



# Country Study

- How do Chinese applicants file patent applications abroad?

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# Overview

- ◆ What is the motivation of the study?
- ◆ What data do we use?
- ◆ What can we learn from the data?
- ◆ How can we improve?



# Objective

- ◆ Most studies focus on patent filings within China
- ◆ There are studies on Chinese filings at specific offices
- ◆ There is lack of systematic description of Chinese filings abroad



# Database description

- ◆ We use primarily *PATSTAT* database
- ◆ We construct patent families (first-filing based)
- ◆ We group applications by WIPO's IPC-technology concordance
- ◆ We exclude PCT international filings



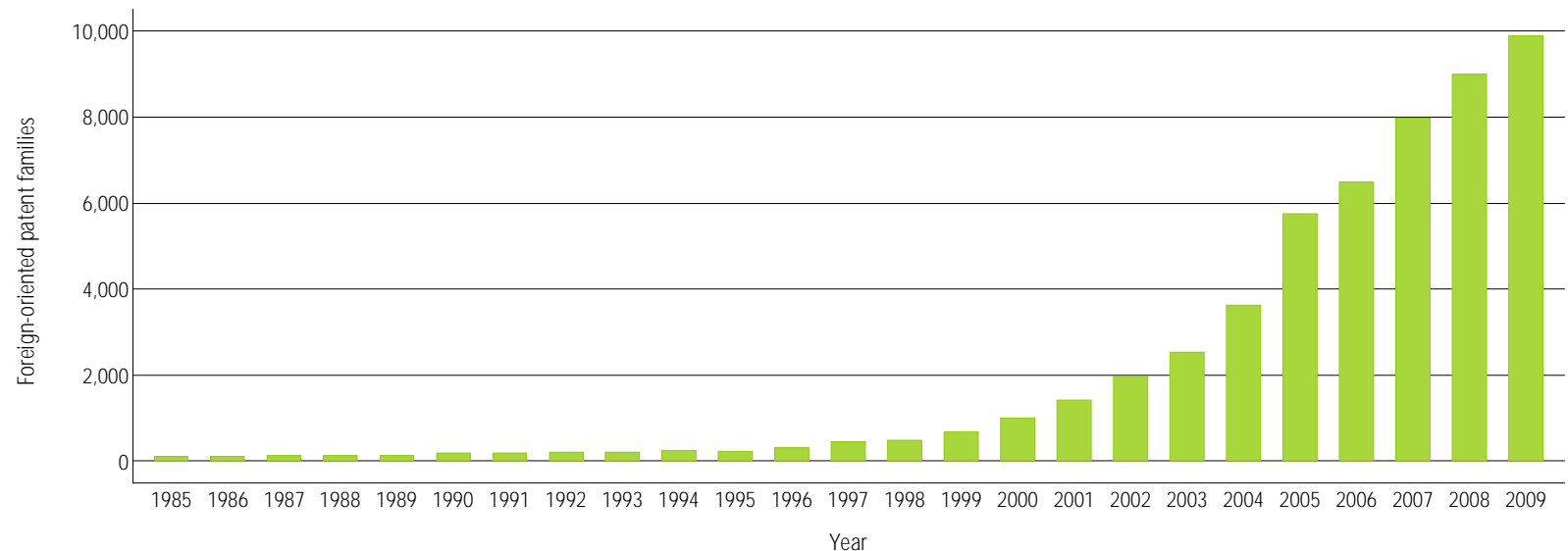
# Database issues

- ◆ Name cleaning
- ◆ Identification of country of first filing
- ◆ Incompleteness due to procedural delay



# Trend of Chinese foreign families

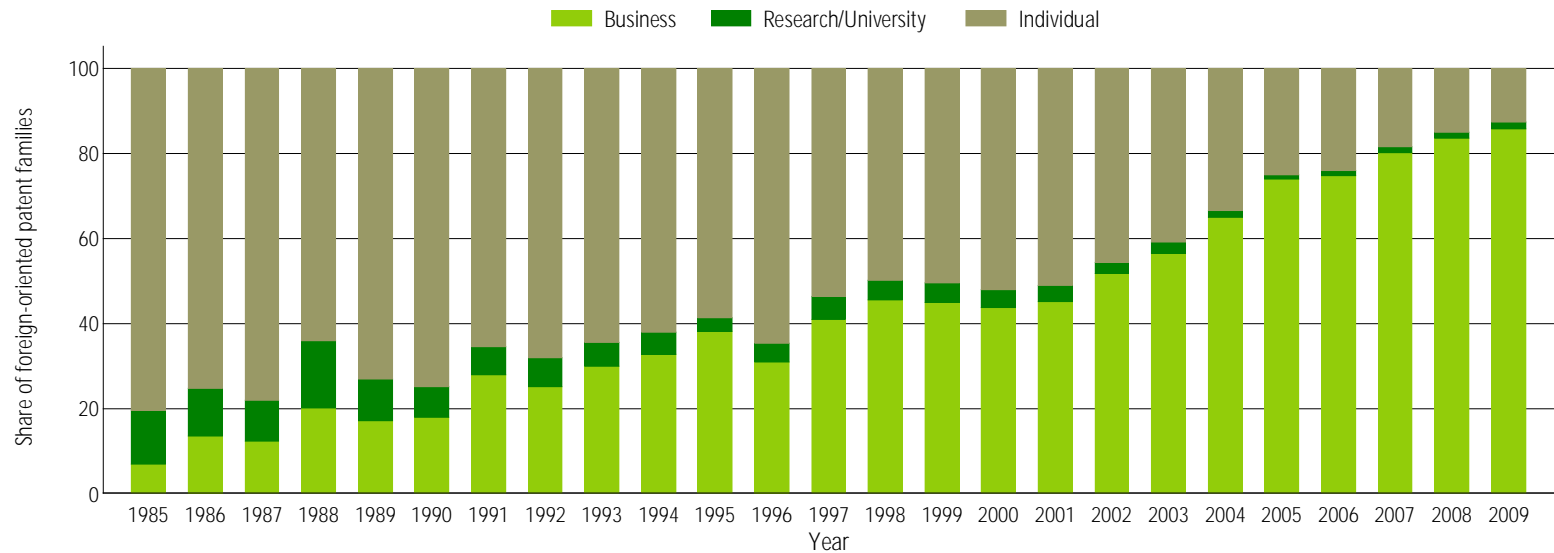
- ◆ There is obvious surge of Chinese foreign patent families since 2004





# Type of applicants

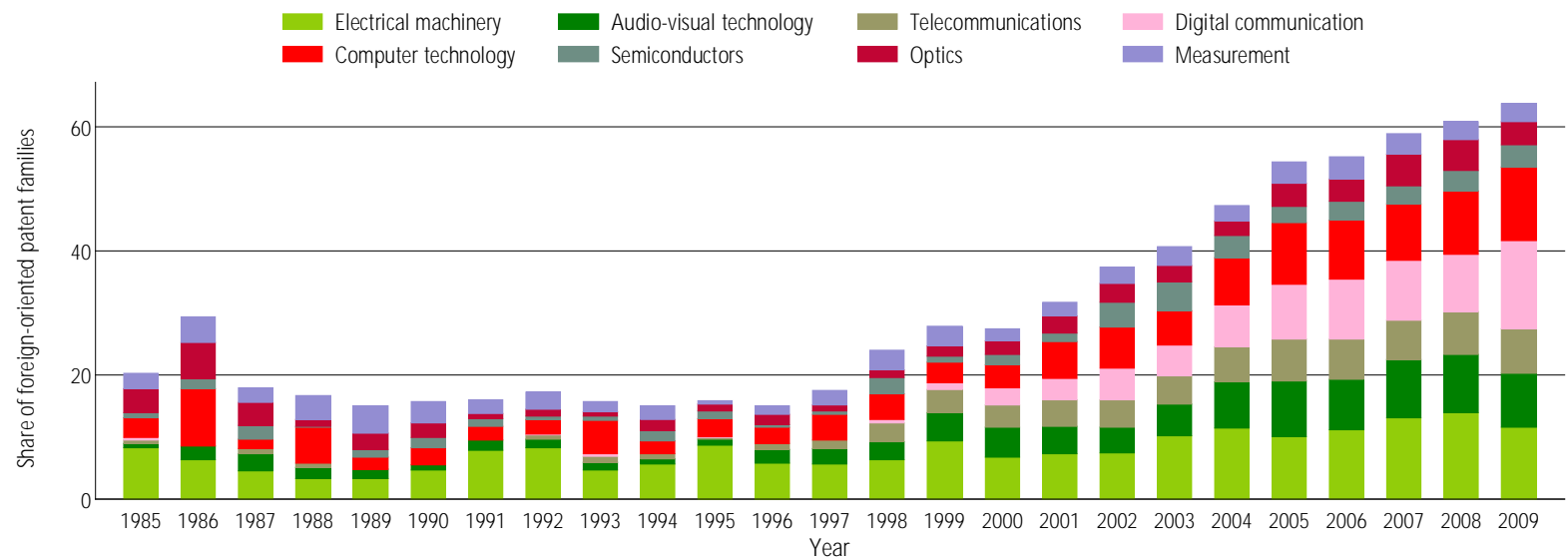
- ◆ More than 80% are owned by companies
- ◆ University share is low





# Type of technology

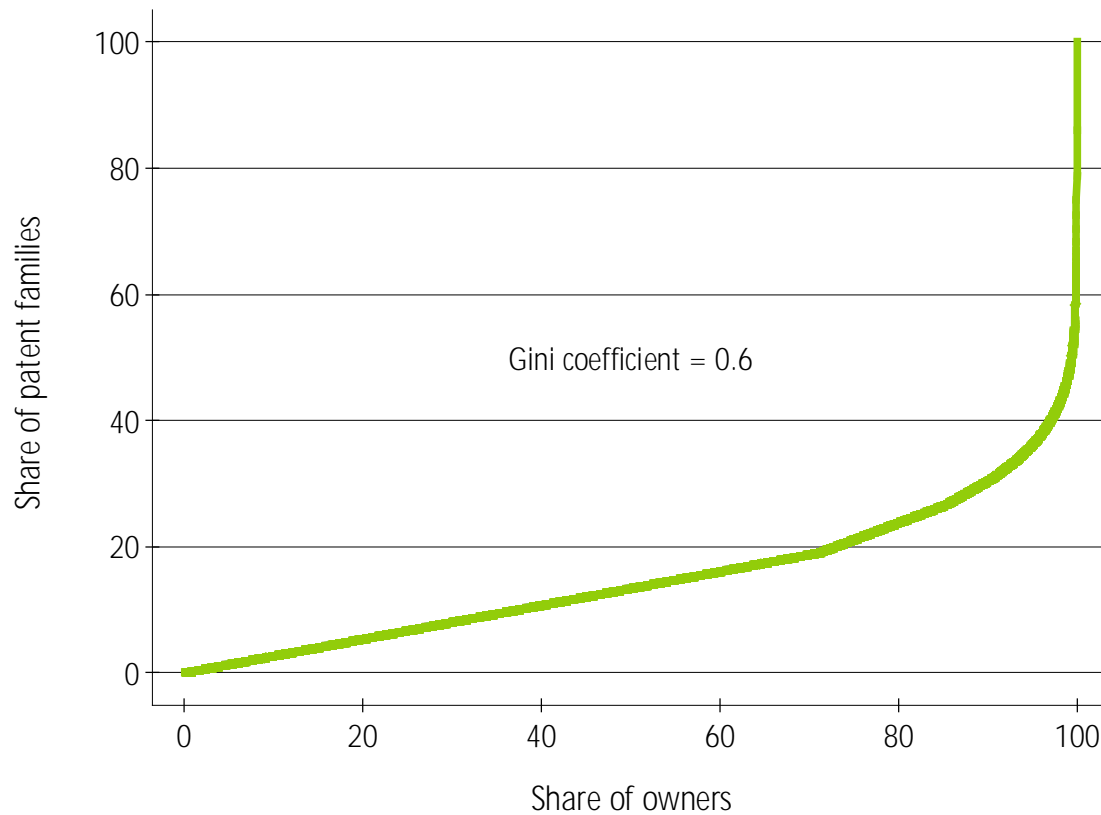
- ◆ ICT sector has the largest number of patent families (~1/3)







# Foreign families: rich vs. poor





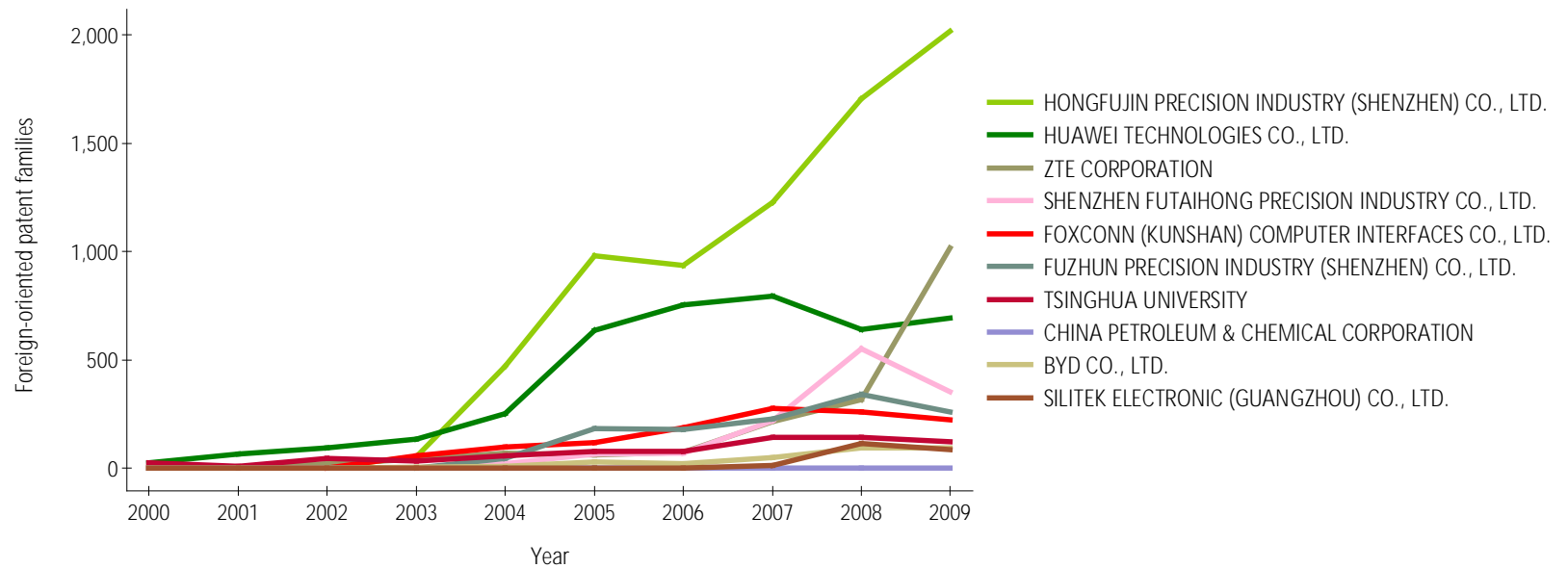
# Foreign families: rich vs. poor

Applicant	Patent families
HONGFUJIN PRECISION INDUSTRY (SHENZHEN) CO., LTD.	9076
HUAWEI TECHNOLOGIES CO., LTD.	4729
ZTE CORPORATION	2480
SHENZHEN FUTAIHONG PRECISION INDUSTRY CO., LTD.	1574
FOXCONN (KUNSHAN) COMPUTER INTERFACES CO., LTD.	1529
FUZHUN PRECISION INDUSTRY (SHENZHEN) CO., LTD.	1296
TSINGHUA UNIVERSITY	955
CHINA PETROLEUM & CHEMICAL CORPORATION	543
BYD CO., LTD.	387
SILITEK ELECTRONIC (GUANGZHOU) CO., LTD.	356



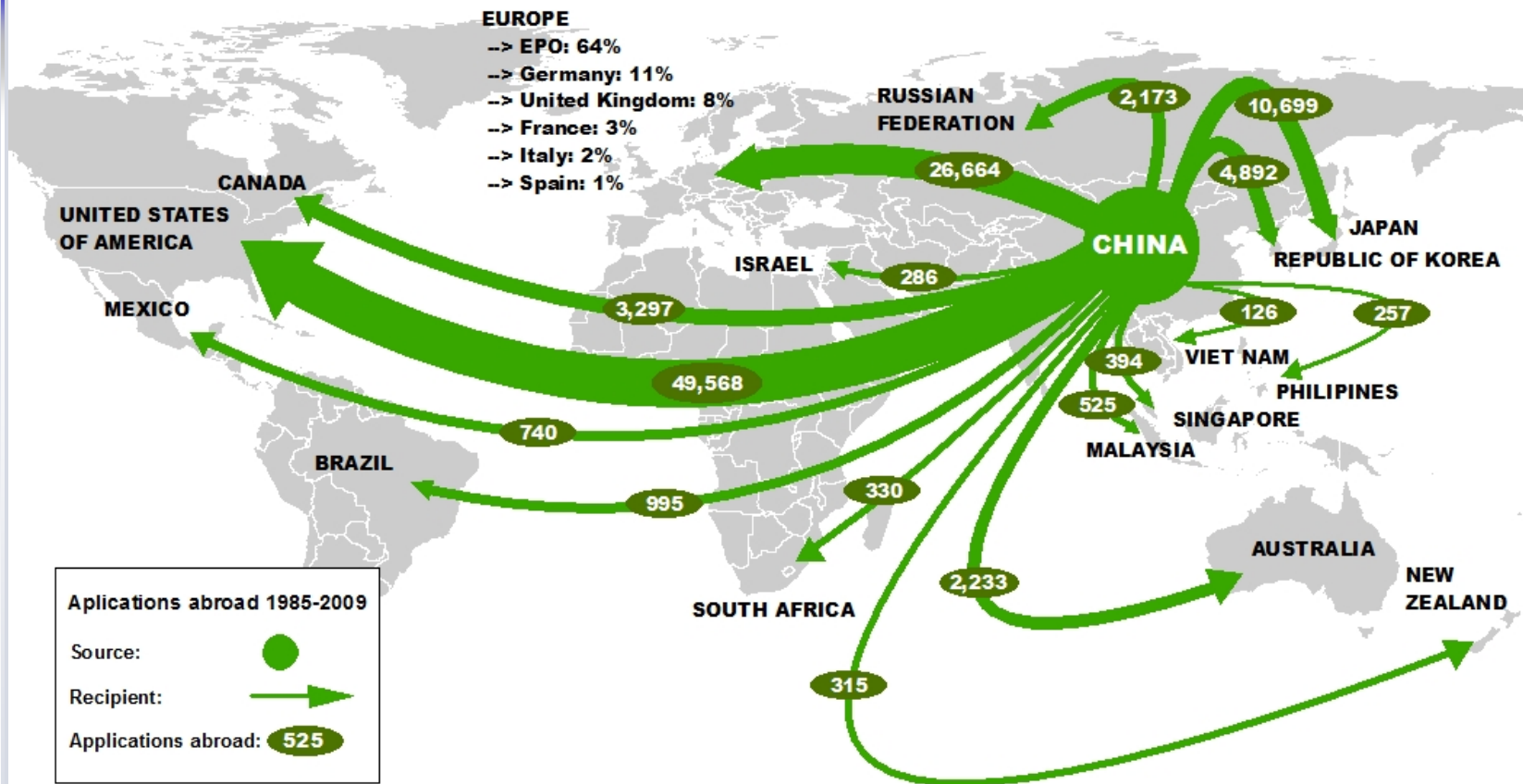
# Foreign families: “nouveau riche”

- ◆ The top 3 – Hongfujin, Huawei and ZTE became “rich” only after 2004





# Filing strategy: destination





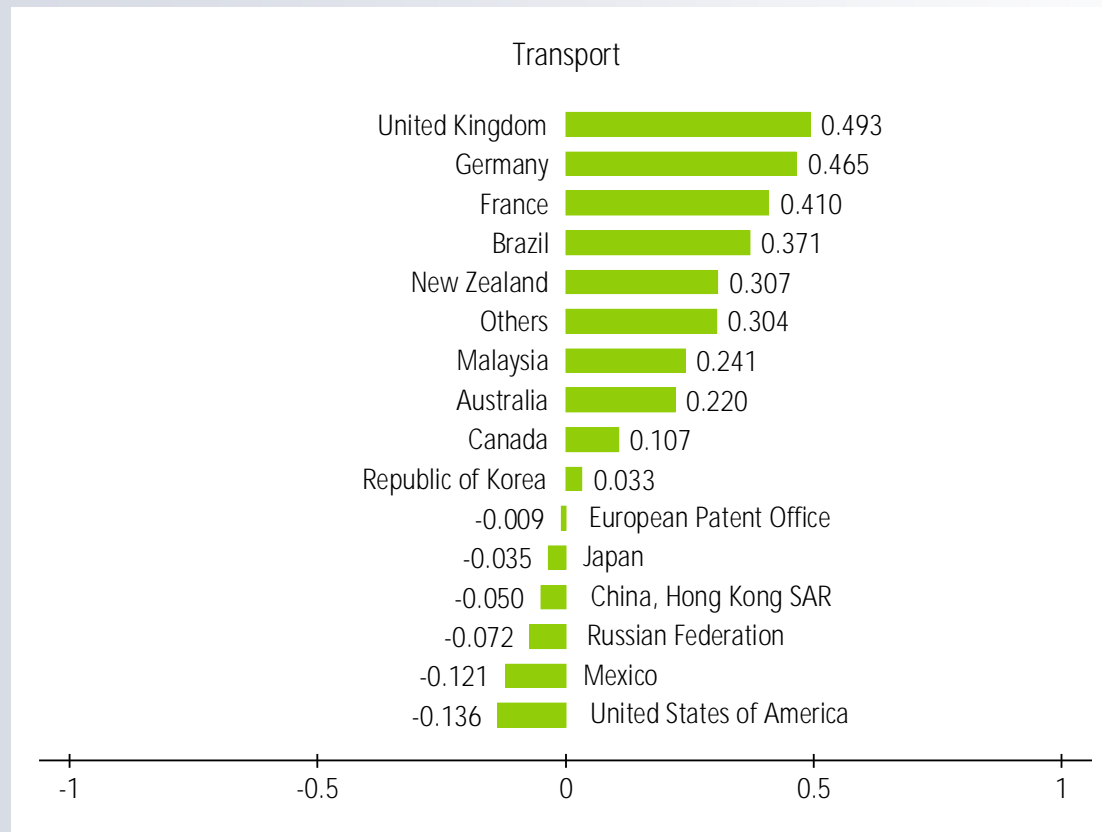
# Filing strategy: destination/technology

- ◆ Relative Specialization Index reveals relative concentration of filings by destination office and technology

$$RSI = \text{Log}\left(\frac{F_{CT} \sum F_{CT}}{\sum F_C \sum F_T}\right)$$

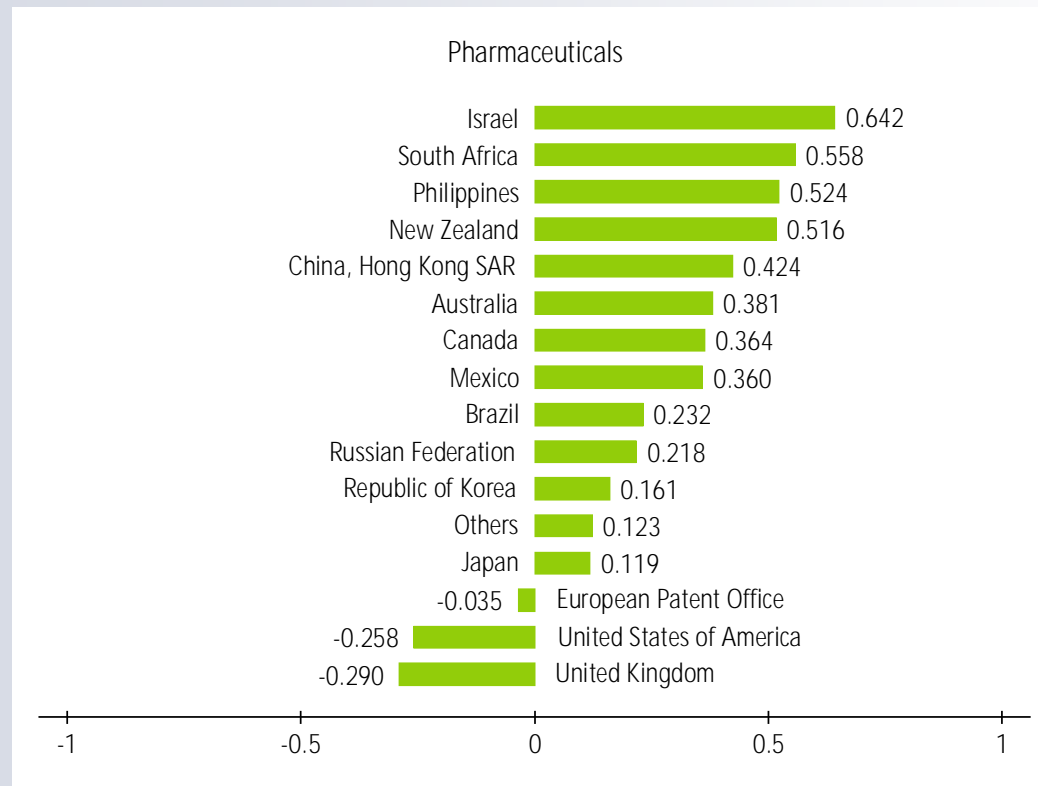


# Filing strategy: destination/technology



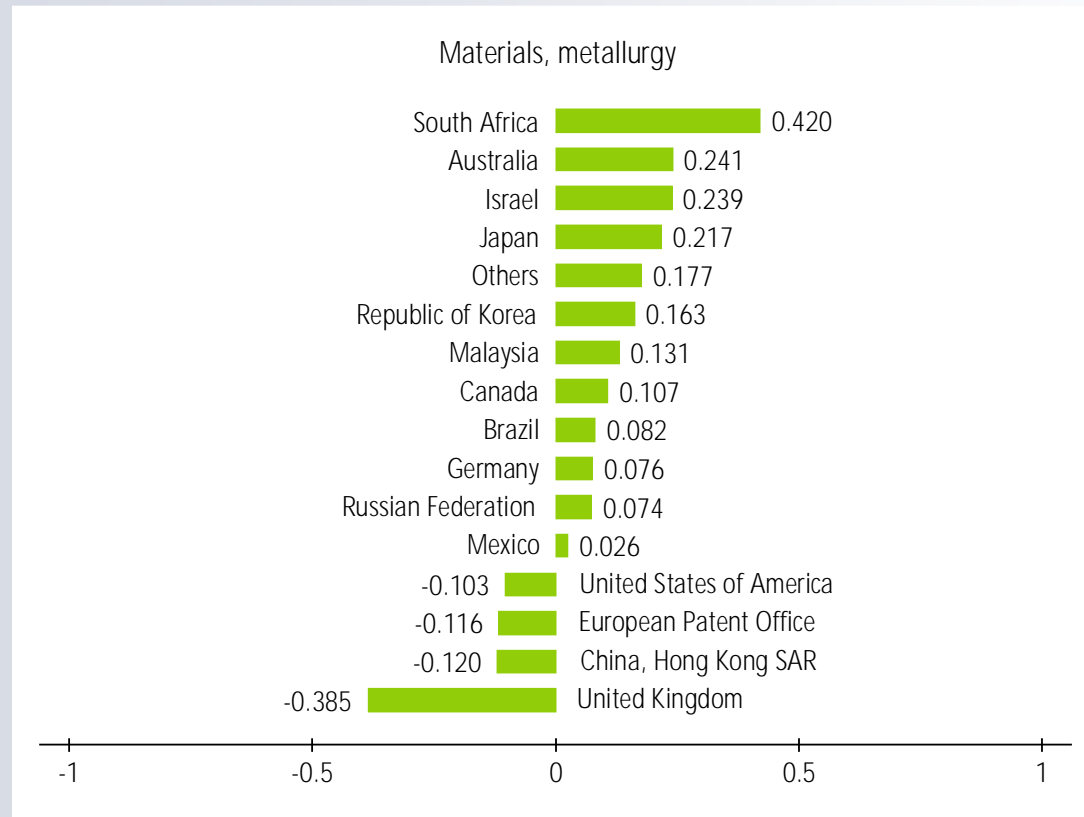


# Filing strategy: destination/technology





# Filing strategy: destination/technology

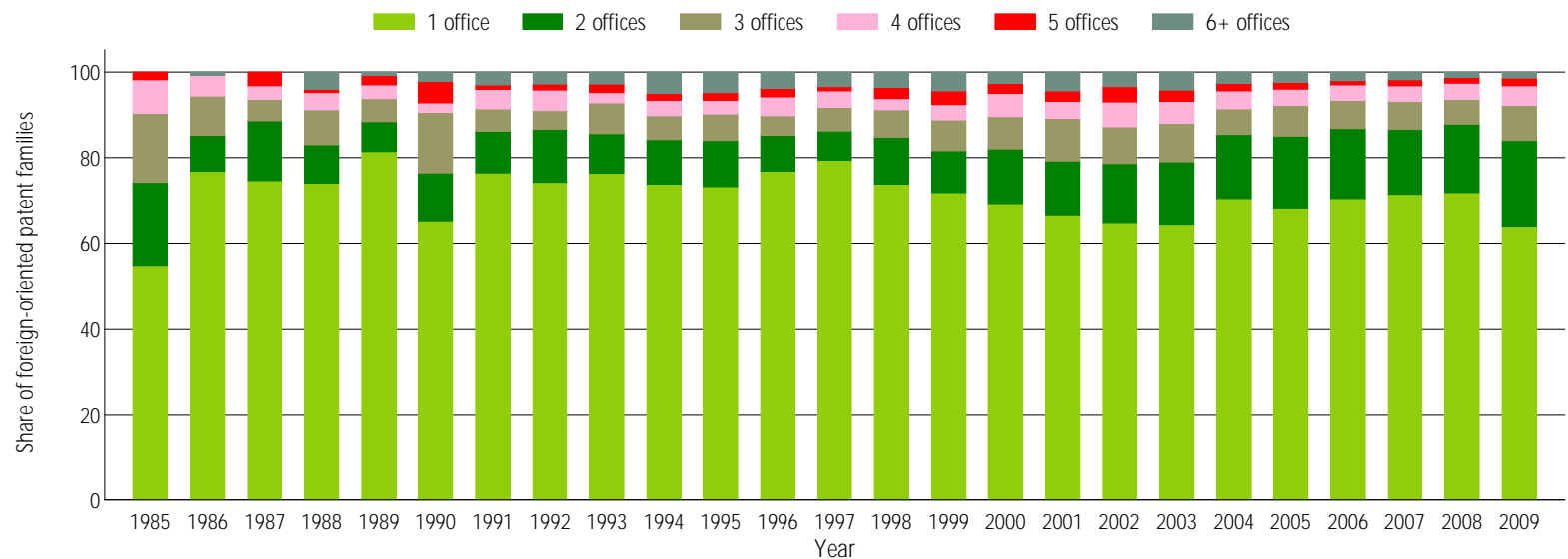






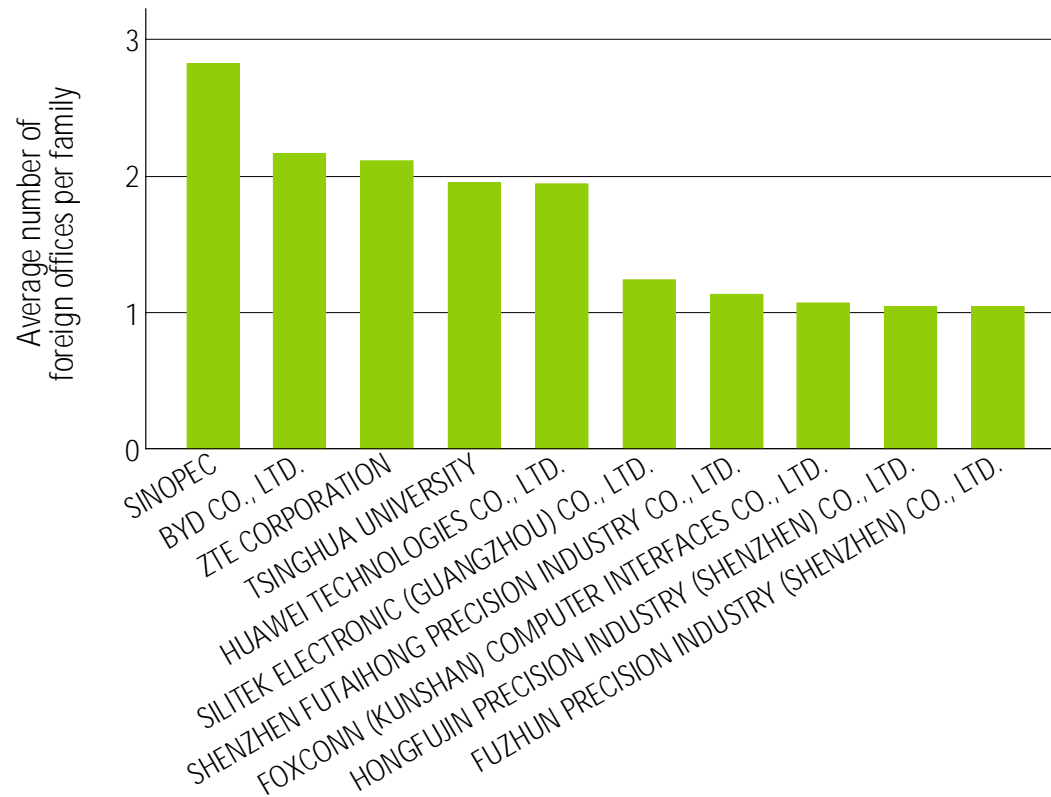
# Filing strategy: number of offices

- ◆ Majority families have just one foreign office (excluding CN, HK, TW)



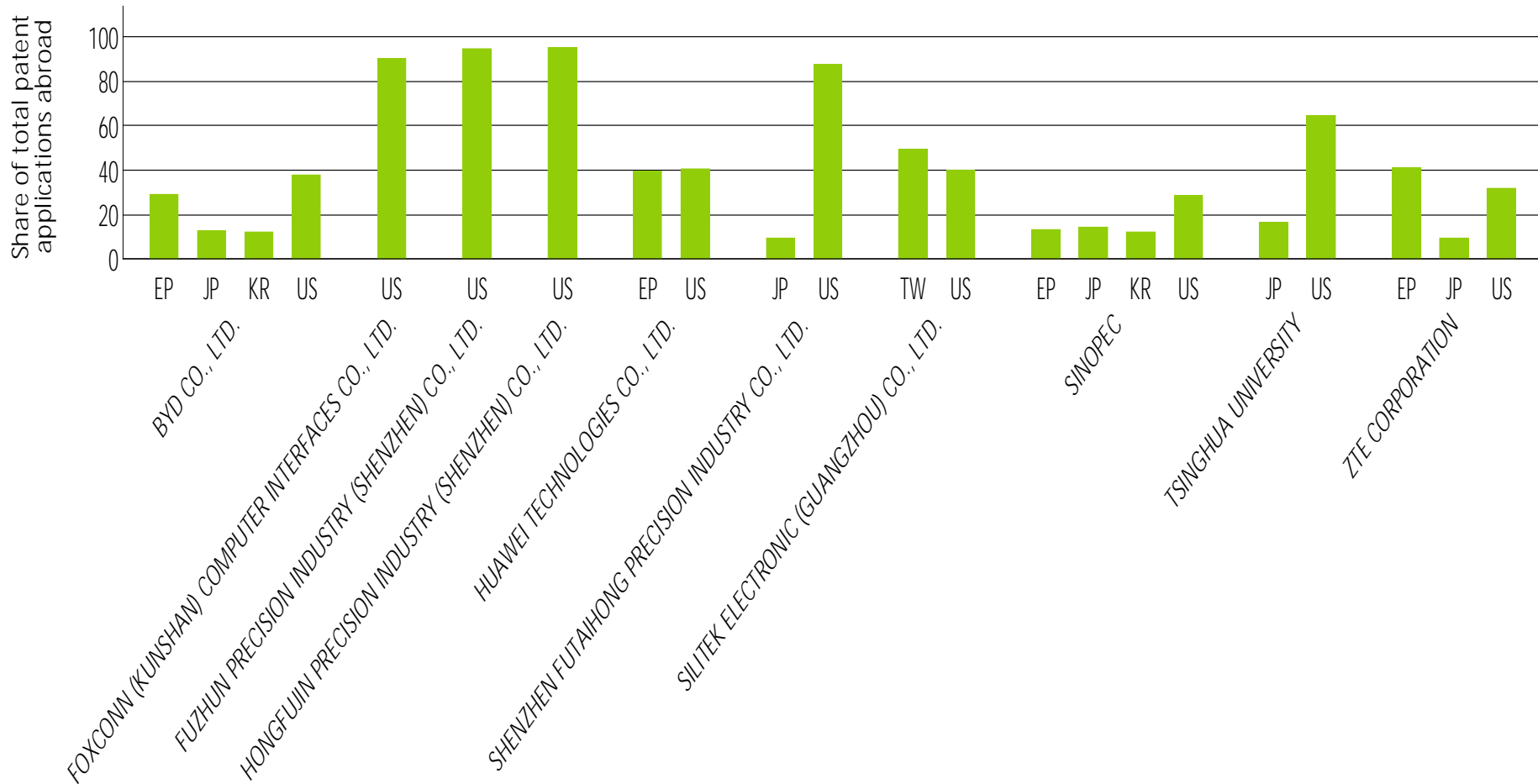


# Filing strategy: top companies





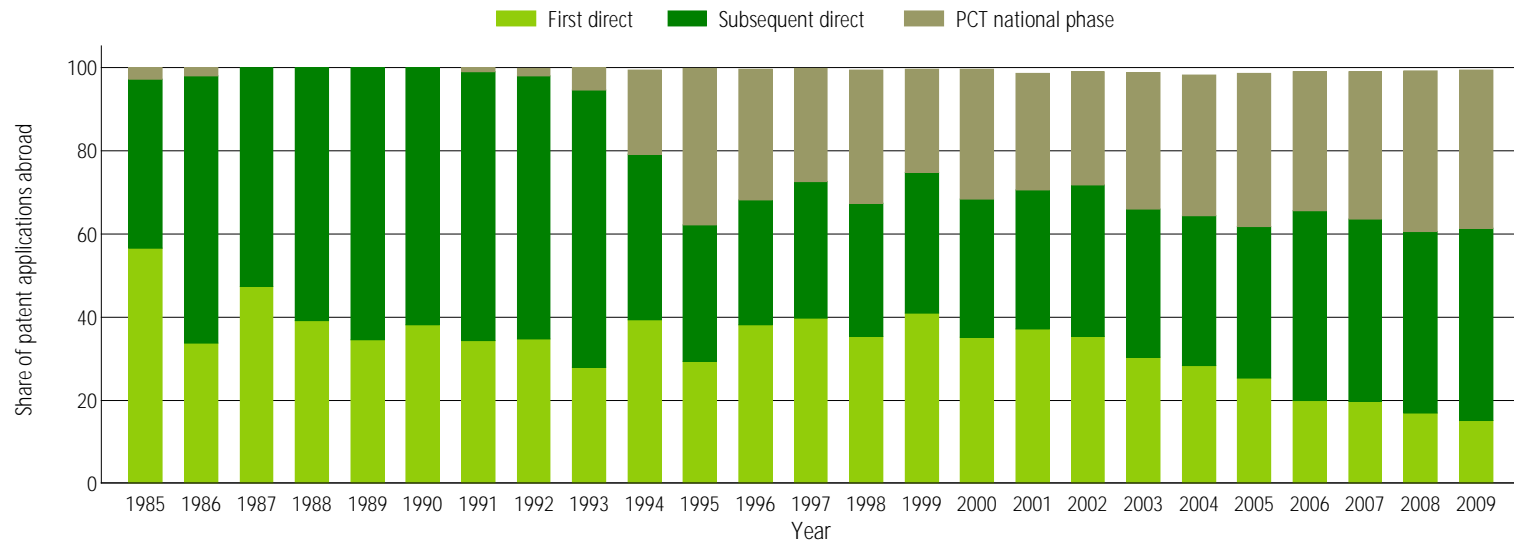
# Filing strategy: top companies





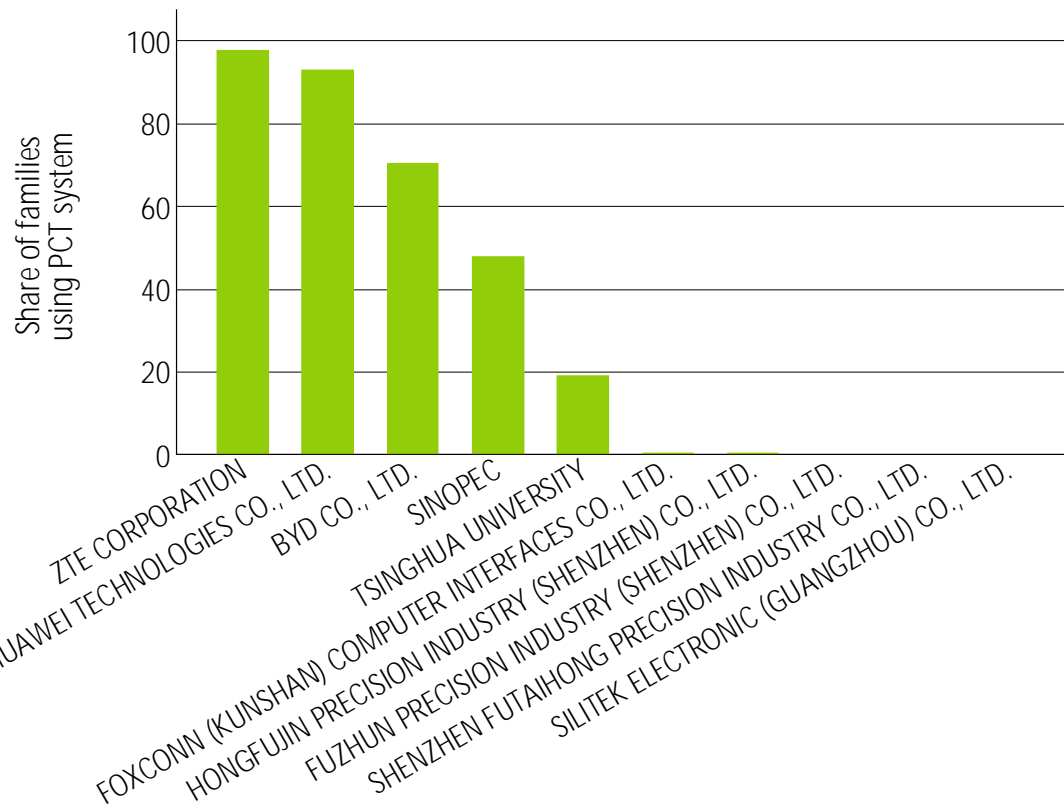
# Use of PCT

- ◆ First direct filings are decreasing
- ◆ PCT national phase entries are increasing





# Filing strategy: top companies



# Use of PCT: regression analysis

	Probit	Probit	Probit
	(1)	(2)	(3)
IPR type (PI)	0.2***	0.2***	0.2***
Company	-0.3***	-0.1***	-0.1***
Individual	-0.1***	-0.03**	0.003
University	-0.2***	-0.1***	-0.01***
Family size > 5	0.6***	0.4***	0.4***
Domestic application	0.4***	0.3***	0.3***
Year FE	Yes	Yes	Yes
Firm FE	No	Top 100	Top 300
Industry FE	Yes	Yes	Yes
Note: *p<0.01 **p<0.05 ***p<0.001			



# Use of PCT: regression analysis

- Families originated through patent for invention applications are more likely to be applied through the PCT route
- Research Institutes are more likely to apply through the PCT route compared to Companies, Universities and Individuals
- The bigger the size of a family, the more likely it is to be applied through the PCT route
- Patent families that include applications with SIPO among other patent offices are more likely to use the PCT route



# Use of PCT: regression analysis

Industry	Coefficient
Pharmaceuticals	0.13
Biotechnology	0.11
Digital communication	0.11
Macromolecular chemistry, polymers	0.08
Analysis of biological materials	0.06
Medical technology	0.06
Civil engineering	0.06
Organic fine chemistry	0.05
Engines, pumps, turbines	0.05
Environmental technology	0.04

Note: the table includes industries with positive and significant coefficients





# Use of PCT: regression analysis

- Digital communication, biotechnology and pharmaceutical companies are more likely to use the PCT route compared to companies in other technology fields



# Preliminary findings

- ◆ Chinese filings abroad increased dramatically after 2004
- ◆ There is huge imbalance between Chinese companies for filing abroad
- ◆ A few companies in the ICT sector dominate the abroad filing activity
- ◆ Highly targeted filing strategy and limited foreign destinations for protection



**Thank you.  
How can we improve?**