



# Developing a Patent Research Database at Statistics Canada

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Delivering insight through data for a better Canada



Statistics  
Canada

Statistique  
Canada

Canada

# Overview

- Linking PATSTAT to Statistics Canada data sources
- Possible research
- Access

# Partners

- Global Affairs Canada
- Immigration, Refugee and Citizenship Canada
- Innovation, Science and Economic Development Canada – Patent Policy Directorate
- Innovation, Science and Economic Development Canada – Strategy, Research and Results Branch
- Canadian Intellectual Property Office



# European Patent Office - PATSTAT

- Worldwide patent data
- Includes information on: Applications, grants, patent families, citations, patent classifications, applicants, inventors, legal status

## Data for Canada

- Roughly 400,000 applications between 1875 and 2018 where the applicant or inventor has a Canadian address
- Between 2000 to 2016, there are approximately 265,000 applications. These are associated with 230,000 companies and 465,000 persons.

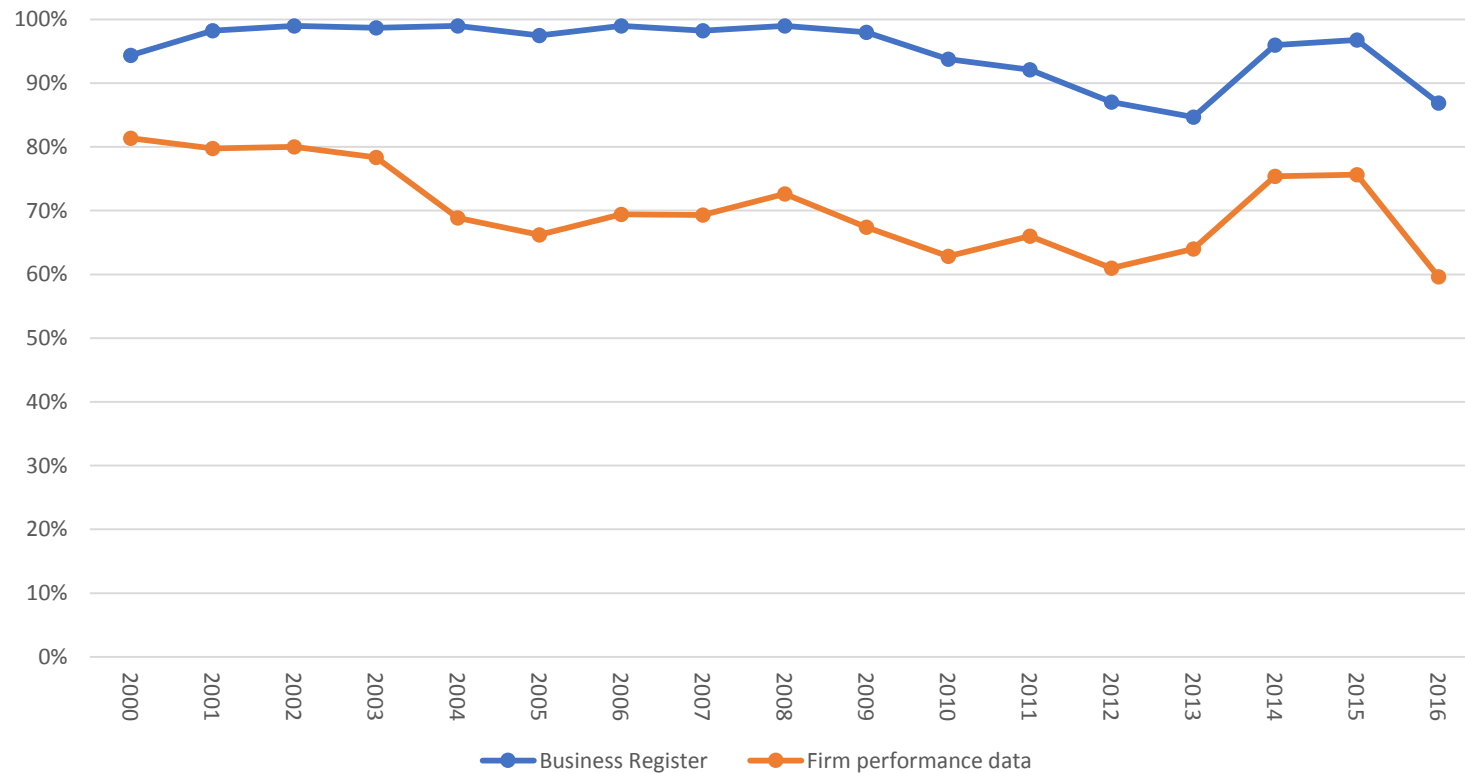


# Linkage to Statistics Canada data sources

Company names are linked to Statistics Canada's Business Register and then to administrative data on firm performance (e.g., T2 corporation income tax, T4 Statement of Remuneration Paid, PD7 Payroll Deduction)

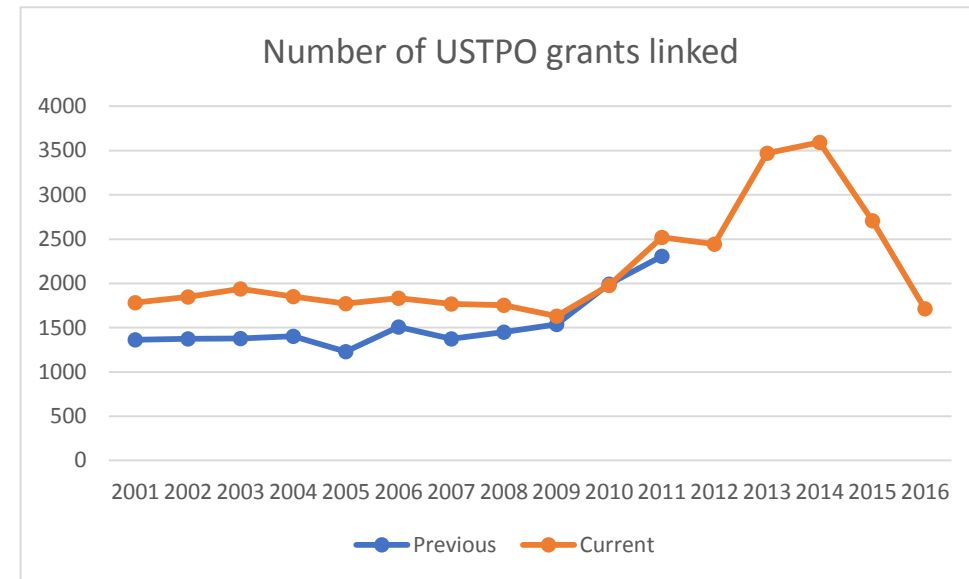
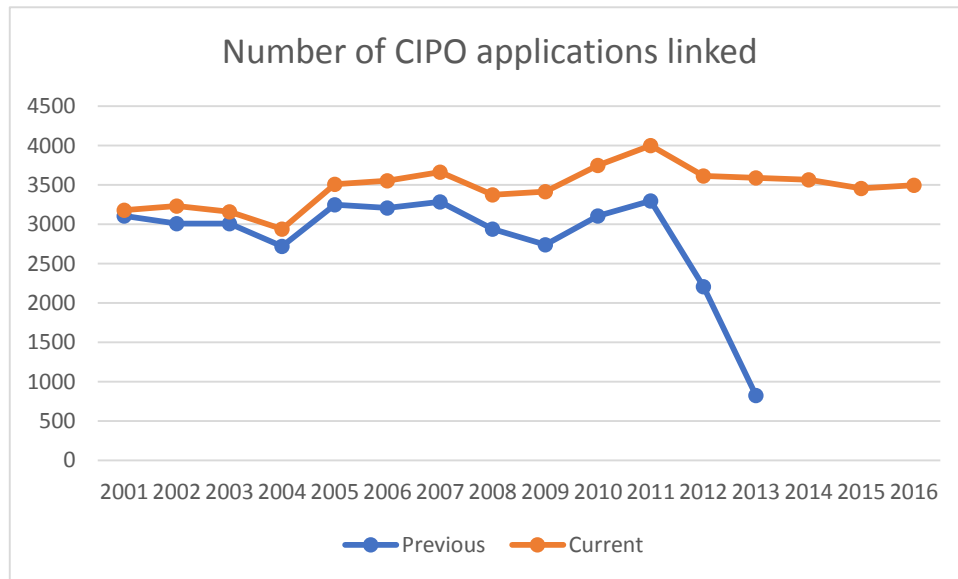
The Social Data Linkage Environment facilitates the linkage of individual names to administrative databases, such as the Canadian Employer-Employee Dynamics Database

# Linkage rate to Business Register and administrative data on firm performance



# Comparison to previous linkage

Previously, older data from CIPO and the USPTO had been linked

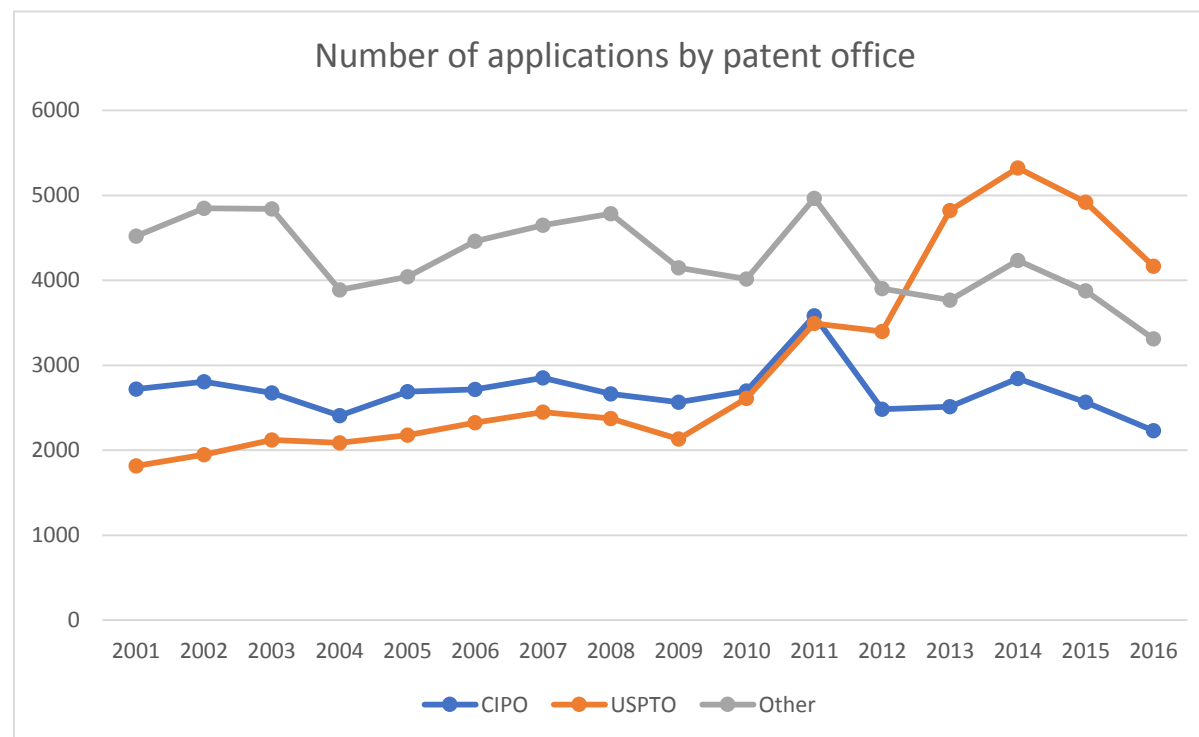






# More current and comprehensive data

Compared to the previous linkage, the new linkage includes data for years after 2011, data from other patent offices and data on grants and applications

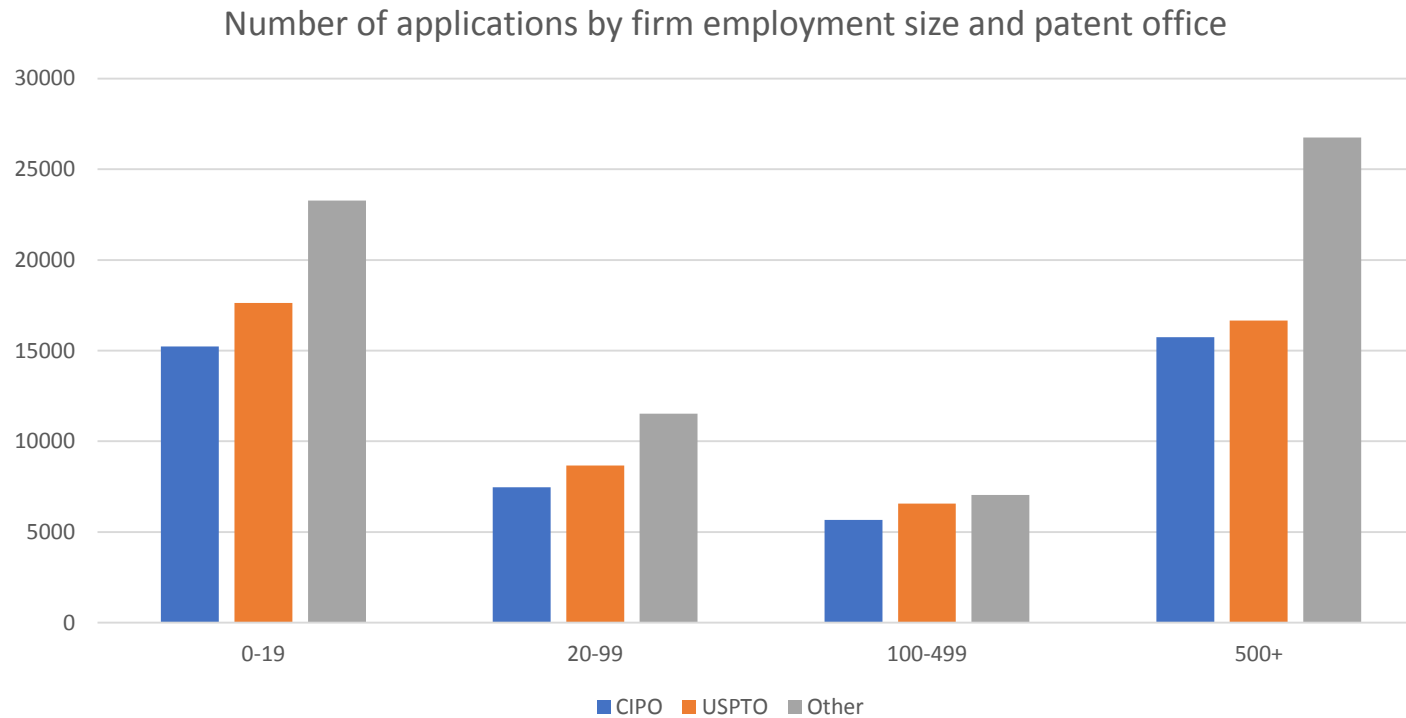






# Supplements survey data targeted at larger firms

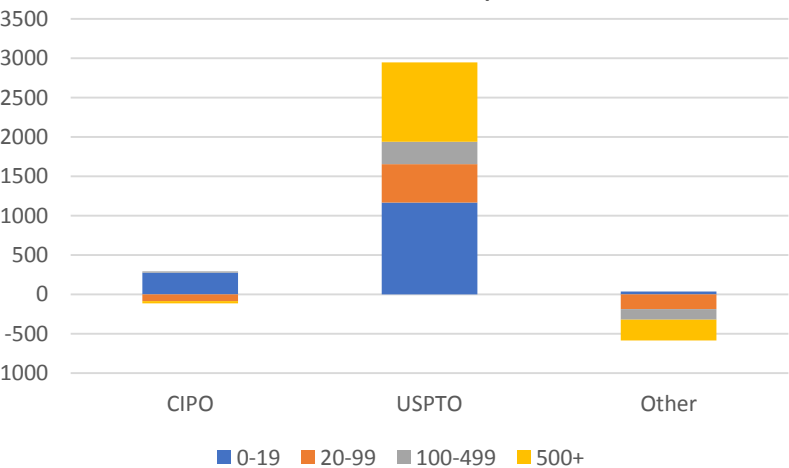
Firms with less than 20 employees account for a significant fraction of patent applications



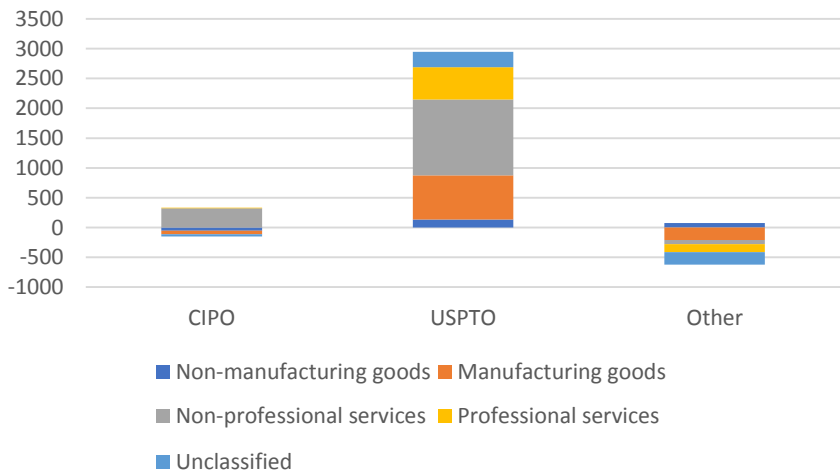
# Decomposition of the change in the number of applications by patent office

Change in the number of applications between 2008 and 2014 by firm size, by industry, and by firm type

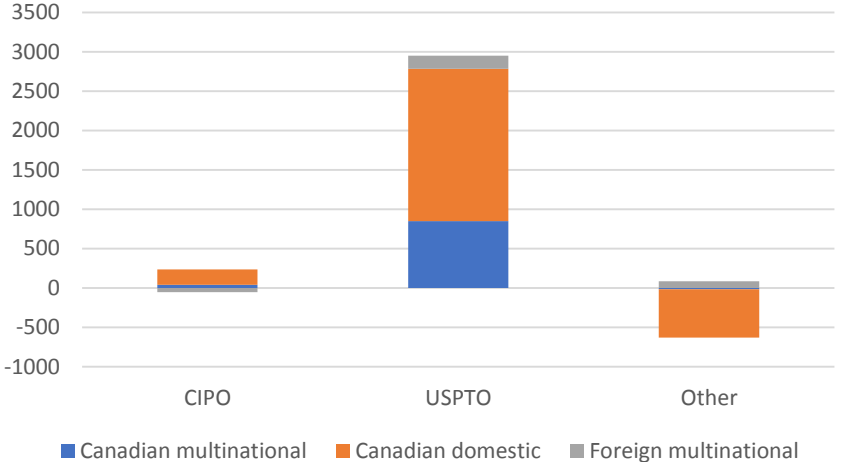
Firm size decomposition



Industry decomposition



Firm type decomposition





# Linkage with the Survey Data Linkage Environment

Stay tuned!

# A selection of Statistics Canada data sources

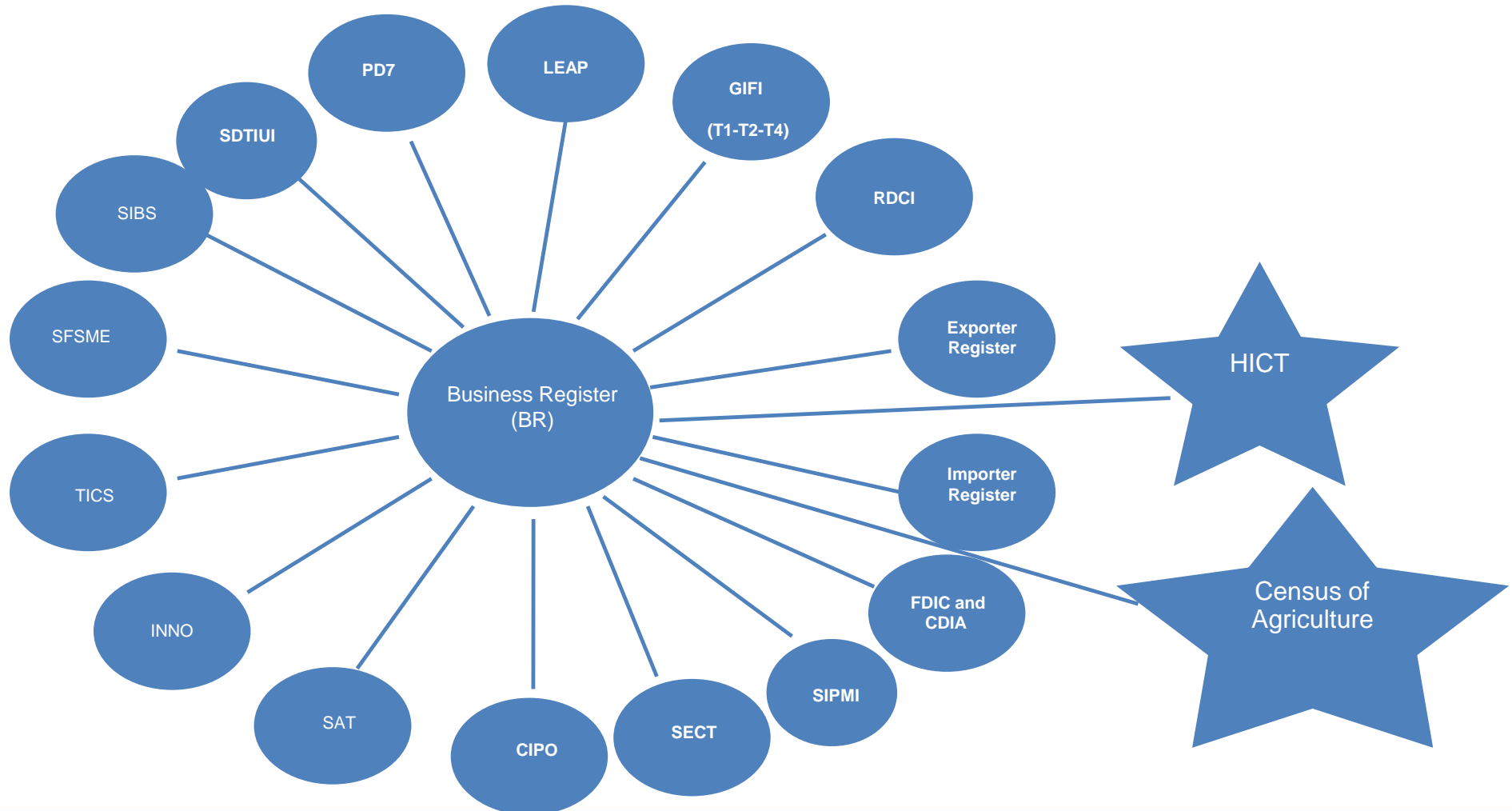
## Linkable File Environment

- The objective of LFE is to up date business linked files using the most recent available data from various sources of information. This file provides a longer series of data for longitudinal and cross-sectional analysis.
- The LFE includes data from the Business Register; corporate tax and payroll data, export and import register data, as well as a broad range of business surveys.
- [http://www23.statcan.gc.ca/imdb/p2SV\\_f.pl?Function=getSurvey&SDDS=6000](http://www23.statcan.gc.ca/imdb/p2SV_f.pl?Function=getSurvey&SDDS=6000)
- The Business Register of Canada is the main source of information for LFE

## Canadian Employer-Employee Dynamics Database

- Matched employer-employee linkage environment, 1983 to 2015
  - more variables are available after 2001, especially at the firm-level
- Covers the universe of individual tax filers: unincorporated businesses and corporations in Canada.
- Links across various administrative tax files on individuals and firms

# Overview of the Linkable File Environment



# Data sources (Administrative data)

- Business Register (BR) – 2000 - 2017 (SDDS 1105)
- Longitudinal Employment Analysis Program (LEAP) - 2000-2015 (SDDS 8013)
- General Index of Financial Information (GIFI - T1) Unincorporated Businesses -2005 – 2016
- General Index of Financial Information (GIFI-T2) Incorporated Businesses - 2000-2017
- Statement of Remuneration Paid (T4)– 2000-2016
- Payroll Deductions Account (PD7) - 2001- 2017
- Exporter Register - 2010-2017 (SDDS 2201)
- Importer Register - 2012 (SDDS 2201)
- Patents (Canadian Intellectual Property office) - 2001- 2006
- United States Patent Office (USPTO) Canadian Enterprises only - 2000- 2011
- HICT (Horizontal Innovation and Clean Tech) database - 2007-2016

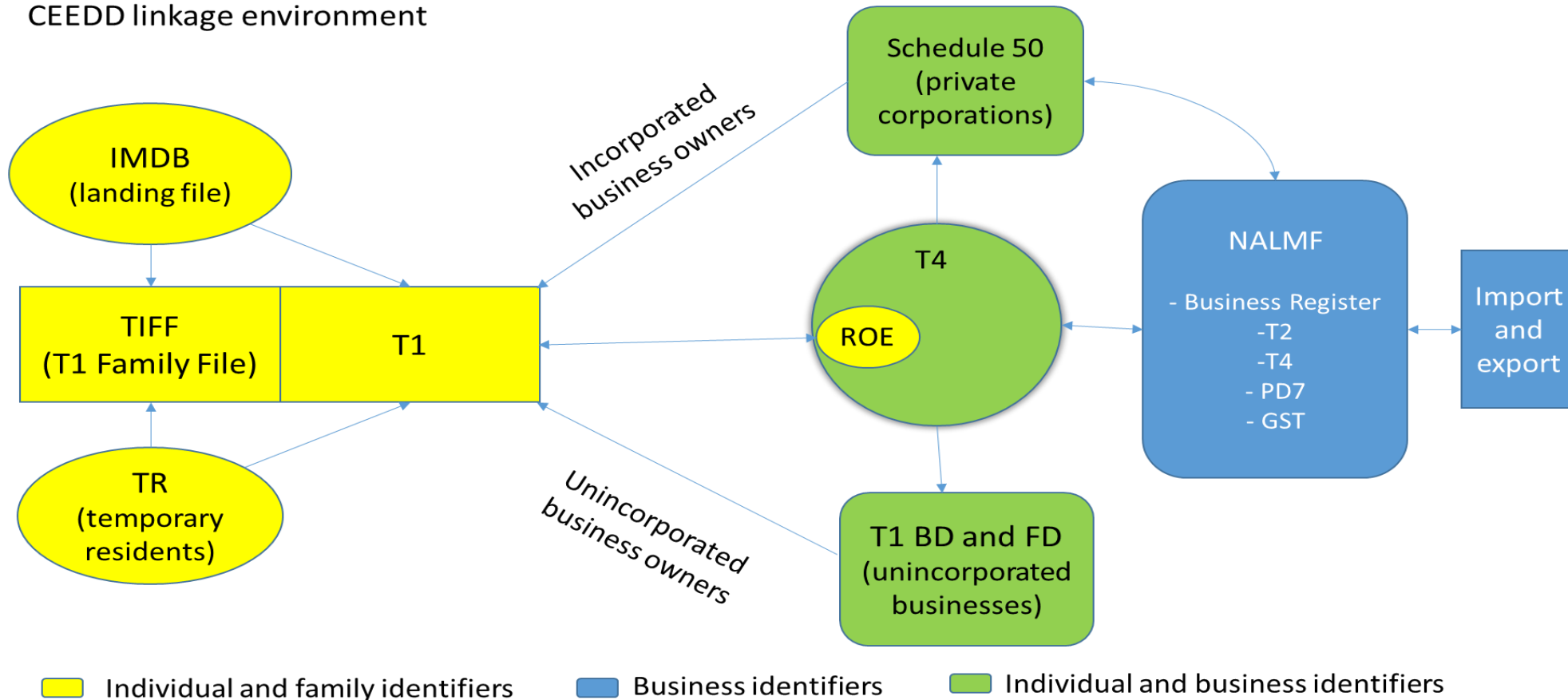
## Data sources (Survey data)

- Annual Survey of Research and Development in Canadian Industry (RDCI) – 2000 to 2013 (SDDS 4201)
- Canadian Direct Investment Abroad (CDIA) 2000-2013 (SDDS 1537)
- Foreign Direct Investment in Canada (FDIC) - 2000-2013 (SDDS 1537)
- Trade in Commercial Services (TICS) 2000-2014 (SDDS 1536)
- Survey of Innovation and Business Strategy (SIBS) 2009, 2012 (SDDS 5171)
- Surveys of Innovation (INNO) 2003, 2005 (SDDS 4218)
- Survey of Electronic Commerce Technology (SECT) 2000-2007 (SDDS 4432)
- Survey of Advanced Technology (SAT) 2007, 2014 (SDDS 4223)
- Survey of Commercialization of Innovation (COI) - 2007 (SDDS 5140)
- Survey on Financing and Growth of Small and Medium Enterprises (SFSME) - 2007, 2011, 2014 (SDDS 2941)
- Survey of Intellectual Property Management (SIPM) - 2010 (SDDS 5183)
- Survey of Digital Technology and Internet Use (SDTIU) – 2012, 2013 (SDDS 4225)
- Census of Agriculture- 2016



# Canadian Employer-Employee Dynamics Database – linkage environment

CEEDD linkage environment



# CEEDD: overview and use

- Contains information for 3 main fields:
  - Employees (demographic, immigrant status, employment income, etc.)
  - Firms (business type, employment, payroll, revenue, expense, profit, workforce, etc.)
  - Business owners (demographic, ownership type, ownership share, income from business)
  
- Possible Uses
  - Self-employment and business ownership
  - Interaction between workers and firms
  - Immigrant business ownership
  - Immigrants' initial firm allocation

# Some research possibilities

## Firms

- Explaining trends in patenting
- Analyzing the link between R&D and patenting
- Studying the link between patenting (and patenting strategies) on firm performance
- Examining the impact of a change in ownership on R&D and patenting
- Examining spillovers effects of patenting and R&D

## Business owners

- Examining the socio-demographic characteristics of the business owner (e.g., age, gender, nation of origin) and patenting

## Inventors

- Studying the diffusion of knowledge as inventors move between firms, from employee to business owner, from public sector to private sector, or from student to employee, or from student to business owner

# Access to business microdata

Canadian Centre for Data Development and Economic Research

- Established in 2011 at Statistics Canada's headquarters to provide secure access to business microdata for approved analytical research projects
- Cost-recovery operation – researchers must cover the cost of their project
- Used by over 100 researchers from about 30 Canadian and foreign academic institutions, 16 federal government departments and agencies, provincial government and non-profit institutions



# For more information:

Patent Research Database and Canadian Employer-Employee Dynamics Database

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Linkable File Environment

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Canadian Centre for Data Development and Economic Research

Access to business microdata, [www.statcan.gc.ca/cder](http://www.statcan.gc.ca/cder)

[Statcan.cder-cdre.statcan@canada.ca](mailto:Statcan.cder-cdre.statcan@canada.ca)

Social Data Linkage Environment

[www.statcan.gc.ca/eng/sdle/index](http://www.statcan.gc.ca/eng/sdle/index)

[STATCAN.SDLE-ECDS.STATCAN@canada.ca](mailto:STATCAN.SDLE-ECDS.STATCAN@canada.ca)