

Review of the Research Institute's Reform

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Abstract: Two decades ago, Mr Deng Xiaoping, the architect of "reform and opening up", proposed to transform the economy system step by step in order to maintain a rapid development. In the meantime, the research system faced the challenge to meet the remarkable changes in the economy field. At that time, most of the Chinese research institutes were founded in the 1950s, and all these kinds of institutes were financed by the governments at different levels, including those application research institutes. Moreover, the research institutes were affiliated to different government departments, therefore they had few concerns about the markets, and the researchers were promoted by the papers they had published, not by how the research result had been exploited.

In an attempt to facilitate the science and technology (SC) to contribute to the economy growth, from 1985, China began to encourage the institutes to commercialize their fruits. In the same year, China released a regulation named the decisions on the reform of the management system of science and technological institutions, which marked the first step of the transformations of the Chinese research institutes. In this document, China showed its' resolution to change the operating system and the management system of the research system. Many measures were taken such as: reforming the traditional appropriate funds system, exploring technology market.

In 1995, the State Council issued a decree titled the decision of accelerating the progress in SC, it was the first time that the SC and Education invigorating Strategy was posed in this document. After decades of efforts, for the applicable technology research institutes, more than 90% of their incomes come from the market.

1999 saw a remarkable breakthrough in the reform march. In this year, the central government held a nationwide conference focusing on the banner of strengthening technology innovations, developing high-tech, realizing industrialization. Consequently, several major measures were declared in this meeting: All the state-owned technology-related research institutions are required changed into enterprises, and some of the commonwealth research institutes would be sorted out to be financed by the government on the precondition that they have to reduce their surplus staff and adjust their research field in line with the nation and economic development demands.

Till now, there are 376 applicable research institutes which affiliated to different central government ministries, transformed into corporations, and 15 companies originated from these institutes have been listed in the market. And 70% of the provincial research institutes have become thorough enterprises.

1. Former Research System

In November, 1949, the Chinese Academy of Science was founded, subsequently, in 1956, the Science Plan Committee and the Technology Committee were established by the State Council, and in 1958, the two committees were incorporated into a new one named: National Science and Technology Committee. Meanwhile, China had founded its preliminary research system, which mainly imitated the experiences and practices in Soviet, featuring the centralized political and planned economy system. Though it was undermined in some extent in Culture Revolution, it was still remained the major planned properties until 1978. However, in the 1950s, China lacked the abundant resources to finance large scale research activities, it had no other choices than to concentrate its meager resource on some aspects which were in urgent demand. In fact, this kind of research system had contributed a lot in the planned economy era.

Various SC administrations at different levels were set up to be in charge of the SC activities, the CAS, Universities, Research Institutes affiliated to the industrial departments, the military defence research units, forming the fundamental R&D system. To sum up, this planned system bore the following characteristics: highly planned, the allocation of the SC resources, the assessment of the fruits, the spread of the technology, were all controlled by the government depts. The R&D units had little space to determine their own R&D directions according to needs. Furthermore, the R&D units were entirely independent from the enterprises, therefore, they have no impetus to care about what the problems the enterprises were facing. What's more, the governments at various levels had set up plenty of research institutions, it is inevitable for these institutions to engage in the close research areas, leading to a sort of waste of the limited resource. For a long time, the lack of sophisticated SC legislation had hampered the development of SC in China, there was not yet a law regulating and clarifying the activities' relationship between the government, organizations, and individuals. Meanwhile, there was no practical assessment system for the R&D institutions and personnel.

2. Start-up of the Reform

In 1978, China began to implement the "Opening and Reform" strategy in an attempt to get a rapid economy growth. At the same time, many tools of market economy started to land China, from 1978-1985, A package of policies were issued to ensure a smooth and gradual reform process in the economic field. Noticeable changes had occurred during this period, a lot of enterprises, especially the township and private enterprises sprung up, The outputs of the R&D were far from to meet the growing demands of technology coming from the enterprises. This situation forced the government to consider the possibility of restructuring the R&D system into be a more innovative one. In 1982, the central government proposed a strategy "Economy development must rely on the SC, SC must serve the economy development" to pilot the SC-related work.

1985 had seen a milestone in the research institutes' reform history. In this year, a crucial national wide conference was held by the State-Council which marked the commencement of the system reform. The research institutes' reform was a highlight topic in this conference. After heat discussions and consultations, several far-reaching and profound measures were made in a document titled "The decisions on SC reform". The essence of the reform was to push the SC to play an important role in economic development, and the major tasks were to alter the administrative system, adjust the structure of the organizations, and reform the management of the personnel.

Transforming the financing means : The government was going to transform its present financing methods for research institutes, different categories of institutions would get different degree of finance from the government in line with their functions and tasks. The budget support for those who were mainly involved in the applicable technology development would be curtailed year by year, they should acquire the income from the market by selling their fruits or commercializing them. In the meantime, they could apply for the project assistance from the government through competition. For the institutes who were working on the disease, hygiene, meteorology, and so on which could not survive in the market, the government will secure its stable finance support. As for the institutes working on different researching fields, they could not get the support from different channels.

Offering more freedom to the institutes: the research institutes were granted rights to determine the R&D projects according to their real advantages, institutes also had the right to employ the personnel it needed.

Establishing the technology marketplace, it was the first time for China to admitted the technology as commodities, and allowed the R&D units to sale, transfer or commercialize the research results. This measure was to encourage the R&D units to develop new technologies and accelerate the pace of commercialization. In Nov. 1985, the state council released the provisional regulations on the transfer of technologies.

Establishing the nature foundation. In response to suggestions of renowned Chinese scientist, China decided to set up a nature foundation primarily to bolster the investigations in basic science such as physics, chemistry, biology and so on. The foundation was mainly come from the government finance. The foundation has been concerned by the scientist in home and abroad, and has been played an important role. A handful of important discoveries finished by Chinese scientist had ever been gotten the support from it.

2. Deepening the Reform

From 1989 to 1991, the reform entered an adjustment stage, during this period, the government had been reflecting the problems emerged in the reform process, and trying to find a new way to continue the reform. In 1994, China proposed a new policy summarized as "secure the key institutes, free most of the institutes". On one hand, china will steadily sustain the support to the basic research activity, and the relevant institutes who were carrying out it. On the other hand, China had mapped out a series of preferential policies to promote the applicable institutes to make money from the market, combining their activities into the economic field.

3. Breakthrough

At the National Technology Innovation Convention held by the State Council and Central Committee of the Communist Party of China in August 1999, a document was issued namely *The Decision on Strengthening Technology Innovation, Developing High Technology and Realizing Industrialization*. It was pointed out explicitly that we should strengthened the principal position of technology innovation for enterprises, give the market mechanism free rein to play its fundamental role in the allocation of science and technology resources, impel the access of most of the science and technology forces into the market, and promote actively the building of national innovation system while proceeding with that of the innovation main body. In this connection, with rich fermentation and full preparations, the central government decided to implement the transformation to enterprises of research institutes oriented to technology development based on the existing reform achievements as a breakthrough to deepening the reform of the science and technology system. By this reform, 1618 institutes oriented to technology development are transformed from public institutions to enterprises. It is not only momentous in Chinese history of science and technology but unprecedented in the whole world.

Before the reform, there are in total 1618 research institutes oriented to technology development, including 376 central institutes and 981 provincial and municipal ones. There have long existed some problems with such institutes. As they are not closely linked with and even dissociated from the corporations, it leads to the terrible lack of impetus for market competitions and deficiency of incentive mechanism for science people to innovate and pioneer undertakings. At the same time, specialty structures of some institutes are outdated and the mechanism of openness, fluidness, competition and collaboration has not been established yet. Besides, brain drain also shows to be quite a serious problem.

Among the 981 provincial and municipal research institutes oriented to technology development, 70% of them have finished the business registration for enterprises, and the national overall transformation of institutes to enterprises is expected to be accomplished by the end of the year. As for the over 2400 research institutes oriented to public benefits, classified reforms have been launched in an all-around way. According to the statistics, 29 provinces have mapped out reform programs while other 21 provinces have already kicked off such reforms.

The reform of transformation to enterprises of the research institutes oriented to technology development performs as a momentous landmark in the building of the national innovation system.

Overall situation: The reform has been started in an all-round way since 1999. The transformation of the 242 research institutes affiliated to the 10 state bureaus administrated by the former State Economic and Trade Commission was considered as the point of breakthrough. By far, the periodic task for the transformation of the institutes oriented to technology development that are originally affiliated to the central government departments have been accomplished on the whole, while 376 such institutes finished the business registration one after another.

Orientations of the transformation of such institutes are as follows: 12 of the institutes are transformed into large-sized science and technology enterprises directly under the central government, 307 ones are transformed or merged into science and technology oriented enterprises, while the other 57 are either transformed into intermediary organizations or merged into universities or even cancelled.

For the past three years, some preliminary achievements have been made for the transformation of the research institutes with four main aspects stated as follows.

First, the industrialization of the transformed research institutes develops rapidly, with industry scale and benefits increased greatly. According to the statistics on the 188 of the total 242 institutes in the first round transformation, the gross revenue in 2002 reached 14.89 billion yuan, growing at a speed of 10% per year and increased by 40.6% than the income of 10.59 billion yuan in 1999. As the main body of the revenue, industrial marketing income accounts for 61.2% of the gross revenue in 2002 growing from 50.0% in 1999. In 2002, the net assets count for 14 billion yuan growing by 29.9% than that in 1999, return profit totals 1.1 billion yuan growing by 127.8% than that in 1999, while taxes amount to 560 million yuan growing by 71.8% than that in 1999.

Second, with the investment for science research increased yearly, the transformed institutes are undertaking more and more state science research projects and have improved their service capacity for the science and technology progress of the industries. In 2002, the year investments for science and technology development of the 188 institutes total 1.52 billion yuan, increased by 51.2% than 1.01 billion yuan in 1999. Finance for undertaking the state science research projects is increased by 48.5% from 450 million yuan in 1999 to 680 million yuan in 2002. At the same time, the capacity of service towards enterprises in the industry is enhanced continuously. The horizontal revenue of science and technology oriented industry is increased by 9.1% from 2.09 billion yuan in 1999 to 2.28 billion yuan in 2002.

Third, more importance is attached to the innovation of science and technology with the numbers of patent applications and authorizations on the increase. Comparing with 1999, in 2002, the numbers of patent applications and authorizations are increased by 76.9% and 14.1% respectively, while the numbers of doctors and masters fostered by the institutes are increased by 104.8% and 60.2% respectively.

4. Reforms of the public benefits orienteil institutes

Overall situation: There are totally 266 institutes oriented to public benefits under the central government departments. They have 80,000 personnel in total, covering 22 departments including agriculture, forestry, water resources, health, etc. In November 2001, 98 public benefits oriented institutes, which are affiliated to Ministry of Land and Resources, Ministry of Water Resources, State Forestry Bureau and China Meteorological Administration, took the lead in launching the reform. In October 2002, 107 institutes under nine governmental departments including Ministry of Agriculture made their reform programs and started the transformation. By far, 205 institutes under 13 departments have started the reform in two rounds, covering over half of the governmental departments and 77% of the institutes throughout the country.

Orientations of the reform for the public benefits oriented institutes are as follows: institutes competent for the market, which count for over half of the total, shall be transformed into enterprises. As for institutes that are engaged in basic research for technology application or public services, have no access to economic returns, and need support from the government, they will remain to be public institutions and run as non-profit organizations. Besides, research institutes are encouraged to join the universities to strengthen the linkage between science research and education.

The reforms of the regional science and technology systems have been promoted positively for the recent years. According to the investigations and statistics on 45 of the total 47 provinces and municipalities, there are in total 2145 research institutes directly under the governments of provinces and cities specifically designated in the state plan. Among them, 985 ones are oriented to technology development while other 1140 are oriented to public benefits.

Regarding to the reform of the institutes oriented to technology development, by the end of 2002, 652 of the total 985 institutes (67%) have finished the business registration. In 19 provinces and municipalities including Beijing and Hebei, all the institutes oriented to technology development have finished business registration, while other provinces and municipalities are expected to finish it by the end of this year. At the same time, the property system reform of the research institutes is actively explored throughout the country. Among the registered institutes that are oriented to technology development, 219 institutes, which count for 1/3 of the total, have restructured into corporations.

In future, we shall focus on the overall objectives of the national innovation system building and further promote the development of the reform of the science and technology system. The transformation of the institutes oriented to technology development should be centered on the property reforms, build a modern enterprise system with clear property relations, and establish an operation mechanism of competitions and collaborations. As for the institutes oriented to public benefits, we should strengthen and promote the implementation of the reform in an all-round way according to the principle of classified reforms. Through the improvement of the national innovation system as well as the macro-control of the government and the fundamental roles of the market, an innovation situation with guidance from the government and coordination from the interactive society is expected to appear.