OECD Triadic Patent Families

OECD methodology: an overview

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WIPO – OECD WORKSHOP ON STATISTICS IN THE PATENT FIELD
Geneva, September 18 and 19, 2003
The OECD and Patents Statistics

- Increasing demand for patent statistics to provide a measure of technology performance across countries: from policy makers, analysts, researchers.

- Develop a statistical infrastructure for patents (databases and methodologies):
  - high quality indicators
  - with an improved international comparability
Most frequently published patent statistics refer to counts of patents applications to a single PTO.

Weaknesses in providing internationally comparable indicators of technology performance:
- Home advantage bias
- No filters on patents’ values
Patents Indicators based on PTOs
Patent applications to the EPO / Patent grants at the USPTO
Country shares - residence of the inventors, priority year 1999

OECD Triadic Patent Families

- European Union: 46.5%
- United States: 27.8%
- Japan: 17.4%
- Other countries: 8.3%

EPO: 8.3% Other countries: 10.9%
USPTO: 20.6% European Union: 15.9%
OECD: 52.6%
OECD Triadic Patent Families

Patents Indicators based on PTOs

Patent applications to the EPO / Patent grants at the USPTO
Country shares - residence of the inventors, priority year 1999

OECD Triadic Patent Families
Patent Families Indicators

- A patent family is defined as a set of patents - taken in various countries - that protect the same invention.

- Patents are filed at different patent offices:
  - No more home advantage, international comparability of indicators is improved
  - High value patents selected, costs-benefits to file for protection in several PTOs
OECD Triadic Patent Families

Patent Family: country coverage

- OECD definition of patent families focus on the triad US – Japan – Europe:

→ Coverage of patent applications in Europe?

  - Filings at the EPO:
    
    *More than 80% of patent applications and grants designate at least Germany, France and the United Kingdom altogether.*

  - Filings at national PTOs in Europe:
    
    *Priorities at any European PTO (eg FR) extended to applications to JPO & USPTO but not to any other PTO in Europe included in the families.*
Patent Family: country coverage

- 3 alternative definitions tested:
  1) USPTO + JPO + EPO
     resulting indicators show more balanced country shares:
     bias of regular patent indicators suppressed (home advantage).
  2) USPTO + JPO + (EPO or Germany and France and UK)
     no significant changes compared to definition (1),
     especially in the later years where less than 2% of total
     patent families are added by DE-FR-UK condition
  3) USPTO + JPO + (EPO or Germany or France or UK)
     introduction of country specificities: +15% difference
     with definition (1) for Germany, 30% more families for Japan.

→ Definition (1) covers almost all of the
patent families in the triad US-Japan-Europe
**Patent Family: protect a same invention**

- OECD patent families are built by tracking priority applications that have led to subsequent filings at USPTO, EPO and JPO.

- Depending on the PTO or on the applicant’s strategy:
  - a single priority can lead to several patents in a same office;
  - a single patent can be based on several priority applications.

<table>
<thead>
<tr>
<th></th>
<th>Number of priorities per patent</th>
<th>Number of patents with same priority</th>
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<tbody>
<tr>
<td>USPTO</td>
<td>1.8</td>
<td>1.7</td>
</tr>
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<tr>
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OECD Triadic Patent Families

Patent Family: protect a same invention

- **U1-{P1,P2}
- U2-{P2,P3}
- J1-{P1}
- J2-{P2}
- J3-{P3}
- E1-{P1,P2}
- E2-{P2}
- E3-{P3}

**a) Direct link only (3 families):**
- P1-[U1,J1,E1]
- P2-[U1,U2,J2,E1,E2]
- P3-[U2,J3,E3]

**b) Direct or Indirect links (1 family):**
- {P1,P2,P3}-[U1,U2,J1,J2,J3,E1,E2,E3]

- **Most frequent combinations of triad patents in families -1998:**
  - 1USPTO & 1EPO & 1JPO : 78 % of (a) -- 73 % (b)
  - 2USPTO & 1EPO & 1JPO : 13 % of (a) -- 12 % (b)
  - 1USPTO & 1EPO & 2JPO : 1 % of (a) -- 5 % (b)
  - 2USPTO & 2EPO & 2JPO : 2 % of (a) -- 3 % (b)

- **Average number of triad patents in families (a) and (b) - 1998**
  - 1.1 EPO patent, 1.3 USPTO patent, 1.1 JPO patent
OECD Triadic Patent Families

Patent Family: protect a same invention

- Consolidate families - *(include indirect links)*: neutralise patenting behaviour influenced by rules and regulations of a given PTO

| Share of countries in triadic patent families, 1997 |
|---------------------------------|---------------------------------|
| *(a)* Non consolidated          | *(b)* Consolidated               |
| Germany                         | 14.7 %                          | 13.2 %                          |
| Japan                           | 28.2 %                          | 26.6 %                          |
| United Kingdom                  | 4.7 %                           | 3.7 %                           |
| United States                   | 30.2 %                          | 35.2 %                          |
| European union                  | 34.3 %                          | 31.4 %                          |

\[\rightarrow\ \text{OECD Patent family} : \text{set of patents taken in various countries that share one or more priorities}\]
Processing Triadic Patent Families

- List all priority applications;
- Identify priorities with at least one subsequent patent at the EPO, USPTO and JPO;
- Regroup priorities (*consolidation*) when
  - more than one priority lead to one EPO patent application;
  - more than one priority lead to one USPTO grant;
  - more than one priority lead to one JPO application.

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OECD Triadic Patent Families

Graph showing the number of non-consolidated and consolidated families from 1977 to 1999.
The consolidation process considers any linkage between patents:
- reduced volume of patent families,
- national specificity suppressed

**OECD Triadic patent families**, after consolidation, provide an **improved measure** of the innovative performance and technological change at an **international level**.
Patents Indicators

Patent applications to the EPO / Patent grants at the USPTO
Triadic Patent Families
OECD country shares, priority in 1999

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Patents Indicators

Patent applications to the EPO / Patent grants at the USPTO
Triadic Patent Families
OECD country shares, priority in 1999

OECD Triadic Patent Families

- Canada: 1.5%
- Finland: 1.4%
- France: 6.9%
- Germany: 20.2%
- Italy: 1.7%
- Korea: 1.0%
- Sweden: 2.1%
- Switzerland: 2.4%
- United Kingdom: 5.4%

OECD Triadic Patent Families

- EPO
- Triadic Patent Families
- USPTO
Conclusion

→ The OECD Triadic Patent Families are defined as a set of patents taken at the EPO, JPO and USPTO that share one or more priorities.
  – Provide an improved internationally comparable indicator for OECD requirements (measuring innovative performance of countries).

→ Remaining weaknesses:
  – **Asymmetric information** in patents for the triad: EPO and JPO applications but USPTO grants *(USPTO applications published as of 2001)*
  – **Timeliness:** according to the earliest priority date, data almost complete up to 1997, nowcasts conducted on series up to 1999