中国科学院科技政策与管理科学研究所
INSTITUTE OF POLICY AND MANAGEMENT

The Dragon and The Elephant:

Understanding the Development of Innovation Capacity in China and India

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Changing National Innovation Strategy in China: Capacity Building and Policy Selection

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I. Changing National Innovation Strategy

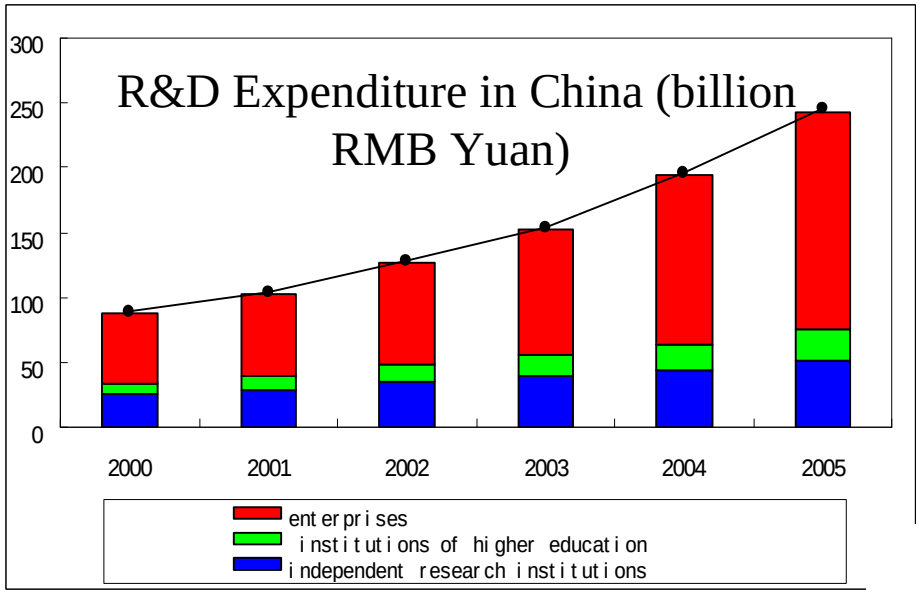
- Thanks to the policies for reform & opening, China has experienced over 20 years of high-speed economic growth and become the fourth largest economies.
- However, the economic growth of China mainly results from low cost of labor and increasing investment instead of innovation.

- New Development Philosophy: innovation
- Innovation-driven Country: capacity
- Harmonious Society: cost

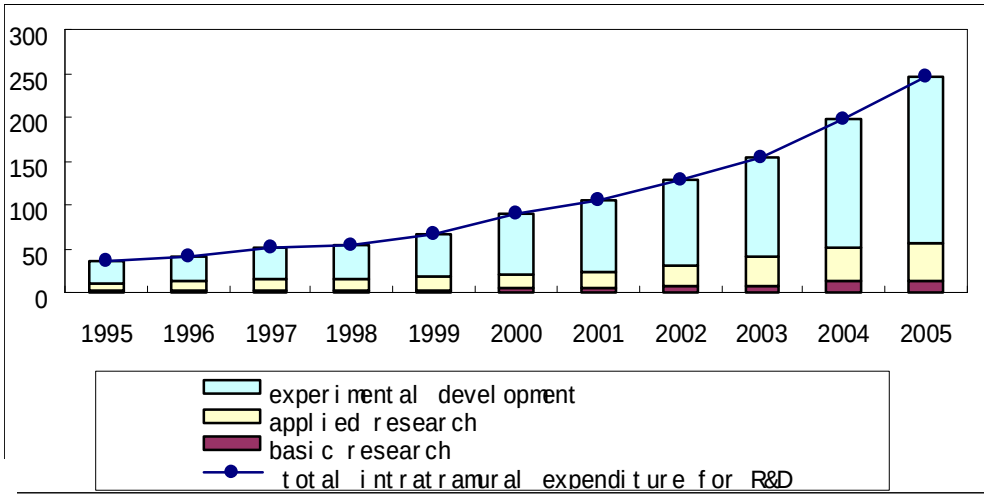
I. Changing National Innovation Strategy

- The NIS of China is generally less effective than that of developed countries.
- The innovation strategy in China has changed from keeping balance of allocation of innovation resource in all sub-systems of NIS to strongly promoting the enterprises' capacity-building for innovation, which has become the focus of the Innovation policies.
- Therefore, capacity-building for enterprise innovation become the major task and key to the NIS development.

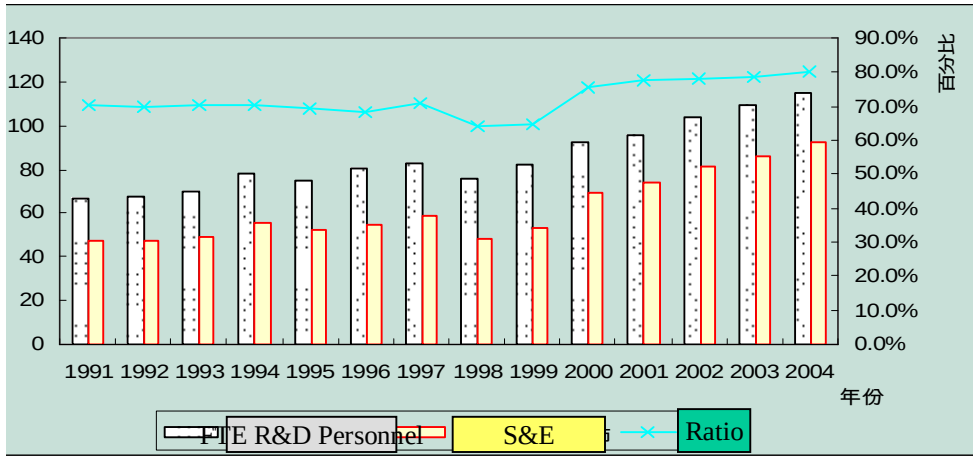
II. Issues on Innovation Capacity in China



R&D Expenditure in China (billion RMB Yuan)

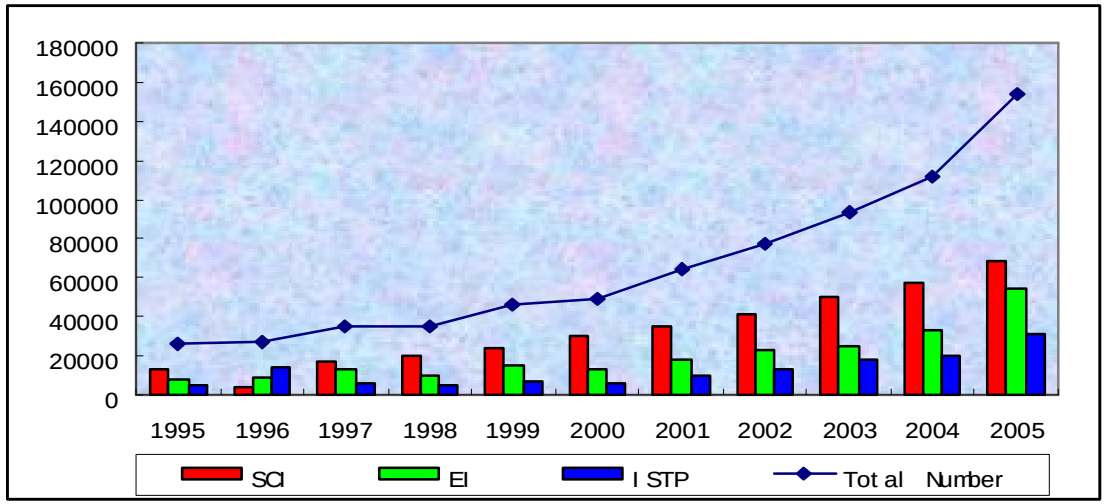


- The expenditure for R&D in China has increased very fast since 1998. Enterprises play important role in the growth of R&D expenditure. Meanwhile, the experimental development domains the R&D expenditure.

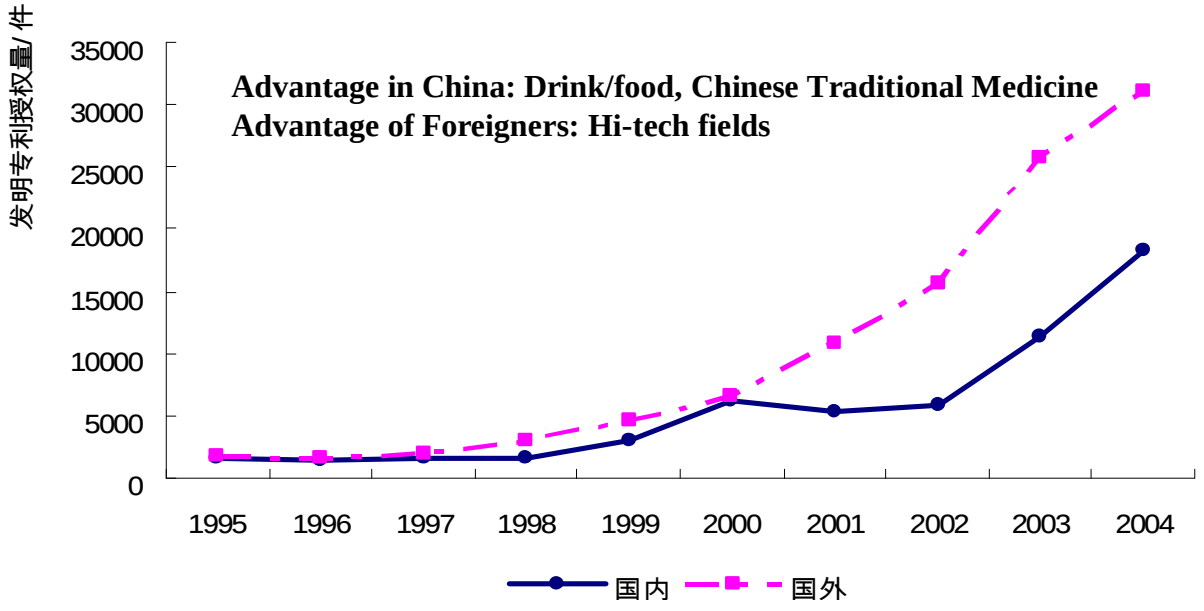


II. Issues on Innovation Capacity in China

1. There is a big gap between R&D capacity of universities/research institutes and enterprises
2. The enterprises' capacity for tech. development is relative weak in terms of patent productivity.
3. The linkage between tech. development in enterprises and R&D in universities and research institutes is not effective.
4. Chinese firms have less experiences in high-level innovation management

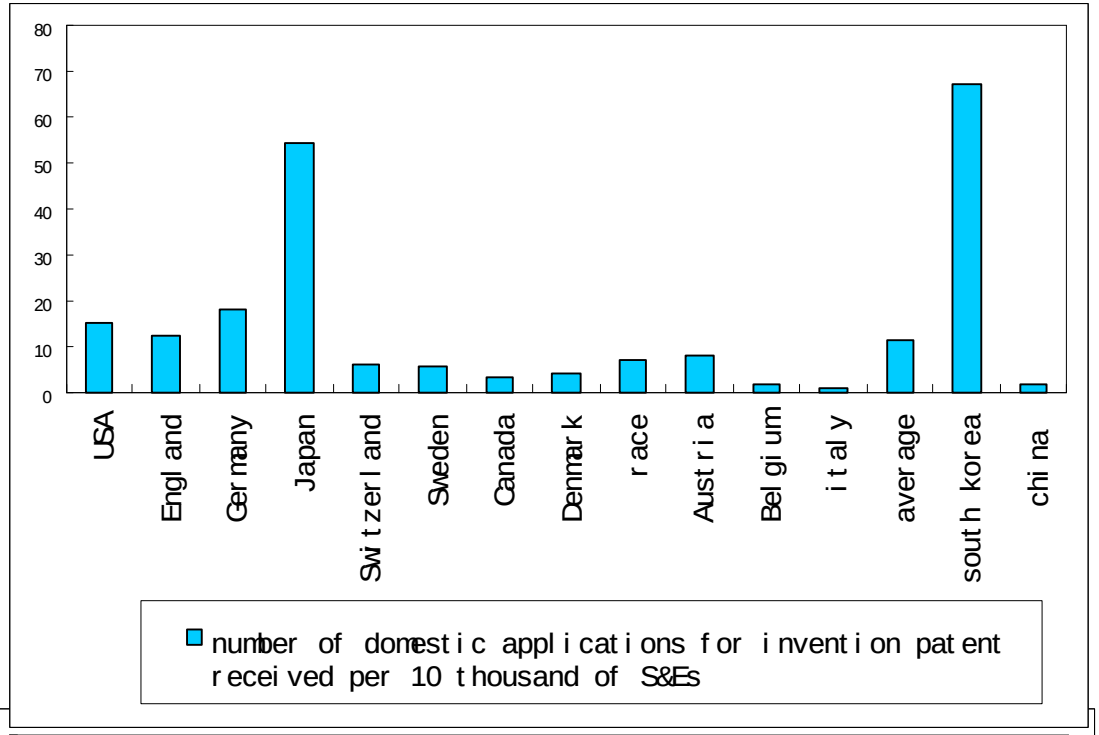


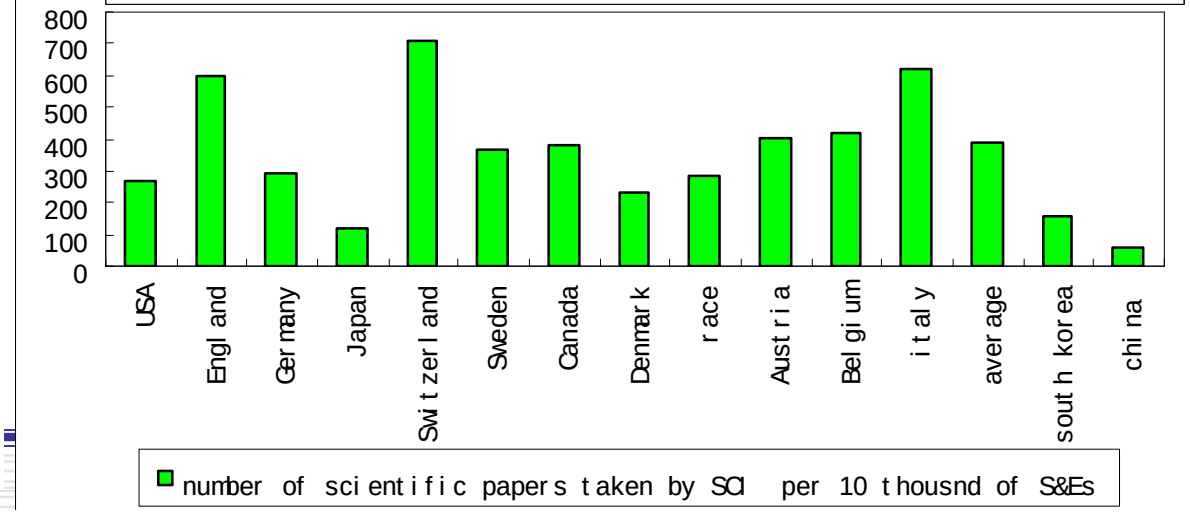
S&T Papers Taken by Major Foreign Referencing System

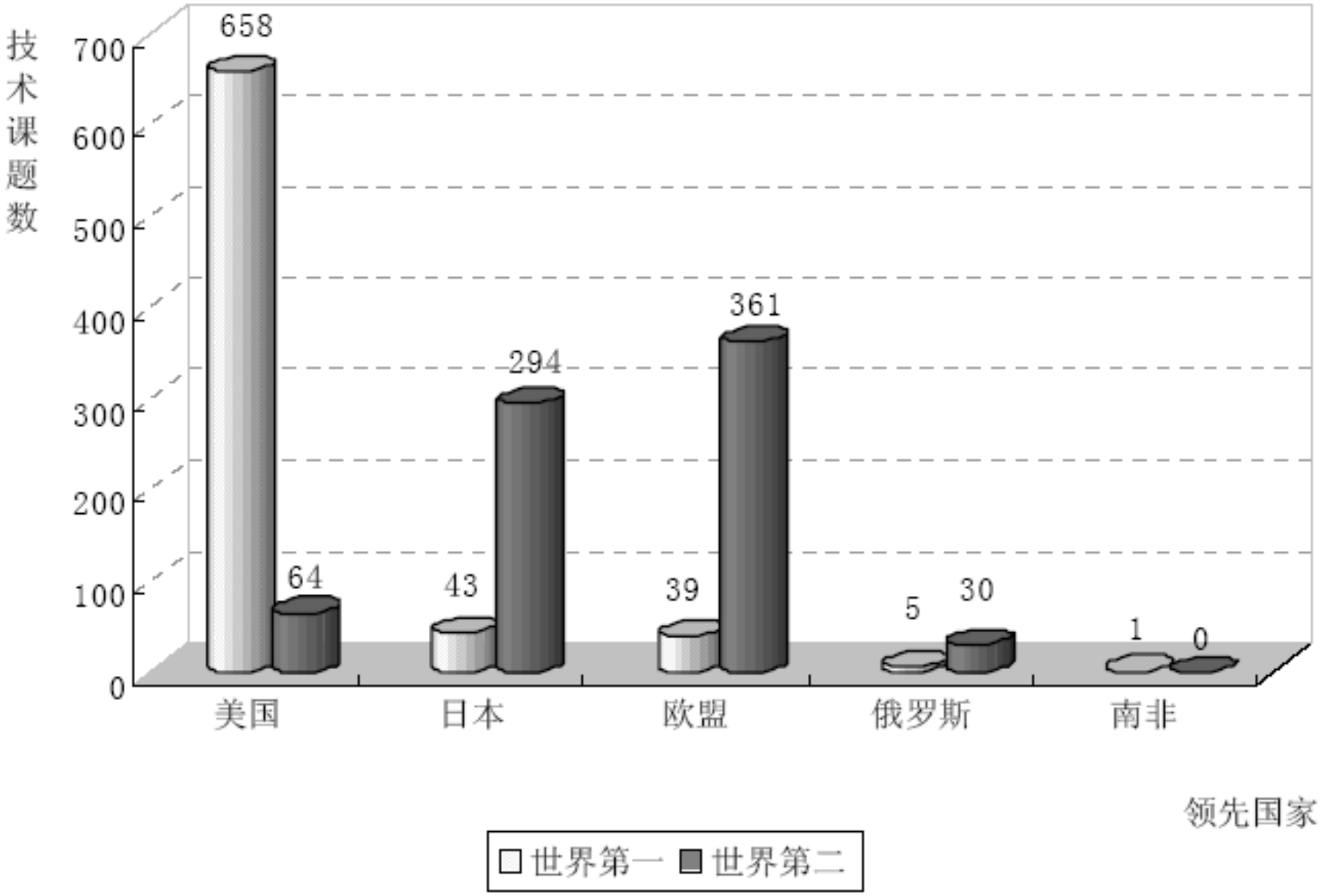


II. Issues on Innovation Capacity in China

5. In terms of S&T papers and patents (granted/application), the productivity of S&E in China is still much lower than that in developed nations.
6. The effectiveness of R&D investment is still lower than many developed countries Even if we consider the quantity of output







Leading country in all important technologies

Key Issues and Barriers Identified

Generally speaking, following issues are critical to the changing innovation strategy and policies.

1. Investment in innovation:– insufficient
2. Allocation of innovation resources: – un-balanced
3. The number of R&D organizations: – decreased
4. R&D/innovation personnel: – insufficient/qualified, mobility
5. The linkage among S&T, economy & education: Weak
6. IPR and standardization strategies– lack of effective linkage
7. Incentive mechanism for firm's innovation: –less effective
8. Evaluation system for : –less effective
9. Mechanism for cooperation Industry and Uni/Inst. barriers

III. Policies for Innovation Capacity Building

1. Supportive Policy

(1) S&T Input

•To increase S&T expenditure dramatically and maintain a growth rate faster than governmental regular revenues.

•To adjust the structure of S&T expenditure and the structure of national S&T programs so as to stimulate enterprises' investment in innovation.

•To set up new mechanism for managing public S&T expenditure.

•To innovate a new management mechanism for public S&T expenditure.

III. Policies for Innovation Capacity Building

(2) Tax Incentives

•To share the cost of technology development in enterprises by means of tax deduction (50%).

•To provide policy for deducting tax of imported facilities & instruments, for speeding up the depreciation of the facilities and instruments so as to upgrade enterprises' experimental capacities.

•To provide tax incentives for equipments & instruments & materials imported by ETDC & ERC & National S&T projects so as to promote capacity building for innovation in enterprise.

•To support the development of transformed PRIs, venture capitals, and S&T service institutions by providing tax deduction.

III. Policies for Innovation Capacity Building

(3) Government purchase

•To promote the indigenous innovation by providing various measures related government purchases, concerning identification of indigenous innovative product, the evaluation measures for government purchase.

(4) Finance support for innovation (VC, bank, stock market)

(5) Innovation based on imported/assimilated technology

•To strengthen the management of technology import and assimilation. To make special technology policy and list technologies to be encouraged/limited so as to strengthen capacity-building for innovation.

III. Policies for Innovation Capacity Building

(6) To create and protect the IPRs.

•To support enterprise to generate & protect IPRs, to engage in standard-making procedure at national and international level.

•.To speed up the checkup cycle of patent application, and improve the system for IPR protection.

(7) To train qualified HRST & promote them flow to firm

•To train talents in different level from top scientist to skilled workers. To encourage the flow of talents from Universities to enterprises. To set up S&T credit system.

III. Policies for Innovation Capacity Building

2. Detailed Rules for Implementing the Policy

So far, Chinese government have issued 54 detailed rules for implementing supportive policies. 37 of which are related to enterprises' capacity-building for innovation.

Among the 37 rules, mainly focus on the innovation investment, the innovation infrastructures, and the innovation output such as IPRs and product.

The entrepreneurship, start-ups and innovation diffusion have to be strengthened in the rules to be issued in the future.

III. Policies for Innovation Capacity Building

3. The Effectiveness of the Policies and Rules

(1) The central governments have issued many detailed rules for implementing the supportive policies.

(2) local governments also have issued many regional policies for implementing the supportive policies.

(3) The S&T investment in most province has increased dramatically since 2006.

(4) There are still many enterprises who have not benefited from the supportive policies and detailed rules.

III. Policies for Innovation Capacity Building

The main reasons for enterprises who have not benefited from the policies and rules:

1. There are still some unfinished important detailed rules that is very important for implementing the policies.
2. Many enterprises do not know the policies and rules.
3. The procedures for implementing the policies & rules are relative complicated for enterprises.
4. Most of enterprises in China have less experiences in innovation management, for example, it is often difficult for them to clearly calculate the cost of tech. development.

IV. Conclusion Remarks

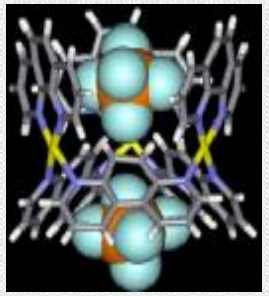
To become innovation-driven country is for China very ambitious, which depends on many factors.

- Firstly, it depends on the efficiency, effectiveness, efficacy of technology learning process.
- Secondly, it depends on the effectiveness of mechanism for implementing/adjusting supportive policies & detailed rules.
- Thirdly, it depends on the innovation-friendly culture.
- Fourthly, it depends on talents supply and the effectiveness of education and training system.
- Fifthly, it depends on the effectiveness, efficacy of international cooperation.

IV. Conclusion Remarks

- China is far away from the so-called techno-super power.
- However, it is possible in the future for China to make a significant contribution to world science and technology in some fields, such as biology and Chinese medicine, nanotechnology, space science & technology, energy technology.
- China is expected to play increasingly important, active role in the global innovation system, especially when innovation capacity of Chinese enterprises have been highly strengthened.





Thank you for your attentions

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