
The role of IP in economic development: the case of China

Albert G. Hu

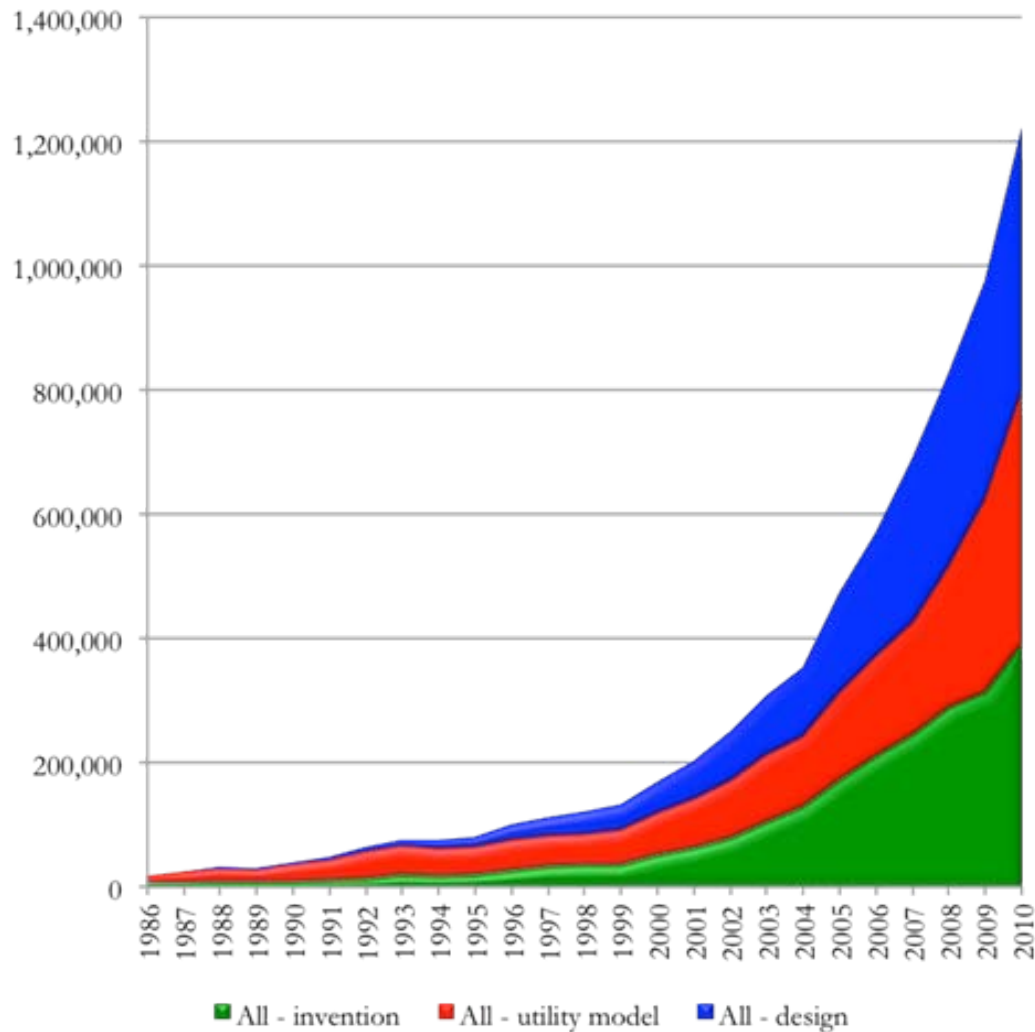
Department of Economics

National University of Singapore

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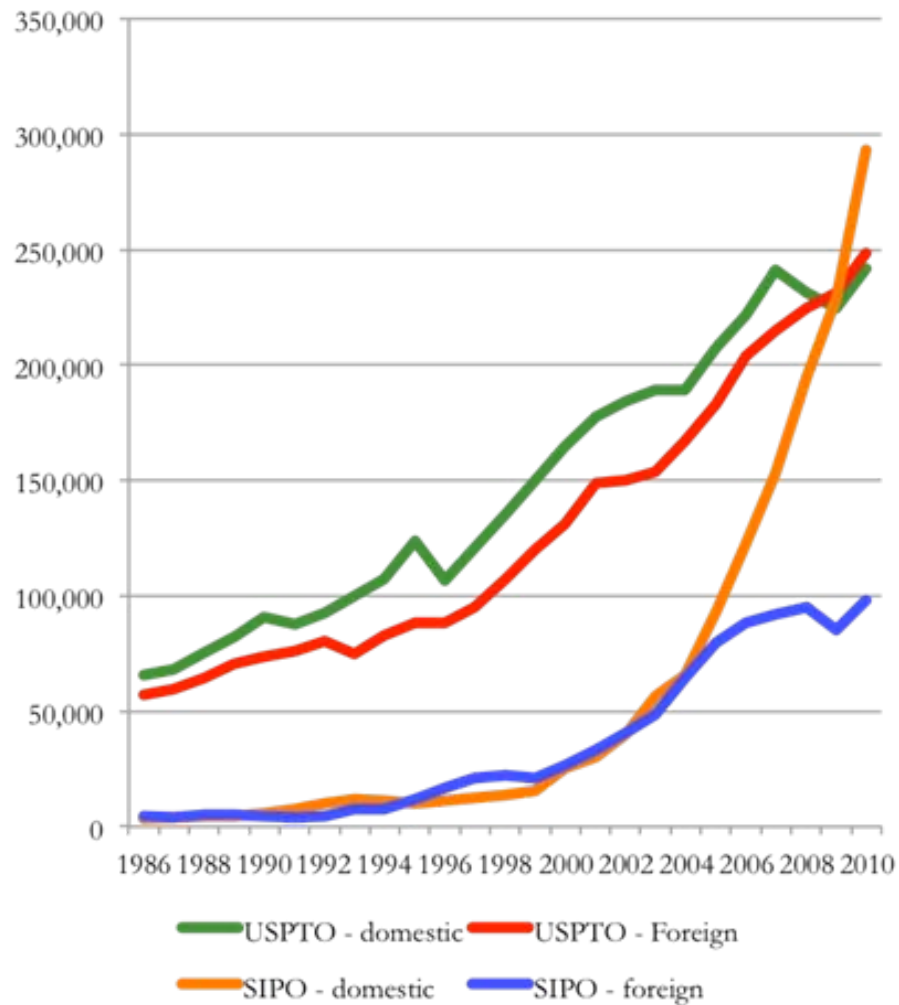
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China's patent explosion



Type of patent applications	Growth rate: 1986-2000	Growth rate: 2001-2010
Invention patents	13.3%	20.3%
Utility models	14.0%	18.2%
Design patents	29.3%	21.5%

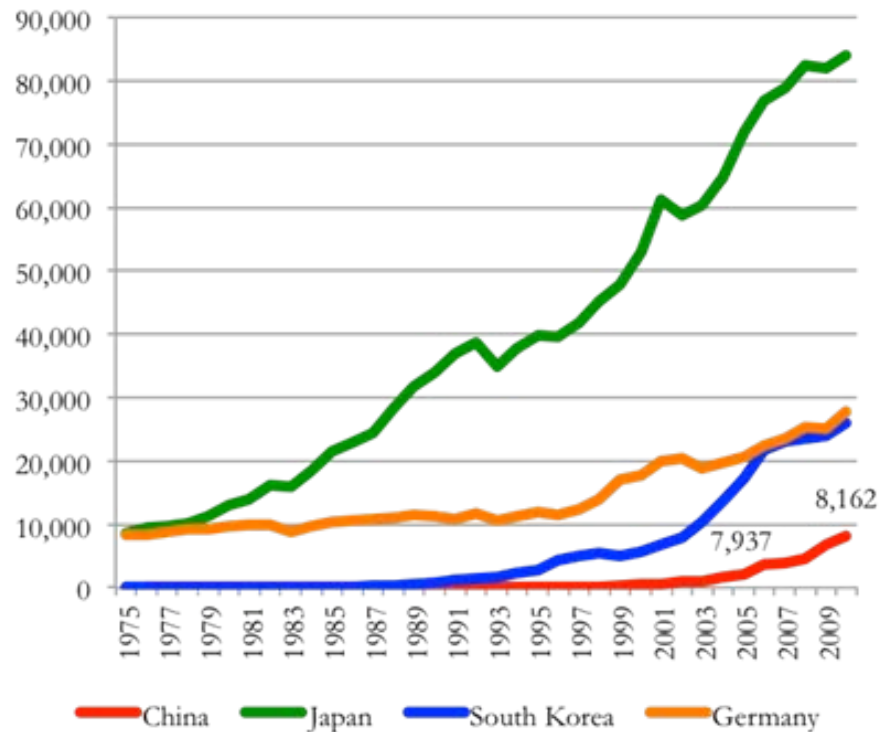
Patent explosions: U.S. and China



Invention patent applications	Growth rate: 1986-2000	Growth rate: 2001-2010
US - domestic	6.6%	3.4%
US - foreign	6.0%	5.7%
China - domestic	14.2%	25.3%
China - foreign	12.6%	12.1%

USPTO patent applications

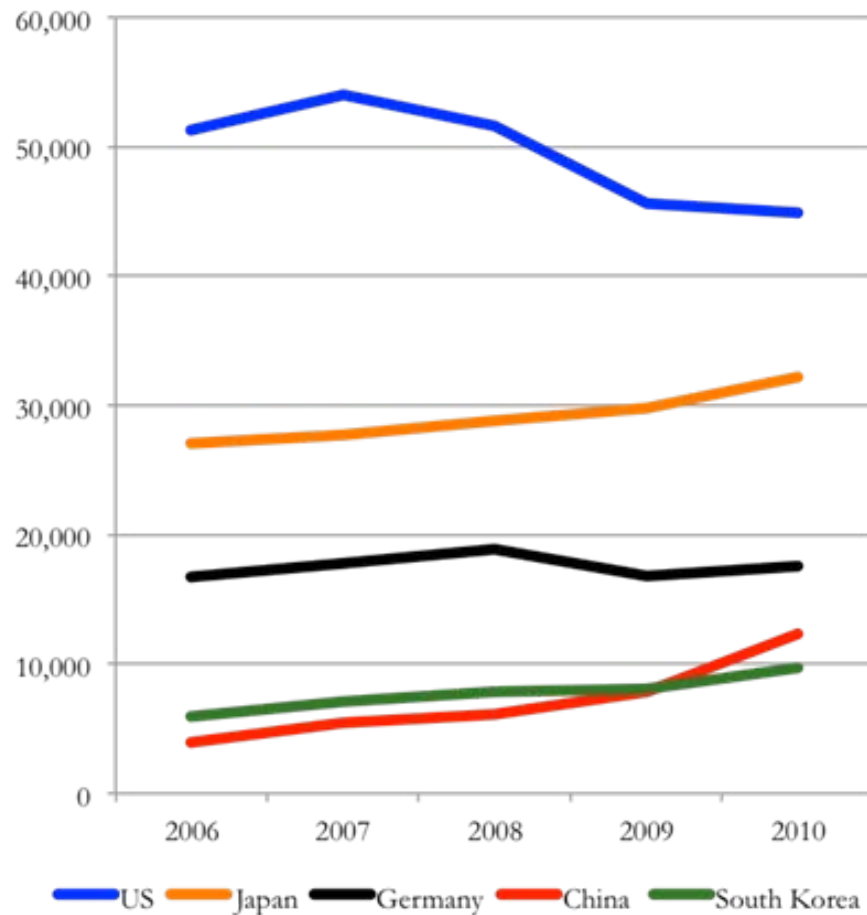
USPTO patent applications



China vs. South Korea

	China (2010)	S. Korea (2002)
USPTO applications	8,162	7,937
Growth rate (previous decade)	29%	17%
GDP per capita (2000 US\$)	2,433	12,478

PCT patent applications (WIPO, 2010)



Top applicants	Applications (2010)	Change from 2009
Panasonic	2,154	263
ZTE	1,868	1,351
Qualcomm	1,677	397
Huawei	1,528	-319
Philips	1,435	140
Bosch	1,301	-287
LG	1,298	208
Sharp	1,286	289
Ericsson	1,149	-92
NEC	1,106	37

China's IPR regime (1)

- It looks good on paper...
 - Patent law (1984), copyright law (1990), trademark law (1982)
 - Member of/signatory to major IPR-related international organizations or treaties: WIPO, Berne Convention, Paris Convention, Patent Cooperation Treaty, etc.
 - Three amendments of China's patent law
 - 1992: extended to pharma & chemicals; longer duration
 - 2000: injunction and statutory damages; private enterprises
 - 2008: world-wide novelty standard

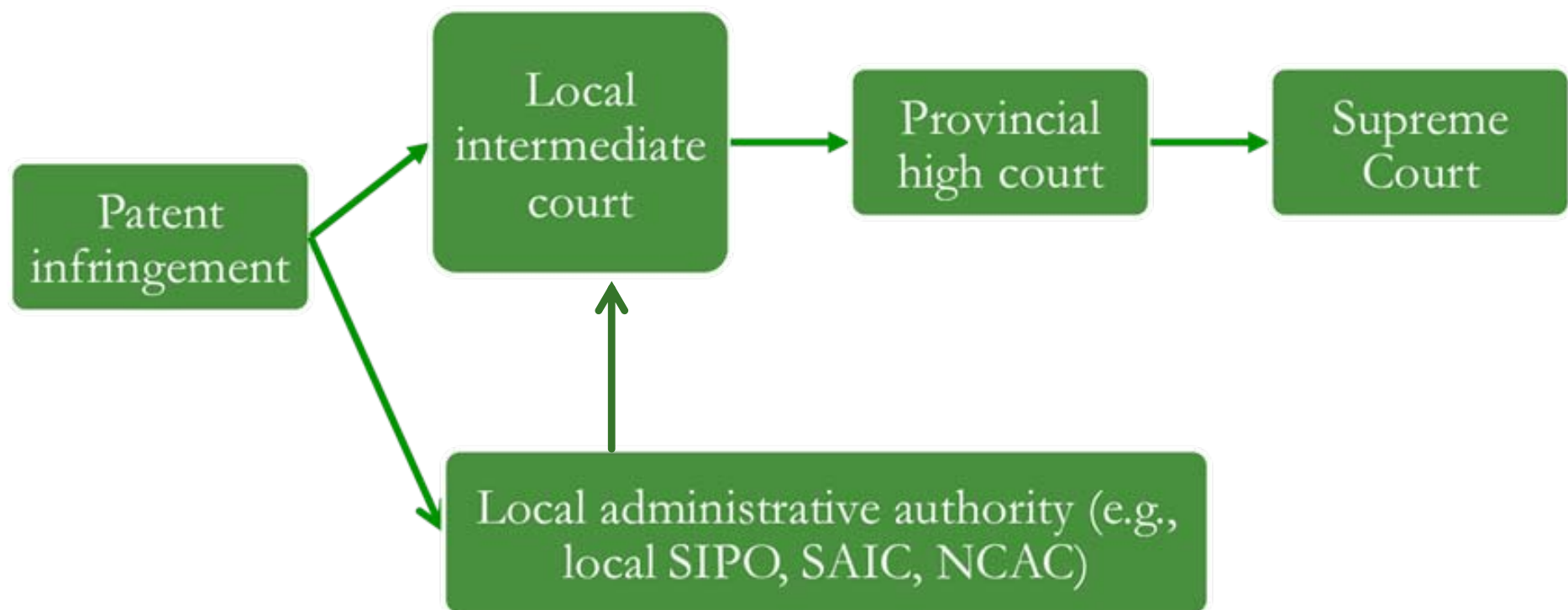
China's IPR regime (2)

- But the devil is in the enforcement...
 - Judicial vs. administrative enforcement
 - Regional variation and protectionism
 - Variation across IPR types
 - Most serious: copyright and trademark
 - Administrative capacity

China's IPR regime (3): measurement

	1985	1990	1995	2000	2005
Ginarte-Park index	1.33	1.33	2.12	3.09	4.08
Fraser Institute Law Index	6.8	5.8	5.5	4.9	

China's dual-track patent enforcement mechanism



China's patent explosion: what's behind it? (1)

- Huge market potential
 - Rapid economic growth, rising living standards, fast growth of FDI and trade
- Increasing market competition: foreign vs. domestic, foreign vs. foreign, and domestic vs. domestic
- Greater awareness of the strategic value of patents
 - Increasing patent litigation: 40% increase in 2009
- Government policy incentives
 - Subsidies for application fees
 - Researcher performance evaluation incentives

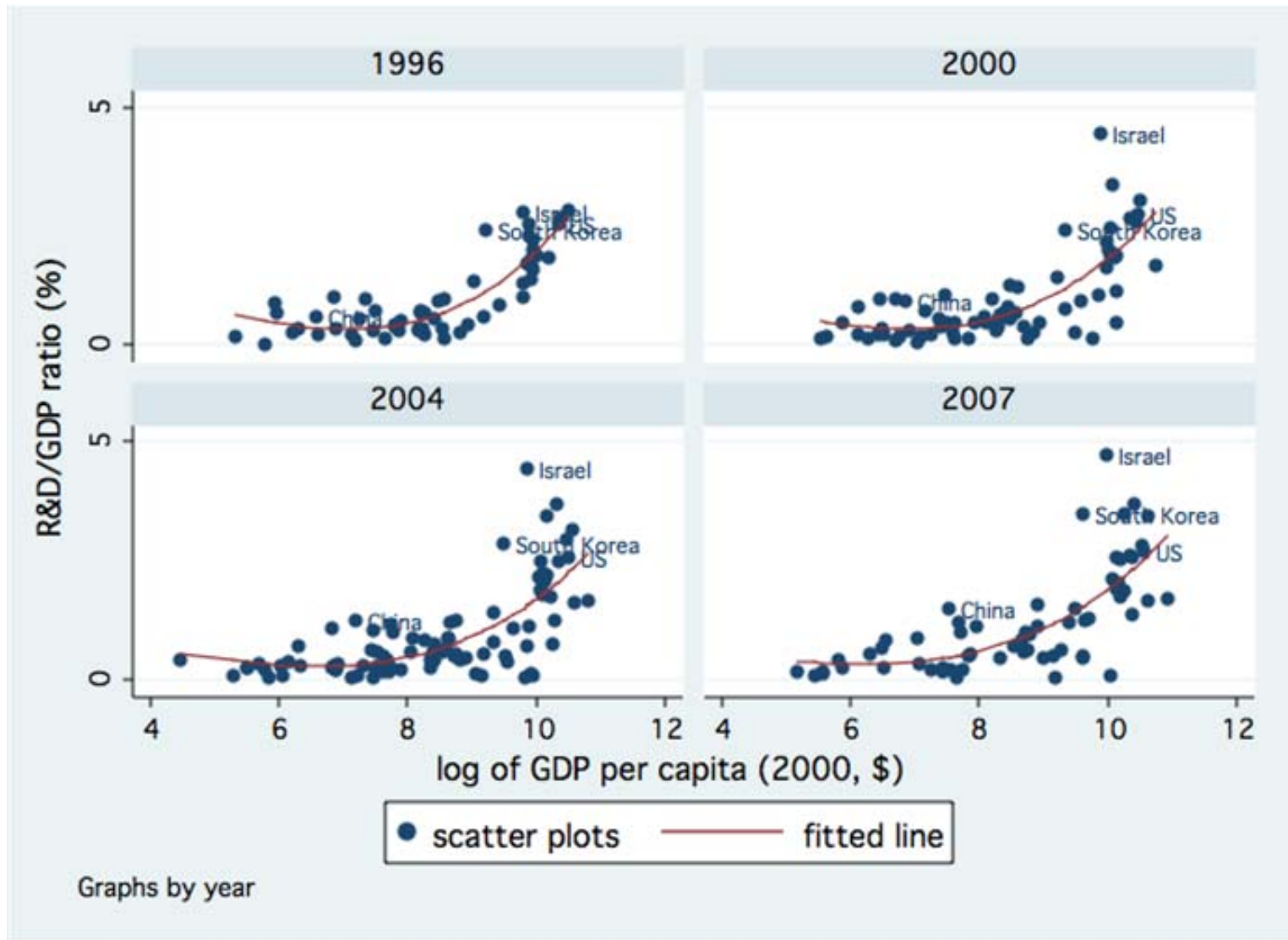
China's patent explosion: what's behind it? (2)

- Stronger protection of private property including IP
 - Privatization from the late 1990s
 - Constitutional recognition of private property in 2004: “*legally obtained private property of the citizens shall not be violated*”
- R&D intensification
 - R&D to GDP ratio: from 0.9% (2000) to 1.7% (2009)
 - Annual growth rate of real R&D: 18.6%
- Shift of global R&D activities
 - MNC R&D centers: 200 (2002) to 750 (2006)

China's R&D intensification (1)

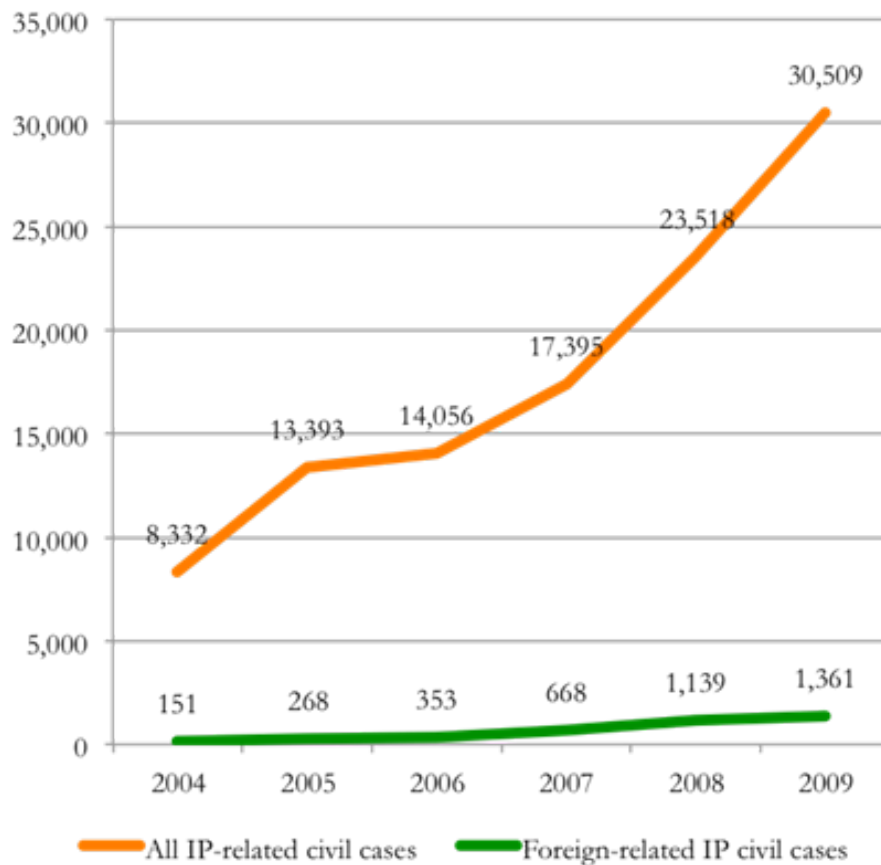
	R&D/GDP ratio (%)		Real R&D annual growth rate (%)
	2000	2009	2000-2009
US	2.7	2.8 ^a	2.9 ^a
Japan	3.0	3.3	3.4
South Korea	2.3	3.4 ^a	10.3 ^a
Taiwan	1.9	2.93	7.5
China (Mainland)	0.9	1.7	18.6
Brazil	1.0	1.1 ^a	-
Argentina	0.4	0.51 ^b	6.9
India	0.8	0.9 ^a	-
OECD	2.2	2.3	3.5
Note: ^a 2008; ^b 2007			

China's R&D intensification (2)

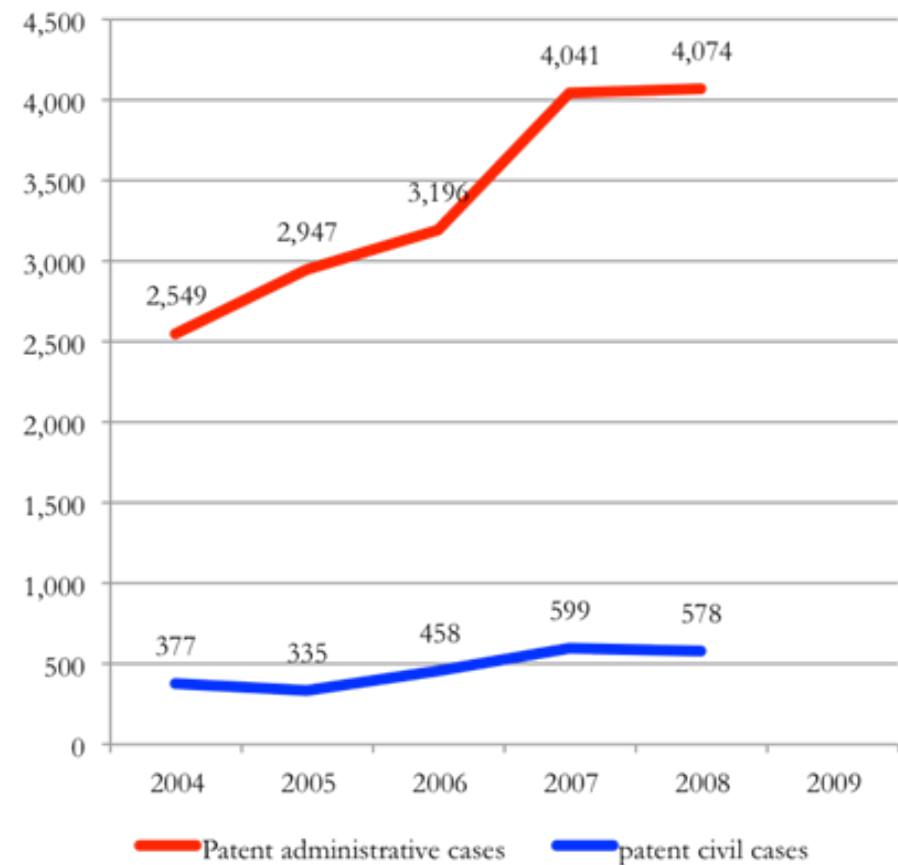


Resolution of IP-related disputes (Pattloch, 2010)

IP civil cases



Patent cases



Schneider v. Chint: a landmark case

- Plaintiff: Chint Group (Wenzhou, China)
- Defendant: Schneider Electric (France)
- The two had a long history of IP dispute.
- Patent dispute
 - ❑ “Miniature low-voltage circuit breaker”
 - ❑ Schneider has an earlier patent, both in France and China, on the product, but didn’t disclose all the technical details.
 - ❑ Chint introduced a similar product in China and obtained a utility model patent on it.
 - ❑ China sued Schneider for patent infringement when Schneider started selling the product in China

Schneider v. Chint

- Chint filed a complaint with the Wenzhou Intermediate People's Court
 - Schneider tried to invalidate Chint's utility model patent but failed.
 - Schneider tried to use the argument of first implementation but the documentary evidence was considered insufficient.
- Damages awarded by Wenzhou Intermediate People's Court in September 2007: \$44.7 million
- After Schneider appealed, the two parties settled at allegedly half the amount of damages.

Lessons from Schneider v. Chint

- China's patent system has got very sophisticated.
- Importance of filing Chinese patents
- Importance of checking for Chinese patent filings
- Strategic role of utility models
- Technology leakage through outsourcing and rapidly increasing innovative capacities of Chinese firms
- Forum shopping

Other cases

- Viagra patent dispute (2007)
 - First granted then revoked after 12 domestic Chinese pharma companies challenged it
 - Upheld by Beijing First Intermediate People's Court and High Court
- Motorola v. Guangzhou Weierwei (2007)
 - Motorola sued for infringement of one of its Chinese design patents in Beijing
 - Favorable judgment within a year
- Huawei v. ZTE

Albert G. Hu and Gary H. Jefferson,
“A Great Wall of Patents: What is behind China's
recent patent explosion?”, *Journal of Development
Economics*, 90: 57–68, September 2009

Hu and Jefferson (2009) (1)

- Research question
 - What's behind China's patenting surge?
- Data
 - Chinese large and medium size enterprises (LMEs) database
 - 1995-2001; 18,000 manufacturing LMEs/year
 - 1995: 22% of R&D and 4.7% of invention patents
 - 2001: 38% of R&D and 8.5% of invention patents

Hu and Jefferson (2009) (2)

■ Main findings

- Weak patents – R&D link: 0.01~0.03 vs. 0.6~0.99
- A 10% increase in industry FDI leads to 15% increase in patenting by domestic firms.
- Greater propensity to patent after 2001 patent amendments
- Enterprise restructuring leads to more patent applications: private vs. state owned enterprises
- Inter-industry differences in propensity to patent: discrete vs. complex

Albert G. Hu, “Propensity to patent, competition and China’s foreign patenting surge”, *Research Policy*, 39: 985-993, 2010

Hu (2010) (1)

■ Research question

- ❑ What's behind China's foreign patenting surge?
- ❑ Market covering vs. competitive threat hypothesis

■ Data

- ❑ SIPO patent database and USPTO patent database
- ❑ World Bank Trade and Production Database
- ❑ OECD Technology Concordance

Hu (2010) (2)

■ Main results

- ❑ Applications from foreign inventors are correlated beyond what technology opportunity and changes in macro economic environment would predict.
- ❑ The pattern of correlation is consistent with patterns of trade and FDI.
- ❑ Foreign competition (exports to China) explains 21-36% of China's foreign patenting surge.

Summary

- China's patenting surge is likely to have been driven by a confluence of forces:
 - ❑ Rapid economic growth and huge market potential
 - ❑ China's R&D intensification
 - ❑ Greater awareness of the strategic value of IP
 - ❑ Increasing FDI and international trade
 - ❑ Strengthening of IP protection
 - ❑ Policy incentives

Concluding remarks

- IP plays a complex role in China's economic development: diffusion vs. innovation
- Many questions remain to be understood:
 - Would China have effected greater technology transfer from foreign multinational companies had it adopted stronger IP protection?
 - How will the drastically increased use of patents affect future innovation in China?
 - How effective has the strengthening of IP protection been in incentivizing indigenous innovation in China?