



From shopfloor to knowledge factory?

- *Foreign R&D in China*

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Introduction

- Corporate R&D is internationalizing and, increasingly, it is moving east
- China has more knowledge resources than any other country with the exception of the United States
- China ranked most attractive location for future R&D by numerous companies and experts
- 980 R&D centers by foreign companies in China (according to official statistics)

=> *What does it mean (for China and the rest of the world)?*

Outline

- How much foreign corporate R&D in China and how much of it is global / innovative?
- Why are foreign companies establishing R&D in China?
- What does it mean?

Foreign corporate R&D in China

- Recent but rapidly increasing phenomenon
- From product development to more strategic R&D
- China ranked one of the world's most attractive countries to locate R&D

...but

- Some 'window dressing'
- Growing debate over its benefits for China's innovation system

Foreign corporate R&D in China, contd.

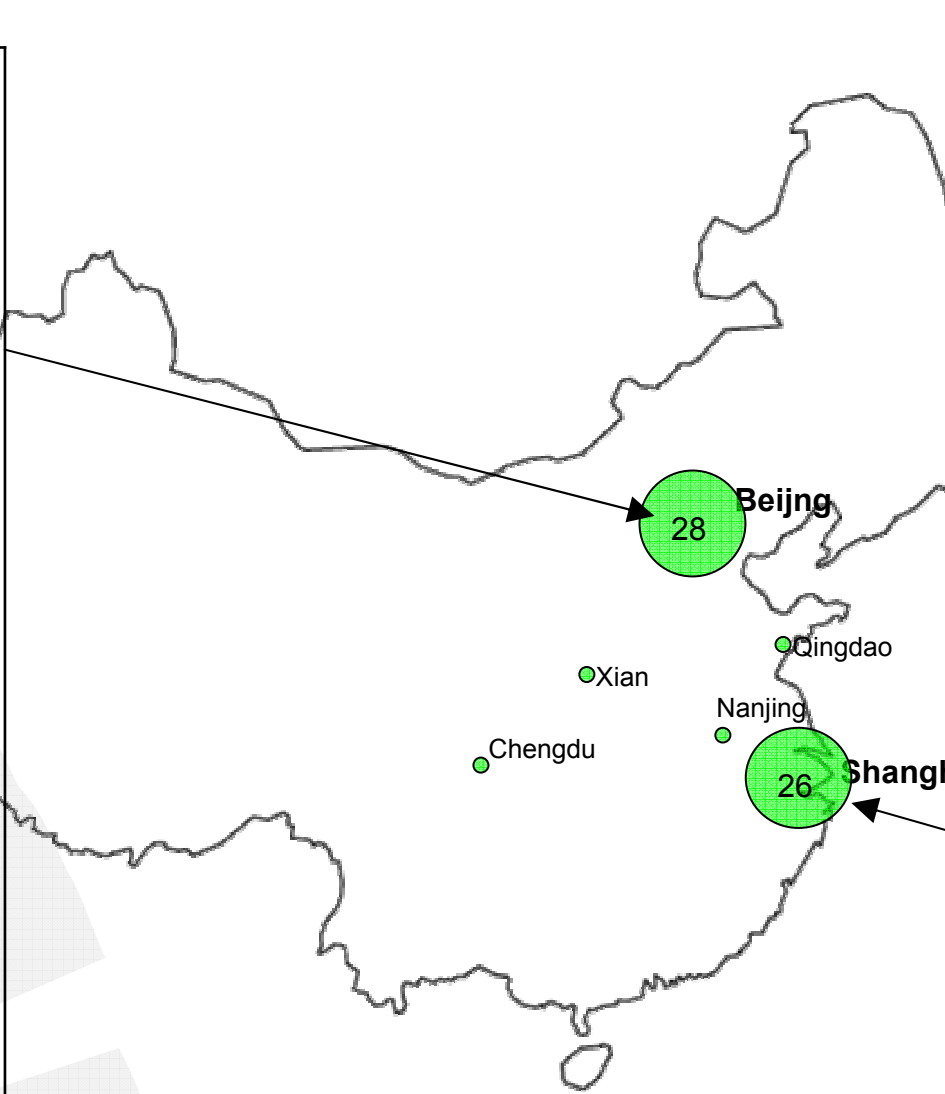
- at least 300 foreign R&D centers
- heavily concentrated in a few large manufacturing companies...
- in a few sectors... (IT, telecom, appliances, transportation, design)
- ... and a few cities or regions
- *but rapidly changing picture*

'Global' or 'innovative' R&D centers

- between 30 and 40 companies have set up around 60-70 global R&D centers in China
- primarily IT, telecom, appliances, but lately also chemicals, pharmaceuticals, software, global design centers
- strong concentration in Beijing and Shanghai

Global R&D centers in China: Location

- ABB
- Agilent Technologies
- Alcatel Lucent
- DoCoMo
- Ericsson
- France Telecom
- Fujitsu
- Google
- Hewlett Packard
- IBM
- Infineon
- Intel
- Matsushita/Panasonic
- Microsoft
- Motorola
- NEC
- Nokia
- Nortel
- NovoNordisk
- Novozymes
- P&G
- Ricoh
- Samsung
- Siemens
- SonyEricsson



- Alcatel Lucent
- AMD
- Astra Zeneca
- Ciba Spec. Chemicals
- Cisco Systems
- Dell
- Dupont
- Electrolux
- Eli Lilly
- Ericsson
- General Electric
- General Motors
- Hewlett Packard
- Honeywell
- Intel
- Microsoft
- Motorola
- Omron
- Philips
- Ricoh
- Roche
- Rohm and Haas
- Samsung
- Siemens
- Sony
- Toray
- Unilever

Global R&D centers

■ *country of origin:*

➤ US	16
➤ EU	15
➤ Japan	10
➤ other	5

■ *location:*

➤ Beijing	28
➤ Shanghai	26
➤ Other	5-10

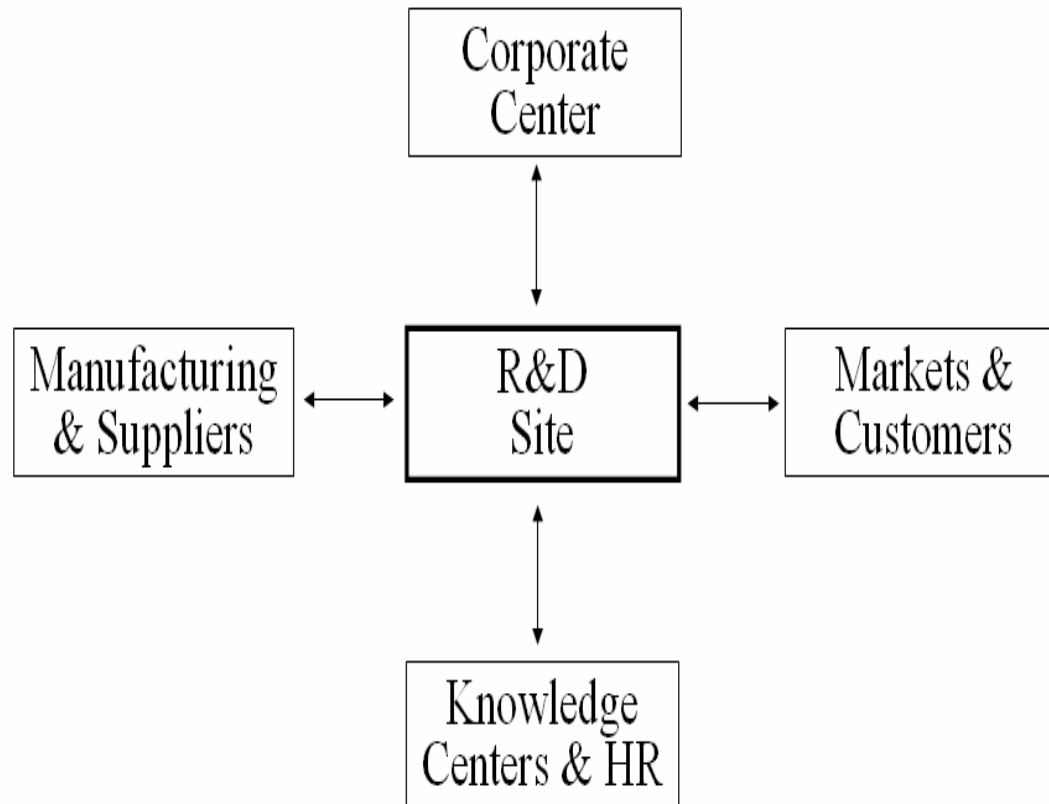
■ *sectors:* primarily IT, telecom, appliances, but lately also chemicals, pharmaceuticals, software, design

■ *company segment:* large manufacturing companies

Why do foreign companies locate R&D in China?

- Requirements and incentives from the Chinese government ('technology-for-market')
- Market
- Proximity to production
- Rapidly increasing knowledge resources and attractive human capital

Determinants for locating R&D



Recent developments

- growing domestic debate over the benefits of foreign R&D
- increasing focus on 'independent' or 'indigenous' innovation with international ramifications
- Chinese companies encouraged to establish R&D abroad

Foreign R&D in national innovation systems

- Knowledge spillovers occur through
 - upstream and downstream linkages in the value chain (suppliers, customers)
 - R&D cooperation with Chinese universities, institutes, companies
 - people!
- Knowledge spillovers or linkages may be limited because of
 - limited mobility (differentiated labour markets? Domestic firms crowded out of the market for highly skilled labor?)
 - limited receptive capacity among domestic firms, institutes, universities and customers
 - IPR, social capital, trust

Challenges for foreign companies

- Personnel turnover
- Shortage of people with appropriate skills
- IPR protection
- Changing policy environment?

Summary

- *"first foreign companies established R&D because they had to but now they see the advantages"*
- rapid development but few 'hard facts'; important to distinguish 'real trends' from 'hype'
- Clear ambition to move from shopfloor to innovation economy – and indications that this is happening in a handful of sectors, companies and regions – but significant obstacles / weaknesses remain
- So far, limited positive spillovers of foreign corporate R&D on China's domestic innovative capacity
- foreign corporate R&D has been rising rapidly and has, so far, been strongly supported by the Chinese government -> what will happen in the future?

Foreign R&D in China: What does it mean?

Globally:

- ⇒ Establishment of R&D centers less path-dependent than assumed
- ⇒ Knowledge landscape is changing -> will geography of innovation change too?

For China:

- ⇒ Still considerable weaknesses in China's innovation system
- ⇒ R&D (and S&T) has been given greater priority than education and learning
- ⇒ Weak social welfare creates human capital bias against private firms and SMEs

For other countries:

- ⇒ A highly sensitive issue
- ⇒ Important for foreign firms' competitiveness to succeed in China
- ⇒ Need for strategies on how to benefit from China's development (incl. R&D)
- ⇒ Foreign R&D centers in China completely dominated by large firms
- ⇒ How to remain an attractive location for R&D?

What will happen in the next 5 years?

- China's top level human capital and market likely to strengthen
- Chinese firms will increase their presence abroad (seeking know-how and human capital)
- China will increase the global demand for highly skilled labor?
- Chinese government policy towards FDI and foreign R&D?
- political, economic and other risk scenarios



Thank you!

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Sweden

- Sweden: R&D expenditure heavily concentrated in a few large corporations
- Corporate R&D performed by Swedish companies outside Sweden has increased from 20 % in 1995 to 40 % in 2003
- Sweden one of the most internationalized countries in the world when it comes to the share of foreign-controlled R&D: 45 % in 2003, compared with 10 % in 1995
- In 2003 there were around Swedish 60 corporations with ~ 17000 employees in China

What does it mean?

- R&D not only for adaptation to the Chinese market
- R&D not only there because of market or government pressure
- If having R&D in China important for companies' ability to compete and if only large multinationals have R&D in China (if one has to be big to be able to have R&D in China): what does this mean for the small and medium-sized firms