Beyond Low-tech Manufacturing: Foreign Research and Development Investment in China

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Introduction

- China: “World’s Factory”
  - Cheap products
  - Cheap labor
- New development in China
  - High-tech industries: export
  - Domestic high-tech industries:
  - Upgrading of foreign investments in China: from manufacturing to R&D


Computer Associates
ca.com.cn
intel
Audi
2004 7 25


Microsoft
微软亚洲研究院
2004 7 20


MOTOROLA NORTH ASIA CENTRE
摩托罗拉北亚中心


Sun
microsystems
2004 7 22


Infineon
technologies
NO.7,8,LANE 647,SONG TAO RD.,
ZHANG JIANG HI-TECH PARK
上海张江高科技园区松涛路647弄7-8号

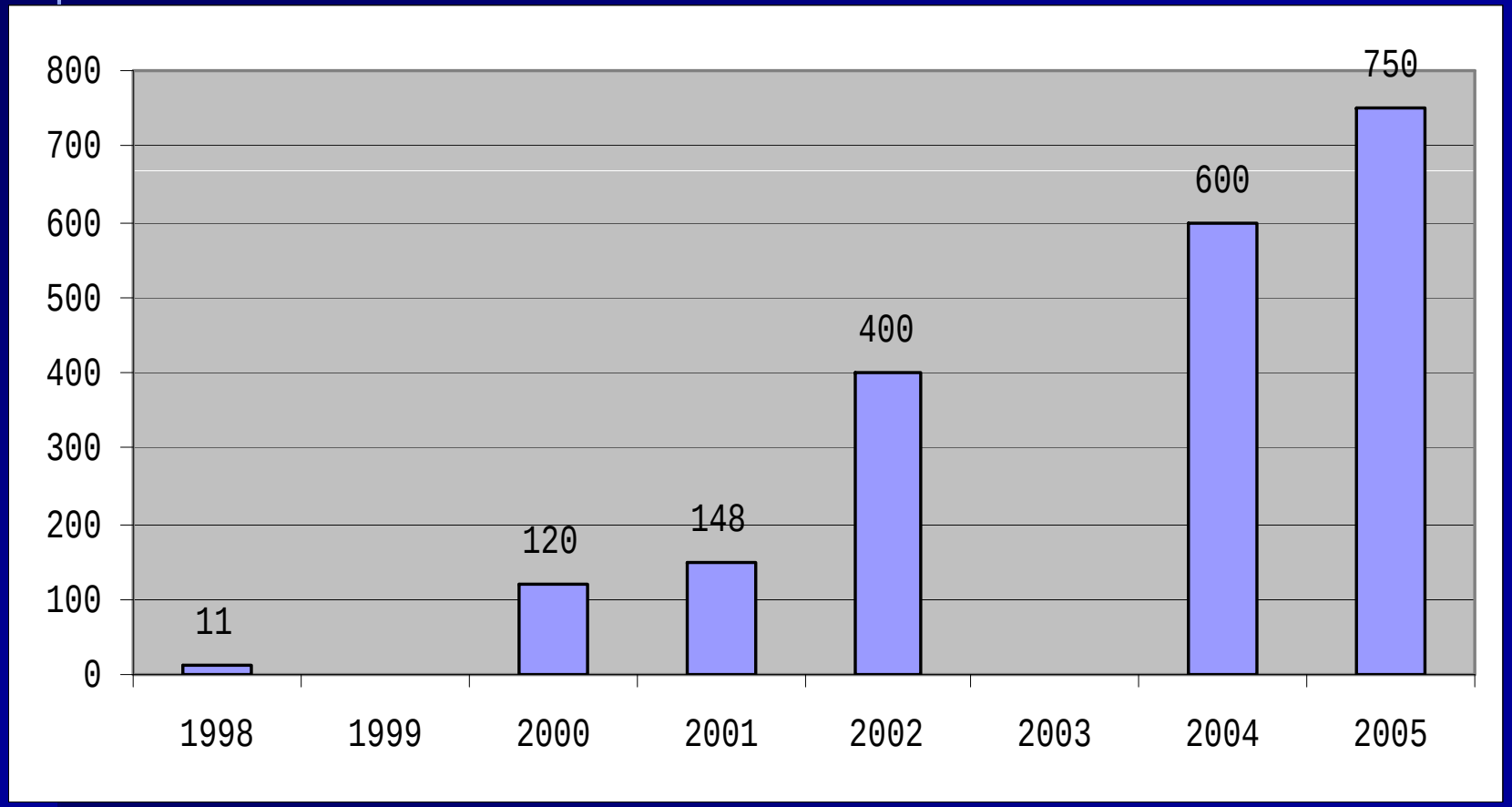

Honeywell


SHARP
夏普电子(上海)有限公司
SHARP ELECTRONICS (SHANGHAI) CO., LTD.
家用电器研究开发中心
APPLIANCE PRODUCTS R&D CENTER

Issues

- A controversial issue
- Current research
  - What are they doing?
  - Why are they coming to China?
  - Where are they located and why so?
  - Management challenges

Growth of Global R&D in China



Walsh, 2005

Country distribution

Parent Countries	Total R&D Centers		Autonomous R&D Labs		R&D Units	
	No	%	No	%	No	%
North America	103	47.9%	52	48.6%	26	44.1%
Japan	47	21.9%	23	21.5%	12	20.3%
Korea	24	11.2%	9	8.4%	8	13.6%
Europe:	40	18.6%	22	20.6%	13	22.0%
	24	11.2%	11	10.3%	12	20.3%
UK,France&German North Europe	8	3.7%	6	5.6%		0.0%
Other European Counties[3]	8	3.7%	5	4.7%	1	1.7%
Other Countries	1	0.5%	1	0.9%		0.0%
Total	215	100%	107	100%	59	100%

Xue and Liang, 2005

Globalizing R&D II: Classification

- Ronstadt (1977)
  - Technology transfer unit (TTU)
  - Indigenous technology unit (ITU)
  - Global technology unit (GTU)
  - Corporate technology unit (CTU)
- Kuemmerler:
  - Home-base-augmenting lab*
  - Home-base-exploiting lab**

Types of Foreign R&D in China

- Internal Service Provider (Motorola Software Development)
- External Service Provider (Infineon)
- Technology adapter (MS Office Chinese)
- Indigenous technology developer (DaimlerChrysler SIM Technology)
- Global Technology Center (Nortel Network)
- Corporate Research Center (Microsoft Asia Research, IBM China Research, Unilever China Research)

Motivations of Going China

- Market
- Technology
- Talent

- China:
  - Big market
  - Quality talent

Location of Foreign R&D Centers within China

Regions	Total R&D Centers		Autonomous R&D Labs		R&D Units	
	Number	Percent	Number	Percent	Number	Percent
Beijing	82	38.1%	51	47.7%	14	23.7%
Shanghai	60	27.9%	35	32.7%	14	23.7%
Tianjin	9	4.2%	2	1.9%	6	10.2%
Guangdong	23	10.7%	8	7.5%	7	11.9%
Jiangsu	18	8.4%	5	4.7%	9	15.3%
Other regions	23	10.7%	6	5.6%	9	15.3%
Total	215	100%	107	100%	59	100%

Xue and Liang, 2005

Over-concentration in Beijing and Shanghai?

City	Top100 U	MOE U	Col. Students
Beijing	19 (19%)	22 (30.1%)	212984 (5.2%)
Shanghai	8 (8%)	8 (11.0%)	165129 (4.0%)

City	R&D Ins.	KeyLabs	Scientists
Beijing	231 (5.7%)	97 (24.0%)	35506 (16.2%)
Shanghai	156 (3.9%)	32 (7.9%)	13450 (7.0%)

City	HT Emp (000)	HT Output (BY)	HT Exports (M$)
Beijing	403 (11.6%)	148 (11.4%)	2877 (8.7%)
Shanghai	109 (3.1%)	94 (7.3%)	3010 (9.1%)

Environmental Challenges of Foreign R&D

Infrastructure	6.2
Internet access	3.1
Financial services	3.1
Producer services	3.1
Human Resource Management	81.2
Increasing labor cost	40.6
Lack of creative and experienced labor	50.0
High labor mobility	18.8
Managing a diversified staff	21.9

R&D Centers that report problems on	Europe and North America		Asia	
		%		%
Institutional Barriers				
Yes	12	48.0	2	28.6
No	13	52.0	5	71.4
Infrastructure Barriers				
Yes	2	8.3	0	0
No	22	91.7	7	100
HR Management Barriers				
Yes	21	87.5	4	57.1
No	3	12.5	3	42.9

	Yes	%
Local Chinese	7	87.5
Returned mainlanders	7	100
Overseas Chinese	6	75
Foreigners	5	71.4

Conclusions

- China is not just an export platform of cheap products for MNEs. It has become increasingly attractive for high-end activities, including R&D
- Cheap labor is not as significant as the large and growing market in attracting foreign R&D, particularly strategic R&D
- Foreign companies are overly concentrating in Beijing and Shanghai
- Foreign companies are facing many challenges in managing R&D in China