

Research on Property Right Allocation of University Scientific and Technological Achievements Conversion from the Perspective of Incomplete Contract Theory

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Abstract: At present, the property right of scientific and technological achievements in colleges and universities is not clear, which leads to the dilemma of transformation of achievements. In order to promote the transformation of scientific and technological achievements in colleges and universities, it is necessary to first clarify the boundary and ownership of property rights. This paper studies how to clarify property rights and the obstacles in the implementation path. The transformation of scientific and technological achievements in colleges and universities is regarded as a kind of transaction behavior, and its contract structure is decomposed. Based on the incomplete contract theory, this paper examines the economic implications of property rights allocation of scientific and technological achievements.

1. Introduction

At present, although there are many scientific and technological achievements in Chinese universities, both academia and practice believe that the transformation rate of scientific and technological achievements in universities is surprisingly low. Although there are many factors affecting the transformation rate of scientific and technological achievements in universities, institutional constraints are undoubtedly fundamental, and property rights is the core of institutional factors. Property rights are the core of institutional factors. Due to the unclear property rights of scientific and technological achievements in colleges and universities, the dilemma of transformation of scientific and technological achievements has arisen. Because the property right of scientific and technological achievements in universities is not clear, it is a kind of public goods, which will lead to the excessive use of scientific and technological achievements and their resources. Because of the knowledge nature of scientific and technological achievements, the harm of excessive use leading to their dissipation is not serious, but it will seriously affect the participants' investment in the development of scientific and technological achievements. Promoting the transformation of scientific and technological achievements should clarify the boundary and ownership of property rights. Therefore, it is of great practical significance to study how to clarify and what obstacles will be faced in the implementation path.

2. Basic model of incomplete contract theory

The incomplete contract theory holds that even if the transaction cost is zero, the allocation of property rights is also important. The reason is shown in Figure 1 below.

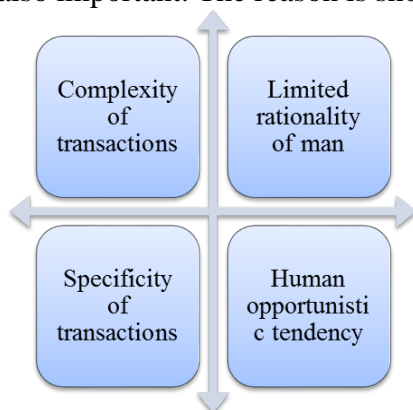


Figure1. The basic logic of incomplete contract theory

Because of the non-verifiability of the third party, the execution force outside the transaction relationship is powerless. Therefore, we can only rely on the authority of the private order within the transaction relationship. Because of the incompleteness of the contract, this authority can only come from the property right outside the contract. Therefore, the allocation of property rights to the party making the special investment or to the party who is more important for the special investment will improve efficiency.

3. The contract nature of the transformation of scientific and technological achievements in colleges

3.1. The contract relation structure of the transformation of scientific and technological achievements in colleges and universities

The transformation of scientific and technological achievements in universities involves a large number of participants and complex transaction relationships. The general path is shown in Table 1 below.

Table1. General path of scientific and technological achievements transformation

Phases	Contents
Theoretical transformation	Making theoretical innovation and producing basic theoretical achievements
Technological transformation	Technical breakthroughs based on theoretical achievements already produced
Market transformation	Utilize the existing technological achievements to develop and commercialize the existing technological achievements

The participants of the whole transformation path include the government, universities, intermediary organizations, enterprises, etc. Therefore, there are many basic contractual relationships involved in the transformation of university scientific and technological achievements, which shows the complex transaction relationship behind the transformation of university scientific and technological achievements.

3.2. The nature of the contract for transforming scientific and technological achievements in colleges and universities

As a knowledge-based information product, the uncertainty and complexity of scientific and technological achievements are very high. It is difficult for University researchers to ensure the final theoretical results when they apply for research funds from the government or get sponsorship from enterprises, which is mainly limited by the natural nature of the research object and the cognitive ability of researchers. The uncertainty of transforming scientific theory into applicable technological achievements is mainly affected by technological risks. The success or failure of the development of scientific and technological achievements is closely related to the nature of technology or existing technological matching. However, the market transformation of scientific and technological achievements is mainly affected by the market demand risk of commercial scientific and technological achievements. Therefore, the information of the contract for the transformation of scientific and technological achievements is not complete. The information asymmetry of transformation of scientific and technological achievements is also very high, because scientific researchers have more private information in theoretical research or technological development than government, enterprises and intermediaries, and enterprises and intermediaries have private information on market demand. In addition, due to the high level of expertise in scientific and technological achievements, it will be costly for third parties to fully understand the situation in case of transaction disputes. Therefore, the contract of transformation of scientific and technological achievements in colleges and universities is doomed to be an incomplete contract, and the degree of incompleteness of the contract is also very high.

Specialized investment in the transformation of scientific and technological achievements in universities is very large, and the funds invested by the government in scientific and technological projects can hardly be realized. The operating platform built by enterprises for commercialized scientific and technological achievements is also a highly specialized investment. Among them, the government has the highest investment specificity in the stage of transformation of theoretical achievements; the university has the highest investment specificity in the stage of technology transformation; the enterprise has the highest investment specificity in the stage of market transformation; while the investment specificity of intermediaries in the stage of theoretical transformation is very low, and the investment specificity in the stage of technology transformation and market transformation is in the middle level.

4. Property right allocation of scientific and technological achievements in colleges and universities

The transformation of scientific and technological achievements in universities involves not only incomplete contracts, but also specific investment in transactions. The overall level of investment specificity is very high, coupled with opportunistic speculative tendency of people, so serious opportunistic phenomena will occur in the transaction of scientific and technological achievements in incomplete contracts. According to the incomplete contract theory, it is necessary to allocate the property rights of scientific and technological achievements to protect the special investment from its negative impact; allocating the property rights of scientific and technological achievements to the one who is more important for the special investment or the special investment can improve the transformation efficiency of scientific and technological achievements.

The analysis of the distribution of the participants' specific investment level in the contract of transformation of scientific and technological achievements will help to find out how to allocate it so as to improve the conversion rate of property rights in the transformation of scientific and technological achievements in universities. In the stage of transformation of basic theory

achievements, the government has the highest level of investment specificity, so basic theory achievements should be allocated to the government. This is also the reason why academic achievements such as papers or monographs are similar to a kind of public goods, although scientific researchers have certain copyright. In the stage of technology transformation, the investment specificity of universities or researchers is the highest, so the technological achievements developed by universities or researchers should be owned by them. However, the existing system also regards technological achievements as a simple extension of theoretical achievements or theoretical achievements, thus weakening the property rights requirements of universities or researchers on technological achievements, which is the root cause of a large number of technological achievements being put on the shelf. In the stage of market transformation, the level of investment specificity of enterprises is the highest, so the commercialized achievements of science and technology belong to the highest efficiency of enterprises.

5. Conclusions

In order to promote the transformation of scientific and technological achievements in colleges and universities, we should first clarify the boundary and ownership of property rights. This paper studies how to clarify property rights and the obstacles in the implementation path. This paper regards the transformation of scientific and technological achievements in colleges and universities as a kind of transaction behavior, and decomposes its contract structure. Different from traditional property rights theory, incomplete contract theory re-examines the economic meaning of property rights allocation of scientific and technological achievements. It holds that the property rights of theoretical achievements in the transformation of scientific and technological achievements in universities should be attributed to the government, making them public goods; the property rights of technological achievements should be attributed to universities or scientific researchers; and the property rights of scientific and technological commercialization achievements should be attributed to enterprises. Such a property right structure is conducive to improving the efficiency of the transformation of scientific and technological achievements in colleges and universities.

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