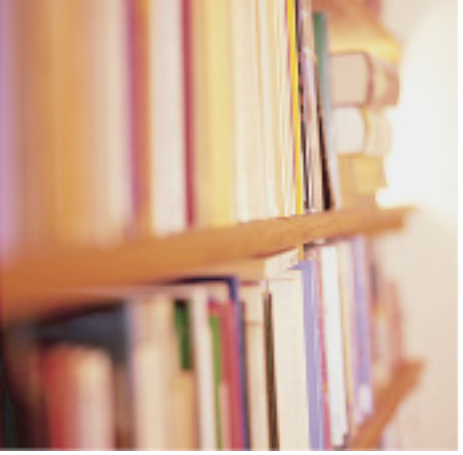

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INNOVATIVE OR INDEFENSIBLE?

AN EMPIRICAL ASSESSMENT OF PATENTING WITHIN STANDARD SETTING

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Director, Global Competition Policy Group

BoF-CEPR Helsinki Conference 16 October 2008

Cooperative Standard Setting

- **Increased importance of Standard Setting Organizations (SSOs)**
  - More industries require cooperation to define products and services
  - Process takes time, money, and effort
  - The financial stakes can be quite high

EUROPEAN PAYMENTS COUNCIL
Towards our Single Payment Area

Accredited Standards Committee X9 Incorporated
Financial Industry Standards
"Always Part of the Solution"

EUROSMART
THE VOICE OF THE SMART SECURITY INDUSTRY

ETSI World Class Standards

MOBEY FORUM
Mobile Financial Services

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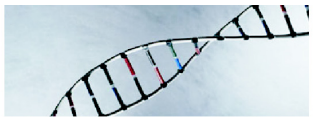
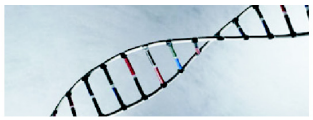


SSO IPR Rules

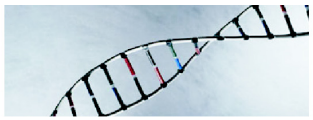
- **IP Disclosure rules**
  - Majority request disclosure of “potentially relevant” IP
  - Most do not require members to conduct IP searches

- **Licensing rules**
  - A few SSOs require royalty free licensing
  - Most request FRAND licensing of IP required to implement
    - Fair, Reasonable, And Non-Discriminatory
  - None define what FRAND means



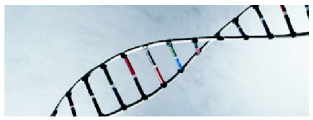
The Potential for Problems

- **Standards can create or augment market power**
  - IP “essential” for a standard, by definition, must be licensed to implement the standard
- **Patent Hold Up**
- **Royalty Stacking**



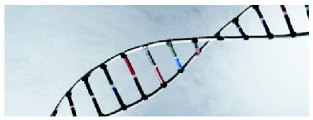
…And Opportunistic Patenting

- **Strategic filing of patents *during* standard setting**
  - Early patents define the technology for the standard
  - Once the technology path of the standard is set, later patents could be opportunistic
    - Firms deduce direction the standard is headed and strategically file for patents that fit
    - Strategic patents do not contribute to the standard, but still earn rents
    - Bekkers & West (2006), Hunt, Simojoki, and Takalo (2007)



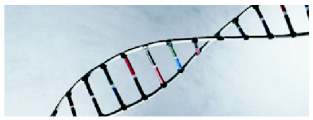
Another Possibility: Incremental Innovation

- **Consider the standardization process**
  - Identify an industry-wide problem requiring cooperation
  - Agree on the general approach to solving the problem
  - Define the specific components within the chosen approach
  - Begin to implement the standard
  - Solve problems that arise during implementation
  - Final modifications to the standard



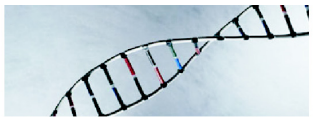
How Do We Distinguish Between the Two?

- **It's an empirical question**
- **The ideal measure would perfectly discriminate between valuable, innovative patents and "weak" patents (standard "padding")**
- **Best we can accomplish are proxy measures**
  - The analysis here is a first step toward testing the two hypotheses



Testable Hypotheses

1. **R&D expenditures as an innovation input**
   - R&D expenditures should decline ex post with strategic patenting
2. **Patent variables**
   - Patent value proxies will be lower than "average" if they represent "padding"
3. **SSO technical submissions**
   - Firms following opportunistic patenting strategy are less likely to file technical documents
4. **Patent mining**
   - Firms strategically patenting will increase their patent propensity ex post, to mine for more patents after the direction is set

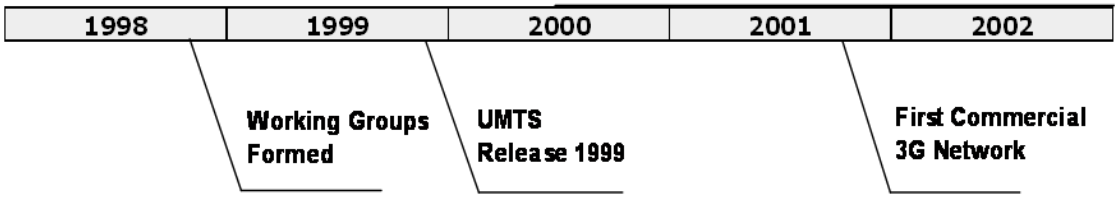


The Dataset

- **Empirical analysis of patents disclosed to an SSO as "potentially" essential**
- **ETSI (European Telecommunications Standards Institute) public database of disclosed patents**
  - UMTS-WCDMA 3G Mobile standard
  - 1247 US patents and 341 EPO patents (with no US counterpart)
  - Declared by 27 for-profit entities

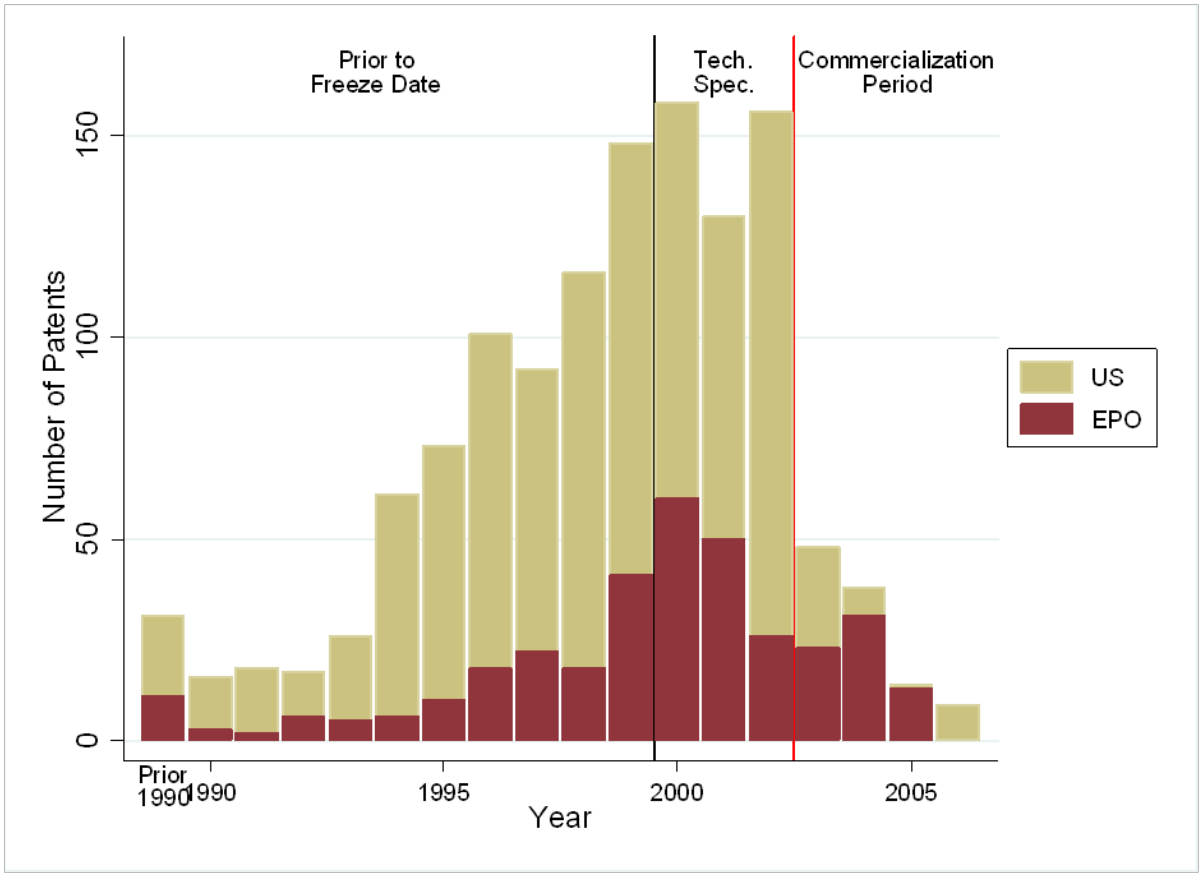
Distinguishing Ex Post from Ex Ante

- **Classify disclosed patents by phase of standard: early development, after publication, during commercialization**



- **Everything declared after Release 99 is considered "ex post"**

The Extent of "Ex Post" Patenting



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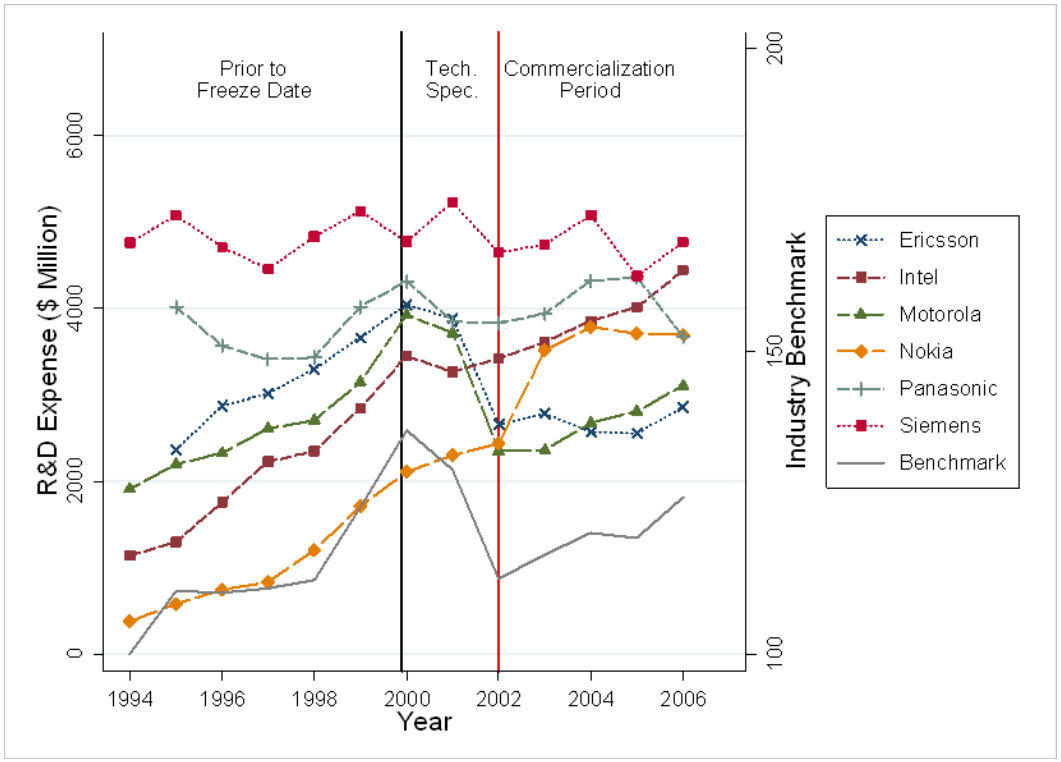
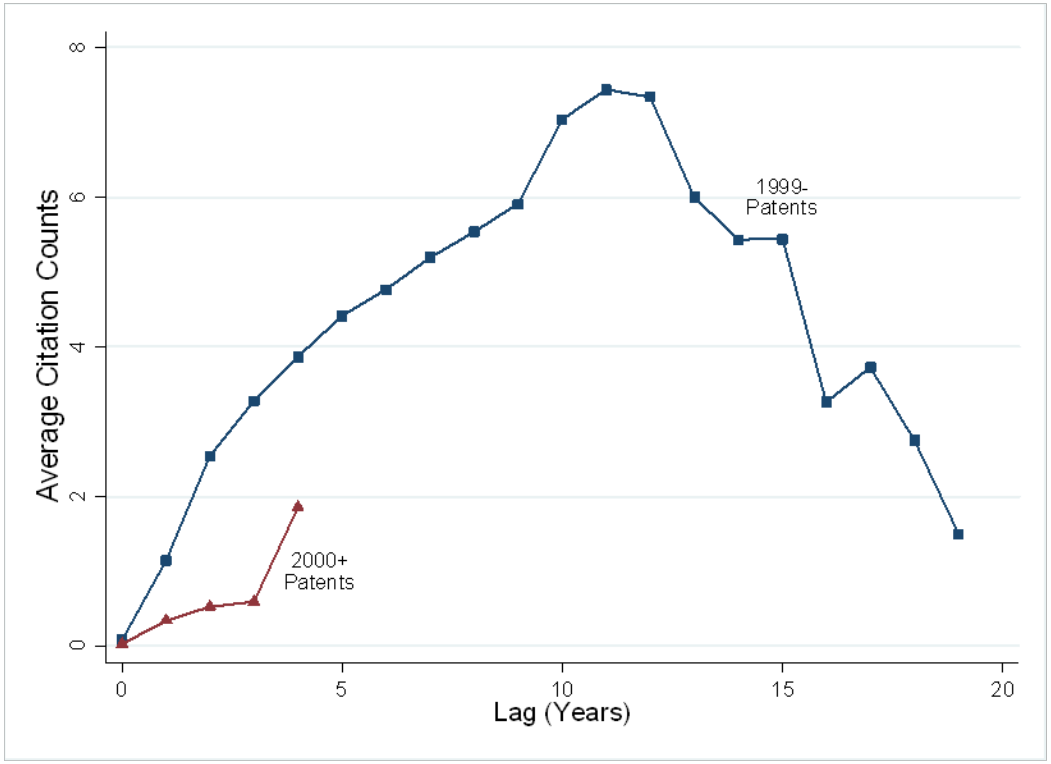
1st Test: Ex Post R&D Declining



2nd Test (a): Patent Value Lower Ex Post

Figure 1: Distribution of Average Yearly Non-Self Forward Citation Lags Pre/Post Standardization



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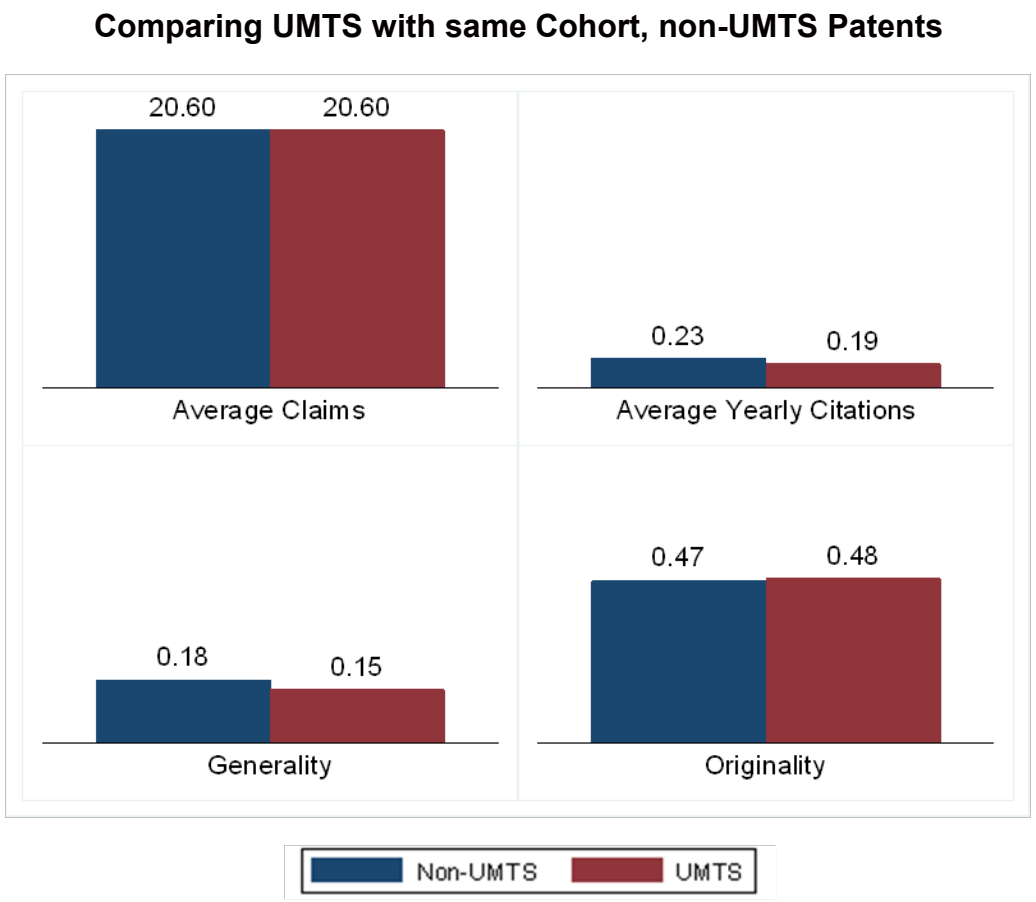
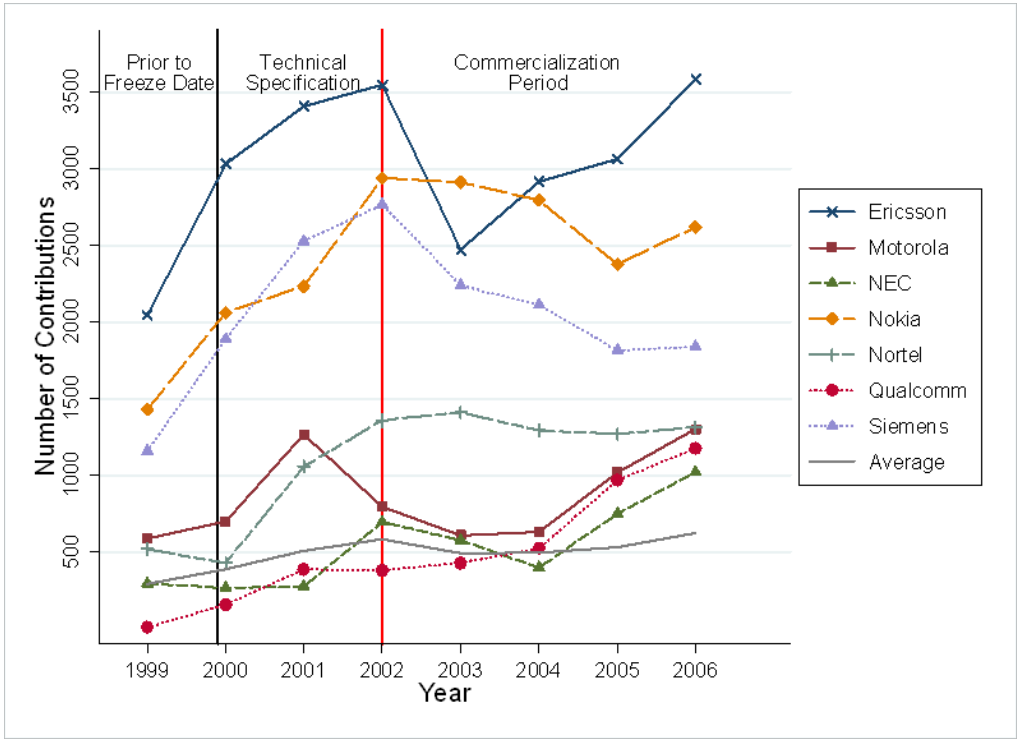
2nd Test (b): Patent Value Lower in SSO vs. non-SSO Cohort



3rd Test: Technical Contributions Not Correlated with Patent Filings



Technical submissions are positively and statistically significantly correlated with patent filings: 0.37 – 0.55

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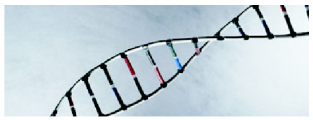


4th Test: Patent Mining

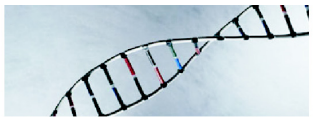
- **Dependent variable**
  - Number of UMTS patents filed for in a given year by a given firm
- **Independent variables**
  - Annual, inflation adjusted R&D expenditure
    - Note: lagging R&D did not affect the results
  - Total number of US patents the given firm applied for in the given year
  - Post standardization dummy (post 1999)
  - Interaction between R&D expenditure and post standardization
- **Negative Binomial Regression is best fit for data**

Estimation Results

Negative Binomial Regression Estimates, Dependent Variable is Annual UMTS Patent Filings

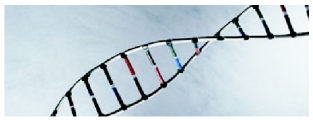
Independent Variables:	Coefficient	P-Value
Inflation Adjusted R&D ($M)	0.000213*	0.04
Total # of Applied US Patents	0.000577**	0.00
Post Standardization Dummy	1.36527*	0.05
Interaction R&D/Standardization Dummy	0.000024	0.76
Constant	-1.03909	0.13

Note: Year dummies included in the regression. For 1994-1998, coefficients were not statistically significant; for 1999 positive and significant; for 2001-2006 all were negative and significant.



Results Suggestive but Not Definitive

- **All four empirical tests point in the same direction**
  - Both strategic *and* incrementally innovative ex post patenting
- **But … we cannot determine how many ex post patents are truly innovative versus strategic**
- **We can reasonably conclude that innovation does continue as the standard develops and moves through commercialization**
  - Thus some ex post patent filing likely to make valuable contribution



The Bottom Line

- **Reality likely lies in the middle**
  - A combination of strategic and innovative ex post filing
- **This make sense given the realities of patent licensing**
  - Firms offering portfolio licensing have little to gain through "padding"
    - A higher patent count won't raise royalties
    - It is only the valuable patents in the portfolio that affect pricing and terms
  - But new (IP) entrants or firms without portfolio licensing may stand to gain through padding
- **The next research step is assessing how much of each occur**