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Analyzing the evidence of a IPR take-off in China and India

8th Ph.D. School on Innovation and Economic Development

GLOBELICS
ACADEMY 2012

Rio de Janeiro: 20th August – 31st August, 2012

Outline

- 1. The legal structure of IPRs**
2. A brief panorama of global IPR demand
3. IPR take off in China and India

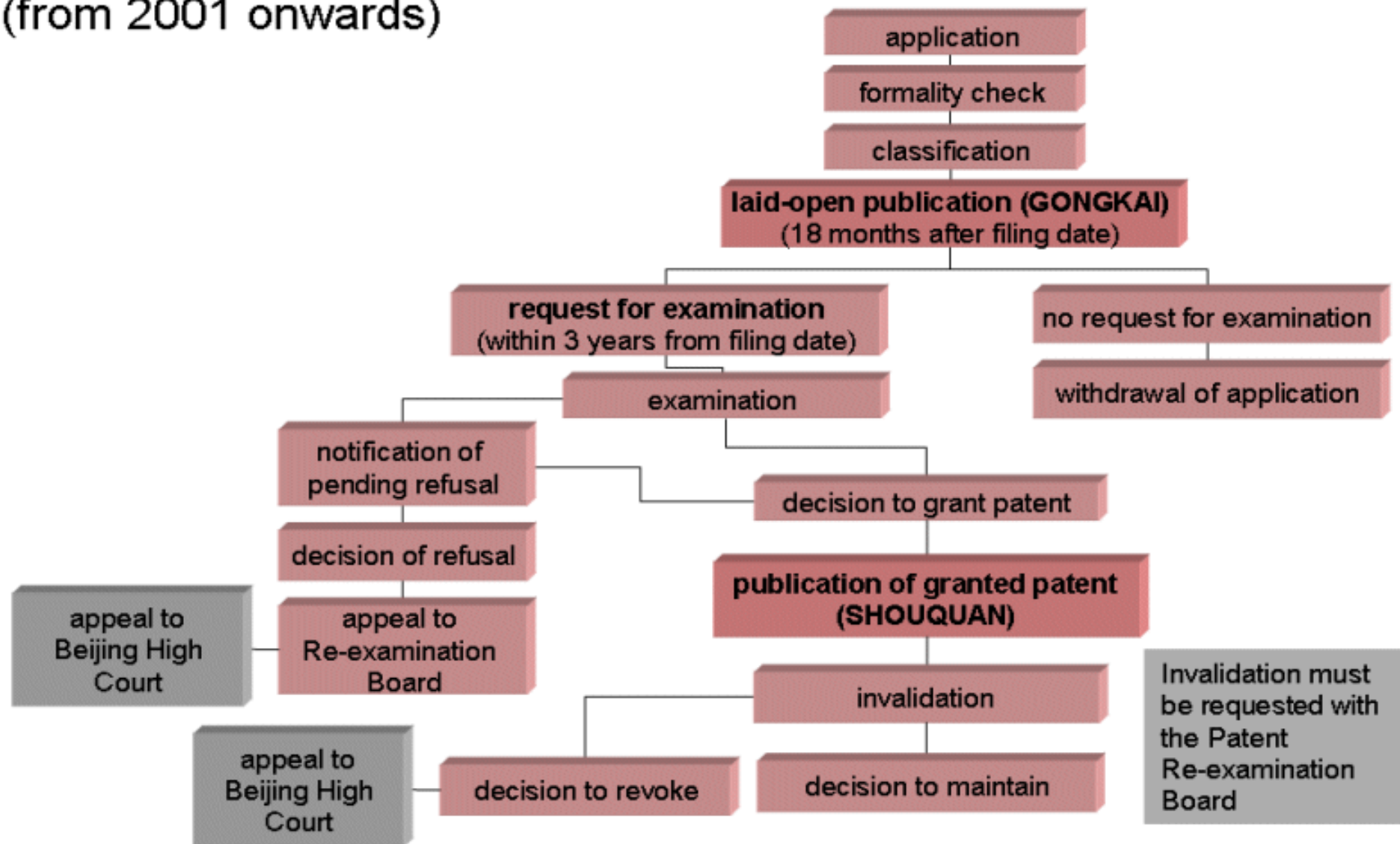
*3 is based on Godinho and Ferreira, **Analyzing the evidence of a IPR take-off in China and India**, published in Research Policy, Feb. 2012.*

4. Further research on Chinese patenting institutions

Intellectual Property Rights (IPR)

Intellectual Property	Industrial Property	Patents	Technological inventions
		Trademarks	Identify supplier, provide differentiation
		Designs	Aesthetic and functional aspects
	Copyright	Protects intellectual creations, such as films, books, poems, plays, music, paintings, sculptures.... or software + databases	

Patent granting procedure in China (from 2001 onwards)



Patentability criteria

- **Novelty** - An invention is new if it is not part of the “state of the art”.
- **Utility (or “industrial application”)** - The invention should be useful in order to be patented .
- **Non-obviousness (or “inventive step”)** - The invention shall not be obvious to someone familiar with the patentable subject matter.

The “priority”

- **The priority right** is triggered by the first filing of an application for a patent.
- The **priority period** is usually 12 months.
- **The priority right** allows an applicant to file subsequent applications in other countries for the same invention.

Patent duration: 20 years

Designs

- In different countries: Design Patents, Industrial Designs, Community Designs
- **A design** is the outward appearance of a **product** or part of it, resulting from the lines, contours, colours, shape, texture, materials and/or its ornamentation.
- **A product** can be any item including packaging, graphic symbols and typographic typefaces.

Trademarks

- **Distinctive signs** which identify certain goods or services as those provided by a specific supplier.
- **Differentiation and information function:** TMs help consumers to identify a product or service and help suppliers to differentiate their products
- **Protection function:** TMs ensure their owners the **exclusive right** to use it or authorize others to use it in return for payment.

What kinds of TMs can be registered?

TMs may be one or a combination of words, letters, and numerals, and they consist of:

- Drawings
- Symbols
- 3-D designs such as the shape and packaging of goods
- Audible signs such as music or vocal sounds
- Fragrances
- Colors used as distinguishing features

TM: Duration

- The period of protection varies, but a trademark can be renewed indefinitely beyond the time limit on payment of additional fees.

Copyright

- Exclusive rights granted to the authors of original works, including the right to copy, distribute and adapt the work.
- Some exceptions under 'fair use'.
- Rights enforceable for a specific period of time (most jurisdictions: life + 70 years), after which the work is said to enter the public domain.
- In many countries: no registration requirement

Legal Framework

Each individual country

- National IP laws

Patents

- Paris Convention (1883)
- Patent Convention Treaty (PCT) (1970) (' *International Patent*')
- European Patent Convention (1973)

Trademarks

- Paris Convention (1883)
- Madrid Agreement(1891) (' *International Trademark*')
- Community Trademark (1996)

Copyright

- Bern Convention (1886)

Wider legal framework: TRIPS (1994)

TRIPS - trade-related aspects of intellectual property rights

- Annex to the 1994 WTO founding treaty
- All WTO members deemed to respect TRIPS
- Harmonization of IP law worldwide
- Integration of the principles of the Paris and Bern conventions on industrial property and copyrights
- Part of the deal to liberalize trade worldwide: access to richer markets by DCs + global enforceability of IPR

What the possibilities are?

- National Patents, TMs, or Industrial Designs (Country X, Country Y etc.)
- International Patent or International TM systems (WIPO) (common application procedure, one examination, granting by national offices)
- Regional systems (Europe; Africa...)
- Which choice??

1. The legal structure of IPRs
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4. Further research on Chinese patenting institutions

As much as three-quarters of the value of publicly traded companies in America comes from intangible assets, up from around 40% in the early 1980s.

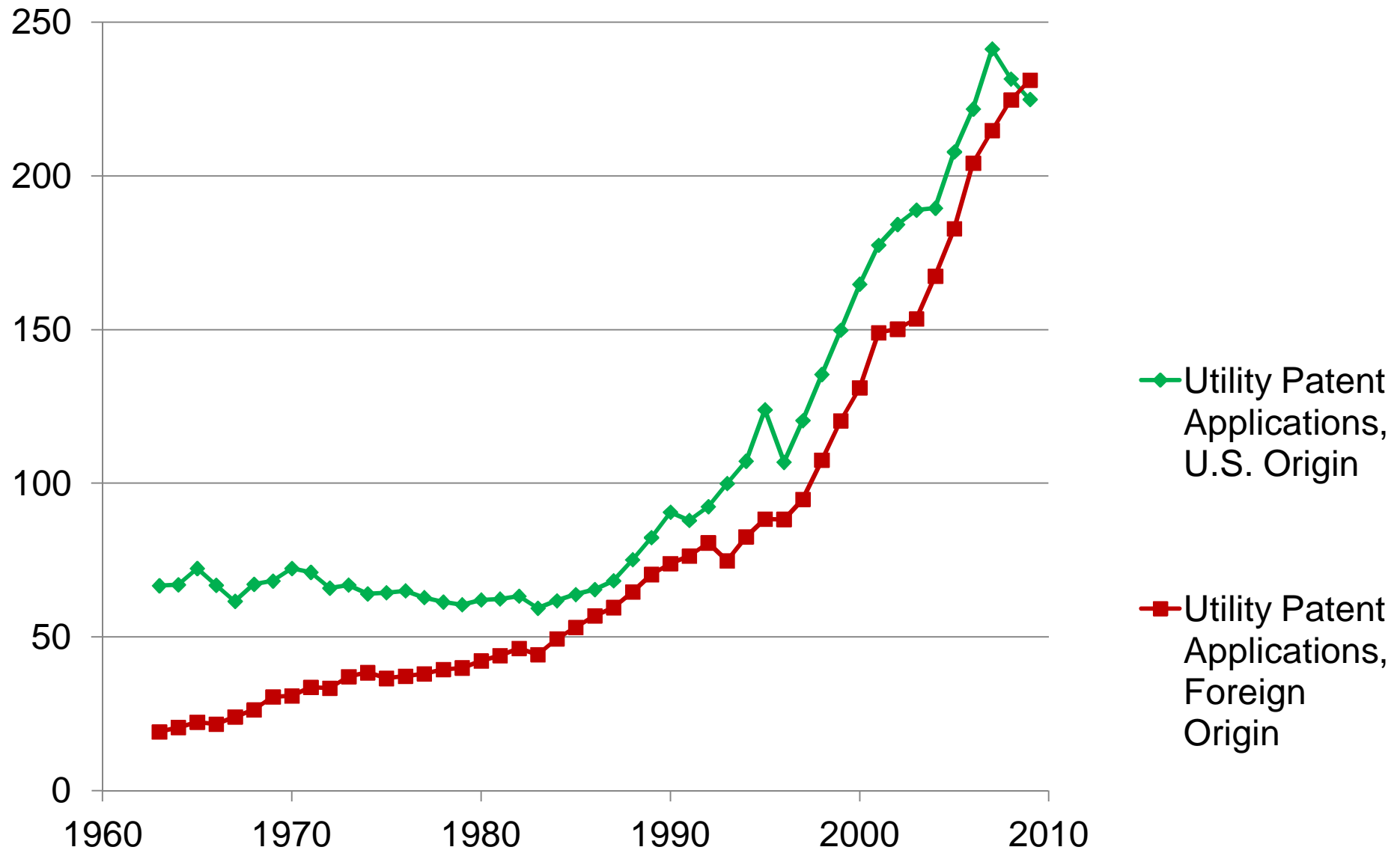
(The Economist, 20 Oct. 2005)

BrandZ™ Top 100 Most Valuable Global Brands 2012

#	Category	Brand	Brand Value 2012 (\$M)	Brand Contribution Index	Brand Momentum Index	% Brand Value Change 2012 vs 2011	Rank Change
1	Technology		182,951	4	10	19%	0
2	Technology		115,985	4	5	15%	1
3	Technology		107,857	4	5	-3%	-1
4	Fast Food		95,188	4	8	17%	0
5	Technology		76,651	4	8	-2%	0
6	Soft Drinks		74,286	5	7	1%	0
7	Tobacco		73,612	3	7	9%	1
8	Telecoms		68,870	3	5	-1%	-1
9	Telecoms		49,151	3	7	15%	4
10	Telecoms		47,041	4	9	-18%	-1

- Grandstrand, O., 1999. The Economics and Management of Intellectual Property: **Towards Intellectual Capitalism**. Edward Elgar Publishing Limited, London.
- Hall, B., 2005. Exploring the **Patent Explosion**. The Journal of Technology Transfer 302_2, 35-48, 01.

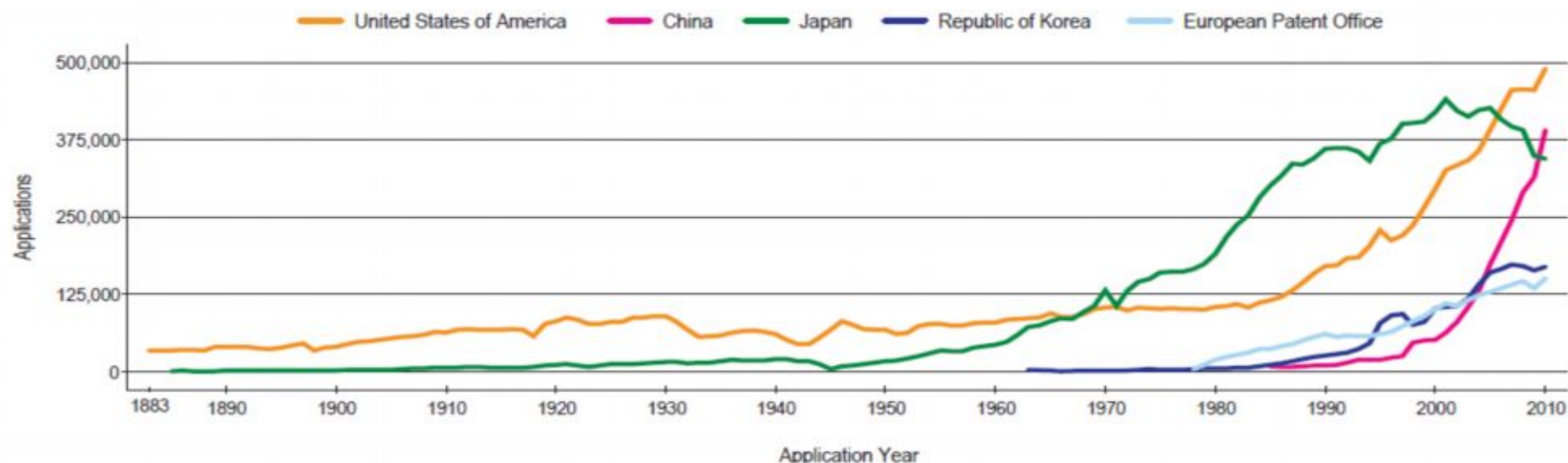
'Patent boom' → USPTO: 1963-2009 (10³)



' Patent boom'

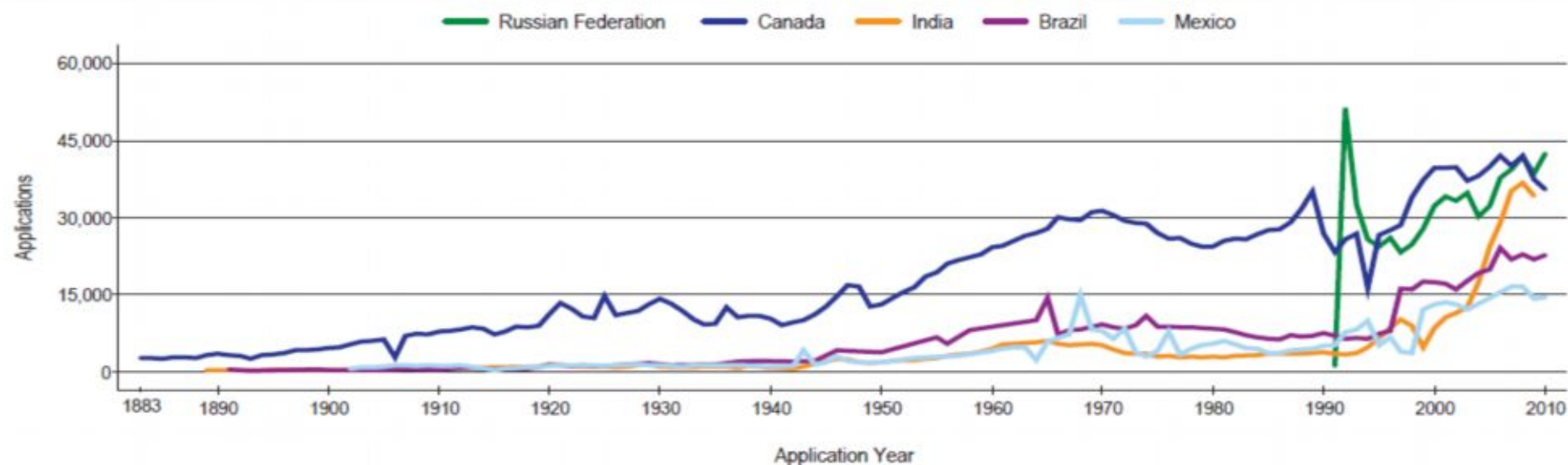
- New science-intensive sectors
- University patenting
- Strategic use of patents

Figure A.2.1.1 Trend in patent applications at the top five offices



Source: WIPO Statistics Database, October 2011

Figure A.2.1.2 Trend in patent applications at selected offices



Source: WIPO Statistics Database, October 2011

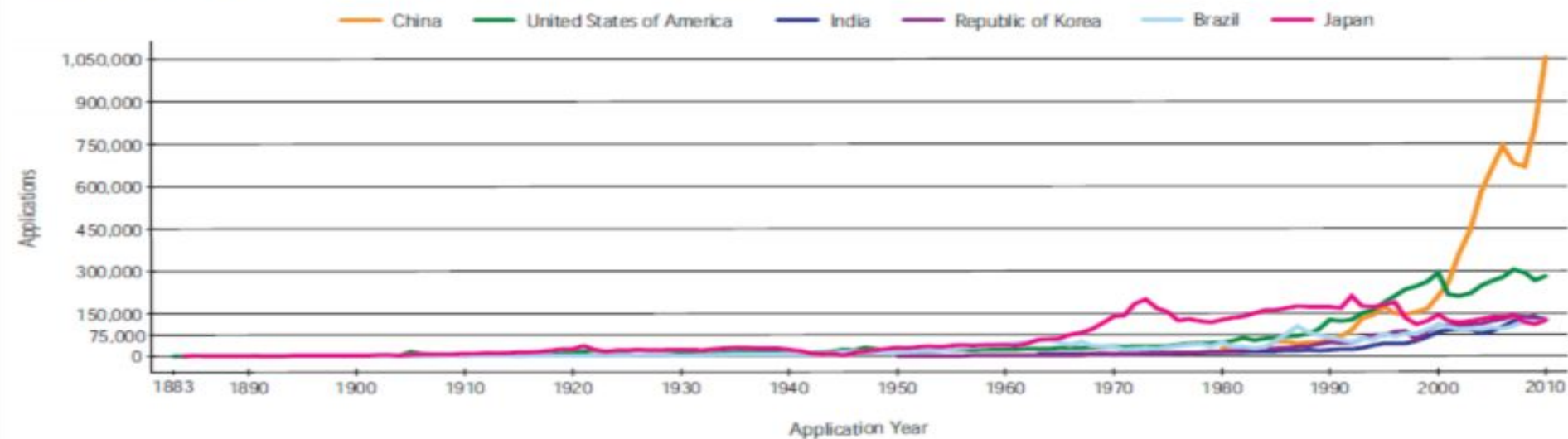
Figure A.2.3.1. Patent applications at the top 20 offices, 2010



Note: *2009 data. D.P.R. of Korea = Democratic People's Republic of Korea. The low non-resident shares for France and Italy could partly be explained by that fact the PCT national phase procedure is closed there. A PCT applicant seeking protection in these countries must enter the PCT national phase at the EPO.
Source: WIPO Statistics Database, October 2011

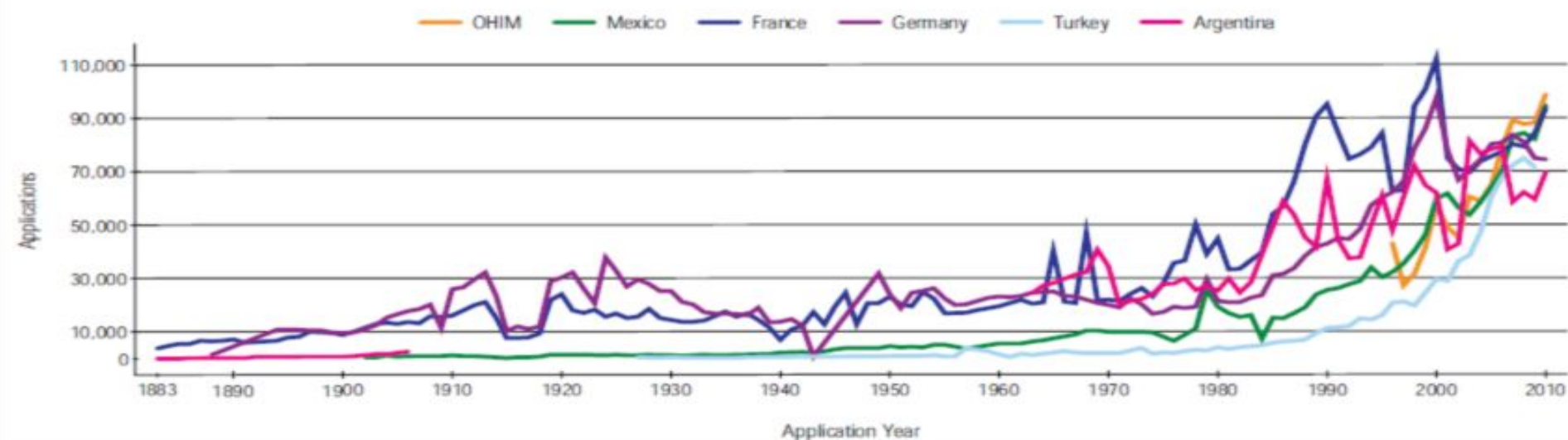
Source: WIPO - World Intellectual Property Indicators 2011

Figure B.2.1.1 Trend in applications at the top six offices



Source: WIPO Statistics Database, October 2011

Figure B.2.1.2 Trend in applications at selected offices



Source: WIPO Statistics Database, October 2011

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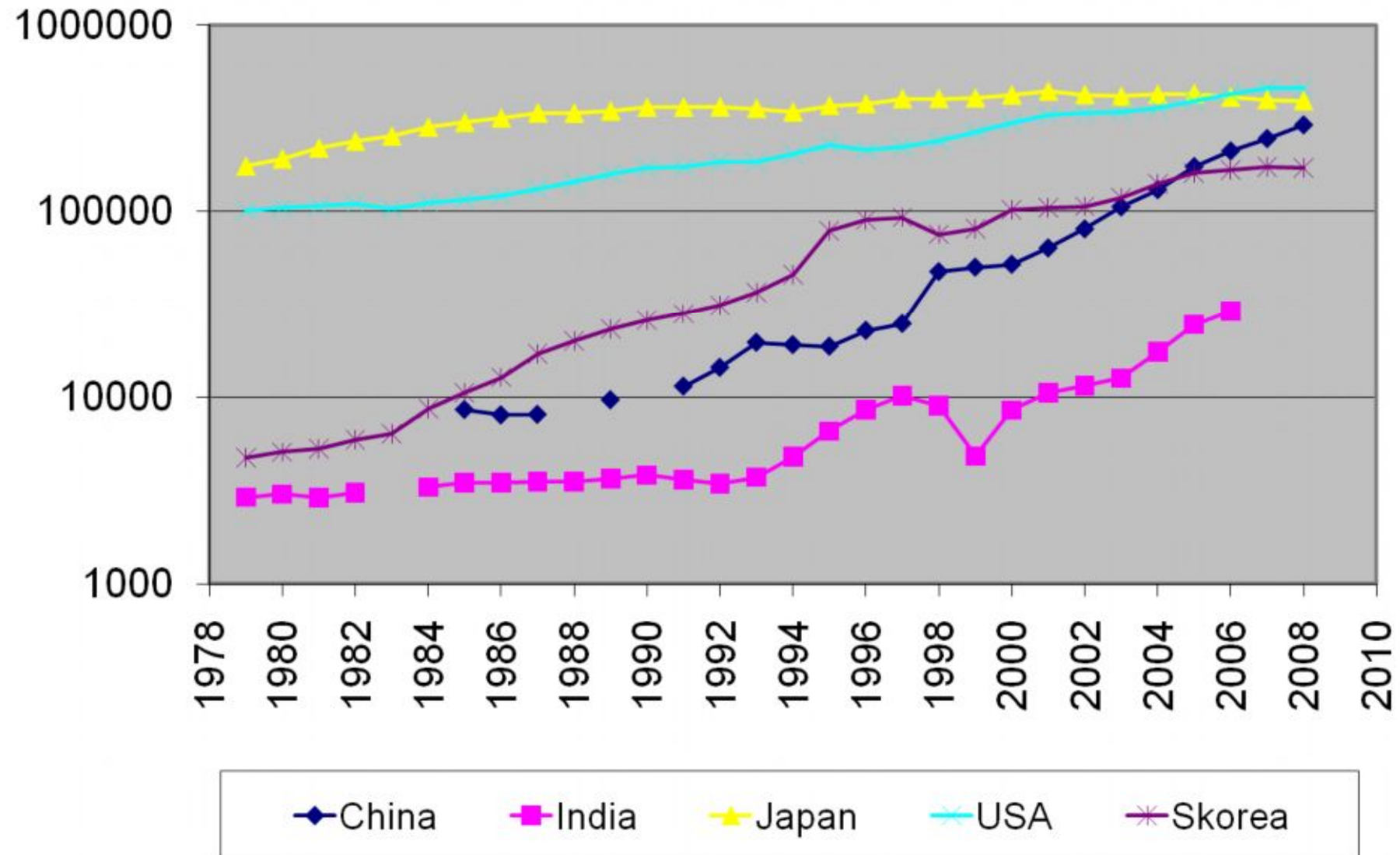
Questions addressed

- What are the causes behind IPR “take-off” ?
- The same as those behind the “patent explosion” in the US etc. since the 1980s?
- Is there a relationship between such “IPR take-off” and innovation in China and India?
- Questions of sustainability and NIS “fitness”

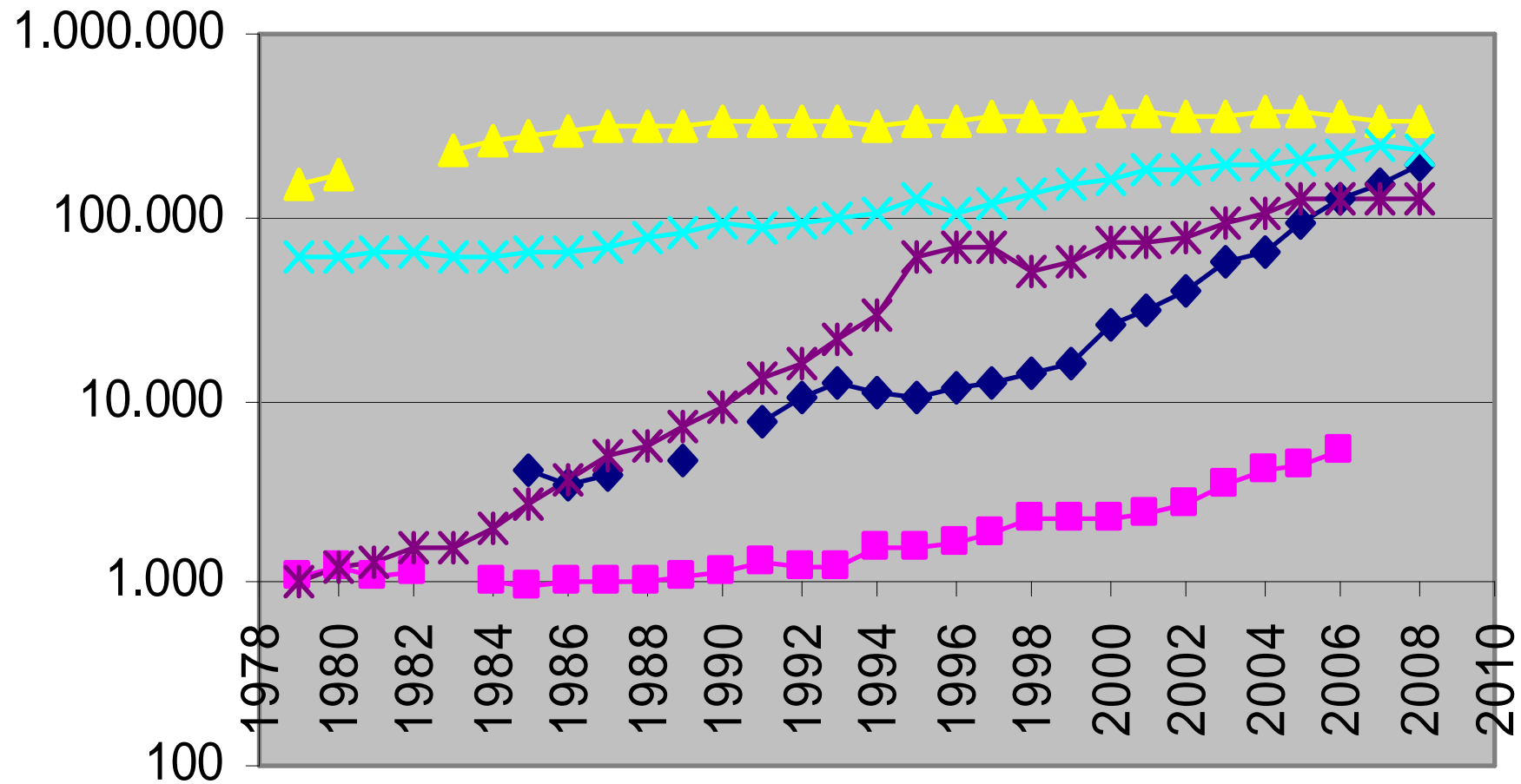
Observation of the “ IPR Take-off”

- Demand on National PTOs
 - National Patents
 - National Trademarks
- Demand on Other Systems

Total Patent Demand (residents and non-residents) in each
PTO, 1979-2008

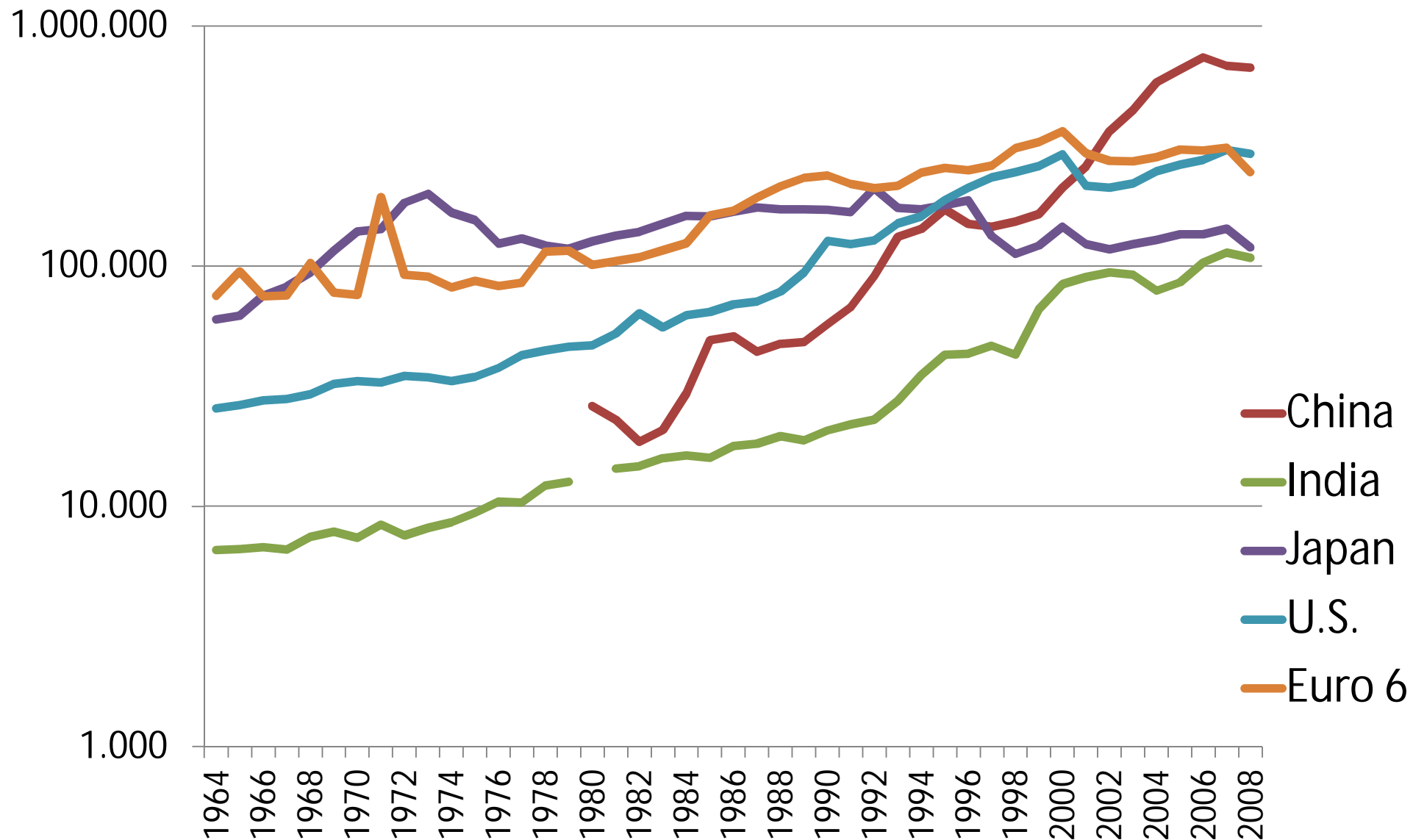


Domestic Demand for Patents in national PTOs, 1979-2008



China India Japan USA Skorea

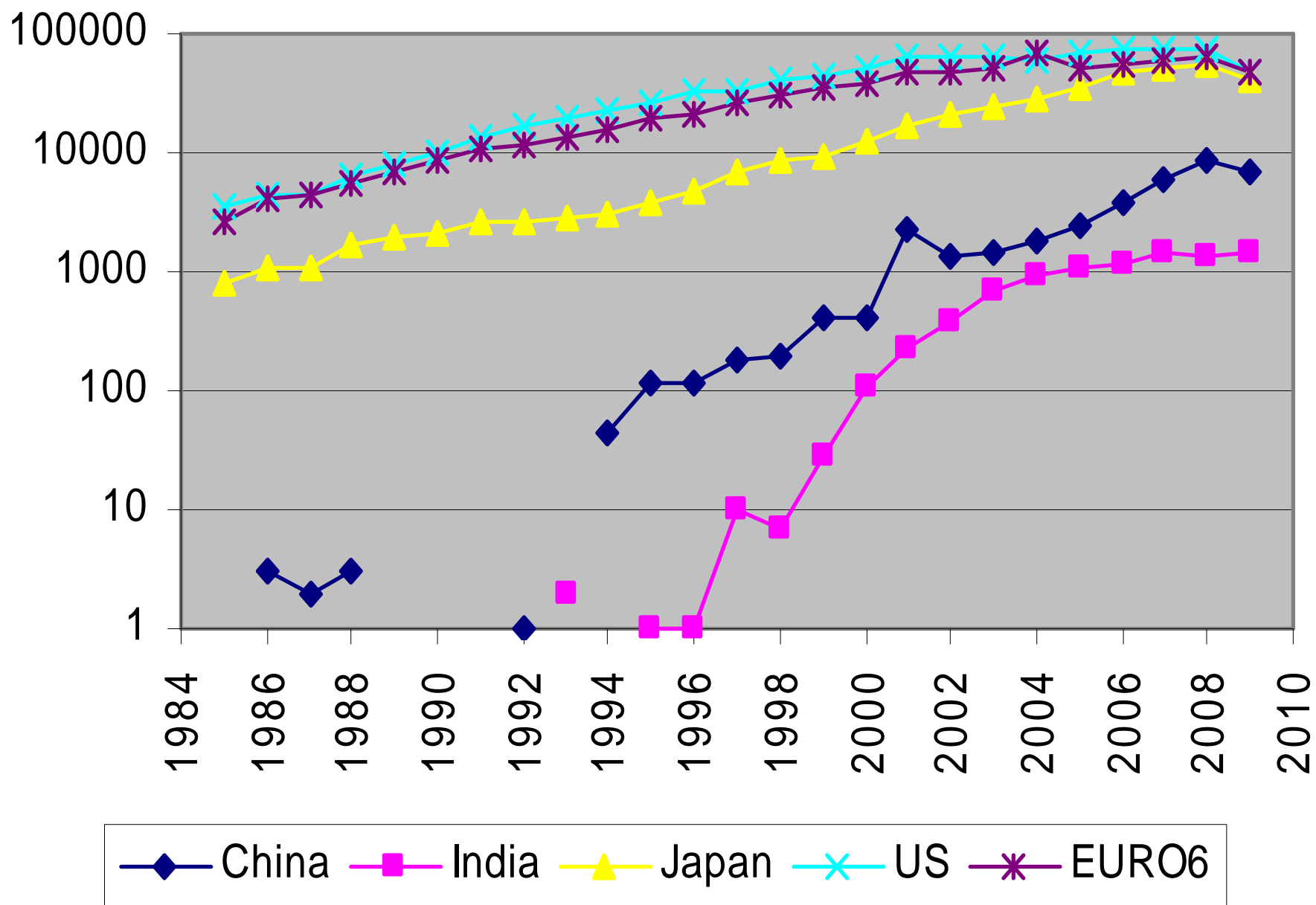
Total trademarks demand (residents and non-residents) in each PTO, 1964-2008



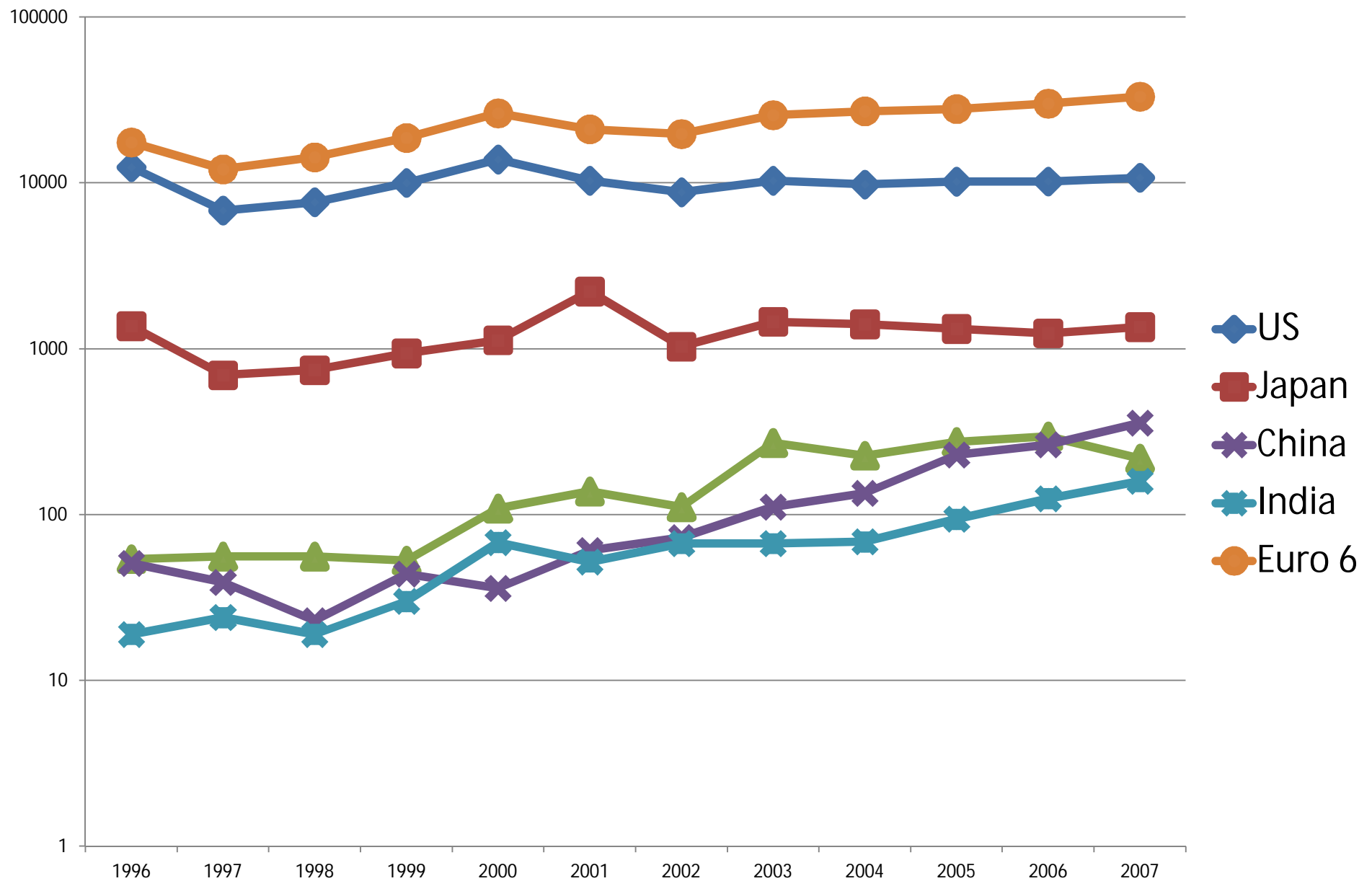
Demand on “other systems”

- **International PCT Patents**
- National systems: USPTO, JPO, CPO, IPO + EPO
- International trademarks
- National systems + **EU CTM system**

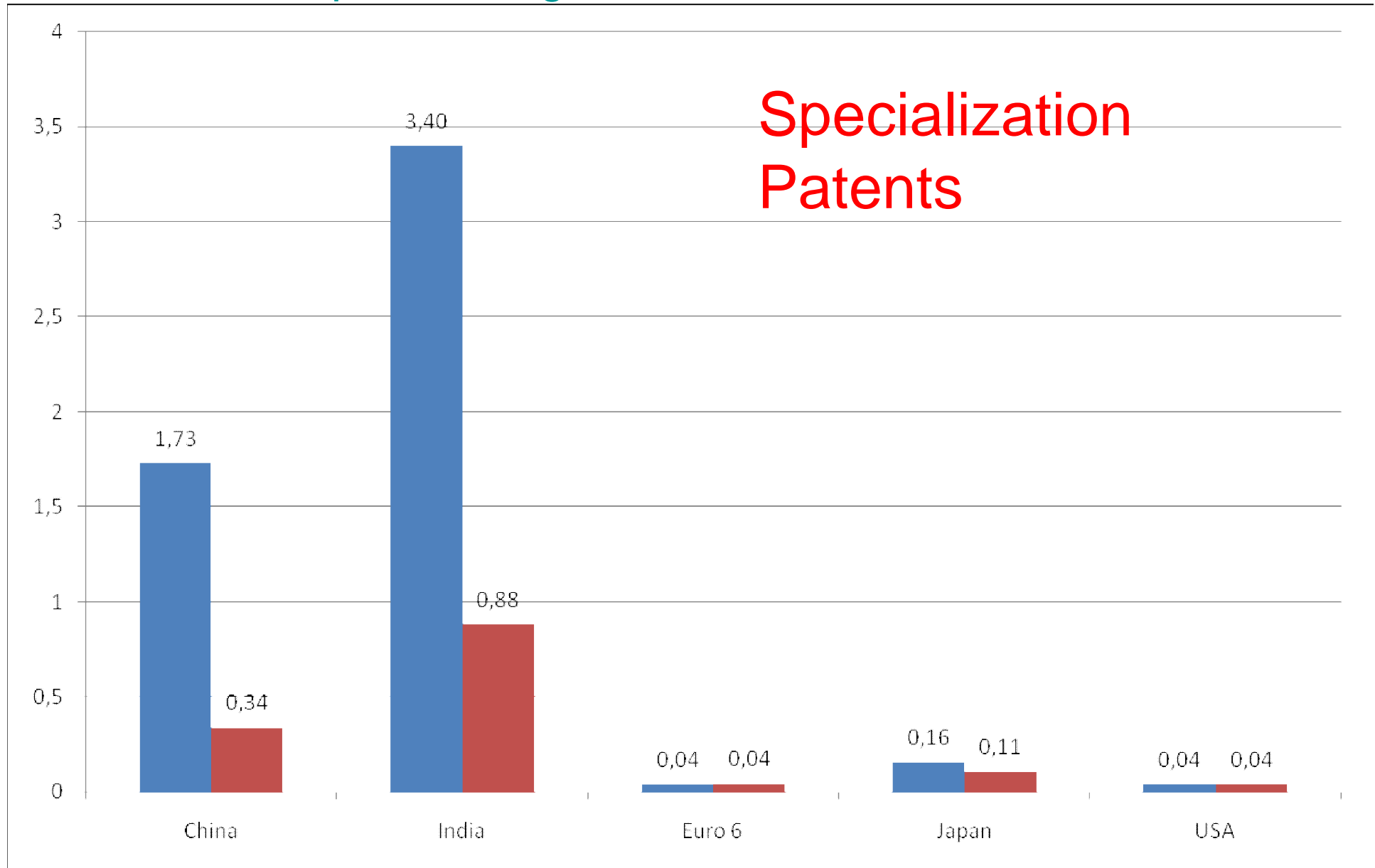
PCT filings, 1985-2009



Total trademarks demand in the EU CTM system, 1996-2007

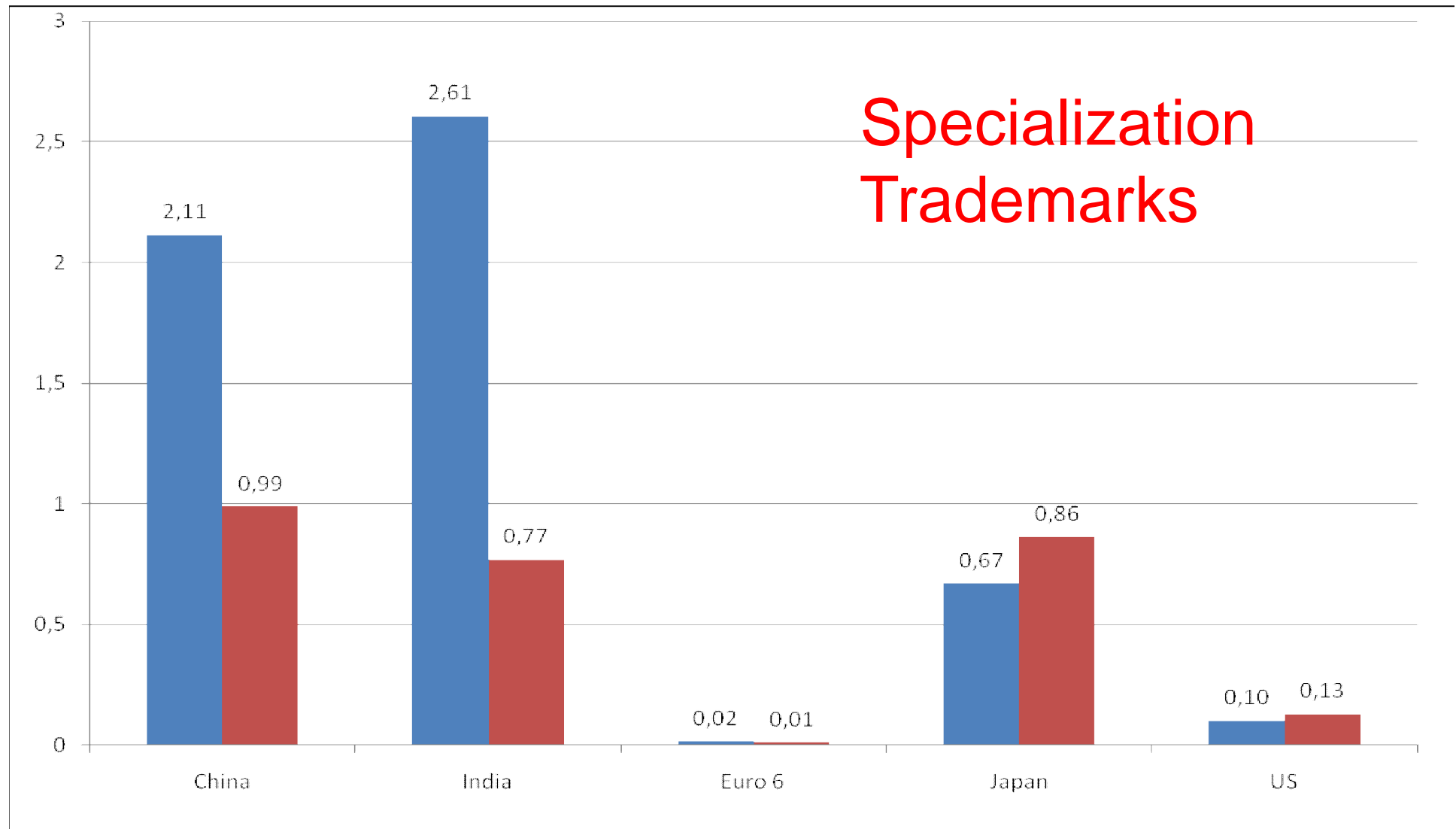


Technological specialization as given by the chi-squared ratio
PCT patent filings, 1989-1998 and 1999-2008



Trademark specialization as given by the chi-squared ratio

EU CTM system, 1996-1999 and 2000-2007



4. Further research on Chinese patenting institutions

Top PCT Applicants (applicants with more than 10 PCT applications)

Source: WIPO Statistics Database January 2012

Note: Counts are based on publication date and first-named applicant

APPLICANT'S NAME	COUNTRY OF ORIGIN	2011 PCT APPLICATIONS
ZTE CORPORATION	CN	2,826
PANASONIC CORPORATION	JP	2,463
HUAWEI TECHNOLOGIES CO., LTD.	CN	1,831
SHARP KABUSHIKI KAISHA	JP	1,755
ROBERT BOSCH CORPORATION	DE	1,518
QUALCOMM INCORPORATED	US	1,494
TOYOTA JIDOSHA KABUSHIKI KAISHA	JP	1,417
LG ELECTRONICS INC.	KR	1,336
KONINKLIJKE PHILIPS ELECTRONICS N.V.	NL	1,148
TELEFONAKTIEBOLAGET LM ERICSSON (PUBL)	SE	1,116
NEC CORPORATION	JP	1,056
SIEMENS AKTIENGESELLSCHAFT	DE	1,039
MITSUBISHI ELECTRIC CORPORATION	JP	834
BASF SE	DE	773
SAMSUNG ELECTRONICS CO., LTD.	KR	757
NOKIA CORPORATION	FI	698
INTERNATIONAL BUSINESS MACHINES CORPORATION	US	661
HEWLETT-PACKARD DEVELOPMENT COMPANY, L.P.	US	591
3M INNOVATIVE PROPERTIES COMPANY	US	563
HITACHI, LTD.	JP	547

Top 100 Chinese Patenting Institutions

EPO + USPTO + PCT

2009 + 2010 + 2011

(based on published applications)

Top 20 Chinese Patenting Institutions (Score ← USPTO, EPO, PCT)

		Type of Institution	SCORE
1	HUAWEI TECHNOLOGIES CO. LTD.*	Corporation	100,00%
2	ZTE CORPORATION*	Corporation	66,51%
3	TSINGHUA UNIVERSITY*	University	6,50%
4	BYD COMPANY LIMITED	Corporation	3,88%
5	TENCENT TECHNOLOGY (SHENZHEN) COMPANY LIMITED	Corporation	3,67%
6	LENOVO*	Corporation	3,35%
7	CHINA ACADEMY OF TELECOMMUNICATIONS TECHNOLOGY	R. Institute / Academy	2,74%
8	CHINA IWNCOMM CO. LTD.	Corporation	2,12%
9	TCL CORPORATION*	Corporation	2,10%
10	SEMICONDUCTOR MFG INT SHANGHAI	Corporation	2,06%
11	CHINA MOBILE COMMUNICATIONS CORPORATION	Corporation	1,84%
12	BEIJING BOE OPTOELECTRONICS TECHNOLOGY CO., LTD.	Corporation	1,75%
13	PEKING UNIVERSITY*	University	1,71%
14	NUCTECH COMPANY LIMITED	Corporation	1,61%
15	TSANN KUEN ENTERPRISE CO. LTD.	Corporation	1,34%
16	CHINA PETROLEUM & CHEMICAL CORPORATION (SINOPEC)	Corporation	1,18%
17	XIAMEN SOLEX HIGH-TECH INDUSTRIES CO. LTD	Corporation	1,13%
18	CHERY AUTOMOBILE CO. LTD.	Corporation	1,10%
19	INSTITUTE OF MICROELECTRONICS, CHINESE ACADEMY OF SCIENCES	R. Institute / Academy	1,07%
20	DA TANG MOBILE COMMUNICATIONS EQUIPMENT CO., LTD.	Corporation	1,07%

Score	Business	University	Res. Institute / Academy of Sc.	Total
> 10	2	0	0	2
2-10	6	1	1	8
1-2	8	1	1	10
<1	57	16	7	80
N	73	18	9	100

Top patenting Chinese Universities and Research Institutes / Academies of Science

3	TSINGHUA UNIVERSITY*	University	6.5
13	PEKING UNIVERSITY*	University	1.71
21	NANJING UNIVERSITY	University	0.94
26	ZHEJIANG UNIVERSITY	University	0.86
37	FUDAN UNIVERSITY	University	0.57
46	BEIJING UNIVERSITY OF CHEMICAL TECHNOLOGY	University	0.41
51	EAST CHINA UNIVERSITY OF SCIENCE AND TECHNOLOGY	University	0.36
54	SOUTHEAST UNIVERSITY	University	0.32
56	SUN YAT-SEN UNIVERSITY	University	0.3
59	DALIAN UNIVERSITY OF TECHNOLOGY	University	0.28
60	UNIV NORTHEASTERN	University	0.26
73	SOUTH CHINA UNIVERSITY OF TECHNOLOGY	University	0.21
75	SHENYANG PHARMACEUTICAL UNIVERSITY	University	0.21
78	SHANGHAI JIAOTONG UNIVERSITY	University	0.2
81	HUAZHONG AGRICULTURAL UNIVERSITY	University	0.2
89	XIAMEN UNIVERSITY	University	0.17
90	UNIV PLA 2ND MILITARY MEDICAL (Second Military Medical University)	University	0.17
92	JIANGSU UNIVERSITY	University	0.17
7	CHINA ACADEMY OF TELECOMMUNICATIONS TECHNOLOGY	R. Institute / Academy	2.74
19	INSTITUTE OF MICROELECTRONICS. CHINESE ACADEMY OF SCIENCES	R. Institute / Academy	1.07
25	SHANGHAI INSTITUTE OF MATERIA MEDICA CHINESE ACADEMY OF SCIENCES	R. Institute / Academy	0.89
32	DALIAN INSTITUTE OF CHEMICAL PHYSICS. CHINESE ACADEMY OF SCIENCES	R. Institute / Academy	0.65
33	INSTITUTE OF PHARMACOLOGY AND TOXICOLOGY ACADEMY OF MILITARY MEDICAL SCIENCES P.L.A. CHINA	R. Institute / Academy	0.59
45	SHANGHAI INSTITUTE OF MICROSYSTEM AND INFORMATION TECHNOLOGY CHINESE ACADEMY OF SCIENCES	R. Institute / Academy	0.41
49	SHANGHAI INSTITUTES FOR BIOLOGICAL SCIENCES. CHINESE ACADEMY OF SCIENCES	R. Institute / Academy	0.37
85	CHINA ELECTRIC POWER RESEARCH INSTITUTE	R. Institute / Academy	0.19
87	CHONGQING PHARMACEUTICAL RESEARCH INSTITUTE CO.. LTD.	R. Institute / Academy	0.18

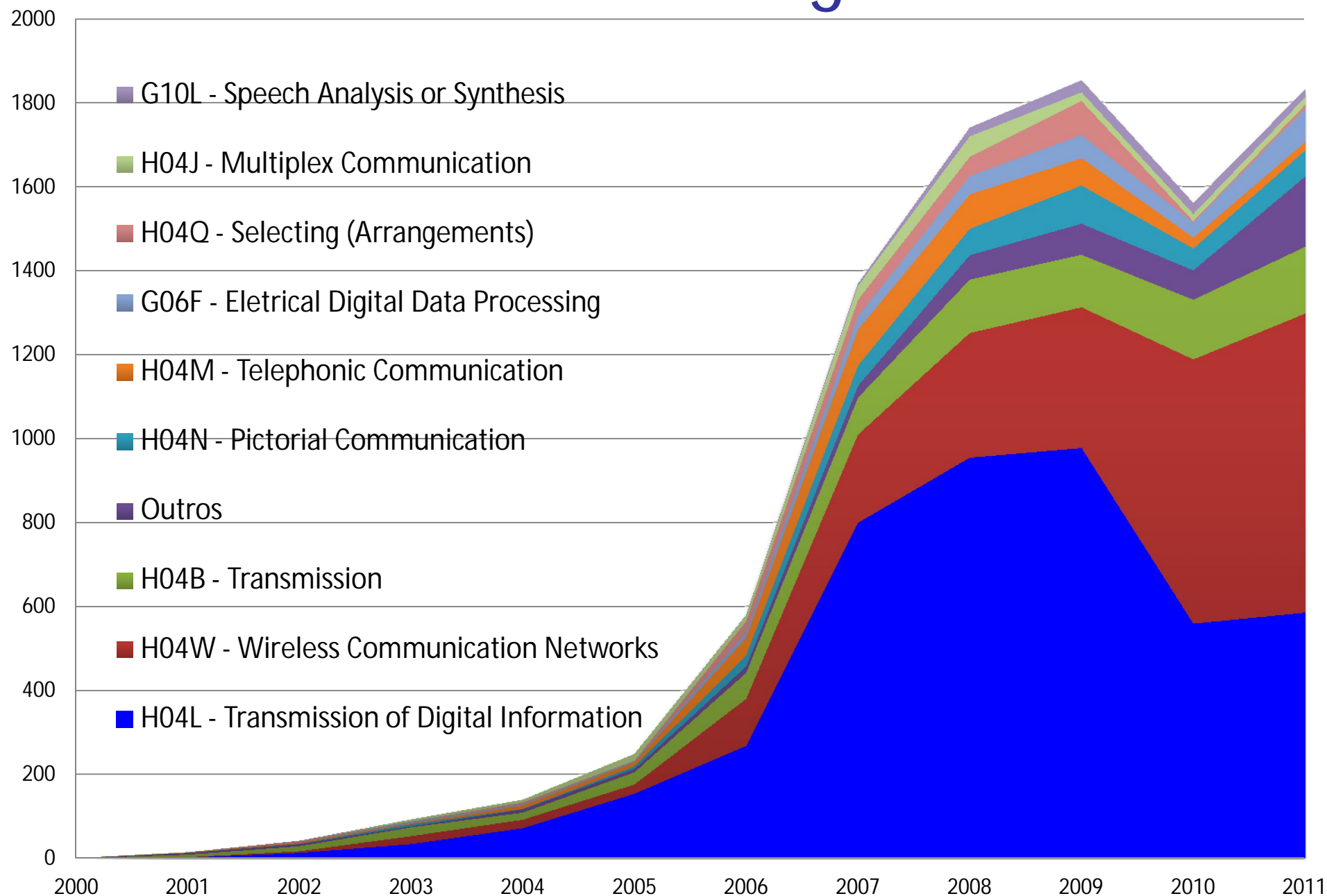
Grant rate at the EPO, USPTO and SIPO, sample of patents for the TOP 100

		2004	2005	2006	2007	2008
<i>Applications</i>	EPO	44	93	145	51	6
	USPTO	37	78	149	107	70
	SIPO	95	166	99	28	1
<i>Grants</i>	EPO	25	50	51	21	1
	USPTO	27	54	92	70	29
	SIPO	85	132	59	10	0
<i>Grant Rate</i>	EP	56,82%	53,76%	35,17%	41,18%	16,67%
	US	72,97%	69,23%	61,74%	65,42%	41,43%
	SIPO	89,47%	79,52%	59,60%	35,71%	0,00%

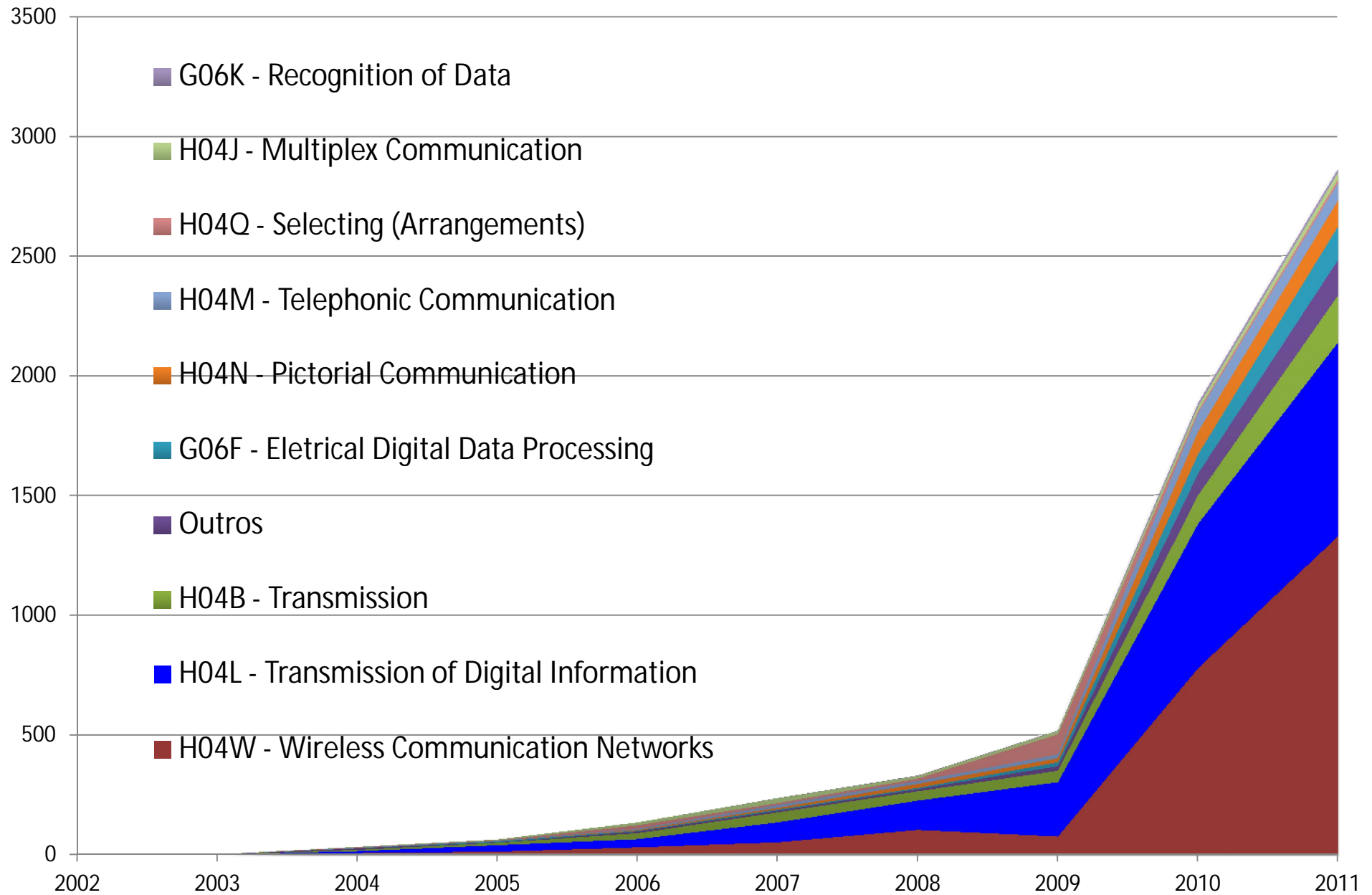
Top Chinese Applicants at the USPTO

	2002-2004	2005-2008	2008-2011
Total	244 (30)	2056 (67)	4114 (95)
Huawei	77	978	1527
ZTE	2	239	457
Tsinghua Un.	30	144	409
Concentration	43%	78%	58%

Huawei Technologies PCT*



ZTE Corporations PCT*



Application to Grant – Huawei (USPTO+EPO+JPO+KIPO)

AP - GR	2006	2007	2008	2009	2010	2011	2012	TOTAL - G	TOTAL - AP	Grant Rate
2004	0	0	4	2	2	1	0	9	12	75%
2005	1	2	4	12	15	10	3	46	67	69%
2006	0	1	2	18	29	14	5	69	141	49%
2007	0	0	3	6	23	23	11	66	161	41%

Application to Grant – ZTE (USPTO+EPO+JPO+KIPO)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	TOTAL - G	TOTAL - AP	Grant Rate
2004	0	0	0	0	0	1	7	5	1	14	33	42%
2005	0	0	1	1	1	1	6	8	1	19	67	28%
2006	0	0	0	1	0	2	3	10	2	18	54	33%
2007	0	0	0	0	0	0	0	7	4	11	135	8%

Conclusions

IPR take-off in China and India:

1. Causes not 100% the same as those behind “patent explosion” in US etc...; related to innovation but also part of a “proprietary rush”
2. Innovation becoming central to India and China growth
(patents + TMs = innovation) (quality concern)
3. This might guarantee continued economic growth
4. Catch-up in volume but overall not yet *per capita*
5. Problems of NIS cohesion as certain regions
(Shanghai, Pearl River Delta, Bangalore, Mumbai)
might catch up with advanced economies over the next 2-3 decades while others left behind
6. Eventually “quality problem”

Thank You !