Predicting Patent Litigation

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250K Patents
250K Patents

Held by:
- IBM
- Nortel
- Google
- Apple
- Others
250K patents...

"Most of its junk"

"there's a lot of crap out there"

“Need to kiss a lot of frogs"
Which are the good ones?

250K Patents
250K Patents

Defensively: Which patents are the riskiest ones?
Problem: Which Patents will be litigated?

Issuance

<table>
<thead>
<tr>
<th>United States Patent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zadesky et al.</td>
</tr>
<tr>
<td>发明: 便携式手持设备</td>
</tr>
<tr>
<td>发明人: Stephen Paul Zadesky, San Carlos, CA; Eugen Yew, San Francisco, CA</td>
</tr>
<tr>
<td>受让人: Apple Computer, Inc., Cupertino, CA</td>
</tr>
<tr>
<td>Note: Subject to any disclaimer in agreement, this patent is assigned or licensed under Title 35 U.S.C. 114(a) by LG Electronics.</td>
</tr>
<tr>
<td>Appl. No.: 10/191,832</td>
</tr>
<tr>
<td>Filed: Jul. 1, 2004</td>
</tr>
<tr>
<td>Priority Data: US 2003/013830 A1</td>
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</tbody>
</table>

Enforcement

Litigate

1 %
Problem: Which Patents will be litigated?

Issuance

Enforcement

Litigate

1 %
Relevant Traits

Issuance

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<tr>
<td>Zadesky et al.</td>
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Enforcement

Litigate

1%

Intrinsic Traits
Methods

Data
- Matched pair set: 667 litigated patents and 3 x 667 unlitigated patents issued in 1990 and matched by primary PTO technology class (rare events model)
- Log-transformed versions of continuous variables

Coding
- Transfer: hand-coded to find true re-assignments and exclude M&A, intra-company transfers
- Reexamination: ex parte only

Statistics
- Logistic regression (SPSS)
- Characteristics developed over life and prior to first litigation (time-series)
- Intrinsic, acquired, and intrinsic + acquired
Litigated vs. Unlitigated Patents – Acquired Traits (Characteristics Developed Over Patent Lifetime)

- **Transfer**: 13% Unlitigated, 15% Litigated
- **Setting Change**: 7% Unlitigated, 25% Litigated
- **Reexam**: 0.1% Unlitigated, 10% Litigated
- **Maintenance**: 1.8% Unlitigated, 2.6% Litigated
- **Securitization**: 41% Unlitigated, 39% Litigated (39 cites)
- **Forward Cites**: 19% Litigated (19 cites)
Litigated vs. Unlitigated Patents (Characteristics Developed Prior to Litigation)

- **Claims**: 12.6 vs. 9.2, +3.4 claims
- **Prior Art Citations**: 10.3 vs. 7, +3.3 citations
- **Small Entity**: 36% vs. 27%, +23% small
- **Family Members**: 4.0 vs. 3.1, +0.9 family members
- **Transfer**: 8.0% vs. 7%, +1% transfer rate
- **Entity Size Change**: 4.2% vs. 3.7%, +9.7% entity size change
- **In Force at Time of Lit**: 66% vs. 60%, +34% in force
- **Reexamined**: 0.5% vs. 0.4%, +5% reexamination rate
- **Securitized**: 0.5% vs. 0.4%, +10% securitization rate
- **Fwd Cites (per month)**: 0.05 vs. 0.025, 2x forward cites
## Logistic Regression Model Results

(Time-Series)

<table>
<thead>
<tr>
<th>Variables in the Equation</th>
<th>Lifetime Model (Characteristics Acquired over Patent Life)</th>
<th>Time-Series Model (Characteristics Acquired Prior to Filing of First Litigation)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intrinsic Variables Only</td>
<td>Acquired Variables Only</td>
</tr>
<tr>
<td>Nagelkerke R Square</td>
<td>.106</td>
<td>.334</td>
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<tr>
<td>Intrinsic Variables</td>
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<td></td>
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<tr>
<td>Claims (Log)</td>
<td>1.475*** (.059)</td>
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<tr>
<td>Prior Art Cites (Log)</td>
<td>1.126* (.061)</td>
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<td>Small/Ind Initial Owner</td>
<td>3.156*** (.102)</td>
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<tr>
<td>Family Members (Log)</td>
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<td>Acquired Variables</td>
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<tr>
<td>Assignments (Log)</td>
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<td>.279*** (.140)</td>
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<tr>
<td>TransferF</td>
<td>-</td>
<td>2.061*** (.196)</td>
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<tr>
<td>Size ChangeF</td>
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<td>2.833*** (.144)</td>
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<tr>
<td>ReexamF</td>
<td>-</td>
<td>80.822*** (.747)</td>
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<tr>
<td>Maintenance FeesF</td>
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<td>1.949*** (.059)</td>
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<tr>
<td>Fwd Cites (Log)</td>
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<td>1.513*** (.047)</td>
</tr>
<tr>
<td>SecuritizedF</td>
<td>-</td>
<td>1.694** (.170)</td>
</tr>
</tbody>
</table>

**s convey significance of Difference.

More stars = difference more likely to be real
Predicted v. Actually Litigated Patents (Time-Series)

<table>
<thead>
<tr>
<th>Model</th>
<th>Nagelkerke R2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intrinsic Characteristics</td>
<td>.104</td>
</tr>
<tr>
<td>Acquired Characteristics</td>
<td>.372</td>
</tr>
<tr>
<td>Intrinsic and Acquired Characteristics</td>
<td>.418</td>
</tr>
</tbody>
</table>

*Bigger (R2) is Generally Better*
Payoff: Predicted v. Actually Litigated Patents (Time-Series)

- No Model: 1,405 patents
  - Intrinsic Traits: 467
  - Acquired Traits: 467
  - Intrinsic and Acquired Traits: 467

- Model: 1,872 patents
  - Predicted and Not Actually Litigated (False Positives): 864
  - Predicted and Actually Litigated: 1,330

70% observation rate
Potential uses of this work

- Patent Defense 1.0: freedom to operate, R&D planning and decision-making
- Patent Defense 2.0: defensive buying/aggregation, reexamination, insurance

Policy implications

Patent risk is a function of value and ownership

- A new kind of patent notice failure. Not a problem of what does this patent cover, but who owns the patent, what they do with it. Those transactions aren’t required to be recorded, should they be?