Exploring the Opaqueness of the Patent System - Evidence from a Natural Experiment

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The fundamental deal of the patent system: Is it flawed?

Grant of exclusion rights $\iff$ Disclosure of technological information

$\downarrow$

Supports competition among technologies
The fundamental deal of the patent system: Is it flawed?

Grant of exclusion rights $\leftrightarrow$ Disclosure of technological information

$\downarrow$

Supports competition among technologies

*Implicit assumption in most of the patent literature:* Patent system meets its function to inform third parties about what technologies are protected by the respective patents.

$\leftrightarrow$ *Is this assumption justified?*
Concerns among practitioners: Patents seem to be intransparent with respect to what they protect.

“[…] notice [function] - how well a patent informs the public of what technology is protected.”

“[…] By far the most serious concerns were identified in the IT sector, where some panelists asserted that the notice function “is not well served at all”.

In contrast, panelists [from] pharmaceutical and biotech sectors, indicated that the notice function “by and large” is “very well met.”

(From “The Evolving IP Marketplace”, FTC report from March 2011.)
Our research question:

Is the (European) patent system intransparent?

That is:

Does the patent system actually meet its function to inform third parties about what technologies are protected by the respective patents?
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Answer via exploitation of a quasi-experiment:

- In 2001 the EPO concealed information about applicants’ requests for accelerated examination.
- From changes in behavior:
  Conclusions on transparency of patent system.
Applicant can request accelerated examination.

**Before 2001:** Request for accelerated ex. public information.

**After 2001:** Request for accelerated ex. private information.
1. Introduction

2. Theory
   Model of patent application process;
   \[\rightarrow\] Derivation of hypotheses about behavioural changes.

3. Empirics
   Data on acceleration and opposition frequencies;
   \[\rightarrow\] Test whether hypotheses about behavioural changes are met.

4. Conclusion
Our basic theoretical framework:

**Two players:**

**Firm A:** Applies for a patent for a certain technology; can request **accelerated examination** of its patent (costly).

**Firm B:** Active in same market as firm A; can choose to **oppose** firm A’s patent. (Costly for both parties; patent gets revoked with certain probability.)
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(Costly for both parties; 
patent gets revoked with certain probability.)

“Technological content of patent” \[\xrightarrow{\text{operationalized by}}\] “Value of patent”

**Patent value:** Future stream of revenues from patented technology.

→ Firm A has a good estimate of the value of its patent.
→ In case firm B could inspect firm A’s technology: 
Would arrive at similar estimate.
Sketch of our model of the patent application process:

Patent value $v$: high or low;  
Private information to A.
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*Patent value* $v$: high or low;  
*Private information to A.*

---

Acceleration decision:  
*Before 2001: Public.*
Sketch of our model of the patent application process:

Patent value $v$: high or low;
Private information to A.

Acceleration decision:
After 2001: Private.
In case acceleration information gets concealed:
We expect to observe changes for high-value patents.

Main parametric assumptions:

- Small share of high-value patents; profit from high-value patent $\gg$ profit from low-value patent.

- Acceleration costly; gain in profits from acceleration only for high-value patents.

- Opposition costly for both parties; only opposition of high-value patents worthwhile for rival.
In case acceleration information gets concealed: We expect to observe changes for high-value patents.

Main parametric assumptions:

- Small share of high-value patents; profit from high-value patent $\gg$ profit from low-value patent.
- Acceleration costly; gain in profits from acceleration only for high-value patents.
- Opposition costly for both parties; only opposition of high-value patents worthwhile for rival.

If gains from acceleration are low: Increase in acceleration frequency (of high-value patents).

If gains from acceleration are high: Decrease in opposition frequency (of high-value patents).
1. Introduction

2. Theory
   Low gains from acceleration $\rightarrow$ Acceleration frequency $\uparrow$; 
   High gains from acceleration $\rightarrow$ Opposition frequency $\downarrow$.

3. Empirics
   Data on acceleration and opposition frequencies;
   $\rightarrow$ Test whether hypotheses about behavioural changes are met.

4. Conclusion
Acceleration and opposition frequencies change after concealment of acceleration signal.

(EPASYS data. Acceleration information after 2001 not available to public.)
Difference-in-Difference estimations: Changes are *caused* by the EPO’s 2001 policy change.

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<th>Treatment Coefficients</th>
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<td>Acceleration frequency</td>
<td>0.031***</td>
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<tr>
<td>Opposition frequency</td>
<td>-0.003</td>
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**Treatment group:** High-value patents. (Top quartile of distribution.)

**Non-treatment group:** Low-value patents. (Bottom quartile of distribution.)

**Value proxy:** Count of country-years a patent is active in after grant.
Difference-in-Difference estimations: Changes are *caused* by the EPO’s 2001 policy change.

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Treatment group: High-value patents. (Top quartile of distribution.)
Non-treatment group: Low-value patents. (Bottom quartile of distribution.)
Value proxy: Count of country-years a patent is active in after grant.

Matured technologies; → Low gains from acceleration.
**Difference-in-Difference estimations:** Changes are *caused* by the EPO’s 2001 policy change.

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**Treatment group:** High-value patents.

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Young technologies; $\rightarrow$ High gains from acceleration.

Value proxy: Count of country-years a patent is active in after grant.
Difference-in-Difference estimations: Changes are *caused* by the EPO’s 2001 policy change.

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Results less robust:
→ Electr. Eng.: Also decrease in oppositions observable.
→ Chemistry: Also increase in accelerations observable.
1. Introduction

2. Theory

   Low gains from acceleration $\rightarrow$ Acceleration frequency $\uparrow$;
   High gains from acceleration $\rightarrow$ Opposition frequency $\downarrow$.

3. Empirics

   Data on acceleration and opposition frequencies;
   $\rightarrow$ Hypotheses about behavioural changes seem to be met.

4. Conclusion
Patterns of behavioral changes in our data correspond to our theoretical predictions for the case of a (partially) intransparent patent system.
Conclusion

Patterns of behavioral changes in our data correspond to our theoretical predictions for the case of a (partially) intransparent patent system.

In important technological areas the European patent system seems to be intransparent in the sense that it does not meet its function to inform third parties about what technologies are protected by the respective patents.
Thank you!

Q&A
Outcomes:

I:  
(¬a-o, ¬a-o)  
(a-i-o, ¬a-o)

II:  
(¬a-o, ¬a-o)  
(a-o, ¬a-o)

III:  
(a-o, ¬a-o)  
(a-o, ¬a-o)

IV:  
(a-o, ¬a-o)  
(a-o, ¬a-o)

Legend:

Action firm A  Action firm B
A  B
( a-o, ¬a-o)  ( a-o, ¬a-o)

v = h  v = l
## Backup

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Main area 1
Sample: Accelerated appl. which were granted later on

Main area 2
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