



## Implementation of Scientific Outlook on Development and Promotion on Development of Knowledge-based Economy

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### Abstract

Under the background of further world economic integration and speeding up of international industrial transfer, development of knowledge-based economy is a significant approach to establishing a harmonious society and realizing socialism modernization with Chinese characteristics and is a necessity for maintaining scientific outlook on development. Development of knowledge-based economy is a requirement for upgrading industrial structure and strengthening international competition. Development of knowledge-based economy can satisfy fundamental interests of the overwhelming majority of the people, correctly handle relations between all regions and industries, and promote sustainable and integrated development of national economy.

**Keywords:** Knowledge-based economy, Scientific outlook on development, Sustainable development

### 1. Development of knowledge-based economy is necessity for maintaining scientific outlook on development

The primary element of scientific connotation of scientific outlook on development is development, its core is people-oriented, its fundamental requirement is to comprehensively coordinate sustainable development and its basic means is unified planning. This is a succession and development of important thoughts on development by the three generations of the CPC collective leadership, a concentrated reflection of world outlook and methodology on development by Marxism, and a scientific theory which not only derives from the same origin but keeps pace with the times with Marxism-Leninism, Maoism and Deng Xiaoping Theory and the important thinking of Three Represents. Correct understanding of scientific outlook on development has an extremely important strategic meaning to promote establishment of Chinese modernization and to construct socialism with Chinese characteristics. The earliest concept and framework about “development” was connected with earlier modernization theory. Therefore, implementation of scientific outlook on development in the knowledge-based economy is both a necessity of further theoretical logic and a requirement for macro-development of economy and the society.

Knowledge-based economy is based upon production, distribution and use of knowledge and information. The most obvious difference between knowledge-based economy and industrial economy lies in the fact that prosperity of knowledge-based economy is no longer subject to quantity, scope and increment of resources, capital and hardware technology, but directly depends accumulation and application of knowledge. In 1983, Romer, Paul put forward that, in calculation of economic increasing, knowledge should be listed as production function, when it was the first time that knowledge was regarded as a production factor for constitution of foundation of economic activities. Particularity of knowledge factors lies in the fact that it is no longer affected by traditional factor marginal income decreasing principle in economics. On the contrary, it may reflect increasing of factor marginal income. Only ten years or so later, the field of economics regards knowledge as an intangible “the first means of production”. It has the basic characteristics of the first means of production: it gradually becomes the major motive and root of economic increasing, and it has the capacity of allocating such production means as capital. Grasp of knowledge, to great extent, means gaining of domination power in the economy, and knowledge-intensive new high-tech industries become primary industries, etc. As a word to describe the future economic pattern of the world, knowledge-based economy has gained universal recognition from economic circles and scientific communities of the world.

Knowledge-based economy is the third wave brought about by human civilization, which is leading to revolutions of all fields, such as economy, politics and culture, etc of the entire society. It is, on one hand, reflected in the fact that science and technology is the primary productive force, and on the other hand, reflected in technicalization of social living.

With development of the new technical revolution centered by life sciences and computer information science, scientific technology is penetrating into all aspects of social production and living with an unprecedented speed, which results in deep revolution of production structure, economic structure and social structure. Meanwhile, it also leads to great changes in people's living ways, behavioral model, thinking methods, morality and value concept, etc. Therefore, the transition of knowledge-based economy from production to gradual development is a necessary result of development of human beings. We should comply with variation tendency of the society, consciously set up new concepts to adapt to development of the times and continue to promote development of value concept, which is the most important aspect of economic and social development.

It is this current of times that scientific outlook on development complies with, and "people-orientation" is the essence and core of scientific outlook on development. Determination of this essence and core status is not only due to the fact that, in an era of knowledge-based economy, human beings who have the capacity of innovation, creation and use of knowledge occupy a leading status in production and operating activities and in social management activities, development of economy and the society has to be based upon development of people and that development should be centered with people, but what's more, scientific outlook on development emphasizes people-orientation, which is to regard fundamental interests of the overwhelming majority of the people as the foundation, to require us to understand realistic demands and long-term demands of people first of all in considering issues of development. The purpose of development is to satisfy these demands to a greatest extent and also to promote comprehensive development of people.

Reinforcement on energy and resource conservation and protection of environment and enhancement of the ability of sustainable development is interrelated with vital interests of the people and with existence and development of China. Only when study on and practice of knowledge-based economy is highly emphasized and positively promoted, can it be possible to reduce cost, save resources and upgrade competition in the international society. Then it is possible to provide necessary theoretical foundation, economic model and technical support for implementation of sustainable development, and to accomplish the maximization of comprehensive benefit of environmental economy of sustainable development. Therefore, vigorous development of knowledge-based economy is a necessary choice for maintaining scientific outlook on development and building a well-off society in an all-round way for sustainable development of the economy and society, improvement of people's living quality and for security of national environment.

## **2. Importance of maintaining scientific outlook on development and positively developing knowledge-based economy**

### *2.1 Development of knowledge-based economy is a necessity for better and faster development of national economy.*

The 21<sup>st</sup> century is a century of knowledge economy and an era with the most active knowledge innovation and most rapid knowledge dissemination. Therefore, we should grasp opportunities of knowledge economy, carry out scientific outlook on development, implement strategy of sustainable development, impel reform and opening up with knowledge, promote development with knowledge and create wealth with knowledge. Meanwhile, we should make full use of comparative advantages and create competitive advantages, which will guarantee realization of all-round, coordinated and sustainable development of national economy.

After reform and opening up of almost 30 years, we have made great historical achievements in such aspects as improvement of economic system and level of opening up, expansion of economic aggregate, following up of "issues of agriculture, farmer and rural area", development of IT industry, improvement of people's living conditions, reduction of development disparity, handling of contradictions among people and protection of social stability, etc. However, when an economic society is developed to a new stage, some issues will be revealed outstandingly, which are closely interrelated to national conditions of the primary stage of socialism in China and practices of reform, so it will be difficult to some extent to resolve these issues. For instance, bottleneck restrictions of energy, resources, environment and technology are becoming more and more prominent, and great pressure exists to realize sustainable development; the condition of instability in agriculture hasn't been changed fundamentally. A number of core skills and key industries still depend on importation and the ability of independent innovation urgently awaits to be improved. Difficulty in taking into consideration interests of all increases and phenomenon of disparate development still exists. Faced with so many problems and challenges, we will encounter the danger of success or failure in terms of economic construction if we don't thoroughly change our development concept and bring forth new development thoughts.

Essence of economic development currently is to transfer the leading industries from capital and labor-intensive industries to knowledge and information-intensive industries. This means that, economic growth from now on will lessen its dependence upon capital, traditional human capital, traditional energy and raw materials, while its reliance on knowledge and information will be largely enhanced. Therefore, according to requirements of scientific outlook upon development, we should vigorously develop knowledge-based economy, reconstruct and equip traditional industries with new high-technology centered by information technology, upgrade technical level and competitiveness of products in such basic industries as energy, materials, transportation, and light textile, etc. In the process of enterprise production, management and marketing, we should employ information technology to quicken information transmission, reduce

operation cost, decrease resources and energy consumption, and improve economic benefits. In this way, we can effectively resolve further contradictions and problems of current economic development, so as to realize better and faster development of national economy.

### *2.2 Development of knowledge-based economy is an effective approach to optimization of the industrial structure in China.*

In recent years, economic growth in China has transferred from dependence upon consumption, investment and exports to dependence on coordination of consumption, investment and exports to drive changes, from dependence on the secondary industry driving the third industry to coordination of the first industry, second industry and third industry to drive changes, from dependence on increment of material consumption to dependence on improvement of scientific progress, quality of laborers and management innovation. With coming of the era of knowledge-driven economy, industry restructuring and upgrading has become the tendency of economic development. Industry restructuring is centered by enhancing economic performance to transform means of economic growth, develop intensive operation, improve quality, conserve energy, reduce consumption, prevent and remedy pollution, raise labor productivity, adopt new high-technology and make use of advanced technologies to reconstruct traditional industries, and promote optimization and upgrading of industrial structure.

Different from dependence of industrial economy on natural resources, knowledge-based economy will rely on knowledge and information to become important factors of economic development so as to largely reduce consumption of energy and its damage to the nature. Due to properties of being able to be developed, disseminated, reproduced and being nonexpendable of knowledge per se, natural resources consumed by knowledge capital which creates similar value are merely one in several hundred or even in a thousand of those consumed by material capital. Furthermore, in the process of application, knowledge and information will not be consumed, but on the contrary, they will rise in value. The characteristic of high sharing and low exclusiveness is also totally different from that of traditional economic products, because it reduces waste of natural resources. The new concept advocated by knowledge-based economy exactly corresponds to requirements of optimization and upgrading of industrial structure.

With development of new high-tech industries and informationization, technology-intensive production increases, which is a necessary tendency. However, no matter how high-technology industries and informationization are developed, labor-intensive production will not disappear. Under the circumstance of favorable development of knowledge-intensive production and skill-intensive production, labor-intensive production will not shrink, but also will be correspondingly developed. Service industry will necessarily get correspondingly developed and provide substantive positions. Development of knowledge-based economy has optimized industrial structure, is a necessary condition for bringing into play particular advantages of China and for establishing a harmonious society, and is also a necessity to expand domestic demand and maintain social stability.

### *2.3 Development of knowledge-based economy is an important approach and objective requirement for reinforcement on international competitiveness.*

Whether in material life or in spiritual life, modern scientific technology has been omnipresent, which cannot be contained by traditional economic theories. Knowledge is no longer an exogenous variable, but an endogenous variable. In knowledge enterprises, capital employment labor will give place to labor (primarily mental labor) employment capital. Therefore, emergence of knowledge economy symbolizes that human society has entered a new development stage. Knowledge economy theory can more accurately reflect essence of socioeconomic structure, so it has become necessity of development of the times.

A key character of knowledge economy is the marketization of scientific knowledge products and technical trade has become an important component of international trade. An important reason for a minority of developed countries, such as America, to be able to take the lead in entering knowledge-based economy lies in the fact that, they have obvious advantages in production of sci-tech products and their industrial structure, etc. With globalization of knowledge economy development, trade competition of scientific products will necessarily become a significant sign for reflecting competitive strength of comprehensive economy of a nation to a great extent. At present, with overall development of knowledge economy, it is required that scientific technology, as a pillar industry of knowledge economy, should be developed into a complete and a social scale of system which can continue scientific and technology production and enlarged reproduction, which also refers to integrative development of science and technology, education and economy. Only when knowledge economy is developed, can international competitiveness be strengthened.

Economic and social production of China at present is a stage at which high technology and information has been primarily and locally developed but modernization has not been completed as a whole, and at which traditional industrial economy is the major economy. Traditional industrial economy is an extensive economic style of resource consumption. As for economic development in China, traditional economy has come to its end, which is an established reality, so a new road towards industrialization should be pioneered with high technological content, high economic

returns, low resource consumption and fully exerted human resource advantages. Development of knowledge-based economy is a necessary choice for economy to be developed into a particular period, the only way for realization of socialism modernization and an urgent need to adapt to economic globalization.

### **3. Several relations to be handled to maintain scientific outlook upon development and to develop knowledge-based economy**

#### *3.1 To handle relations between development of knowledge-based economy and development of traditional industry*

In the process of handling relations between development of knowledge-based economy and traditional industry, we should combine their development together. China is a large agricultural country in which industrialization hasn't been accomplished yet, and traditional agriculture and industry still occupy a large proportion, with a relatively small amount of emerging industries. So China is at a transition stage from traditional agriculture to modern agriculture. Traditional industry is the main part of the industrial structure in China, which cannot be altered within a short period of time. Under such a circumstance, we cannot leave aside traditional industry to unilaterally develop knowledge-based economy, but should combine traditional industry together with knowledge-based economy, and integrate industrialization with informationization and knowledge.

Knowledge-based economy should be focally developed in relatively developed cities and regions. Developed cities and regions provide high-tech industries and information-based support to backward areas and cities, so as to upgrade traditional industries in these cities and regions as soon as possible. Of course, backward regions appropriately provide part of resources required by high-tech industries and information-based development. Development of traditional industries and knowledge-based economy is not contradictory, and not irrelevant, but supplementary. Enhanced development of traditional industries prepares material and social foundations for transition into knowledge-based economy. Vice versa, development of knowledge-based economy and development of newly emerging industries, such as information technology, has great upgrading effect on traditional industries.

#### *3.2 To handle relations between development of skill-intensive industry, knowledge concentrated industry and labor-intensive industry*

Industrialization process of developed countries usually goes through transition from labor-intensive and capital-intensive industry to skill-intensive industry. However, with development of knowledge-based economy, such new high-tech industries as information technology gradually replace the status of traditional industries and become the leading industry. This means that knowledge concentrated industry and skill-intensive industry are taking the place of labor-intensive industry, which has been such a situation in developed western countries. Industrial structure of a country is also restrained by its human resources in addition to restraint by its skills, because different industries have different demands upon different levels of human resources.

There exist a great many difficulties in modernization of Chinese industrial structure. Within a certain period of time, development of high-tech industry and informationization might contradict with enlargement of occupied population. Flow of a large agricultural population into non-agricultural industries and cities and towns accompanies with development of high-tech industries. Meanwhile, with development of high-tech and information industries and with continual increasing of organic composition of capital and labor productivity in all sections of the national economy, the same amount of capital will coincide with less labor force. Development of high-tech industries indeed contradicts with enlargement of occupied population from an objective perspective. And the large population base in China, without doubt, deepens this contradiction. Development of knowledge-based economy deepens pressure of the enlargement of occupied population. We should take into unified consideration development of skill-intensive industry, knowledge concentrated industry and labor-intensive industry. We should not only develop knowledge concentrated industry and skill-intensive industry, but should also handle relations between skill-intensive production and labor-intensive production, bring into full play advantages of our human resources and maintain overall stability of the society. We have to keep to all-round, coordinated and sustainable development, and promote mutual coordination and development of skill-intensive industry, knowledge concentrated industry and labor-intensive industry. Therefore, in the development of knowledge-based economy, we should also appropriately develop some labor-intensive industries based on practical situations in addition to development of skill-intensive and labor-intensive industries. Then it is probable to realize unification of speed, structure, quality and benefit, coordination of economic development and human resource environment and better and faster development of the economy.

#### *3.3 To handle relations between great-leap-forward development and stratified development*

Development of knowledge economy is to satisfy fundamental interests of the greatest majority of Chinese people. Realization of great-leap-forward development of productivity intrinsically means handling the relation between advanced productivity and backward productivity. When choosing and carrying out the development goal and development path, we should regard great-leap-forward development as strategy of economic development at the time of accepting stratified development. China is at present at the transition period of economic structure. Each astounding

progress of scientific technology and transition of socioeconomic structure offers an opportunity to surpass the backward situation and brings a chance of hypernormal development to a region. From the perspective of participation in the international division of labor, vertical labor division between China and developed countries approaches to horizontal labor division, and horizontal labor division between China and developing countries approaches to vertical labor division. That means that in the field of international industrial transfer, China has a broad space for development. So long as we take into consideration local conditions based on characteristics of economic globalization and knowledge economy, bring into play our advantages, select point of penetration and breakthrough point, grasp the opportunity according to economic rules and scientific development rules, carry out a scientific plan and promote regional coordinated development, then it is possible to realize great-leap-forward development and diminish gap between China and developed regions. We should not only regard great-leap-forward development as the target, but should base on the reality, accept the stratified development model with innovation, and organically combine stratified development and great-leap-forward development, so as to realize great-leap-forward development of social economy.

### 3.4 To handle model of developing knowledge-based economy

Development of knowledge economy cannot guarantee a unified model and doesn't allow the way of "one size fits all". Development of the economic society is a complicated systematic project, so at any time, we should take into consideration each aspect, refuse the situations of "concentrating on one thing only", "one size fits all", "onesidedness" and "absolutization". Due to complex social and historical reasons, there has been lacking harmony and balance in the economic development in China. This determines that we should pay attention to vulnerable spots and essential contradictions in development, give prominence to key points and prevent the situation of "one size fits all". Scientific outlook on development requires us to start from our national situation, unify overall consideration and focus on key points, and handle relations between center and comprehensiveness, focal point and non-focal point, disequilibrium and equilibrium. Then efforts should be made towards equalization and coordination of development and towards overall development of the economy.

Development of knowledge-based economy should highlight focal points, in which high-tech industries and informationization should be developed with emphasis in developed cities and regions according to actual conditions, while "traditional industries" should be developed with emphasis in underdeveloped regions. The "emphasis" here doesn't refer to "uniqueness", because considering China on the whole, there is also the necessity in underdeveloped regions and cities to develop their high-tech industries and informationization based on their own characteristics. Development of knowledge economy in developed cities and regions has their features and development of traditional industries in underdeveloped regions is not unified. Therefore, development of high-tech industries and informationization should be based on practical situations. From the industrial perspective, development of knowledge economy doesn't have a unified model, and prohibit the phenomenon of "one size fits all". Based on features of knowledge economic development, we should strengthen establishment of such knowledge economic development factors as education, scientific research and information network platform, etc. As for China, emphasis on importance of developing knowledge economy means neither unique emphasis on high-tech projects all at once, nor neglect of development of traditional industries. We should carry out a scientific plan and take development into overall consideration based on practical situations.

### References

- (2002). *Document Assembly of the 16<sup>th</sup> National Congress of the Communist party of China*. Beijing: People's Press.
- Cai, Maosheng. (2002). Knowledge Economy and China's Development with Jumping Paces. *Academic Research*, (6).
- Cheng, Qianchun & Cui, Weiqi. (1999). Knowledge-based Economy and Philosophical Reflections on Development in Modern Science and Technology. *Academic Exchange*, (2).
- Dale Neef. (1998). *The knowledge economy*. Zhuhai: Zhuhai Press.
- Heng, Tingdun. (2003). *Modernization Theory and Re-Exploration of Historical Experiences*. Shanghai: Shanghai Translation Publishing House.
- Hu, Jintao. (2007). *Hold High the Great Banner of Socialism with Chinese Characteristics and Strive for New Victories in Building a Moderately Prosperous Society in All Respects*. Beijing: People's Press, October.
- Liu, Jiangtao. (2004). Knowledge-based Economy and Scientific Development Conception. *Journal of PLA Nanjing Institute of Politics*, (3).
- Xie, Lizhong & Sun, Liping. (2002). *Analects of Western Modernization Theory in the 20<sup>th</sup> Century*. Shanghai Joint Publishing Company.
- Yang, Junlong. (2005). On Development of Recycling Economy and Scientific Development Concept. *On Economic Problems*, (10).
- Zeng, Degao. (2005). Knowledge-based Economy and Leaps in Development in Western China *Journal of Chongqing University of Post and Telecommunication*, (3).