China: From Global Manufacturing Hub to Global Innovation Center?

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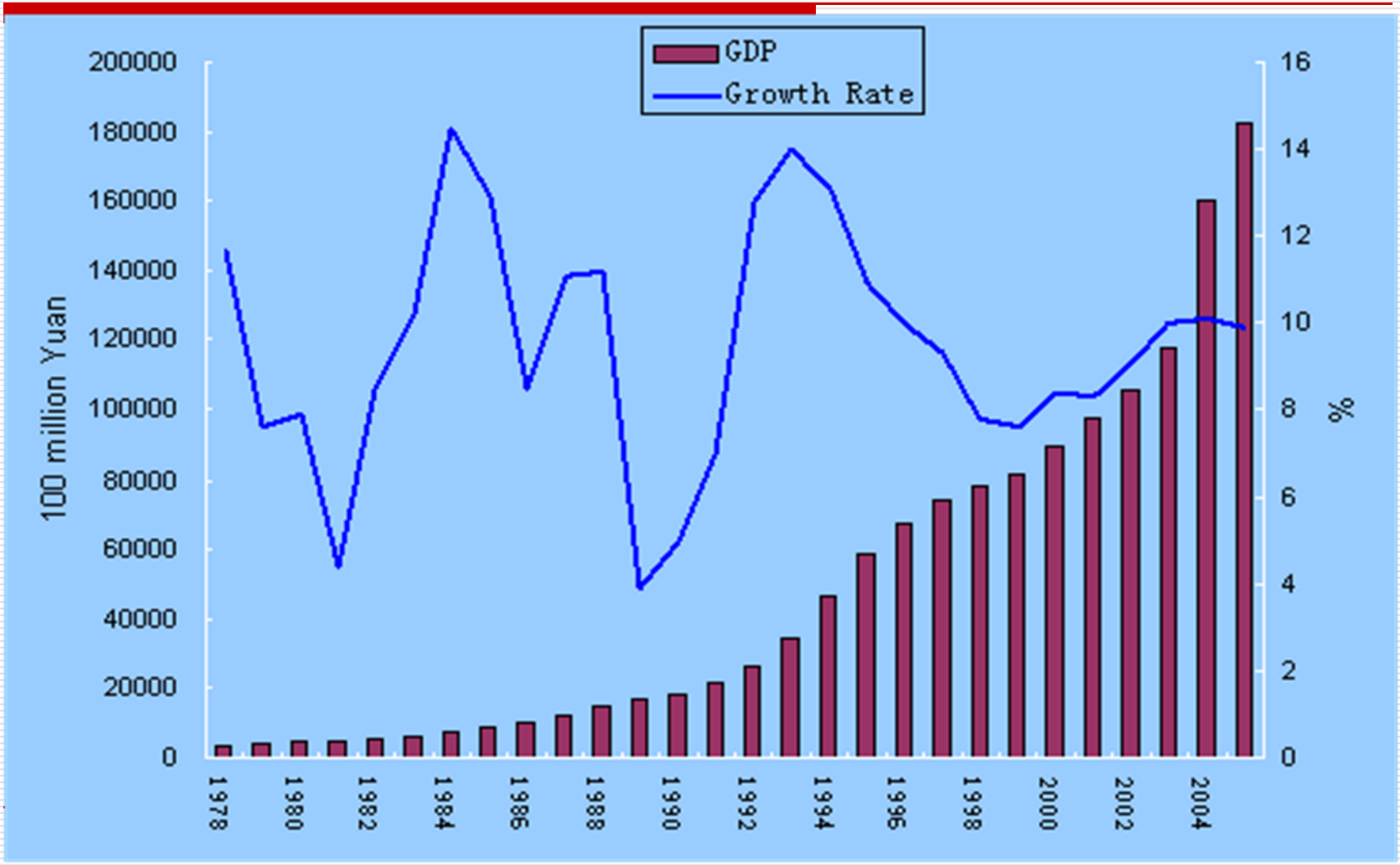
Outline

- I. The context: China in transition
- II. The challenges to the growth model
- III. The new growth model based on innovation
- IV. A global innovation center: challenges ahead

I. The context: China in transition

Economic system: From Central Planning to market-based



Industrial structure: global manufacturing hub

- Agriculture:
  - 1980=30% => 2000=14.8% => 2007=11.3%
- Manufacturing:
  - 1980=49% => 2000=45.9% => 2007=48.6%
- Service:
  - 1980=21% => 2000=39.3% =>2007=40.1%

Society: Rural and closed=>Urban and Open

- Rural =>Urban
  - Urban population 1982=20.6% => 43%=2005
- International Linkage
  - Economy: Self-reliant=>major world trading partners
    - FDI> $60 billion
    - international trade as the percentage of GDP
      - 1978=10% => 2005 =62%
  - Overseas travel:
    - 1998=8.43million => 2004=28.85 million

Governance structure: personal charisma and authority=>rule of law and broad participation

- Village election and township election experiments;
- Administrative and legal systems reforms;
- Broader public participation in the policy process (e.g. public hearing);
- The growth of non-governmental sector;
- Anti-corruption campaigns;
- ……

China in Transition: innovation system

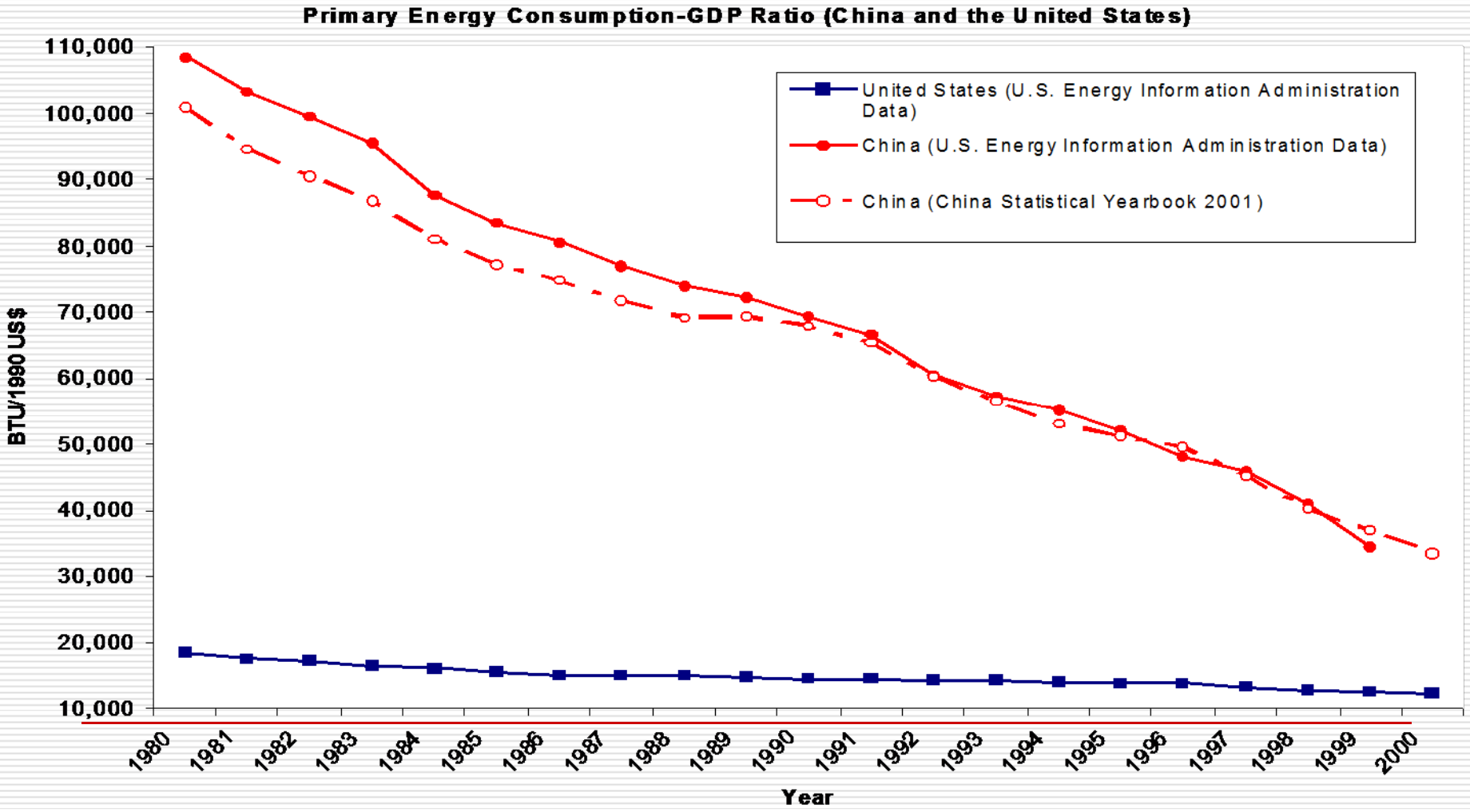
- Three rounds of innovation system reforms
  - 1985 reform--Incentive reform for public research institutes to link with economic development;
  - Late 1990s—structural reform of research institutes and universities
    - By the end of 2003, 1050 research institutes were transformed into business since 1999 government reform;
    - 99 others were merged into universities or transformed into NGOs.
    - Focused support for research universities
  - 2006 median and long term S&T plan
    - Support for strategic areas: such as energy, health, and environment;
    - Focusing on enterprise-centered technological innovation system,;

II. Limitations of the "manufacturing hub" model

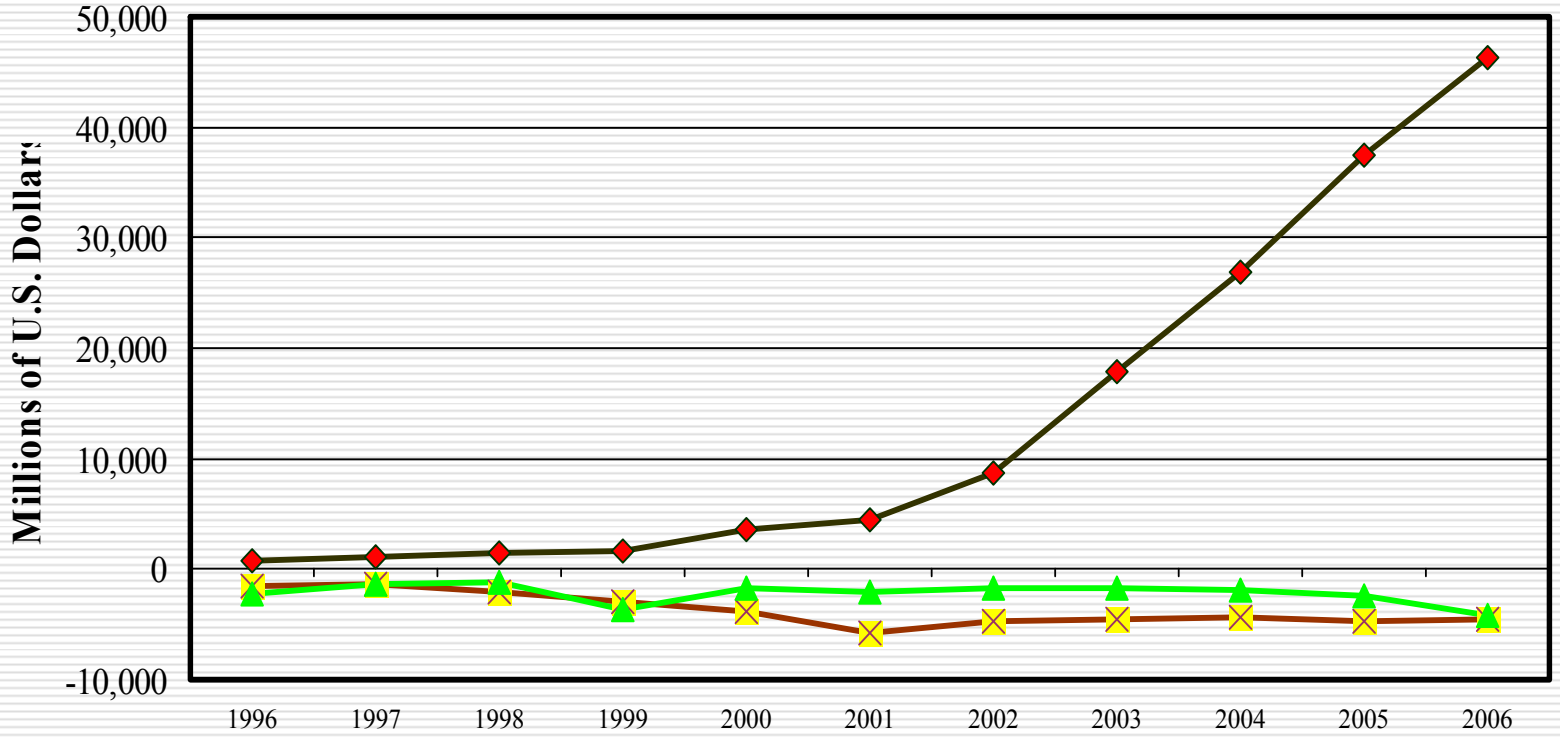
- Environmental pollution and resource constraints
  - Exasperated by the recent financial crisis
- Regional and income disparity
  - 1993=0.407→2004=0.47 (ADB estimates, August 2007)
- Inadequate regulatory regimes
  - Horizontal appointment and budget vs. vertical technical directions
  - Coordination among different regulatory agencies
  - Capacity problems for regulatory agencies

- Enterprise innovation lag
  - Gaps in technology sophistication (see graph)
  - FDI and export orientation=>technology dependency
    - Semiconductor equipment=>100% imports
    - Advanced technology product (ATP) trade (see graphs)

China's energy efficiency

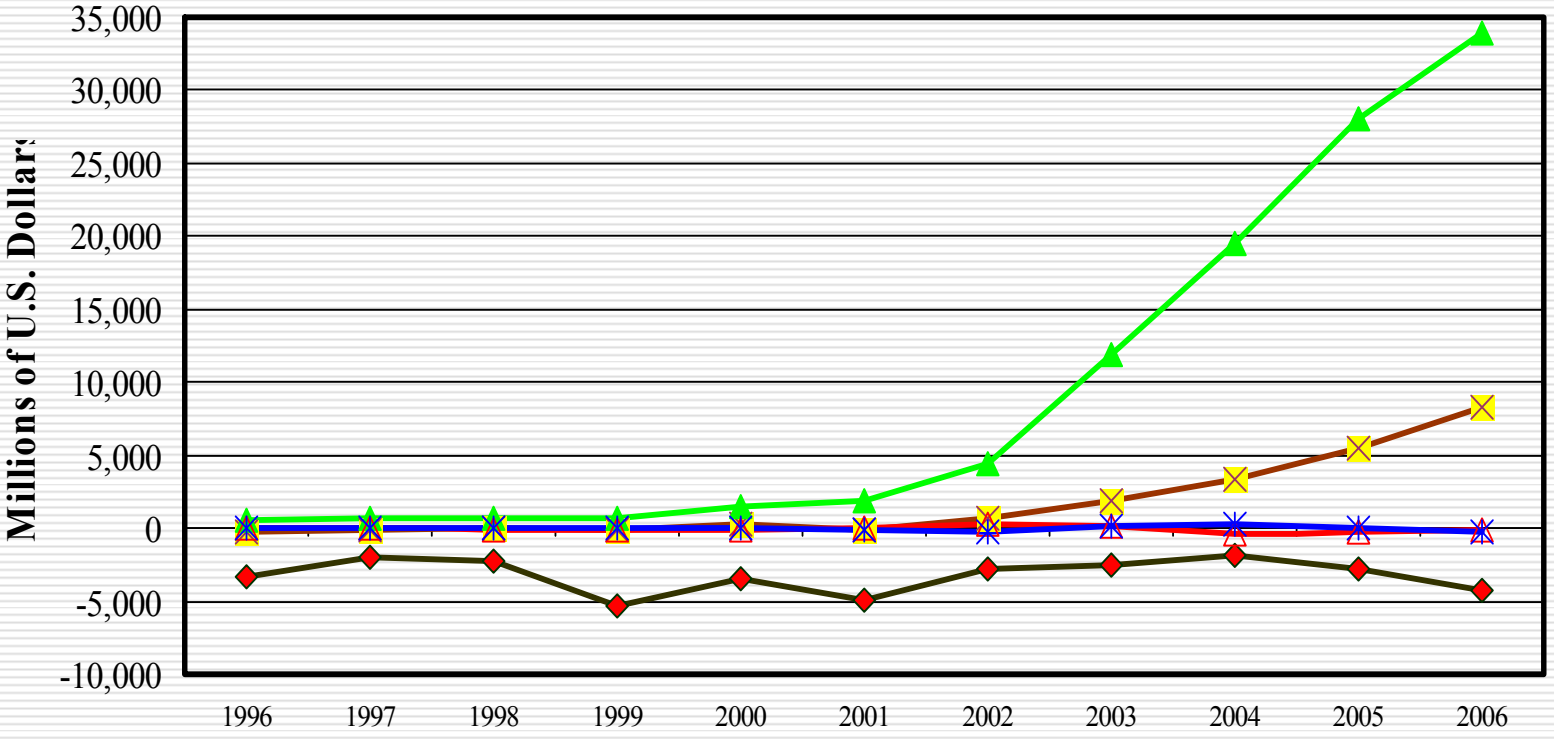


China's ATP Trade Surplus with U.S. : completely from processing exports



Data Source: China Custom Statistics, U.S..Census ATP definition

China's ATP Trade Surplus with U.S.: mostly generated by FIEs in China



Data Source: China Custom Statistics, U.S. Census ATP definition

III. The new growth model based on innovation

- Objective-making China an innovation-based country in 2020;
  - Increasing R&D spending to 2.5 percent of GDP;
  - Increasing the contribution of S&T to the economic growth;.
  - Reducing over-dependency on foreign technology;
  - Stepping up the output of publications and patents in major fields.
- Approach-promoting indigenous innovation;
  - Importation, assimilation, and innovation;
  - Integration innovation
  - Original innovation
- Key players-Innovation system
  - Enterprise-based technical innovation system;
  - Knowledge innovation system;
  - ……

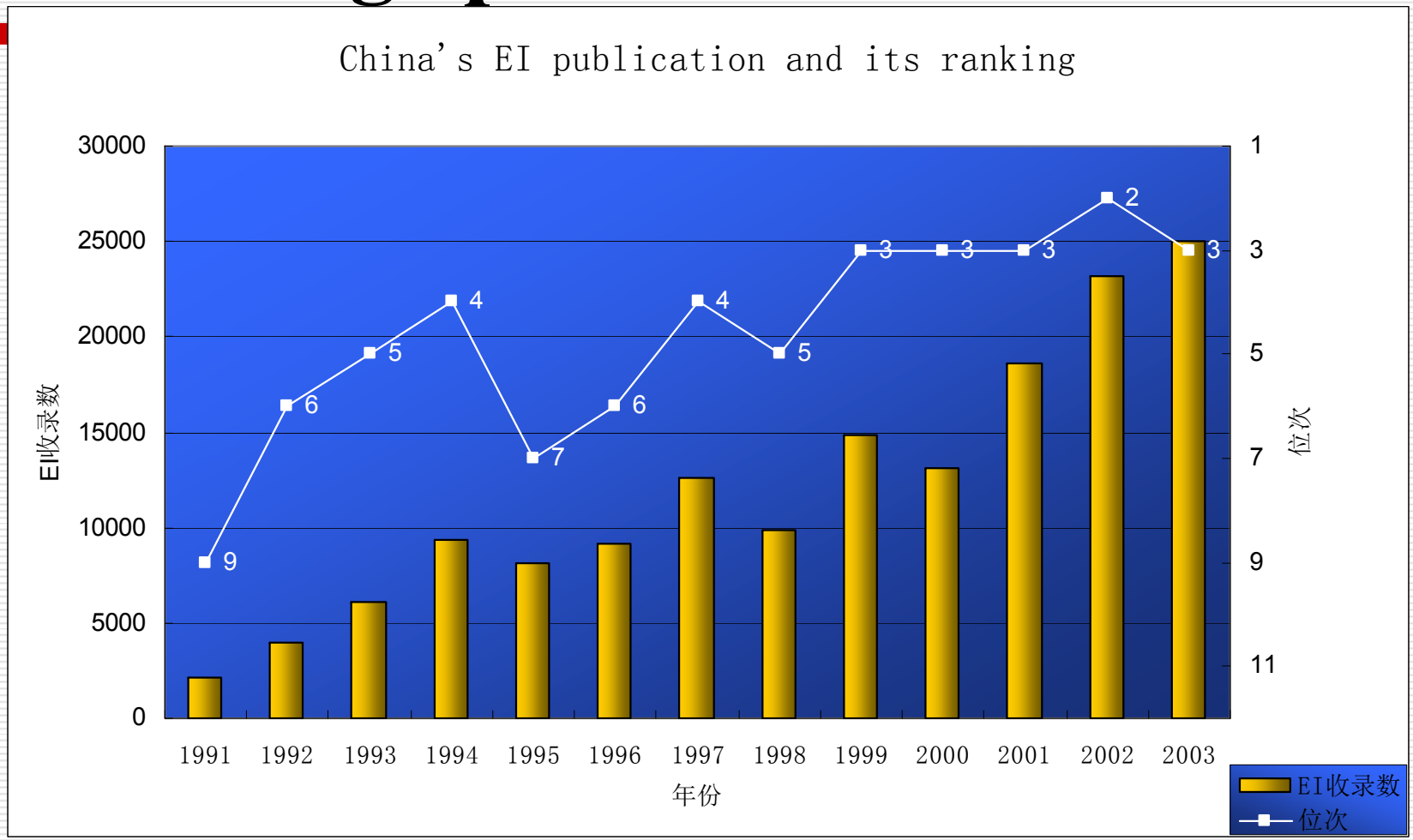
The key role of globalization

- China's national innovation system is part of the global innovation system:
  - China's international S&T publications
    - See graphs below
- Global R&D institutions are important parts of China's national innovation system:
  - MNC R&D in China:
    - investment as % of industrial R&D
      - 2000=20.5%=>2004=27.1% (national)
      - 2000=58.2%=>2004=73.0% (in shanghai)
    - MNC R&D Centers in China (see PPT below)

Knowledge production-SCI

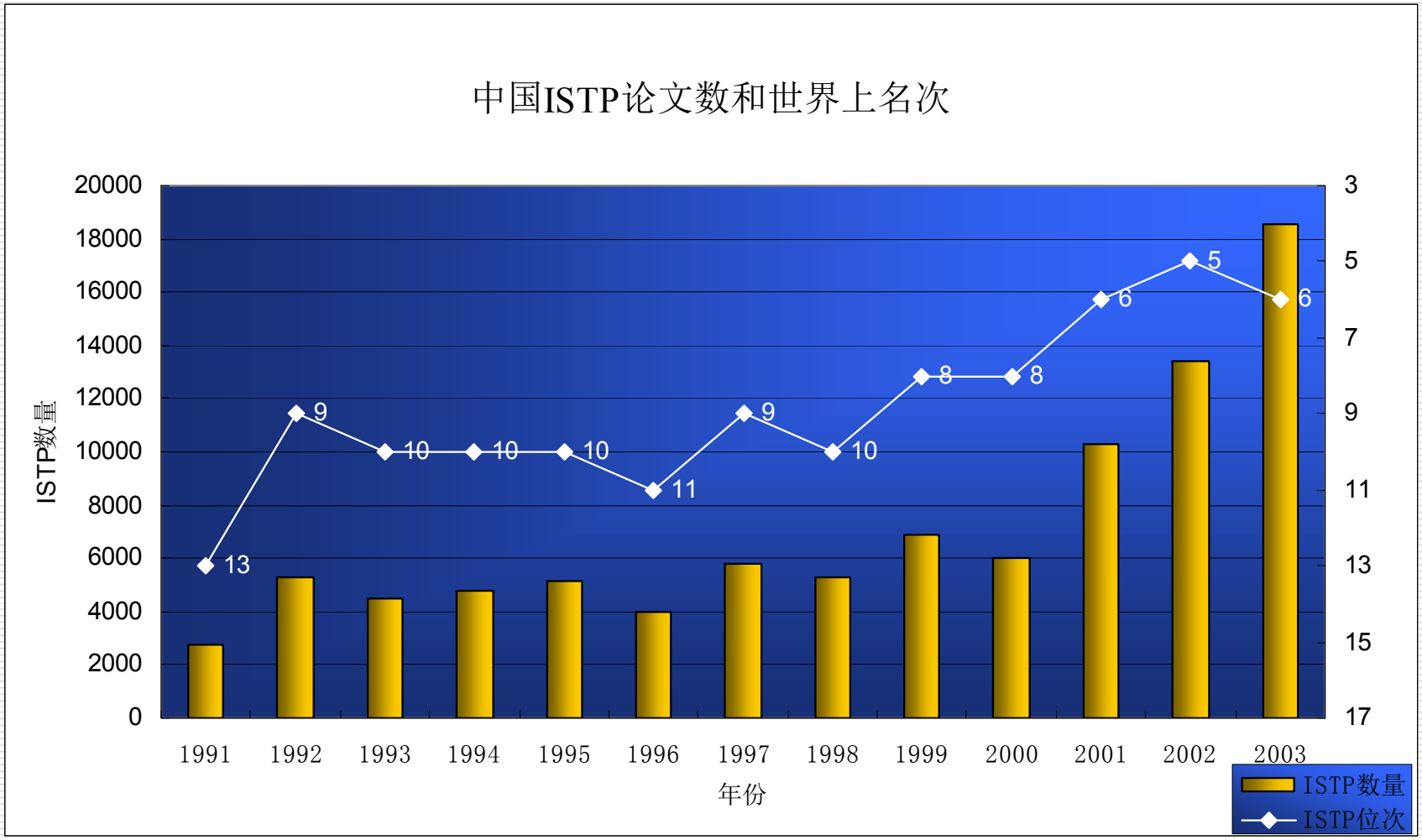
数据来源：中国科技统计年鉴2005、中国科技论文统计与分析 2005 年

Knowledge production-EI



数据来源：中国科技统计年鉴2005、中国科技论文统计与分析 2005 年

Knowledge production-ISTP



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数据来源：中国科技统计年鉴2005、中国科技论文统计与分析 2005 年

Multinational R&D in China

- From 1993 to 2002, MNC overseas R&D spending rose from $30 billion to 67 billion;
- During 2004-2005, over half of leading MNCs have set up R&D organizations in China or India;
- By different accounts, MNC R&D Centers in China:
  - 2001<=200; 2005=750; 2007>980
- Some leading companies have begun to consolidate its R&D organizations in China and established its China R&D system, such as Motorola, Microsoft, and etc.

Overview of our study

- 1st phase study in 1999-2000;
- 2nd phase study carried out in 2004-2006;
- Phone interviews with 289 of MNCs in China
  - 117 companies have set up R&D facilities in China;
  - 215 R&D centers were set up by them;
    - 107 are autonomous R&D labs;
    - 59 are R&D units in the local subsidiaries;
    - 49 joint centers (with universities and so on)

Findings-Types of organization

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- 215 R&D centers were set up by them;
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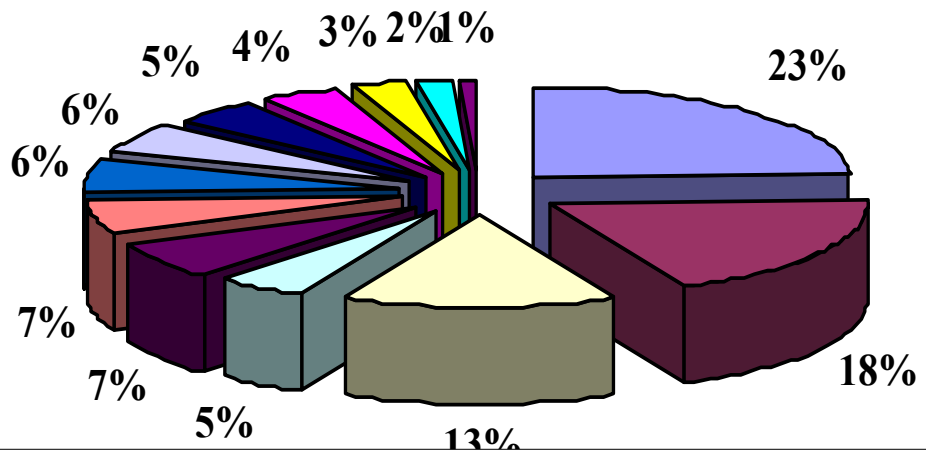
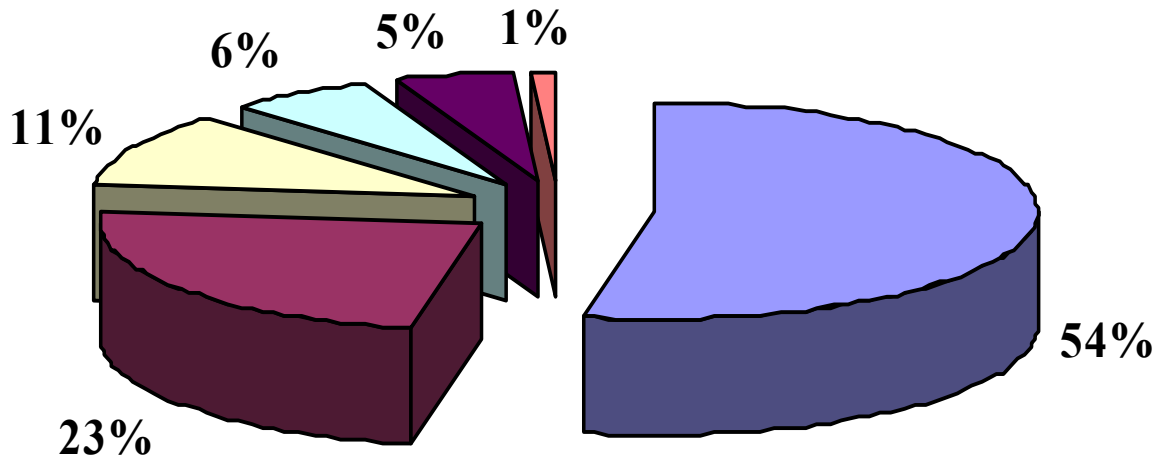
Findings-industrial distribution:

Figure 1 The industrial distribution of autonomous R&D labs settled by Business Week 1000 MNCs in China



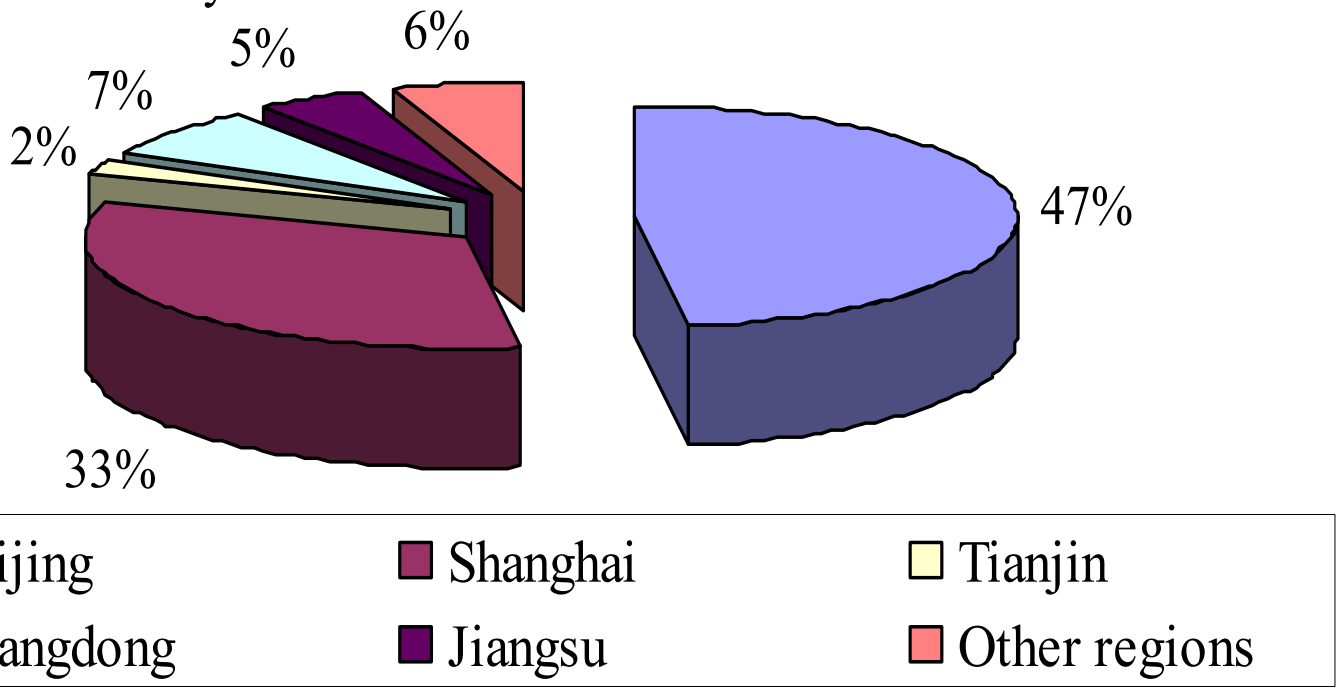
Findings-country distribution

Figure 2 The country distribution of autonomous R&D labs settled by Business Week 1000 MNCs in China

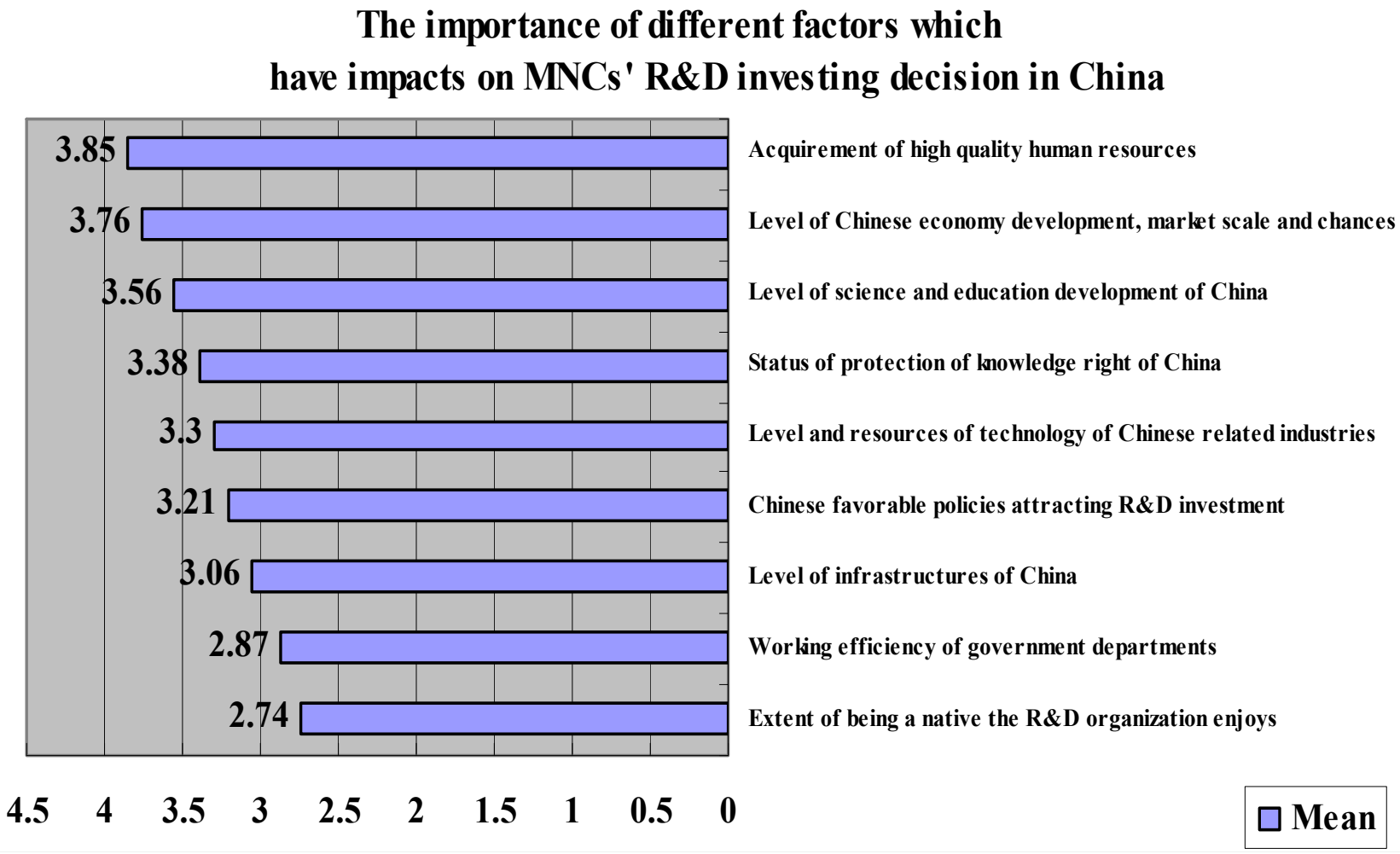


Findings-location choice:

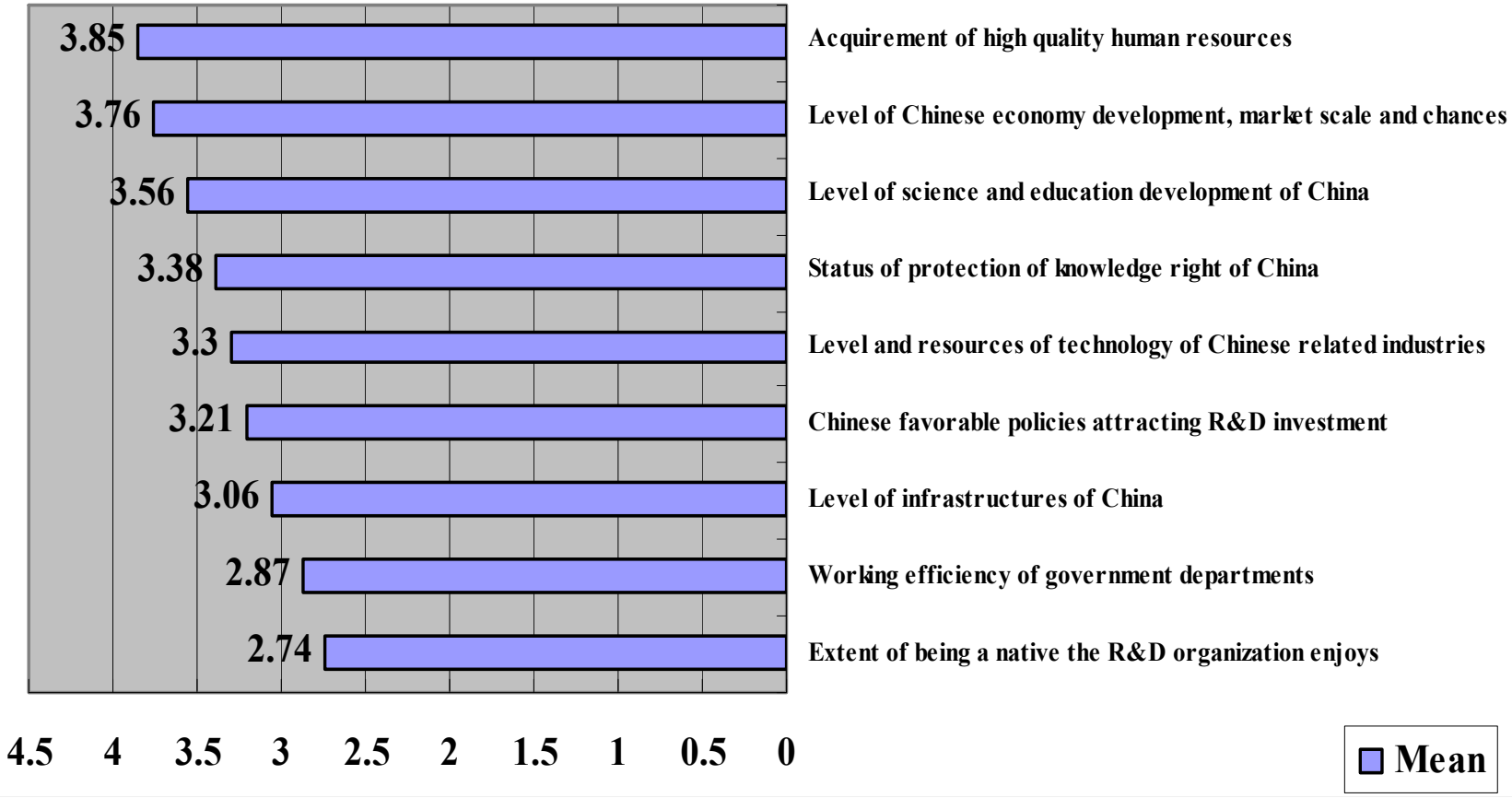
Figure 3 The regional distribution of autonomous R&D labs settled by BusinessWeek 1000 MNCs in China



What attracts these R&D centers to China (Beijing)?



The importance of different factors which have impacts on MNCs' R&D investing decision in China



IV. Toward a global innovation center: challenges ahead

- How to provide a better and facilitating environment for R&D institutions?
  - The mobility of global R&D centers
- How to minimize the negative impact of MNC R&D centers to the local innovation system?
  - Creaming talents from local R&D institutions
- How to link knowledge generation to value creation?
  - Innovation and entrepreneurship --Silicon Valley?
- How to build a global knowledge governance system?
  - IPR, Standards, mega-research projects and etc.

Thank you!