

# The Open Innovation and Scientific Development

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**Abstract** 30 years since the reform and opening up, socialism in China has displayed its Infinite energy and vitality. The reason why socialism with Chinese characteristics has great life-force mainly lies in advancing the mode of independent innovation in the reform and opening up. The paper reviews Schumpeterian innovation theory, endogenous as well as exogenous growth theory, and presents that China should combine the open innovation with participating in economic globalization, and highlight the strategy of rejuvenating the country through science and talents. It draws a conclusion that China must accelerate the transition to innovation-oriented country, ultimately achieving the aim of scientific development.

**Key words** Schumpeterian innovation theory; Modern economic growth theory; Innovation-oriented country; Economic model of open autonomy; Scientific development

## 1 Introduction

since the 1950s/60s, countries in the world have shown the times Characteristics of globalization, peace, cooperation, development, change, adjustment, transformation, diversity and “a globe, two systems” (that is the coexistence of two different social systems).<sup>[1]</sup>At present, it has become a major issue of theory and practice about economic and social development to deepen our understanding of “What is development, how to develop, whom development is for, whom the development depends on and who enjoy the achievements of development”, etc. In the profound changes pattern of productivity, production mode, lifestyle, and development of economy and society, an independent power like China emphasizing Chinese characteristics and Sinicism must own the stuff of independent innovation for wanting to rise. In the meantime, the powers’ history of rise as well as fall and the course of industrialization in China have demonstrated that we must set up a global perspective, energetically advocate the open innovation, always combine open innovation and participation in economic globalization, and found an economic model of open autonomy as well as Innovation-oriented country, which is the indispensable meaning of the scientific development issues of a large developing country.

## 2 The Western Theory of Innovation and Economic Growth

The concepts of innovation people understand originated in Joseph Schumpeter advancing modern innovation theory for the first time. Schumpeter created his own system in the innovation theory of Western economics so as to lay the foundation for his distinctive position in research field of economic thought development history. At the same time, he founded both the dynamic equilibrium theory and a set of “dynamic theory of economic development” that illustrate the economic dynamic phenomena by the internal factors of economic system.

In his writings *Economic Development Theory* (1912), Schumpeter firstly put forward “economic development theory and innovative thought”. In his view, technological creation instead of capital and labor is the main source of capitalist economic growth. The so-called innovation is that a sort of “new combination” about the factors and conditions of production is introduced into production system. The economic development, which can be realized through the introduction of “new combination”, is a creative alteration within economic life caused by the creation of technique and production organization form. In addition, Schumpeter's understanding of innovation is not limited to technical creation and also includes institutional innovation of which blazing new trails in organization can be considered as the part. With the development of productive forces, he paid considerable attention to the constant change of organization and management institution. All of these, to a certain extent, are not only in line with the objective requirements of modern large-scale production, but also bring some enlightenment on accelerating the socialist modernization of China.

Between 1930s and 1940s, Schumpeter have published in succession two books — *The Economic cycle* and *Capitalism, Socialism and Democracy*, which further perfected innovation theory, and formed a original theoretical system based on it. The essence of this system is the thinking of “Creative destruction”, that is that once the existing production technology and mode are updated by competitors,

and come in for the severe impact of products with higher efficiency, innovation will destroy them, even the traditional values, management system and business model attack by the new technology. He believed that in the competitive economic life, the new combination means that the diverse approaches are taken to eliminate old organizations through competition. It is thus evident that from a dynamic perspective Schumpeterian theory of “creative destruction” explained industry evolution law of a country and the whole world.

The modern economic growth theory attached great importance to the problem of technology, knowledge and human capital as the main innovative subjects. Harrod-Domar growth model, the starting point of this theory, was based on such assumptions as inexistence of technical progress, etc., indicated that the economic growth depends on external factors, and thus is also known as the old theory of economic growth or exogenous growth theory. The new economic growth theory, whose main characteristic is study on endogenous technological progress, suggests that economic growth is no longer determined by external factors. Therefore, it is also known as endogenous growth theory. Research ideas of new theory consists of four modes—“P. Romer long-term growth model of knowledge spillovers”, “Robert Lucas external growth model of human capital”, “Stokey, N endogenous growth model of knowledge spillovers by introduction of new products”, “Young, A limited growth model of learning by doing”. The new theory of economic growth broke through the limitations of the neoclassical growth theory, drew the knowledge and the specialized human capital into growth model, stressing in the process of economic development the significance of opening up policy the developing countries implement. The international trade, the positive-sum game of both sides benefits, not only increases the total commerce volume of world, also can speed up the worldwide transmission of advanced knowledge, technology and human capital, which makes in countries involved in trade the technology, knowledge and human capital be rapidly enhanced, and knowledge spillovers effect of learning by doing be well achieved. Clearly, the new theory of economic growth brought up rather meaningful policies and propositions for the economic development in various countries, especially in the developing countries.

### **3 Combining Independent Innovation with Participation in Economic Globalization**

The spirit of innovation is the soul of a nation’s progress, thus to possess innovative ability is the inexhaustible power for a country with prosperity. The open innovation we talk about here, different with closed innovation, is an independent innovation modality promoted in reform and opening up. For example, we must structure both the development strategies of independent innovation-oriented country and economic model of open Autonomy in accord with Chinese conditions. When absorbing the advanced things by globalization, we need to emphasize independent innovation. In other words, in today’s context of peace and development, we should sparkplug the integration between independent innovation and participation in economic globalization.

In order to further the development of socialism with Chinese characteristics, we should seize the opportunity, implement the policy of opening up and actively participate in the process of globalization. Exposed to the tide of contemporary economic globalization, which regards the world market and transnational corporations as the hallmark, Chinese market economy should seek to break national and regional boundaries, and pursue universal communication as well as the nature, inherent requirements and operating rules of global links. The identity of the domestic market and the world market demands that we set up the developed and standardized system of modern market economy combined with the world market and constrained by the world market mechanisms. Only in this way, can various factors of production, goods and services be large flowed, circulated and associated in the world, and can all the positive results capitalism has brought about be speeded up to absorption and possession. Ultimately, we tend to create the historical conditions and material bases that will accelerate our development and final transition to communism.

However, we must also realize the essence of contemporary economic globalization is the globalization of capitalist economy, Just as Marx predicted, “People of all countries have been drawn into the world market network day by day, thus the capitalist system is increasing taking on international nature<sup>[2]</sup>.” As we should be clear to see, in the course of economic globalization, the developed countries have plundered “the dividend” of globalization while the developing countries are at a disadvantage in general and often fall into the trap of globalization. The contemporary globalization of capitalist economy speeds up the globalization of the capitalist system, and undoubtedly promotes the changes of productive forces and production relations. Michell Bode, one of French scholars, believes that

capitalism has entered the generalization stage in face of economic, social and ecological crisis. In his view, the world have been confronted with a new turning point and only by realizing the collective jump, can human beings get rid of crises. This general movement of contradictions between economy globalization and the world market will inevitably lead to two different trends, processes, effects and consequences. It is indicated that the globalization of contemporary capitalist is a double-edged sword or “Dickensian paradox” owing to coexistence of challenges and opportunities, a positive impact and negative effect, as well as destruction and construction.

On the whole, by analyzing the situation, we should firmly grasp the initiative, meet challenges, and adhere to combine the open innovation with taking part in economic globalization. Refusing to participate in world markets and the economic globalization is negative to opening up, socialist market economy and socialism with Chinese characteristics. Meanwhile, we should beware of “westernization”, “division”, “color revolutions” and “globalization trap”, do our endeavor to overcome the negative effects of globalization, and make good use of both domestic and international markets as well as resources, which will be helpful to have control over the tide of globalization, and achieve the goal of equality, universal benefit and win-win.

#### **4 Transition to the Innovation-Oriented Country**

“Innovation-oriented country” has a narrow and broad implication. The former focuses on science and technology innovation, the latter is a comprehensive concept, which covers a wide scope of institutional and technological innovation as well as cultural theory one. This formulation emerged from the concept of “the Core Creative State” in World Economic Forum, but it is generalized. The latter stipulates that country or economic organization that received the number of patents granted by United States Patent and Trademark Office is above 15 pieces per 1 million population can be listed among “the Core Creative State” defined by the World Economic Forum .

According to China’ s conditions, it is necessary to emphasize participation in the international division of labor with the cheap labor and raw materials in the comparative advantage at an early stage. But we can not make it solidify and go to the extreme. Porter, one of western scholars, has mildly criticized the theory of Ricardo comparative advantage, known as the golden rule all through, putting stress on shifting from comparative advantage in lower phase to the competitive edge at the advanced stage. Currently, China should actualize the transformation from comparative advantage stage to competitive edge or the two coexisting phases. The theory of cask effect is not only the derivative of market allocation theory as well as comparative advantage theory, but also the new replica of “market myths” criticized by Stiglitz, an American scholar. “Buy being better than make, renting being better than buy,” or “acquiring the technique at the cost of market” are the discourses with the Chinese interpretation of this theory. The facts have proved that this concept make the national industries (such as domestic large aircraft, cars and nuclear power equipment industry) be “marginalized”, and national innovation frozen .It is inappropriate to rely solely on the general adoption of the market principle and acquire the core technique by means of market exchange. The integration between independent innovation and technology introduction is a realistically rational choice. So theory of comparative advantage and cask effect should be replaced by those of competitive edge and independent innovation.

Nowadays, we come to a turning point in history. When boldly absorbing and drawing on all the civilized results human society has created, learning from today’ various countries including the developed countries of capitalist all advanced mode of operation, technology, management methods, regulation experience and funds reflecting modern production laws, we must complete a big historic leap of innovation ,which means economic transition from the enlightened and imitative transplantation to innovation-oriented economy, from “world plant” and “OEM countries” to “world factory”, “world office” and “world laboratory”, and from “body-type state” that provides such raw materials and low-processed products as wage economy, outsourcing economy to “brain-type state”.

All in all, we must build an economic system of socialist market economy with Chinese characteristics, Social and economic development model in accord with China’s conditions, Independent development strategies of innovation-oriented country, open economy model of independence and science system of philosophy and society with Chinese modality. Only thus, can China be enter into the ranks of innovation-oriented country.

## 5 People as Innovative Subject Being the Key to Open Innovation

The talents, the fundamental and sustainable power of a nation's development, are the most potential and the most reliable resources. The talents of science and technology, bearing innovative consciousness and spirit, can achieve creative fruits by the corresponding ability. From the perspective of social level, they can make innovative contributions towards the social development in the particular field and industry, constantly actualizing self-innovation and self-transcendence through the attitude of scientific inquiry<sup>[3]</sup>.

Giving priority to the development of human resources is the successful experience in economic growth many countries have obtained, and is the important factors in the long-term lead of economy and technology the United States and other developed countries hold. At present, the competition of comprehensive national capabilities, whose core lies in technology and talents, is becoming increasingly fierce. In the face of a new round of global war for talents western developed countries have launched, seeking for long-term development after financial crisis, we need to more actively participate in the international competition for talents, and form Chinese comparative advantage to unceasingly improve overall strength of China. Therefore, giving prominence to cultivating innovative talents is the active demand for enhancing Chinese independent innovation abilities, constructing an innovation-oriented country, and speeding up the transformation of economic development mode.

In recent years, though human resources work and construction of talents contingent have made remarkable achievements in China, we are confronted with new situations and problems in these areas. There is a wide gap between the quality and ability of talents as well as structure of talents contingent and the requirements for building an innovative nation. The main defects lie in lack of high-level technological innovation, leak ability of talents innovation, and structural contradiction and rigid working mechanisms of talents, etc. To solve these problems, we must persist in reform and innovation, scientifically plan talents development, coordinately promote construction of talents contingent, and facilitate the healthy development of human resources work, which is the major measure of better implementing the scientific development concept and the strategy of rejuvenating the country through talents, also is the strategic choice to win the initiative in the fierce international competition.

Lately, China has promulgated and implemented the *National Program for Long-term Talents Development Planning (2010-2020)*, which is the action program of talents work at a crucial stage of China's reform and development, and points out the progress direction for creating the new situation of talented people coming forth in large numbers and giving full scope to qualified personnel. It proposes that by 2020, the overall goal of Chinese talents development is "to cultivate and foster large-scale talents troops with structural optimization, layout reasonable and good quality, establish the comparative advantages of national talents competition, enter into the ranks of the world's talents powers and firm foundation for basically achieving socialist modernization in the middle of this century". Moreover, it specifies that guidelines of Chinese talents development is "service to development, giving priority to talents, innovating in mechanisms, leading of high-end and the overall exploitation". This reflects the strategic positioning, keystone and major tasks of talents development.

To sum up, whether to build an innovation-oriented country and or to take the road of sustainable development, these objects will be ultimately dependent on the people as creative subjects to be attained. We should promote the steps of revitalizing the national spirit of innovation, enhancing independent innovation capability, building an innovative country to the central position of the strategy of state development, which covers strategy of strengthening the country through science, education and talents. To build the world's power with talented people, we need to unceasingly advance our talents undertaking at a higher starting point so as to provide strong and effective human resources insurance for the full realization of fairly well-off society and China's modernization construction.

## 6 Employing Open Innovation to Boost Scientific Development

Development is the eternal theme of human activities. As a large developing country in the period of transition, China is at the historical turning point with landmark sense. Our present goal is to achieve scientific development through open innovation in the context of economic globalization. There exists the difference between growth and development. And the latter is divided into non-scientific development and scientific development, which should be strictly distinguished by us. To realize the transition from the extensive development of non-sustainable to sustainable scientific, one asks us to "lead the development initiative of the whole society into a scientific development as far as possible" (phrase of Hu Jintao).

Non-scientific development can be summarized as follows:

Jobless—the economic growth without creating employment opportunities;

Ruthless—ruthless growth, i.e. the economic growth with the results which can not be shared;

Voiceless—Silent growth, i.e. the economic growth without right to speak and democratic politics;

Rootless—Rootless growth, i.e. the economic growth without the cultural roots, which means that the national culture and traditions is disappearing;

Futureless—Hopeless growth, i.e. the economic growth at the cost of resources wasted and environment damaged;

Independenceless—Bowed growth, that is the phenomenon of dependent growth, which is the sixth phenomenon of economic development leading to unsustainable economic development we should be avoided;

Controllout or Controlless—The phenomenon of uncontrolled growth. For example, advocating market myths and marketization of public goods. T. Weisker maintained that it was a “stupid growth”, that is “unconstrained growth, aimless growth, and the growth of anarchy”.

Furthermore, American scholars T.S.Szold and A. Carbonell underlined “smart growth”; Meredith-Woo-Cummings proposed the concept of “developmental state”<sup>[4]</sup>. The United Nations, World Bank and the OECD put forward the philosophy of “pro-poor growth” in the early 21st Century.

These ideas provide valuable materials for the scientific development theory. But the scientific development must solve such problems as “what is development, how to develop, whom the development is for, whom the development depends on, and who enjoy the achievements of development”, so as to realize the social transition to a comprehensive, coordinated and sustainable scientific development, and to achieve innovation-driven development, fair and harmonious development, green development and independence development in promoting the scientific development. This great task recently has become the major theory and practice problem of economic and social development. A possible contribution of China's economics to the world will arise from the field of development economics or transition economics of scientific development with Chinese characteristics.

## 7 Conclusion

In summary, China, a large developing country in the socialism development in the period of transition, should not only analyze the situation, and seriously absorb the components of scientific development from the western theory of innovation and economic growth, also actively participate in economic globalization, carrying forward its advantages and avoiding its disadvantages, and comprehensively advance the development strategy of open innovation. Furthermore, we need to give prominence to cultivating innovative technology talents, constantly enhancing the ability of open innovation, structure the development model of Socialism with Chinese characteristics, and speed up the transition to innovation-oriented country, thus actualizing the social transformation into the comprehensive, harmonious and sustainable scientific development.

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