

**Review Article**

# Review of Research on Evaluation of the Original Innovation Ability

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**To cite this article:**

Haijian Wu, Yubing Zhao. Review of Research on Evaluation of the Original Innovation Ability. *Advances in Sciences and Humanities*. Vol. 3, No. 6, 2017, pp. 98-101. doi: 10.11648/j.ash.20170306.15

**Received:** November 7, 2017; **Accepted:** November 16, 2017; **Published:** December 5, 2017

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**Abstract:** This paper reviews the domestic and foreign researches on the evaluation of innovation, original innovation and original innovation ability, and based on the comparison of time with foreign research, focuses on the research and development on the original innovation ability in China. Several of the major up-to-date aspects of China's assessment of the original innovation capacity.

**Keywords:** Innovation, Original Innovation, Innovation Ability Evaluation

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## 1. Research Background

The 18th Chinese Communist Congress proposed that "innovation is the strategic support for raising social productivity and overall national strength and must be placed at the core of the national development overall situation." This strengthens the determination and confidence of the entire country in taking the independent innovation path with Chinese characteristics and implementing the innovation-driven development.

Primitive innovation often brings about major adjustments in technology, products and even industrial and economic structures, giving both opportunities for sustainable development and surpassing. However, at present, China's original innovation capability is still rather weak. After China's accession to the WTO, China has ushered in more intense market competition and greater pressure of technological progress.

To enhance our country's original innovation capability is another important strategic decision taken by China to implement the strategy of "rejuvenating China through science and education" and "sustainable development." Studying the theoretical and practical problems of the original innovation undoubtedly has important academic value and social realistic significance.

## 2. The Development of Innovative Research

### 2.1. The Origin of the Concept of Innovation

Joseph Schumpeter, the famous economist, first used the term innovation in his 1912 book *Economic Development Theory*. He pointed out that what is called innovation refers to a process in which an unprecedented production "new combination" introduced into the production system. [1] The concept of his innovation is quite broad and refers to a variety of new activities that increase the efficiency of resource allocation. In his view, innovation is a kind of creative destruction, and every innovation is both creation and destruction. Innovation is a reorganization of the factors of production, the purpose is to obtain potential profits

In Schumpeter's theory, technological innovation and innovation are regarded as the same concept, that is, innovation refers to technological innovation, that is, technological innovation, that is, the same concept. From this point of view, the original "innovation" is an economic concept.

### 2.2. Changes in China's Innovation Policy

In 1978, China National Science Conference determined that science and technology are an important principle of

productivity.

In 1985, China started the first reform of the national science and technology system after the reform and opening up: changing the appropriation system, accelerating the market-based popularization and application of technological achievements and continuing to organize technological innovation activities directly with scientific and technological breakthroughs as the main mode.

In 1996, China formally proposed an innovation policy of "taking enterprises as the mainstay of innovation", and rapidly raised the capability of Chinese enterprises in technological innovation

In 2006, China formally put forth the innovative strategy of "increasing the number of word-number innovative ability as the main line and building an innovative country" at the first national science and technology conference in the new century

In 2012, China once again emphasized the strategy of rejuvenating the country through science and education and strengthening the nation with its talents, stressing the principle of "independent innovation, focusing on leapfrogging, supporting development and leading the future" [2]

### **2.3. Innovation Research in China's Development**

Examining the current understanding and use of innovative concepts in society, many experts and scholars in China have come up with many groundbreaking ideas in terms of technological innovation and knowledge innovation

In terms of technological innovation, Lian Yanhua (1999) [2] considered that the policy of technological innovation is a policy system and is the sum of all kinds of direct or brief policies and measures that a country adopts to promote innovation activities and regulate technological innovation. Tong Dalong (2006) [3] that public finance to support technological innovation for a country's technological innovation and economic development of great significance. Liu Jinliang (2006) [4] proceeded from the necessity of tax revenue promotion innovation, analyzed the deficiency of our current tax revenue in promoting enterprise technology innovation, and put forward relevant policy suggestions. Chen Xiangdong et al. (2004) [6] proposed a theoretical framework for examining the utility of technological innovation policies from two aspects: incentives for innovation creation and application incentives, and actually examined 151 policies for technological innovation during 1985-2000 in China. The empirical results show that the overall development of China's technology innovation policy is shifting from individual innovation incentives to mechanism innovation incentives. At the same time, the overall development of China's technology innovation policies is shifting from individual innovation incentives to mechanism innovation incentives. At the same time, China's technological innovation policies Emphasis on external incentives for innovation activities and external facilities, and innovative incentives within the body of the policy is relatively weak in terms of quantity.

Knowledge innovation, Wujiang (2002) [7] that the main function of knowledge innovation system is only the production, dissemination and transfer. As far as China is

concerned, the understanding of knowledge innovation should belong to the category of "technological innovation". Therefore, it belongs to the source of technological innovation. Technological innovation is the basis of knowledge-based economy and the fundamental driving force for promoting economic growth. It also holds that knowledge innovation with core of science and technology innovation is the source and foundation of technological innovation, and that technological innovation is the result of knowledge innovation. Zhou Zhengxiang (2002) [8] thinks that in the whole innovation system, the knowledge innovation system is a sub-network composed of the institutions and organizations related to the production, diffusion and transfer of knowledge. The core institutions are the national scientific research departments and universities, Function is to produce, spread and transfer knowledge. Liu Xiaoping (2004) [9] thinks that knowledge innovation is the whole process from knowledge production and creation to application. By pursuing new discoveries, exploring new laws and accumulating new knowledge, it achieves the goal of creating added value of knowledge and seeking the competitive advantages of enterprises.

## **3. Original Innovation Ability**

### **3.1. The Concept of Foreign Original Innovation Put Forward**

In the second industrial revolution, the United Kingdom, the United Kingdom, the United Kingdom, Germany and Germany have the tradition of attaching importance to basic research. The United States has begun to attach importance to basic research after World War II. Not only do these countries strongly support basic research, many large enterprises take the initiative to conduct basic research jointly with research universities. Many of them also have their own basic research laboratories such as IBM Labs, Bell Labs and DuPont Labs, among which Scientists at IBM Labs, Bell Labs and General Electric Company in the United States have won numerous Nobel Prizes in Nature Science.

Knowledge innovation "is at the heart of the American business. The reason this happens is that the achievements in the science research labs have now become an integral part of the most important decisions that business policymakers dictate." Therefore, they seldom talk about original innovations in knowledge innovation and separate them for independent research, even rarely adopting the formulation of original innovation or initial innovation.

Foreign scholars study on the concept of original innovation originated in the 1940s. American scientist vannevar bush pointed out that new concepts and new principles are the basis for producing new products and inventing new technologies. The "new concepts and new principles" here can be regarded as primitive An initial prototype of innovation. He believes that basic research has long-term and meaningful social and economic implications.

In March 1994, U.S. President Clinton and Vice-President

Al Gore published a report on science and technology policy entitled "Developing Science for National Interests", stressing the importance of basic research. In August the same year, Gibbs, the U.S. President's science and technology adviser, reiterated in the House hearing that the importance of basic research was emphasized: "Science and technology are part of an interdependent whole that together underpin the economy of the country "[10]

### 3.2. Theoretical Definition of the Original Innovation

In recent years, foreign researchers conducted a lot of researches on primitive innovation. Representatives include well-known scholars such as Jacob Gedebo 12 and David Mazursky. They put forward a whole new concept of original innovation. Original innovation is to solve the problem of amplification, internal changes in innovation caused original innovation. Innovative features are: dynamic, discontinuous, unpredictable sex.

American scholar Laurels Peter put forward that original innovation is a new kind of innovation and is an unprecedented innovation. Use new technologies and innovate in matter.

At present, there is no unified definition of the concept of original innovation in Chinese academia, most of them explain the connotation of original innovation from their respective perspectives.

On the definition of the concept of original innovation, Xu Guanhua, Minister of Science and Technology, pointed out in his speech at the NSFC National Committee in 2001: "Primitive innovation refers to the field of innovative research and development, especially in the field of high and new science and technology of basic research. Instead of lengthening one innovation period, it will create new cycles and create a new upsurge by making a discovery or invention that has not existed before and further withdrawing from innovation. "[11]

Professor Zhang Hsueshen believes that original innovation refers to the creative achievements that are fundamental, breakthrough and have a far-reaching impact on the process of civilization and are the core of human creativity. [12]

Yang Ning believes that original innovation refers to the first discovery and invention of mechanisms, laws, phenomena and new technologies. These first discoveries and inventions have tremendous potential to promote human progress and stand the test of history. [13]

Zhang Chan love that innovation is the essence of basic research is the basic requirements of basic research. The original innovation is particularly important, is the soul of basic research. Primitive innovations in basic research are the highest in all innovation activities. They take the lead in acquiring new knowledge, discovering new phenomena and laws, inventing new technologies and principles in the world by adopting the latest research methods, Innovation provides new basics. [14]

The 973 Program Basic Research Major Issues Strategic Study Group also defines the original innovation from the scientific and technical fields: the original innovation in

science refers to the innovation activities that open up new fields, lead new directions and nurture new disciplines. The achievements include new phenomena. The discovery of new concepts and the formation of a new theoretical system; technical original innovation refers to a major technological breakthrough, the results include new methods, new processes, new products and other major inventions. [15]

Li Ping believes that basic research not only has a positive technology-pulling effect on technological innovation and technology introduction, but also has certain "crowding-out effect" on technological innovation when the structure of research and development is unreasonable, which has a negative effect on technology introduction[16]

## 4. Result of the Research on Evaluation of Original Innovation and Original Innovation Ability

The evaluation of the original innovation ability is through analyzing the influencing factors of the original innovation ability, establishing the index, determining the weight, making comparative analysis, establishing the mathematical model, and expressing the original innovation ability in the form of quantification.

At present, there are not many researches on the evaluation of original innovation capability in our country, but mainly in the following aspects:

In the design and model construction of the evaluation index system of the original innovation ability of colleges and universities, Xing Jihong (2017) evaluated from four aspects: resource level, innovation atmosphere, management level and output level. In recent years, Structural Equation Model (SEM) has been used by more and more scholars to confirm the data analysis. According to the above aspects, the evaluation model of university's original innovation capability, the original innovation ability and resource level, the atmosphere of innovation, the level of management and the level of output can be constructed [16].

In the research on the evaluation of the original innovation ability of high-tech industry, Li Hai-chao (2015) followed the principle of science, comparability and operability to establish the evaluation from four aspects of human resource investment, research funding, environmental support and output level Indicator system. [17]

Based on the theoretical analysis of technological innovation capability, Dong Yuanyuan (2010) divided the original innovation ability system of large-scale enterprises into six competency elements, which are original innovation investment ability, original innovation staff foundation ability, Hexi ability of original innovators, original innovation research and development capability, original innovation management ability and original innovation output capacity. [18]

In the research on the evaluation of the original innovation capability of the equipment manufacturing industry, Shen Bin (2008) constructed the evaluation index system of the original innovation capability of the equipment manufacturing

industry from the five aspects of innovation foundation, investment in science and technology, output benefit, city of fantasy and continuous innovation Level indicators, and the use of analytic hierarchy process (Analytical Hierarchy Process) to establish the weight judgment matrix, but also the technical and economic indicators of the comprehensive evaluation of the selection of the applicability and application of the description of the principle. [19]

## 5. Conclusion

According to the literature available abroad, the related research of the original innovation mainly focuses on the connotation of the original innovation and the original innovation ability. The overall research results are not many

From the domestic point of view, the research results of original innovation are relatively abundant, and there are many researches on the connotation, ability and evaluation system of original innovation. Our country has long experienced low initial innovation capacity, resulting in insufficient international competitiveness. Therefore, the research on the original innovation capability in our country is quite in-depth, mainly from the aspects of the evaluation of innovation ability, the reason of the lack of innovation ability and corresponding countermeasures.

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