0	0	0		0	0
H	0	0	0	1	1	0	1		3

Figure 2. The final order of factors restricting the impact of research institutes.

Then the influence factors are sorted according to the important degree. Compare the relative importance of the final order diagram to the right of two factors and equality. To view the score in a separate comparison between two factors in a sequence diagram, a "+" number is marked after the sum of the more important parties. For example, C factor and H factor alone contrast when the C factor is more important, then the C factor score is \$number, H factor is divided into 3, indicating that the C factor is more influential to the research institute than the H factor. According to the sorting result of the final order diagram, the influence factors are sorted according to the importance degree, as shown in table 3-2 below.

Table 2 The Result of Restricting The Influence Factors of Scientific Research Institutes

number	Total Score	Factor number	Influencing factors
1	7	F	Insufficient maturity of scientific and technological achievements
2	6	B	Imperfect transformation and incentive mechanism of scientific and technological achievements
3	5	A	Insufficient market orientation of scientific research project
4	3+	C	Lack of understanding of market demand by researchers
5	3	H	The cooperation between scientific research institutes and enterprises is not satisfactory
6	2+	D	Lack of complex research talents
7	2	E	The evaluation mechanism of scientific and technological achievements is not sound
8	0	G	Lack of achievement transformation supporting technical equipment support

Finally, the results are tested to verify that the sum of the scores of each influencing factor is equal to the value of formula Tenn $(n-1)/2$, in which T is the total number of comparisons and n is the number of factors. After examination, $T=8*(8-1)/2=28$, which is equal to the sum of each influence factor.

In the same way, the influence factors of enterprises, science and technology intermediary organizations and government are sorted, and the following results are drawn:table3,4,5.

Table 3 Effect Factors of Restricting Enterprise Ranking Result

number	Total Score	Factor number	Influencing factors
1	5	C	Insufficient research in pilot stage
2	4	D	Insufficient investment in pilot phase
3	3	F	The difficulty of connecting enterprises and scientific research institutes
4	2	E	Enterprise's own technology does not pass through
5	1	A	The restriction of enterprise management mechanism
6	0	B	The restriction of enterprise organization structure

Table 4 Influencing Factors of Science And Technology Intermediary Organizations

number	Total Score	Factor number	Influencing factors
1	3	A	The development of technology intermediary industry is not perfect
2	2	D	The level of technology intermediary service is not high
3	1	C	Non-circulation of public information in science and technology intermediary industry
4	0	B	Lack of a fair competitive environment

Table 5 Effects Of Government Factors On Ranking Results

number	Total Score	Factor number	Influencing factors
1	4	A	The related policy and regulation system is imperfect
2	3	C	The Government's fiscal policy is not in place
3	2	D	Government support is not enough
4	1	B	Lack of incentive policy for transformation of scientific and technological achievements
5	0	E	Inadequate management of science and technology intermediaries

4.COMMENTS AND SUGGESTIONS

According to the analysis and sequencing of the influencing factors of the scientific Research Institute, this paper puts forward the following countermeasures and suggestions:

A. Countermeasures and suggestions for scientific research institutes in the transformation of scientific and technological achievements

1. To strengthen the supervision of the maturity of scientific and technological achievements. The scientific research institutes should strengthen the verification and evaluation of the results before the scientific and technological achievements are transferred to the pilot stage.
2. Improve the incentive mechanism of scientific and technological achievements. The establishment of corresponding incentive mechanism, such as the establishment of scientific and technological achievements in the development of the title Evaluation Project, to increase the funding of research and development projects, allowing scientific and technological personnel to invest in results conversion projects.
3. To strengthen the understanding of the market demand of scientific research personnel, the project set up to market-oriented. The transformation of scientific and technological achievements should be market-oriented.
4. Strengthen exchanges and cooperation with enterprises. In the process of transformation of scientific and technological achievements, we need to make use of the power of enterprises to accomplish scientific and technological achievements.
5. Establish the scientific and technological achievements management team. The Scientific research Institute should set up corresponding professional titles to develop the system, train the management team, and assist the achievement transformation.
6. Sound scientific and technological results assessment mechanism. It focuses on the evaluation of the advance, innovation and the market foreground and risk of the result transformation.

B. Countermeasures and suggestions for enterprises in the transformation of scientific and technological achievements

1. The results are strictly tested. Enterprises should ensure that the pilot phase of the necessary human and financial resources in place to solve the scientific and technological achievements in the actual production of raw materials, equipment, technology and other problems, for the results of the scale of production to lay a good foundation.
2. Cooperate actively with scientific research institutes. Enterprises should make full use of research Institute's Research and Development resources, and its sustainable development of good faith cooperation.
3. Establish a high-level technical team. Enterprises to absorb high-level scientific research personnel, to increase the input of technical equipment, the formation of their own technical team.
4. Transition to technology-based enterprises. Improve the enterprise management mechanism and organizational structure, will focus on science and technology innovation, product technology innovation to drive enterprise economic growth.

C. Countermeasures and suggestions for scientific and technological intermediary organizations in the transformation of scientific and technological achievements

1. Sound science and Technology intermediary service system. We should improve the service project of science and technology intermediary, establish the mature evaluation system of scientific and technological achievements, and objectively evaluate the technology, market prospect and investment value of scientific and technological achievements. At the same time to develop a unified industry norms, training practitioners, to enhance the overall service level of the industry.
2. The technology intermediary market competition is transparent. Industry regulatory departments to rectify the unqualified intermediary institutions, the establishment of complaints channels to make the transaction market transparent and open to create a fair competitive environment.
3. Establish information exchange platform for scientific and technological achievements. The intermediary industry should establish the information database of scientific and technological achievements, share the information of scientific and technological achievements, and promote the exchange and

D. Countermeasures and suggestions for government in the transformation of scientific and technological achievements

1. Perfecting the system of policy and regulation, specially the fiscal policy. The Government should perfect the relevant legal and policy system of the transformation of the existing scientific and technological achievements, widen the policy coverage, strengthen the guarantee, clarify the relationship of the main power and responsibility in the process of the achievement transformation, pay attention to the protection of intellectual property, especially to increase the financial and tax support, and arouse the enthusiasm of
2. Organize and coordinate departmental units for the transformation of results. The government needs to coordinate the departments ' units to create a favorable market environment for the transformation of results.
3. Establish incentives for results-based transformation and promote production and research cooperation. The government should set up the policy of transforming the scientific and technological achievements, form the supporting mechanism to guide the scientific research institutes and researchers to attach importance to the transformation of scientific and technological achievements, encourage the enterprises to carry out technological innovation and promote the combination of production and research.

5.CONCLUSION

In this paper, the author starts from the subjects involved in the transformation chain, and classifies, analyzes and sorts the influencing factors from the perspective of the subjects such as scientific research institutes, enterprises, science and technology intermediary organizations and government. So that the subjects can clear their own responsibility and the key impact factors, it is helpful for each subject to take corresponding measures to improve the specific situation.

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