

# Problems and Countermeasures on China's Cooperation of Industry, Universities and Research Institutes

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## Abstract

The cooperation of industry, universities and research institutes is an outcome of the development of science, technology and higher education to certain degree, a manifestation of higher education's adaptability to economic development and its combination with social production as well as an inevitable choice in market economy and the era of knowledge economy. In spite of certain accomplishments made in China's cooperation of industry, universities and research institutes since reform and opening, there are still a lot of problems and shortages compared with that in developed countries.

**Keywords:** Cooperation of industry, universities and research institutes, Problems, Countermeasures

It is pointed out clearly in the Report at the 17th CPC National Congress and the Outline of the National Program for Long-and Medium-Term Scientific and Technological Development (2006-2020) that it is a significant strategic task to improve independent innovation ability and to establish an innovative country. Such a great strategy has to rely on the establishment of a technological innovation system with the principal role of enterprises, the guidance of market and the cooperation of industry, universities and research institutes. In spite of certain accomplishments made in China's cooperation of industry, universities and research institutes since reform and opening, there are still a lot of problems, such as poor independent innovation ability and failure to exert the potential in the cooperation of industry, universities and research institutes.

## 1. Origin and Development of the Cooperation of Industry, Universities and Research Institutes in China

### 1.1 The First Stage (1950s-1960s)

It is in 1958 that China first came up with the idea of combining industry, universities and research institutes with the main purpose of establishing China's status in the whole world. Driven by government, such cooperation is of obvious characteristics of planned economy, such as the project of atomic bomb, hydrogen bomb and artificial satellite. Falling into the supervision of different government departments, enterprises, universities and research institutes have their independent development and keep cooperation under national management. Accordingly, such cooperation is characterized by loose cooperative relations, simple methods, clear responsibilities and weak active consciousness.

### 1.2 The Second Stage (the end of 1970s- the beginning of 1980s)

Ever since the Third Plenary Session of the 11th Central Committee in 1978, the policy of reform and opening has been carried out in China, according to which the cooperation of industry, universities and research institutes has been driven by dual-profits instead of government with the policy confirming the close relations between science and technology and economy. In the 1980s, large and medium-sized state-owned enterprises began to

have technological innovation and some rural enterprises and private economic sectors came into being. Besides, reform has also been conducted in scientific and technological systems through which research institutes offer paid technological transformation, services and consultations for the market. Cooperation in this period is characterized by its rapid development and market orientation.

### *1.3 The Third Stage (1990s)*

In this period, Xiaoping Deng proposed that science and technology are primary productive force and the 15th Party Congress confirmed the strategic policy of developing a country through science and education. In addition, it is the increasingly fierce international and national competition that has raised new challenges to the cooperation of industry, universities and research institutes in China. In April 1992, a joint development project based on the cooperation of industry, universities and research institutes went underway in a nationwide range. At this stage, cooperation was mainly driven by both science and technology and market and focused on the conversion of scientific and technological achievements. As the main force of cooperative efforts, large and medium-sized state-owned enterprises established a cooperative exchange system with universities and research institutes in order to enhance their competitiveness, hence promoting the development of Chinese economy.

### *1.4 The Fourth Period (the beginning of 21<sup>st</sup> century)*

21<sup>st</sup> century is an era of knowledge economy, during which high-tech industries come into being with a rapid pace, pushing the cooperation of industry, universities and research institutes into a new development phase, so are joint ventures and private ones. At this stage, based on market mechanism, operation is widely conducted with the principles of mutual benefits and risks, at more profound levels, in more flexible forms, with expanded scales, wider range of cooperation contents and more standardized behaviors.

## **2. Problems in China's Cooperation of Industry, Universities and Research Institutes**

### *2.1 Government's Problems*

Government's failure to fully exert its dominant role in the cooperation of industry, universities and research institutes is mainly manifested in the following aspects:

- (1) Lacking in a series of regulations, policies and corresponding measures to promote cooperation. Without doubt, correct and efficient regulations and policies on science and technology are a significant guarantee to promote cooperation and scientific and technological advance. However, with incomplete legislative system related to science and technology, China's relevant legislation still lies in its preliminary stage, lacking in accessory implementation rules, favorable operation system as well as coordination and monitor system.
- (2) Government doesn't exert its full potential in collecting funds for the cooperation of industry, universities and research institutes through multi channels. Due to the current one-fold channel for attracting investment in cooperation, government's function seems of particular importance. Actually, the shortage of funds has become a major factor blocking China's cooperation of industry, universities and research institutes.
- (3) There are no perfect agencies for the cooperation of industry, universities and research institutes. Here agencies refer to those intermediate social organizations, involved by all sides in cooperation and expected to offer consultation and information for all three sides and coordinate their relations. With a shortage of such agencies in China nowadays or their incomplete functions, it is very difficult to solve some possible disputes due to the shortage of special institutes for technological arbitration.

### *2.2 Universities' Problems*

- (1) Deviation in goals of school. During the operation process, many universities have paid excessive emphasis on universities' economic functions while neglecting their social responsibility of talent cultivation, leading to deviation in their directions, influencing their quality of talent cultivation and influencing the operation of the whole macro economic environment.
- (2) Dislocated ideas of running schools. A significant conversion in universities' school-running ideas lies in the combination of industry with their education and research. However, influenced by their traditional ideas and lacking in market ideas, such local universities only focus on the quality of key subjects, doctoral programs as well as master programs.
- (3) One-fold cooperation form and poor effect. Having only small scale of cooperation and failing to form group advantages, quite a few local universities have no system for introduction of their technological achievements or professional staff for technological development and introduction and have no obvious effect achieved from the interaction between universities and enterprises.

(4) Incomplete operation system. First come the drawbacks in system. In China, with production and science and technology belonging to different government departments, their various and overlapped projects may cause separation of economy and science. Second comes the incomplete benefit system. Due to their different roles and functions, different sides in cooperation have different understandings of benefit allocation, causing imbalanced understandings of value.

### *2.3 Enterprises' Problems*

(1) Enterprises have no obvious principal role in innovation.

State-owned enterprises are not active in innovation since some conservative leaders hold the opinion that it is the nation that benefits from the capital and profit from their technological innovation while it is they themselves that suffer from risks and debts. In spite of private enterprises' passion for joint technological innovation, they only care about short-term profit while lacking in innovative ideas of foresight and neglecting their absorption, assimilation and innovation of advanced technology.

(2) There are also problems in benefit allocation. During the operation of industry, universities and research institutes, different sides' benefits are not reasonably solved and they have different understandings of the value of technology. Therefore, although they tend to come to a common view at the preliminary stage of their cooperation, they tend to have disagreement in unreasonable capital allocation or improper allocation of intellectual property rights which may draw their cooperation to an end ultimately.

## **3. Countermeasures for the Problems in China's Cooperation of Industry, Universities and Research Institutes**

### *3.1 Facilitating the Construction of Innovative Cooperation System of Industry, Universities and Research Institutes*

It is both highly profitable and highly risky to construct a system for innovative cooperation of industry, universities and research institutes involving both profits and risks. Responsibility system related to the cooperation of industry, universities and research institutes should be established to implement risk responsibilities at different levels and stages. For instance, since the judgment of implementability of technical innovation projects and the specific implementation process fall into the control of research institutes and universities, it is they that should take relevant risks. Nevertheless, enterprises should also be encouraged to participate in research and development and share some expenses and risks during the process. On the other hand, since enterprises should take the dominant role in market research related to the innovative cooperation of industry, universities and research institutes, they are expected to take the risks involved in inputting innovative accomplishments to market. But they can push research institutes and universities to get in closer touch with market to reduce their advance payment for technological transformation. By adopting some distribution methods with technology treated as shares, enterprises have the benefits of research institutes as well as universities linked with their profits, hence reducing their own risks.

### *3.2 Establishing Special Funds for the Cooperation of Industry, Universities and Research Institutes and Expanding Research Financing Channels*

With capital as the economic basis for the cooperation of industry, universities and research institutes, government's special funds for that will help to reduce enterprises' risks in technological innovation, to relieve capital shortage as well as to exert the research and development advantages of research institutes and universities. Currently, special funds established by Chinese government mainly include government's special fund, reward fund and so on. On the other hand, efforts should be taken to absorb social capital through bonus system to establish special research fund in order to reduce possible risks during the process of combining industry, universities and research institutes and to expand capital for that.

### *3.3 Developing Agencies Serving Science and Technology*

The agency is a bridge to promote the cooperation of industry, universities and research institutes. By enhancing the construction of science and technology agencies and fully exerting and perfecting their roles in technological evaluation, service, management and information consultation, the combination of enterprises, research institutes and universities can be promoted. Lying in its preliminary stage, Chinese agencies still fail to fulfill the demands of the cooperation of industry, universities and research institutes. Therefore, agencies at different levels and of different sorts should be developed to serve as a bridge for the cooperation of industry, universities and research institutes.

### 3.4 Constructing Policy Environment Beneficial for the Combination of Industry, Universities and Research Institutes

In terms of policy, a series of relevant preferential policies should be laid down to promote the sound development of the cooperation of industry, universities and research institutes, including those related to industry and commerce, finance, taxation, importing and exporting as well as intellectual property rights. With the interests of all sides taken into consideration, the cooperation of industry, universities and research institutes can be pushed into the orbit of legislation and corresponding laws and regulations can be established and perfected accordingly.

### 3.5 Perfecting Risk Investment System

In the aspect of risk investment, multi-channel investment system involving government, enterprises and the society should be gradually established. Relevant departments should establish funds for the transformation of scientific accomplishments and increase investment in this process to meet the standard of developed countries in the ratio of industry, universities and research institutes. As for risk investment system, government input should take the guiding role, with that from enterprises and research institutes as the main body, financial input as a supporting force and idle funds as a complementary part.

### 3.6 Guarantee from Laws and Regulations

Laws and regulations play the role of normalizing different subjects' actions in the cooperation of industry, universities and research institutes, confirming the belonging of intellectual property rights and benefit allocation, dealing with a variety of possible disputes in cooperation as well as protecting all sides' legal rights. Therefore, we need to establish perfect legal system and provide institutional guarantee for the cooperation of industry, universities and research institutes. For example, France is a country with an emphasis on legislation on science and technology, whose first law on science and technology is *Law for Instruction and Planning of Science and Technology*, after which a lot of laws and regulations on the guarantee and promotion of scientific and technological innovation have been issued.

### 3.7 Establishing Definite and Verifiable National Innovative Strategic Targets

While promoting the cooperation of industry, universities and research institutes, government should clarify national strategic targets first of all since definite and specific targets will help to point out the right direction, to create cooperation environment as well as to raise cooperation conditions related to the cooperation of industry, universities and research institutes. For example, British innovative strategy for the 21<sup>st</sup> century includes 29 sub-goals and 40 indexes involving world-class innovation centers, financial revenues, enterprises' investment and involvement in research and development, cultivation of labor force, public participation and trust in research and so on.

## References

- Li, Deming & Jiang, Wenjuan. (2007). A Research on Problems and Countermeasures in the Cooperation of Industry, Universities and Research Institutes. *Science & Technology Information*.
- Luo, Yan & Li, Ming. (2009). *A Research on Pattern and Operation Mechanism of the Operation of Industry, Universities and Research Institutes in Local Universities*. Sichuan Publishing Group. 8.
- Sun, Fuquan, Chen, Baoming & Wang, Wenyan. (2008). *Innovation in the Cooperation of Industry, Universities and Research Institutes: Basic Experience and revelation*. 1.
- Yang, Dan & Yang, Bin. (2007). Problems and Countermeasures in Promoting Industrial Upgrading through the Combination of Industry, Universities and Research Institutes. *Higher Education and Research*. 1.