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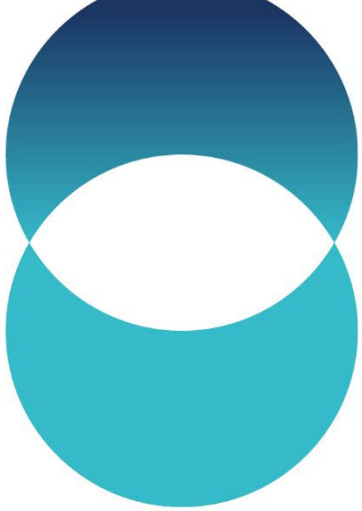

Who Are Canada's Key Patent Holders?

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About the research

These data briefings investigate the concentration of patent ownership in Canada's innovation system by identifying the top 10 patent holders across four fields and 35 technology classes and comparing their share of total patents with that of their U.S. counterparts. The central research question is:

How does the concentration of patent ownership within Canada compare with that of the U.S. across major technology classes, and what do these differences imply for each country's commercialization potential and innovation leadership?

Although Canada and the U.S. differ in the overall scale of their innovation systems, comparing the concentration of patent ownership within each country provides meaningful insight into their respective commercialization potential. Firms ultimately compete globally, but they must first build scale, capability, and market presence at home. Concentration measures, therefore, help identify whether Canada has sufficiently large innovation actors (within each technology class) to support domestic commercialization and eventual global competitiveness.

Because the U.S. operates at a vastly larger absolute scale of patenting, its commercialization potential is generally higher regardless of concentration levels. Therefore, when Canada exhibits higher concentration than the U.S. in a given field, this should not be interpreted as the U.S. being at a disadvantage. Rather, it signals that Canada may have a stronger competitive footing within that specific technology class. In this context, the relationship between concentration and commercialization capacity is more meaningful for Canada than for the U.S., as concentration can help compensate for its smaller overall patenting base.

By analyzing both the distribution of patents and the types of entities involved—private firms, universities, government agencies, and individuals—we peer into the structural dynamics of Canada's innovation ecosystem. A higher concentration of patents among top holders typically signals stronger commercialization capacity, which is increasingly recognized as a key determinant of invention value.[1] In contrast, a more diffuse ownership structure may reflect barriers to scaling and market deployment, particularly when patents are held by actors with limited commercialization capabilities.[2] This research builds on prior work[3] mapping Canada's technological strengths by adding a critical layer of analysis: identifying who holds the patents and what that means for Canada's global competitiveness.

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[1] Ashish Arora and others, "Invention value, inventive capability and the large firm advantage; and S. S. Athreye and others, "Small firms and patenting revisited."

2 Statistics Canada, "Size counts"; David H. Hsu and others, "Benchmarking U.S. university patent value and commercialization efforts."

3 Zafer Sonmez, *Intellectual Property in Canada*.

Observations in these analyses are on patent families (i.e., European Patent Office worldwide bibliographic data [DOCDB]). A simple patent family is "a collection of patent documents that are considered to cover a single invention. The technical content covered by the applications is identical. Members of a simple patent family have the same priorities."[4]

Methodology

Determining the location of patent holders

Patent holder location in this analysis is determined based on the address provided in patent applications, meaning that branch offices or subsidiaries of multinational companies located in Canada are treated as Canada-based entities. This geographic or jurisdictional designation reflects where the inventive activity originated from, rather than the nationality of the company or the location of its global headquarters. As described below, the PATSTAT Global Database supports this kind of geographic analysis since it removes instances where multiple patents are granted in different jurisdictions for the same patent.

Determining the governmental status of patent holders

We report patent holder names as they appear in patent applications. That means in cases where multiple government agencies are listed as assignees, we did not attempt to aggregate and report patents for them under a single government category. For example, the National Research Council is an agency of the Government of Canada, but it appears as a separate legal entity in the patent database. We made this choice to reflect how separate government entities claim intellectual property rights domestically and internationally.

Data source

We used PATSTAT Global Database 2024 autumn edition, the same source used in the companion impact paper. PATSTAT enables comprehensive tracking of simple patent families, linking related filings across jurisdictions to eliminate double-counting and provide a consolidated view of inventions. Crucially, PATSTAT includes organizational-level ownership data, allowing us to identify

4 European Patent Office, "DOCDB simple patent family."

the top patent holders within each technology class and assess their relative concentration. This approach supports a more accurate and jurisdictionally grounded understanding of innovation leadership in Canada.

However, this database comes with few limitations. First, it has an 18-month lag, meaning that we observe 2023 partially and 2022 is the latest year with complete observation. PATSTAT links related patents from different countries and offices around the world into patent families. This helps identify multiple patents related to the same invention across different jurisdictions, eliminating duplication. You can see coverage detail in the European Patent Office's *Data Catalog PATSTAT Global*. Second, the European Patent Office, developer of the PATSTAT database, notes that the ownership information is accurate and complete to the extent that member countries share change of ownership information with the European Patent Office.

Assessing patent ownership concentration

To evaluate whether the concentration of patent ownership among the top 10 holders differs meaningfully between Canada and the U.S., we conducted a **paired-sample t-test** across 35 technology classes. This statistical test is appropriate because the data is paired by technology class—each class has a corresponding concentration value for both countries.

Statistical framework

- **Null Hypothesis (H_0)**: There is no difference in the average share of patents held by the top 10 organizations between Canada and the U.S. across technology classes.
- **Alternative Hypothesis (H_1)**: There is a statistically significant difference in the average top 10 patent holder share between the two countries.

Procedure

1. For each of the 35 technology classes, we calculated the share of total patents held by the top 10 organizations in both Canada and the United States.
2. We then computed the difference in concentration for each class (Canadian share minus U.S. share).
3. A paired t-test was applied to determine whether the mean of these differences is statistically significantly different from zero.

Results

- **Mean difference**: 2.19 percentage points
  (Canadian top 10 holders have a slightly higher average concentration than their U.S. counterparts.)
- **p-value**: 0.127
  (not statistically significant)

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