Enhance Canada's Innovation Ecosystem

Sector Specific Strategies for Global Completeness

MIE 1624 Group Project

Presenters: Group 10

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DEFY GRAVITY

Introduction

- Canada’s Current Global Standing in Innovation
- Canada's Innovation Policies and Key Sectors
- Comparison of Canada to US and Sweden Across Key Sectors
- Main drivers for Canada’s Innovation in Key Sectors
- Recommendations on Building Canada’s Innovation Ecosystem

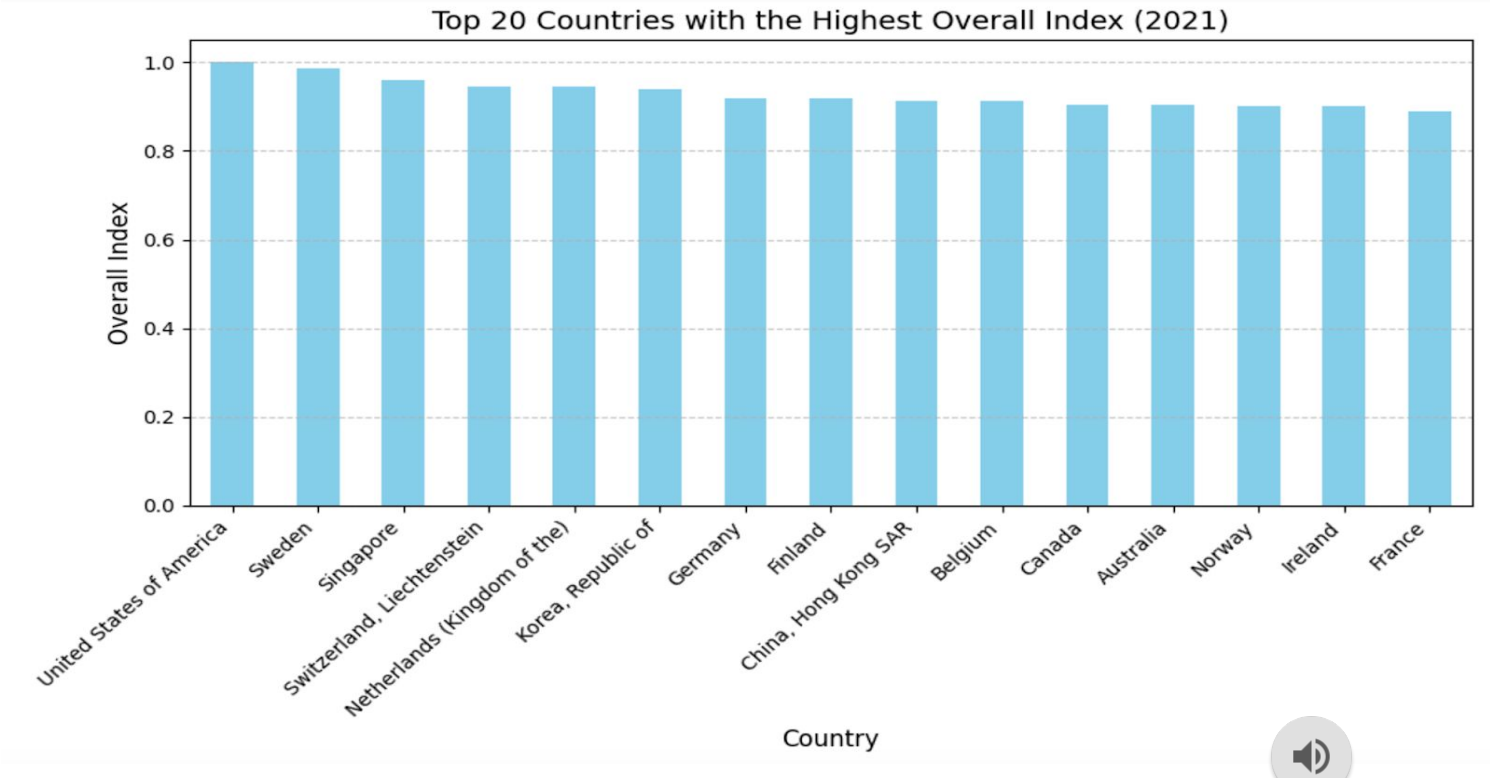
Introduction

Dataset for data collection: The Global Innovation Index (GII) which includes six key features below

- **Overall Index**
- **ICT（Information and Communication Technology）**
- **Skills**
- **Research and Development**
- **Industry Activity**
- **Access to Finance**

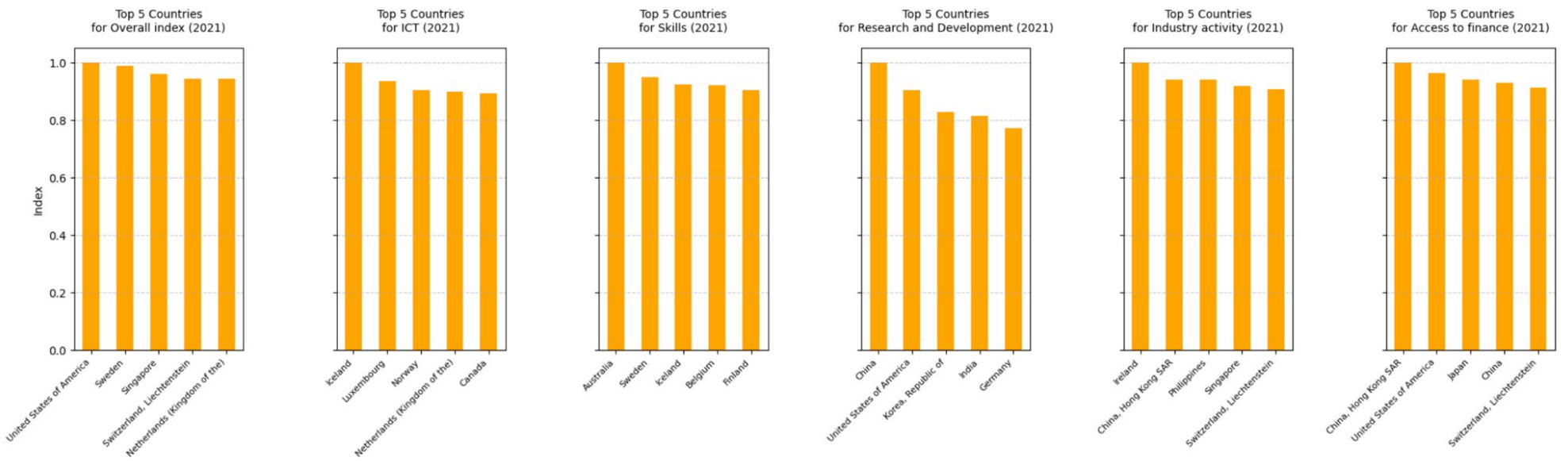
Canada's Current Global Standing in Innovation

- The top three countries in the 2021 Global Innovation Index: US, Sweden, and Singapore
- Canada ranks 11th.



Canada's Current Global Standing in Innovation

Figure 3: Top 5 Countries Across Various Categories (2021)



Among the top 5 countries across various categories of GII, Canada is 5th in ICT in 2021 but does not place in the top 5 for any other features.

Canada’s Current Global Standing in Innovation

R&D (Moderate Performance):

Canada has a stable but relatively lower R&D index compared to Sweden, the US, and Singapore.

ICT (Weakness):

Canada consistently shows lower ICT scores compared to the US, Sweden.

Skills Development (Strength):

Canada maintains a strong and stable skills index, comparable to Sweden and the US, reflecting its robust education system and workforce training.

Access to Finance (Strength):

Canada performs well in access to finance, with consistent scores comparable to global leaders,.

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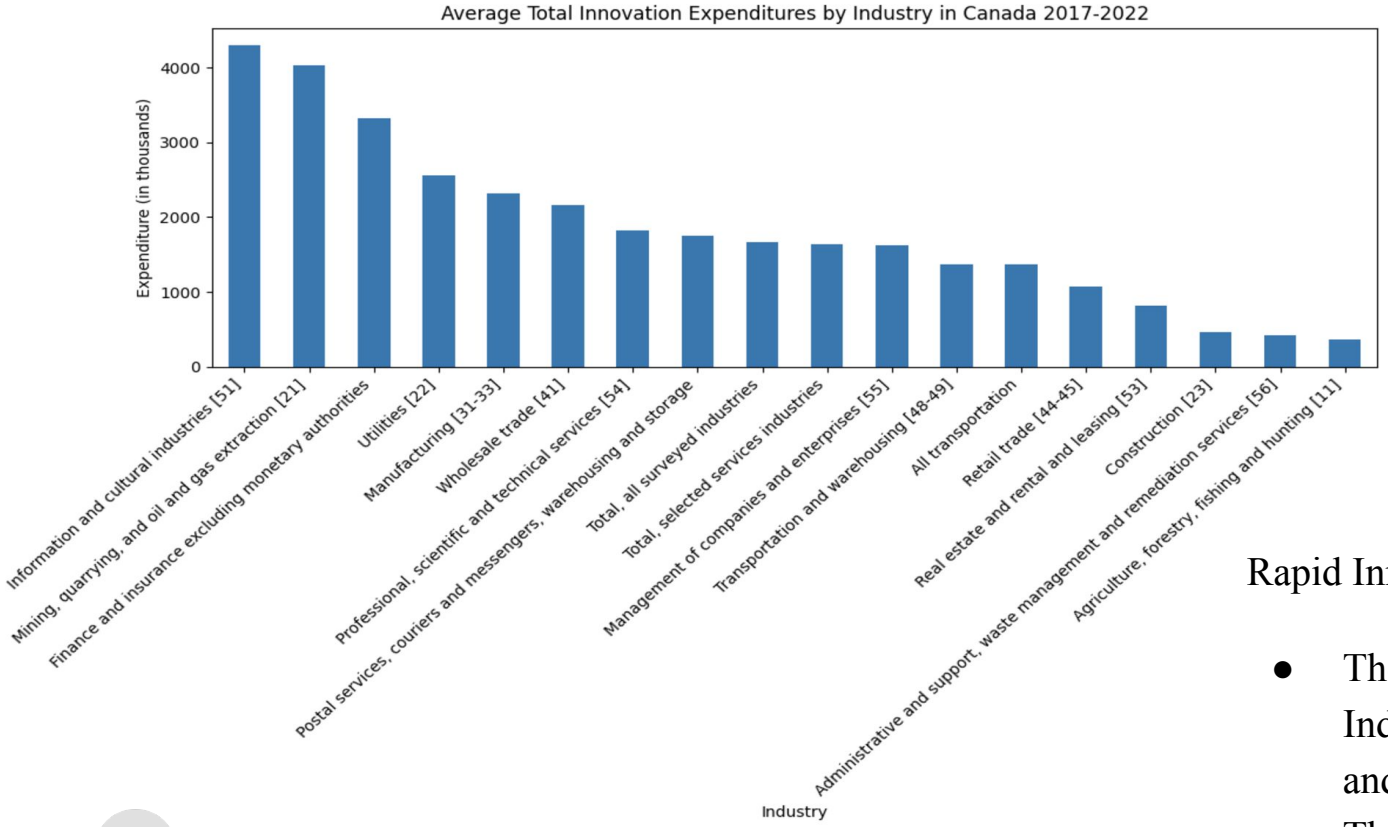
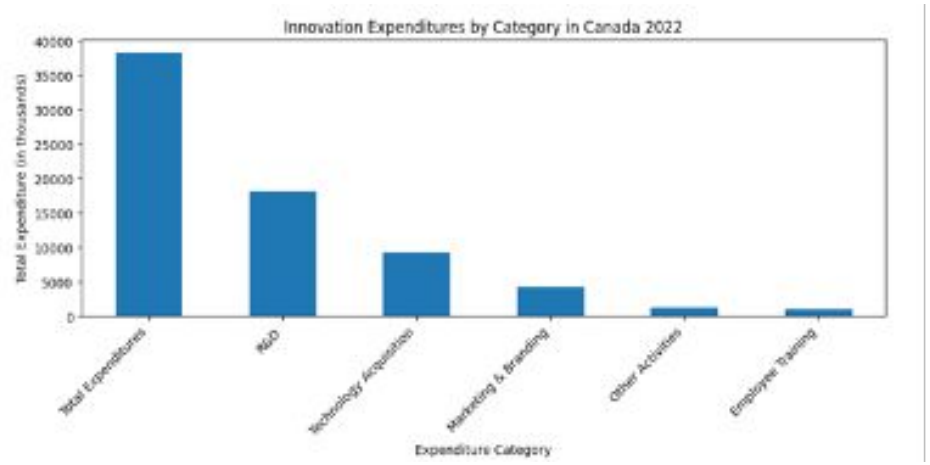
Canada's Innovation Policies and Key Sectors

Canada’s Average Total Expenditure by Sectors in 2022





Rapid Innovation expenditure growth since 2019.

- The largest investments (2022): Information and Cultural Industries (ICT), Mining, Quarrying, Oil and Gas Generation, and Finance and Insurance
- The most common category of innovation expenditure: R&D, Technology Acquisition and Marketing and Branding.

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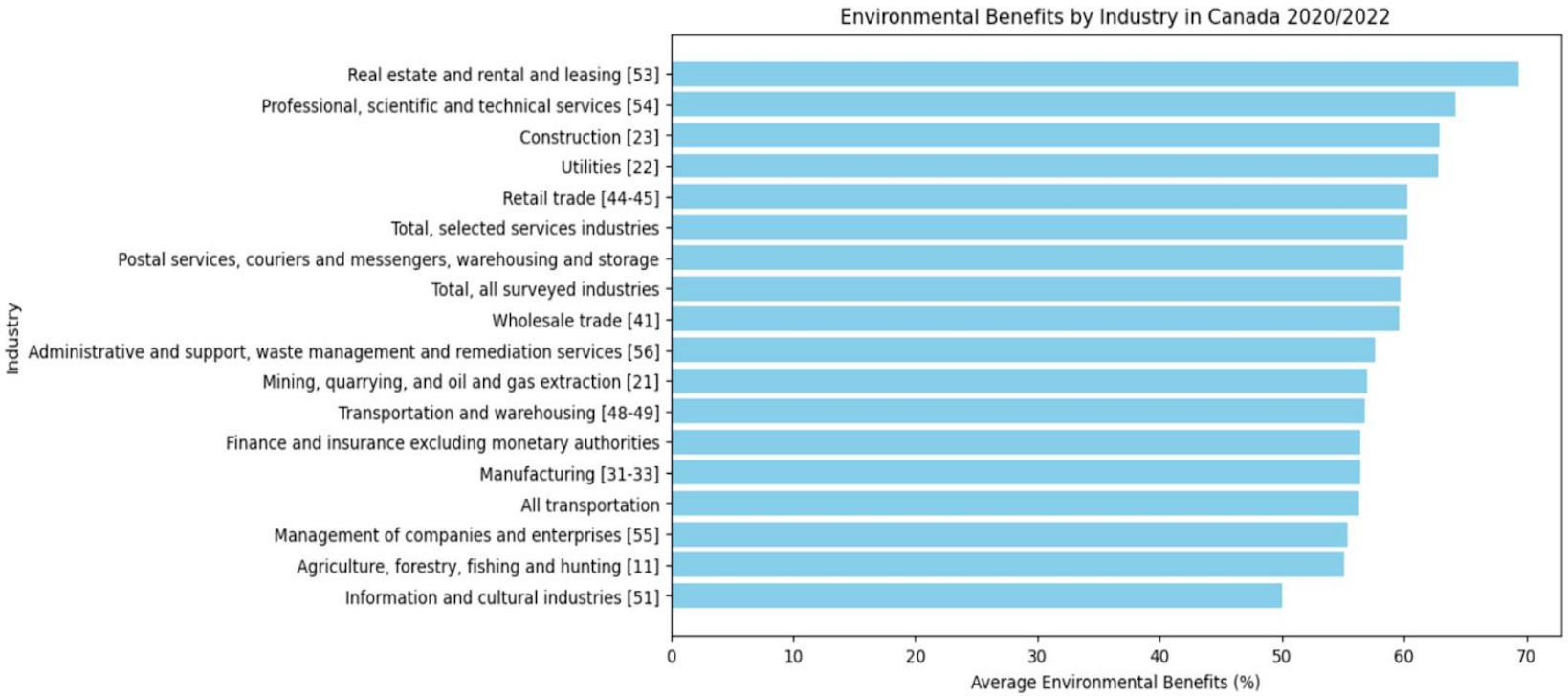
Canada's Innovation Policies and Key Sectors

Canada’s Environmental Benefits by Industry in year 2020/2022



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Canada's Innovation Policies and Key Sectors

Canada’s Three Key Sectors to Explore:

- **Professional, Scientific and Technical Services**: Innovation-driven, significant R&D expenditure ($1,488.75M in 2022), high environmental benefits (64.200), and potential for improvement in R&D capabilities (GII 2021 score: 0.6934).
- **Information and Cultural Industries**: Strong ICT performance (GII 2021 score: 0.8929, top 5 globally), substantial expenditures ($2,105.25M in 2022), and opportunities to align digital innovation with sustainability (environmental score: 50.050).
- **Manufacturing**: Economic cornerstone ($1,459.25M in 2022), moderate environmental benefits (56.400), and potential to modernize through green manufacturing and innovation (lower GII "Industry activity" ranking).

Canada's Innovation Policies and Key Sectors

1. **Professional, Scientific and Technical Services:**

Strengths: Strong innovation potential through R&D and consultancy, significant environmental benefits (64.200), and notable economic presence with $1,488.75 million in expenditures (2022).

Weaknesses: Canada's R&D score (0.6934) in the Global Innovation Index indicates room for improving research capabilities and outputs.

2. **Information and Cultural Industries:**

Strengths: High economic engagement with $2,105.25 million in expenditures, and strong ICT sector performance with a top global ranking (0.8929).

Weaknesses: Lower environmental benefits (50.050), suggesting a need to better align digital innovation with sustainability.

3. **Manufacturing**

Strengths: Vital economic role with $1,459.25 million in expenditures, and potential for green innovation through eco-friendly manufacturing.

Weaknesses: Moderate environmental benefits score (56.400) and lower innovation contributions in "Industry activity," requiring modernization and sustainable integration.

Comparable Studies with Sweden and Canada

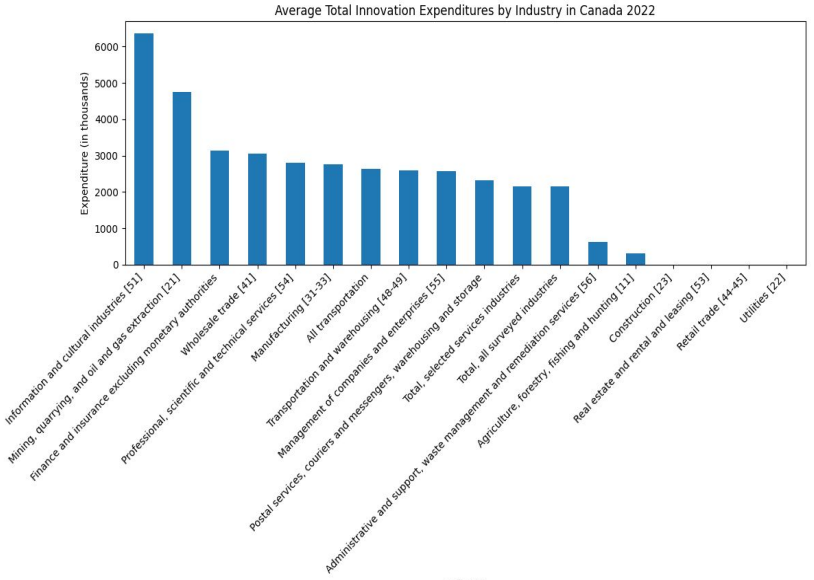
Canada and Sweden’s Total Expenditure in 2020 by Sectors

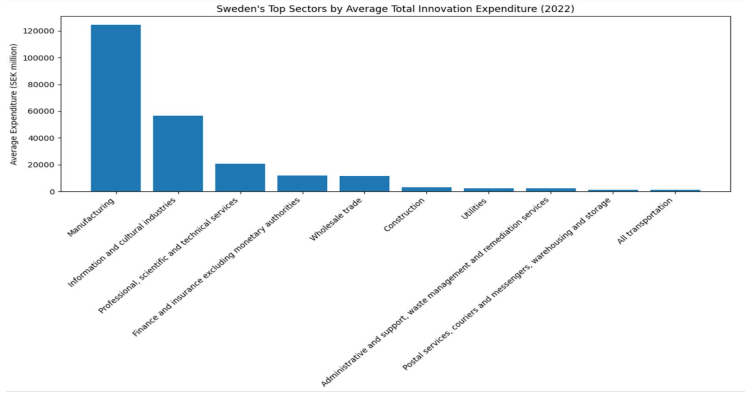
Similar sectoral focuses on innovation activities, with "Information and Cultural Industries" ranking high for both (1st for Canada, 2nd for Sweden).

Sweden prioritizes “Manufacturing” as its top focus, while it ranks 6th for Canada.

"Professional, Scientific, and Technical Services" is Sweden's 3rd focus but Canada's 5th.

Canada emphasizes innovation in Mining, Quarrying, and Oil and Gas Extraction, a sector of lesser importance for Sweden's innovation efforts.

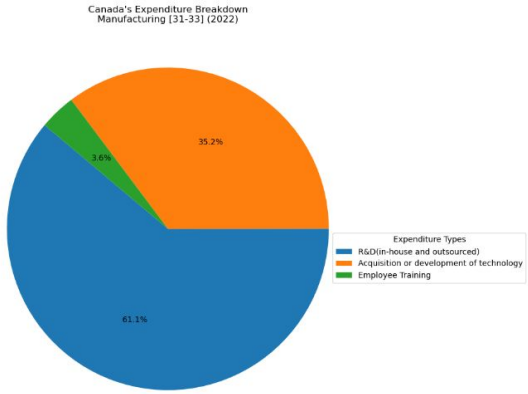


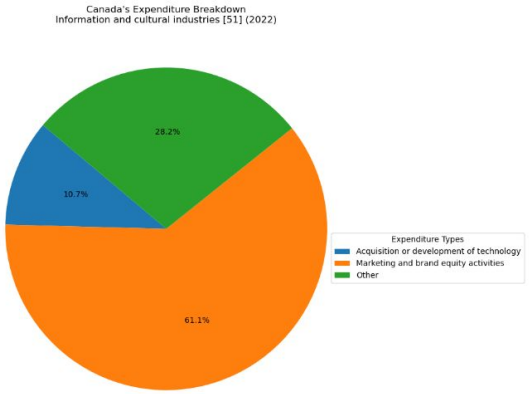


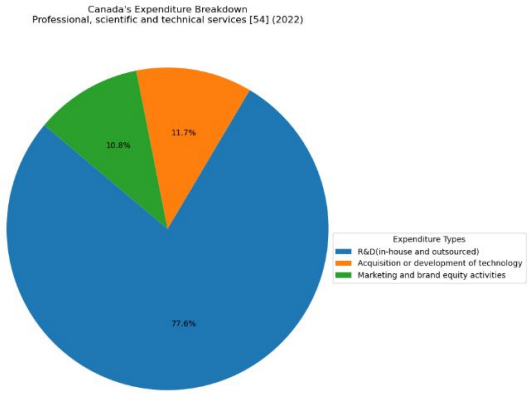
Comparable Studies with Sweden and Canada

- Composition of Innovation Expenditure on three Key Sectors

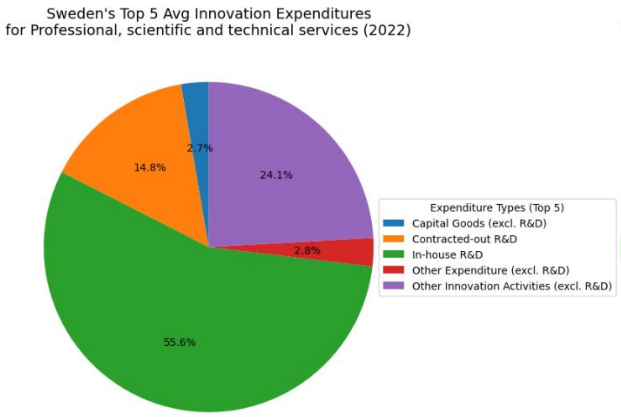
Canada

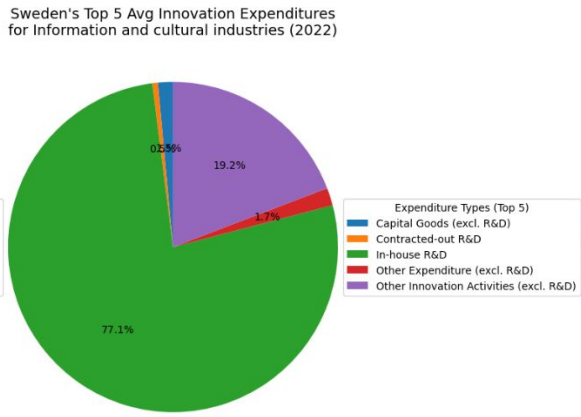


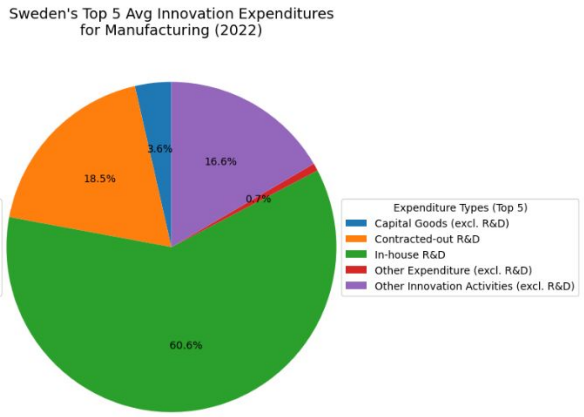




Sweden







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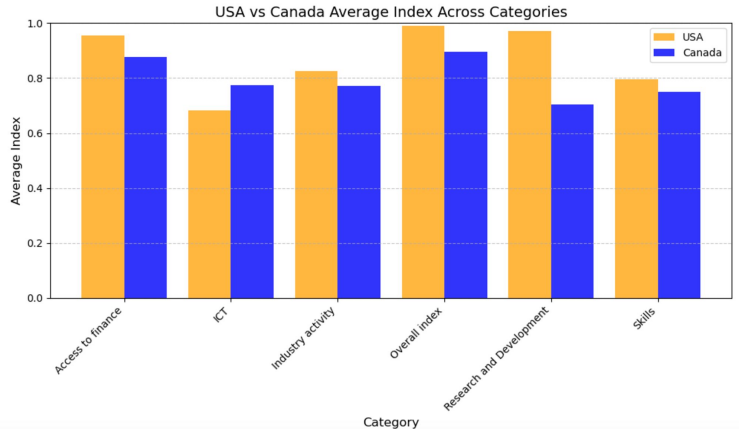
Comparable Studies with US and Canada

The US surpasses Canada in innovation with greater investments in R&D, skills development, and industry activity, alongside significant capital expenditures in the information ($253.9B) and manufacturing ($314.3B) sectors. Despite strengths in ICT and access to finance, Canada lags in these areas.

To catch up, Canada should:

- Increase R&D funding through tax incentives and grants.
- Strengthen industry-academic collaboration.
- Address skill gaps, especially in manufacturing.
- Attract global talent, foster international partnerships, and invest in green technologies.

These measures can enhance Canada's competitiveness and foster a sustainable innovation ecosystem aligned with global leaders.



US and Canada's GII index

Professional, Scientific, and Technical Services

Capital Expenditures for Structures and Equipment for Companies with Employees: 2022 and 2021 Revised (Billions of current dollars)

Capital expenditures	2022	2021	% Change	
Total Professional, Scientific, and Technical Services	**45.0**	**46.4**	**-3.0%**	**NS**
Structures	10.8	10.9	-1.1%	NS
Equipment	34.2	35.5	-3.6%	NS

Source: U.S. Census Bureau, 2022 Annual Capital Expenditures Survey

Information

Capital Expenditures for Structures and Equipment for Companies with Employees: 2022 and 2021 Revised (Billions of current dollars)

Capital expenditures	2022	2021	% Change
Total Information	253.9	195.0	**30.2%**
Structures	75.0	53.3	**40.8%**
Equipment	178.9	141.7	**26.2%**

Source: U.S. Census Bureau, 2022 Annual Capital Expenditures Survey

Manufacturing

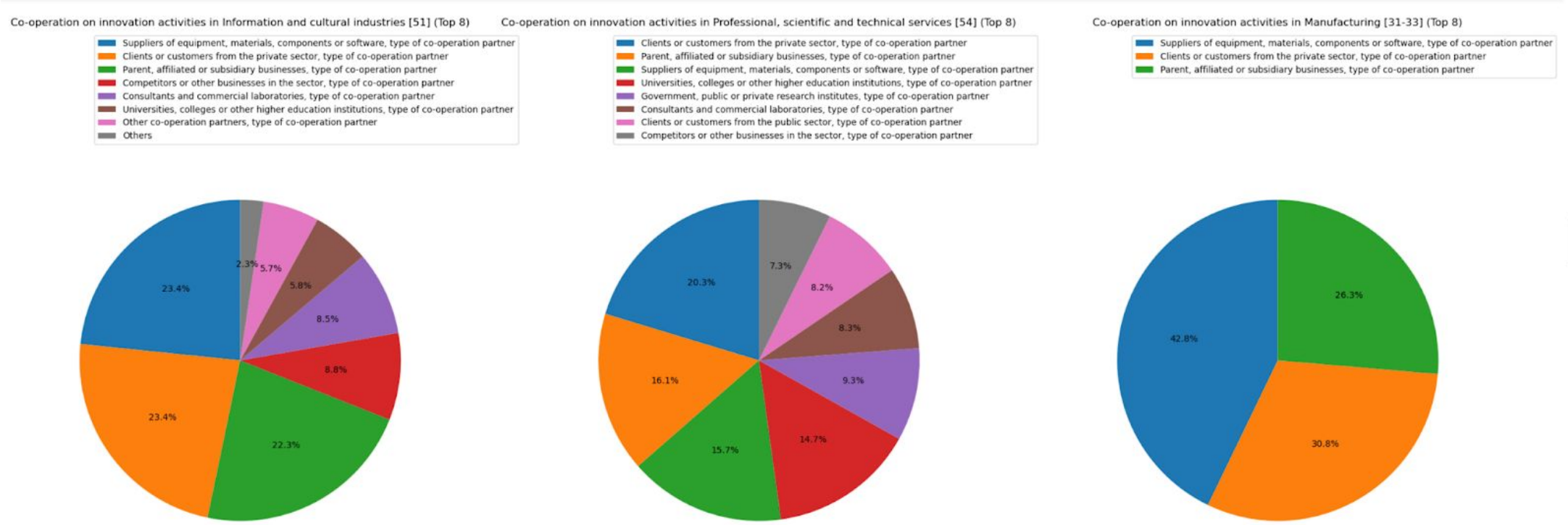
Capital Expenditures for Structures and Equipment for Companies with Employees: 2022 and 2021 Revised (Billions of current dollars)

Capital expenditures	2022	2021	% Change	
Total Manufacturing	**314.3**	**284.2**	**10.6%**	
Structures	76.5	68.6	**11.5%**	
Equipment	237.8	215.5	**10.3%**	
Durable Goods Industries	**179.1**	**155.3**	**15.3%**	
Structures	39.7	32.9	**20.9%**	
Equipment	139.3	122.5	**13.8%**	
Nondurable Goods Industries	**135.2**	**128.8**	**5.0%**	
Structures	36.8	35.8	**2.9%**	NS
Equipment	98.4	93.1	**5.8%**	

Source: U.S. Census Bureau, 2022 Annual Capital Expenditures Survey

US Expenditure On the Three Key Sectors.

Canada’s Potential Factors Influencing Innovation in Key Sectors



Canada’s Co-operation on innovation activities for key sectors 2020/2022

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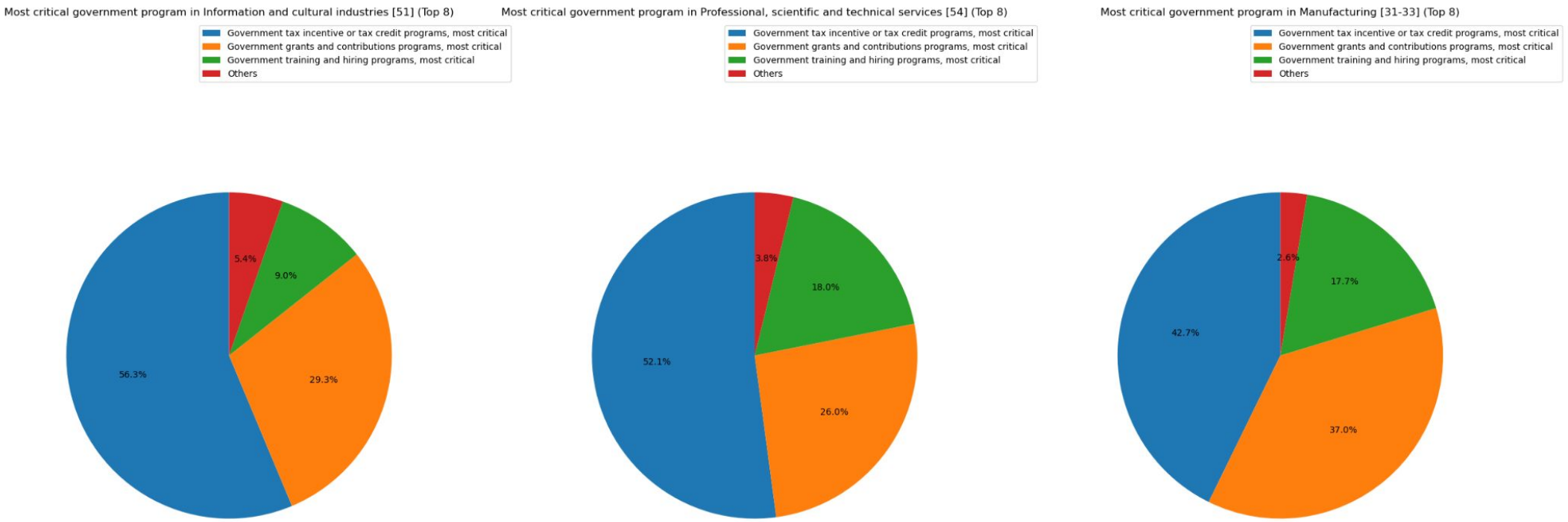
Canada’s Potential Factors Influencing Innovation in Key Sectors



Canada’s most critical government program for key sectors 2020/2022

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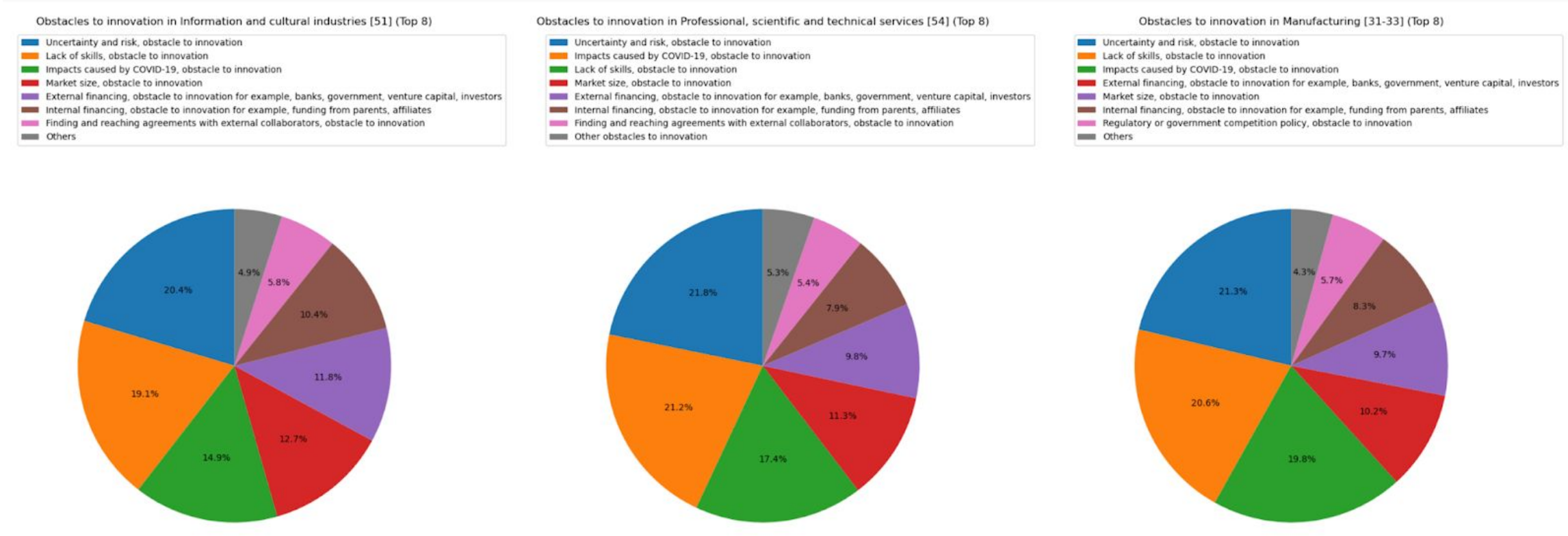
Obstacles in Canada’s Innovation Strategy



Obstacles to Canada's innovation on Key Sectors 2022

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Enhancing Canada's Innovation Ecosystem

Recommendations

1. Professional, Scientific, and Technical Services
Program: Government-Academic-Industry Research Consortium (GAIRC)

- **Objective**: Boost R&D and tech transfer through structured collaborations.
- **Initiatives**:
  - Grants for applied research in AI, biotech, and sustainability.
  - Internships linking researchers with industry-academic projects.
  - R&D tax incentives for high-risk, long-term projects.
  - Defense innovation funding to foster private-sector involvement.
- **Expected Impact**: Strengthen Canada's R&D capacity, foster innovation, and bridge gaps in university-government cooperation.

Recommendations

2. Information and Cultural Industries
Program: Digital Innovation and Sustainability Accelerator (DISA)

- **Objective**: Advance ICT leadership and sustainability in digital industries.
- **Initiatives**:
  - Fund university-industry projects in AI, VR, and green digital tech.
  - Promote international ICT partnerships for innovation and exports.
  - Engage Canadian ICT professionals abroad as mentors for startups.
  - Provide tax incentives for sustainable ICT practices.
- **Expected Impact**: Boost global ICT leadership, foster sustainability, and expand international market access for Canadian innovations.

Recommendations

3. Manufacturing
Program: Advanced Green Manufacturing Initiative (AGMI)

- **Objective**: Modernize manufacturing with eco-friendly and advanced technologies.
- **Initiatives**:
  - Grants for green technologies in clean energy and circular economy.
  - Technology transfer from global manufacturing leaders.
  - Workforce development via apprenticeships in robotics and IoT.
  - Secure international funding for sustainable manufacturing projects.
- **Expected Impact**: Enhance sustainability, boost competitiveness, and establish Canada as a global leader in green manufacturing.

Thank You!

Q/A