

# Policy Suggestions on Innovation and Development of China's Industry-University-Research Strategic Alliance

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## Abstract

As is shown in the latest achievements in scientific research and major developed countries' relevant experience, industry-university-research strategic alliance serves as a crucial way to improve independent innovative ability. With such alliance being an important path to achieve independent innovation and innovative system with Chinese characteristics, government is expected to enhance its policy guidance and create favorable policy environment during industry-university-research cooperation.

**Keywords:** Industry-university-research, Strategic alliance, Policy suggestions

Industry-university-research alliance is an organizational form of three fields' cooperation with enterprises taking the dominance, a new cooperation pattern relying on knowledge, technology and information interaction as its major means as well as an effective way for the combination of economics and technology and for economy guided by science and technology. During the process of promoting the cooperation among the three sides and constructing industry-university-research strategic alliance, government's guidance role has to be exerted to produce more and better policy suggestions for the innovation and development of such alliance.

## 1. The Development of China's Industry-University-Research Strategic Alliance (with Several Typical Universities as an Example)

### 1.1 Tsinghua University's Practice

Tsinghua University, a well-known comprehensive university in China, has achieved remarkable results in industry-university-research innovation and development. Through their exploration into independent and innovative cooperation, a systematic cooperative structure, a diversified cooperative pattern as well as a unique cooperative institution has been established. Now it has established clear goals for its industry-university-research strategic alliance: integrating social resources, guiding scientific and technological innovation and serving social development. By constructing extensive cooperative system, Tsinghua University attempts to enhance its scientific and technological innovation ability, make use of social resources, serve social development and facilitate constructing first-class universities. Up to now, it has established an open cooperative network system with the internal digestion taking the dominance and external digestion taking a subsidiary position. Tsinghua University Science and Technology Park acts as a significant part in Tsinghua University's industry-university-research strategic alliance, an important physical carrier to transfer research accomplishments and to realize cooperation as well as an extension of social service functions. Meanwhile, Tsinghua Holding Company serves as not only a subject for adjusting, implementing science and technology development strategies and coordinating relevant interest but a decision-making and administration center for the cooperation in science and technology as well as economic technology.

### *1.2 Zhejiang University's Practice*

The successful cooperation between Zhejiang Insigma Group and Zhejiang University reflects the naturally close relations between enterprises derived from universities and universities themselves. Their cooperation promotes both the development of interdisciplines and talent cultivation and the improvement of enterprises' independent innovation ability, hence achieving an "1+1>2" effect. With its aim of integrating high technology and serving the whole society, Insigma Group takes full advantage of Zhejiang University's resources in scientific research to set up its innovative platform integrating industry, university and research. Through its strategic alliance with Zhejiang University, Insigma Group realizes effective integration of internal and external resources in different fields and industries and therefore achieves innovation and complementation. Such a unique value chain formed by making use of resources and intelligence helps it to improve its innovative ability in science and technology and market competition. In their cooperation, economy of scale related to innovation is made full use of to extend innovative activities to all sections on the industrial chain, to achieve the best purpose through constant adjustment of available resources, to integrate the most advanced resources at global market and finally realize constant innovation. Overall, Insigma Group's cooperation with Zhejiang University is characterized by agility, economy and harmony.

### *1.3 Shanghai Jiao Tong University's Practice*

The alliance between Shanghai Jiao Tong University and Bao Steel Group has helped to promote the transformation of scientific achievements, to improve technological innovation platform, to conduct the communication of advanced talents, to expand the range of cooperation and so on. The two cooperative parties have been constantly expanding the scale of cooperation, building a brand of cooperation between universities and enterprises and promoting strategic cooperation of industry, university and research. This alliance has promoted the close relations of Shanghai Jiao Tong University's technological cluster and Bao Steel Group's industrial cluster, hence becoming a classical pattern for cooperation between universities and enterprises. Now their cooperation has gone to co-establishing labs and conducting a cluster cooperation pattern, with their cooperation scope expanded to talent cultivation, integrated technology development and industrialized application of achievements and so on. In recent years, Bao Steel Group and Shanghai Jiao Tong University have insisted on complementary advantages to explore a "1+X" cultivation pattern and promote the communication in talent cultivation between universities and enterprises, establishing multi-channel talent cultivation system. Meanwhile, they also explore a pattern relying on enterprises' pre-interference to select and train excellent talents. In addition, a "dual-tutor" pattern employed in postgraduate education is necessary not only for improving enterprises' international competitiveness but for cultivating their self-innovation ability.

## **2. China's Experience in Industry-University-Research Strategic Alliance**

- 1) China has a variety of patterns for industry-university-research strategic alliance, which can be divided into consultation, research, education, new venture creation or into technology, industry consultation, knowledge-based new venture creation and patent transfer.
- 2) Industry-university-research strategic alliance has been ascended to be national or regional strategies, especially the increasing importance of industry-university-research cooperation in a university's development strategy has combined university development with the development of social economy.
- 3) Universities should be encouraged to establish technological transfer office and to lay down assessment system for science and technology coordinating industry, university and research. Meanwhile, they also need to offer sufficient decision-making power related to commercialization of technology and patent.
- 4) Scientific and reasonable patent and intellectual property right policies are important dynamics mechanism for the development and innovation of strategic alliances. Since system is based on interest distribution, our protection for intellectual property right should be relaxed and multi-faceted institutions and policies should be implemented.
- 5) Scientific research system at the national level is the core factor for the development of innovation of industry-university-research strategic alliance. A reasonable allocation of limited funds for scientific research will promote the birth and development of major social items and reduce waste.
- 6) Universities' research direction needs to be reformed to enhance basic applied research, which is a critical path to promote strategic alliance. It helps to transfer traditional single research pattern into an interactive pattern between universities and society.

### **3. Policy Suggestions on Innovation and Development of China's Industry-University-Research Strategic Alliance**

#### *3.1 Policy Suggestions on Strategic Innovation*

##### **3.1.1 Establishing a Strategic Path Based on Independent Innovation**

The Fifth Plenary Conference of Sixteenth Central Committee of the CPC made a significant decision on the overall development of Chinese economy and society as well as a major strategic plan for China's future scientific development and industrial structure upgrade. Since industry-university-research strategic alliance is an important strategic path to improve independent innovation ability and to construct an innovative nation, government needs to have material changes in its function and ideas.

(1) Industry-university-research strategic alliance is a new pattern to convert economic growth methods as well as to implement the scientific outlook on development.

Only by relying on innovative subjects' strategic cooperation to improve the whole nation's self-innovation ability and realized scientific development wholly can economic growth be converted to an innovative growth method. Industry-university-research strategic alliance helps to promote the cooperation among three parties and to convert passive cooperation into active one in the common interest of all parties. It is emphasized to integrate current innovative resources at a strategic level, to design efficient cooperation mechanism, to make use of complementary advantages and to offer more scientific organizational pattern for the development and innovation of strategic and core techniques.

(2) Industry-university-research strategic alliance is an importance basis for enterprises' constant development.

In order to improve their independent innovation ability and to construct an innovative nation, enterprises are expected to exert their critical role as innovative subjects, to stick to the scientific outlook on development, to innovate their development patterns, to convert their ideas as well as to implement the industry-university-research strategic alliance strategy. Only by combining social resources and making use of complementary advantages can enterprises form cohesive forces. Only by grasping core international techniques and creating new products can they remain invincible in fierce market competition.

##### **3.1.2 The Construction of Entrepreneurial Universities**

Entrepreneurial universities are a result of universities' participation in global competition and conversion of their function in the new situation. They pay more attention to their communication and cooperation with society and external environment. Currently, special administrative departments responsible for communication have been established in universities, mainly involving technological consultation, technological transfer, industrial association, continuing education as well as interdisciplinary cooperation.

(1) Establishing projects of entrepreneurial university construction to emphasize industry-university-research alliance' role

As an important knowledge production structure, universities are exerting an increasingly important role in the development of economy and society, becoming a leading structure in the national innovative system and having conditions and abilities for organizational innovation. By satisfying enterprises' needs for scientific production, entrepreneurial universities succeed in gaining the same status as that of enterprises and government and climbing to a major position in innovation and economic development.

(2) Encouraging Universities to Establish Corresponding entrepreneurial organizations

Government is expected to push the construction of entrepreneurial universities based on the goal of research-oriented universities, which is the key to the innovation and development of industry-university-research alliance. Knowledge-based entrepreneurship, an advanced form of industry-university-research alliance, is an important function of universities. Some organizations, such as technological transfer offices, incubators, science and technology parks, appear during the development of entrepreneurial universities, hence enhancing the association between universities and enterprises. In addition to strengthening their research capacity, Chinese universities are expected to rely on government fund projects and to enhance the sense of industrial cooperation in order to serve the development of regional economy and social development as well as to form a university-enterprise-government innovation pattern.

##### **3.1.3 Perfecting Universities' Technological Innovation Evaluation System**

Currently, there is no scientific and systematic system to evaluate technical staff's job performance in universities. In spite of theoretical research, current evaluation system neglects applied research and

application-oriented basic research, having no enough evaluation on researchers' performance in industry-university-research cooperation as well as in technical service. In addition, patent and intellectual property right don't play a critical role in the promotion of professional titles. The construction and development of industry-university-research strategic alliance calls for investment of universities, enterprises, government and all other sides of society, hence encouraging university research staff to participate in social services, to have technological transfer. In addition, greater importance should be attached to universities' technical innovation evaluation system, improving their evaluation standard on technical staff, including performance targets related to industry-university-research strategic alliance in technical innovation evaluation system and guiding technical staff to play an active role in the cooperation process.

### *3.2 Policy Suggestions on Organizational Innovation (Based on Knowledge Traits)*

It is through learning among organizations that industry-university-research strategic alliance achieves an interaction among scientific research, cultivation of talents and demands of enterprises. By nature, this alliance is a knowledge-based one. Due to different traits of knowledge, there are different forms for such strategic alliance. Therefore, it is the key to success to construct diversified forms for industry-university-research strategic alliance according to different traits of knowledge. Knowledge, the core element in industry-university-research cooperation, can be divided into dominant and recessive knowledge. According to knowledge traits, strategic alliance can be divided into two patterns relying on dominant and recessive knowledge respectively. The former emphasizes quick transfer of knowledge and minimized transaction cost in interactive conditions, mainly technological transfer and technology admission while the latter emphasizes mutual learning in joint development and interaction, mainly including jointly establishing technological centers, jointly establishing labs, establishing new enterprises, jointly establishing mobile post-doctoral stations and so on.

### *3.3 Policy Suggestions on Institutional Innovation*

#### *3.3.1 Establishing Perfect Financial System*

Currently, there is no financial system promoting industry-university-research cooperation in spite of the significance of favorable financial system in strategic alliance and the improvement of independent innovation ability. Government is expected to encourage risk investment in industry-university-research alliance, to have a reasonable plan for participation of risk investment as well as to offer relevant policy guidance and tax preferences along with other relevant departments to stimulate risk investment's motivation for participating in strategic alliance. Meanwhile, government and universities are also supposed to enhance planning and design of strategic alliance's risk investment system and institutional framework.

#### *3.3.2 Proposing Open Science System*

Open science and knowledge system is a special knowledge production system offering scientific and reasonable institutional arrangement for cooperative knowledge production among universities, enterprises and scientific organizations. Government should establish and implement open science and knowledge system as soon as possible as well as set up stimulation system related to knowledge production, extension and application. Open science system is one intended to achieve maximized profit from knowledge; open science and knowledge system is an institutional guarantee for the innovation and development of strategic alliance. Actually, open science system refers to the establishment of academic priority and rewards system based on priority. Government are supposed to establish academic priority and right of fame inside a science system as well as a whole set of rewards system based on priority to stimulate scientists' enthusiasm for knowledge production and service efficiency of public investment.

#### *3.3.3 Exerting Duplex Intellectual Property Right System*

China' intellectual property right administration system is one-fold and its classification of intellectual property right between universities and enterprises is quite vague. In industry-university-research alliance, universities and enterprises both should maintain their protection for their intellectual property right at a proper level, which is critical to the innovation and development of such an alliance. Government should create favorable policy environment and stimulation system to protect and encourage inventors' innovative spirit and enthusiasm. Intellectual property right protection system should be established and perfected to put relevant details into practice. Through perfecting and enforcing laws and expanding propaganda and education, innovative actions will come into being, innovative enthusiasm can be stimulated and innovative environment can be improved.

#### *3.3.4 Establishing Laws and Regulations on Technological Transfer*

Currently, there is no special law to coordinate industry-university-research cooperation, so universities have relatively poor independent right in technological transfer. During the innovation and development process of

strategic alliance, laws and regulations on technological transfer should be established, such as technological transfer law with Chinese characteristics as well as corresponding institutions according to China's reality and international rules. Specific technological transfer law and corresponding power of decision are dynamics mechanism promoting the efficient development of industry-university-research strategic alliance. As a result, greater efforts should be made to establish laws and regulations promoting and standardizing technological transfer, to clarify legal status, right and obligation of different institutions and to promote knowledge flow and technological transfer among enterprises, universities and research units.

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