



Development of Science , Technology and Innovation in China

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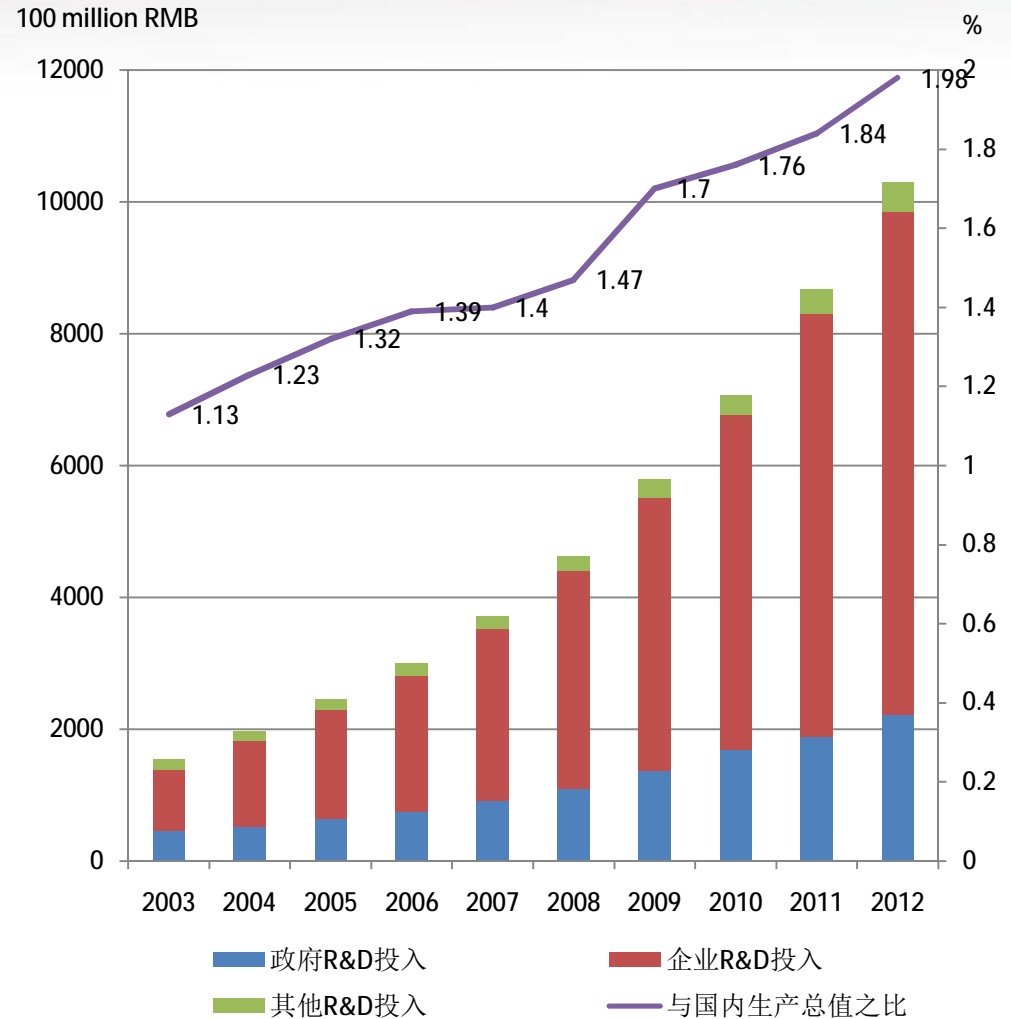
1. Overall Progress of Science , Technology and Innovation in China



Innovation Resources



- **Expenditures on R&D have increased rapidly and steadily.**
 - ∅ **R&D expenditures** of China were 1.19 trillion RMB in 2013, and the **R&D/GDP ratio** was 2.09%.
 - ∅ R&D/GDP ratio of China was near the average of OECD countries(1.94% 2011).
 - ∅ **R&D per capita** is still considerably lower than the level of developed countries.

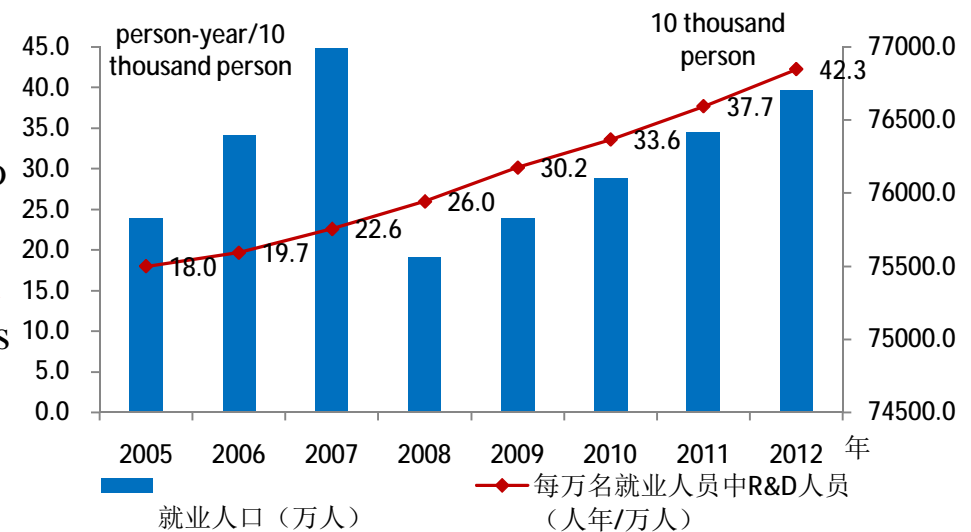
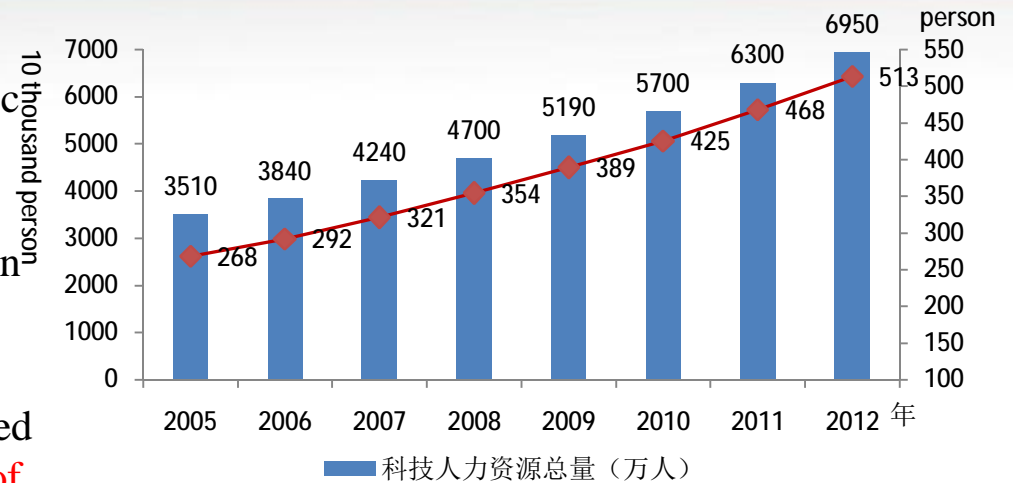


Source: China statistical yearbook of science and technology

Innovation Resources



- The total number of R&D personnel grow significantly, and China is entering demographic bonus period of R&D personnel.
 - ∅ The total number of human resources of science and technology was 69.5 million in 2012, and it was 1.8 times as that in 2006.
 - ∅ The total number of R&D personnel was 3.25 million person-year in 2012(calculated by full-time equivalent), and the number of R&D personnel among 10000 employed workers was 42 person-year.
 - ∅ There were 100 million graduates from universities and colleges in all from 2003 to 2014.
 - ∅ The ratio of persons under 30 age in human resources of science and technology reaches 62%.

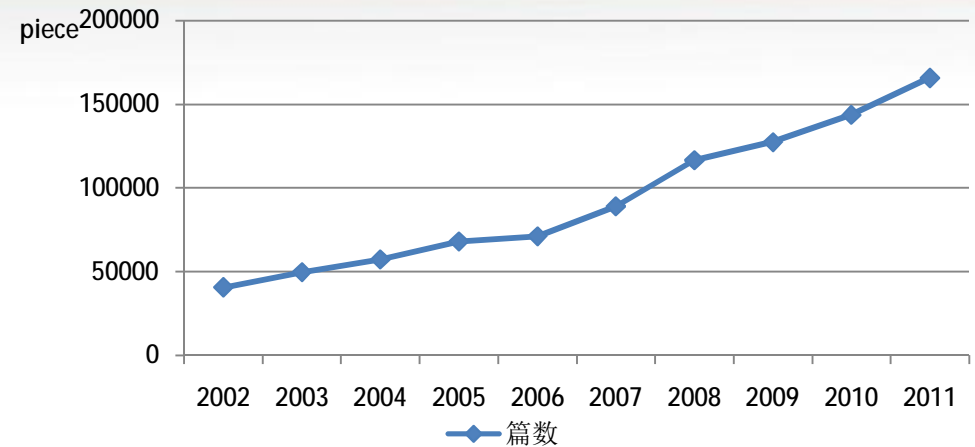


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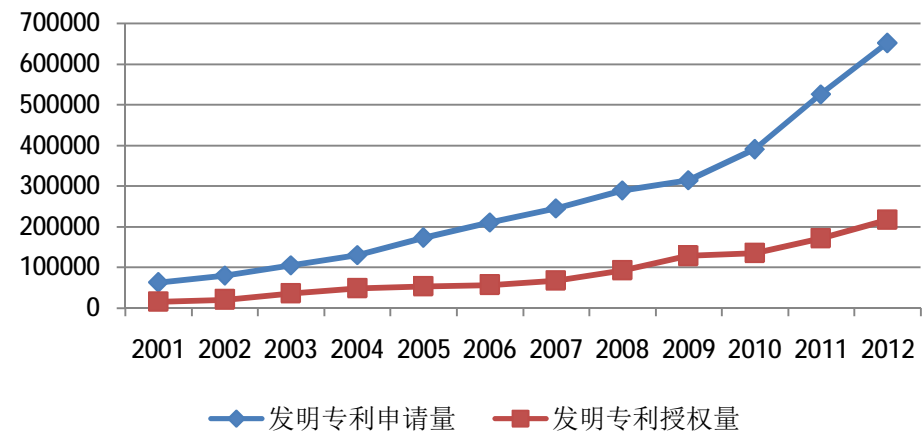
Innovation Capability



- The capability of innovation output strengthened continually.
 - ∅ The quantity and quality of Chinese scientific papers advanced parallelly.
 - ∅ **The number of domestic invention patents in force** was 590 thousand, 8.1 times that of 2006.
 - ∅ Rapid progress was made in leading edge research and strategic high technologies, and the capacity for original innovation of China is enhanced.
 - p Chang'e-3 lunar probe , Jiaolong



The Number of Chinese Scientific Papers Catalogued by SCI (2002—2011)



The Number of Invention Patents Applied and Granted (2002—2012)

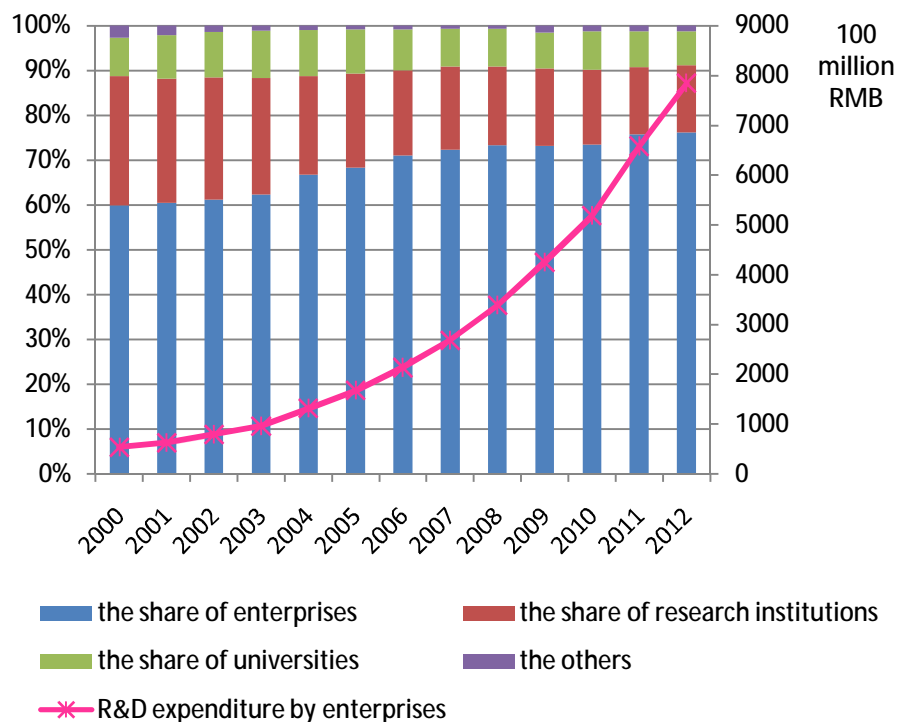
Source: China statistical yearbook of science and technology

Chinese National Innovation System

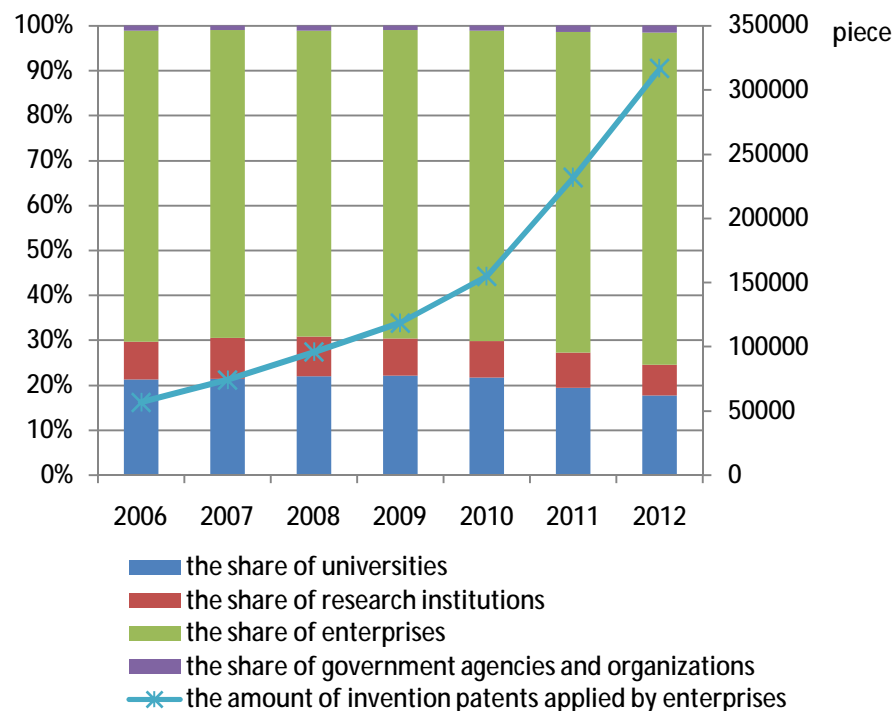


- From a university&institute-centered research and development system to an enterprise-centered innovation system

∅ The proportion of innovation input from enterprises are more than three-fourths of the total.



∅ The proportion of invention patents by enterprises are over 60% of the total.

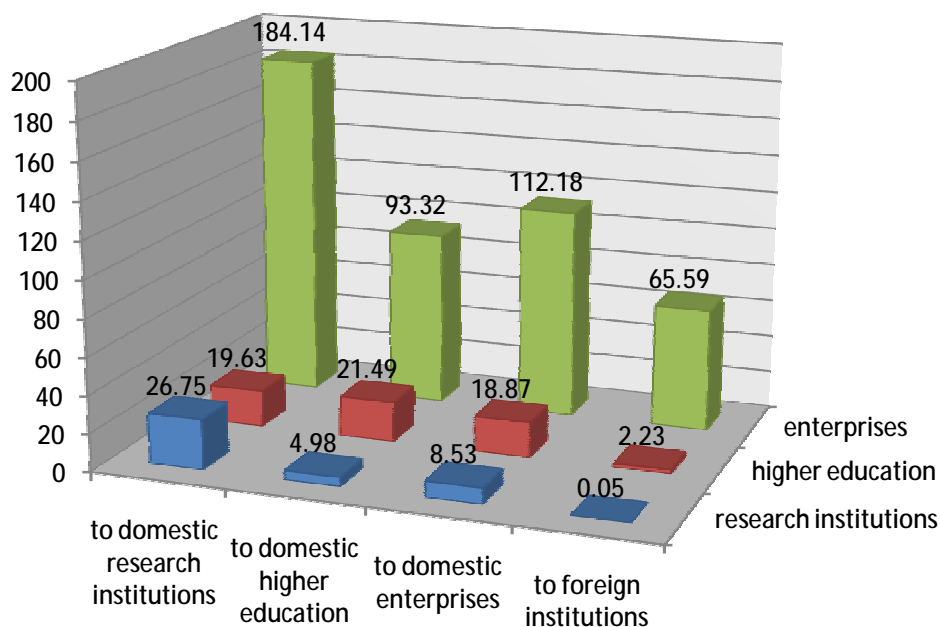


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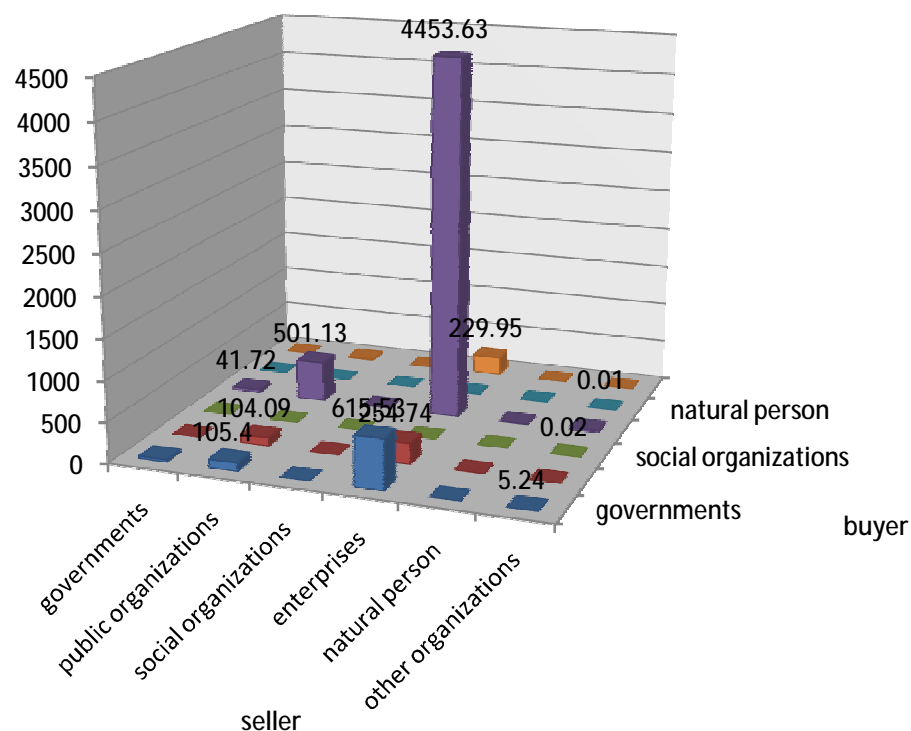
Chinese National Innovation System



Ø An enterprise-centered innovation network is emerging



Relationship among actors based on external expenditure on R&D(2012, 100 million)



Relationship among actors based on value of contract deals in domestic technical markets (2012, 100 million)

Source: China statistical yearbook of science and technology

Institutional Environment



framework

- formed the basically complete framework of innovation regulations and policies
- designed various kinds of policy instruments

market environment

- to build the fair and competitive market environment
- reducing the entry barriers of innovators
 - ∅ the time required to start a business: 48 days (2004) —— 33 days (2012)
 - ∅ the number of start-up procedures to register a business: 13

policy

- improving basic laws and regulations on science and technology
 - ∅ revising the “law on promoting the transformation of scientific and technical achievements”
- establishing national science and technology report mechanism, innovation survey mechanism, and unite science and technology management information system
- to put more emphasis on universal policies
 - ∅ the policy of tax deduction on R&D costs
 - ∅ tax incentives policy for high-tech enterprises



2. New Circumstances and Challenges



Transforming the economic development pattern



economic growth

- Growth rate:7.5%
- from the stage of high-speed growth to the new stage of middle-high-speed growth

economic structure

- high-tech industry and equipment manufacturing industry
- the service industry
- the contribution of final consumption to economic growth

resource constraint

- The economic development pattern is not sustainable, which is characterized by high energy-consuming , high investment, and high emissions.

A new round of technological revolution and industrial revolution



the deep integration of science and technology innovation and industrial changes

- **modern manufacturing technology** : intellectualization, servicization, greenization
- **technological breakthrough and technology fusion** (ICT、 biology、 new energy、 intelligent manufacturing)

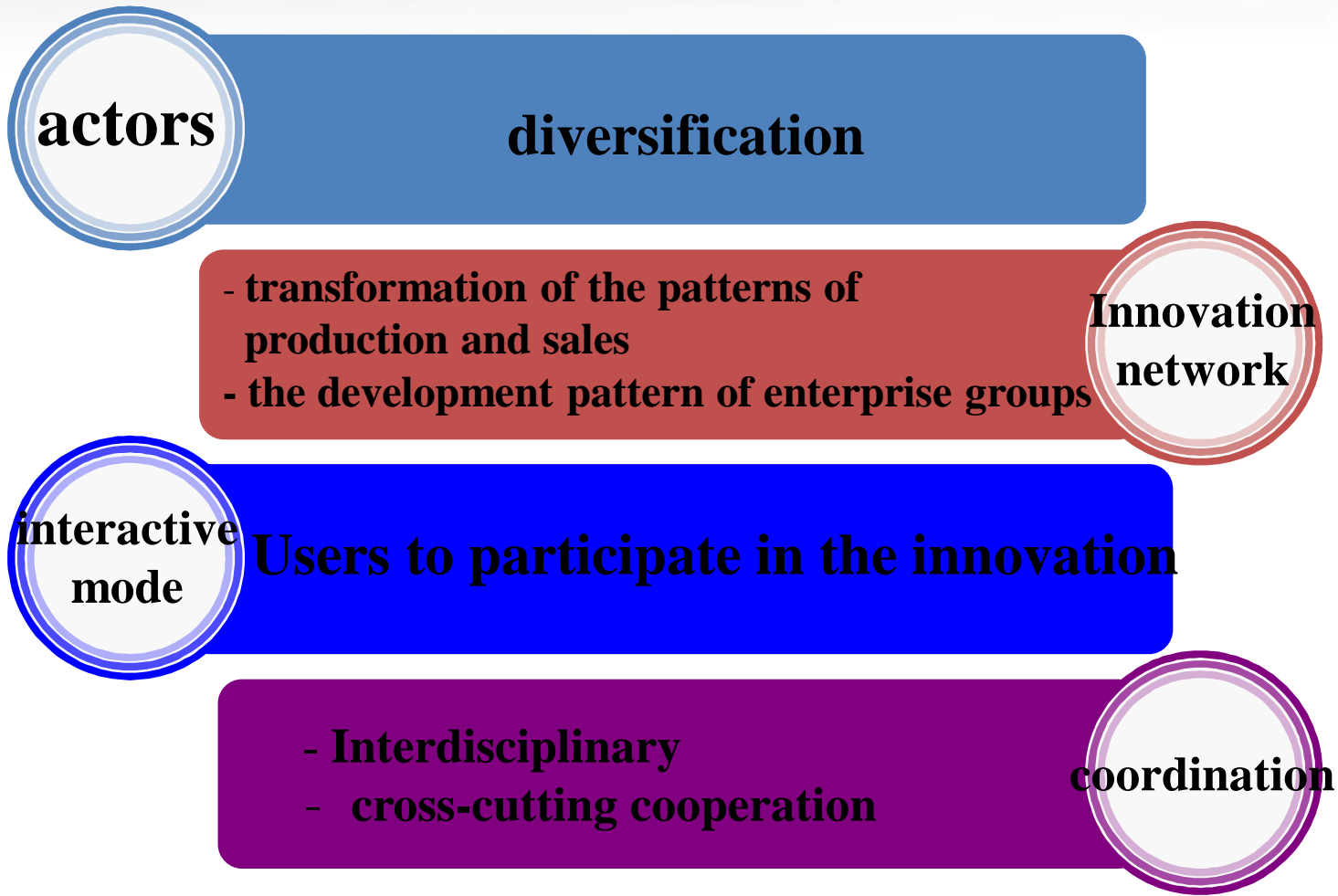
new requirements to industrial innovation

- to change the structures of industries and patterns to compete
- to trigger the changes of manufacturing method, structures of organizations and business model

creating a favorable innovation ecological environment

- to adjust institution and organizations in order to form new innovation mechanism adapted to industrial changes

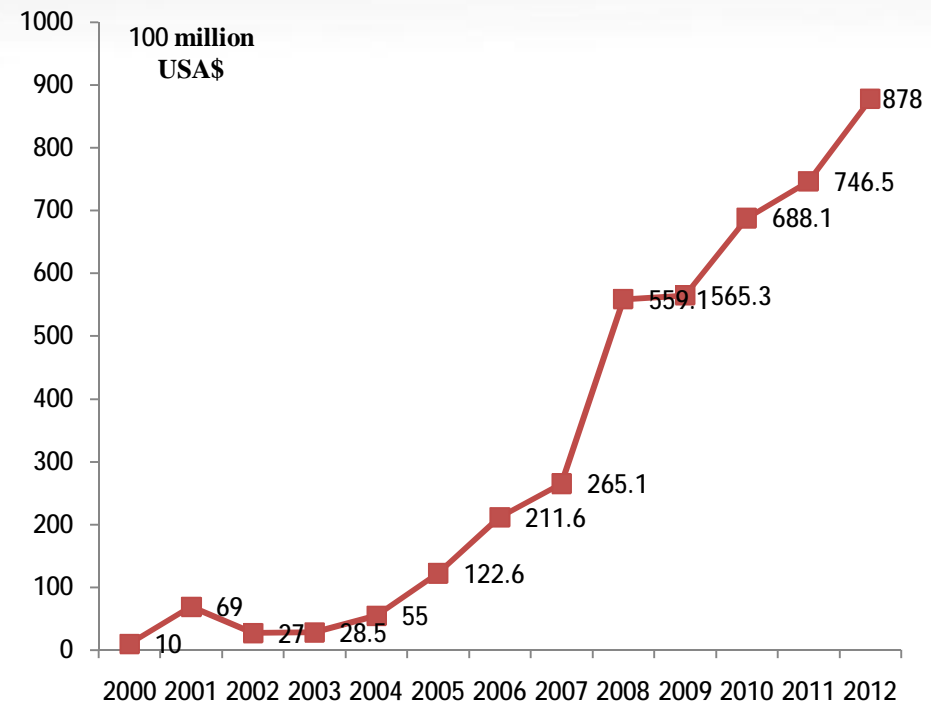
New Characteristics of Science, Technology and Innovation



Global innovation competition is heating up...



- The global free flow and allocation of innovation resources becomes normal.
- The division patterns of global industry chain and value chain are evolving continually.
- R&D institutions build up by multinational companies have played the significant role in Chinese national innovation system.
- to increase openness of national innovation system



China's FDI Outflow (2000—2012)



3. Main Aspects China Concerns



Main Aspects China Concerns



- To strengthen top - level design of innovation strategy

- To enhance the major breakthrough

implementing innovation-driven development strategy thoroughly

Main Aspects China Concerns



- **speeding up the reform of science and technology system, and improving the market-oriented mechanism of technological innovation**



- to enhance enterprises as the major actor of technological innovation



- to establish the mechanism for research-industry collaborative innovation



- to promote the development of science and technology service industry

Main Aspects China Concerns



- **improving the mechanism for talents development, and stimulating the talents' initiative to innovate to the utmost extent**



- carrying out major projects to foster talented personnel thoroughly



- to establish the mechanism conducive to growth of talents and talent aggregation



- to promote the transformation of scientific and technical achievements



Main Aspects China Concerns





- **improving the innovation policy system, and building a suitable atmosphere for innovation**



- to enhance innovation policies coherence



- to enhance the implementation of innovation policies



- to strengthen the basic institutional improvement



Thank you!