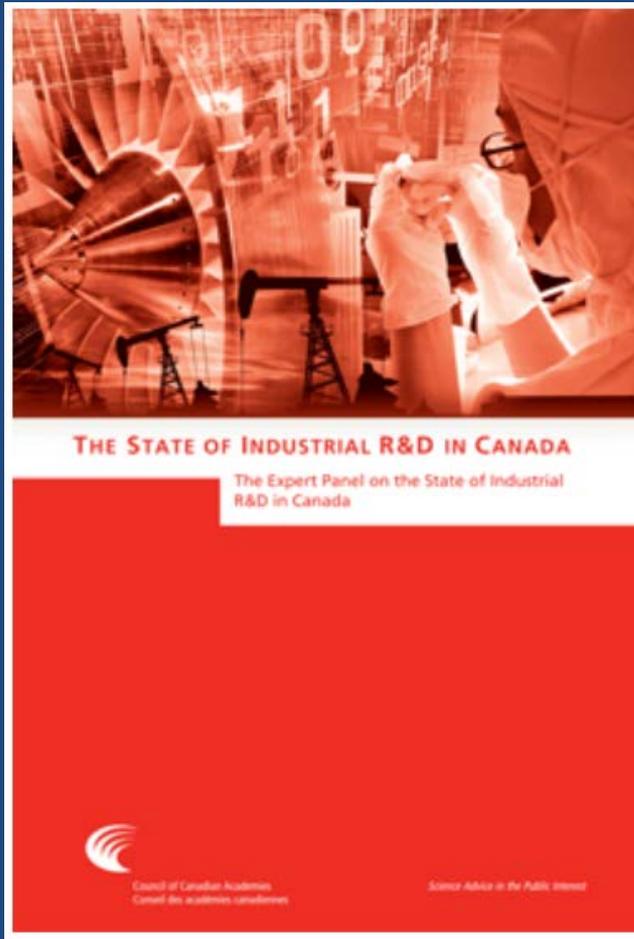


# The State of Industrial R&D

Aled ab Iorwerth

Council of Canadian Academies

# The Council of Canadian Academies' Report on the State of Industrial R&D



- Panel of experts (mostly business)
- Comprehensive examination of input and output statistics on business R&D (all industries)
- Strengths:
  - ICT
  - Aerospace
  - Oil and gas extraction
  - Pharmaceuticals

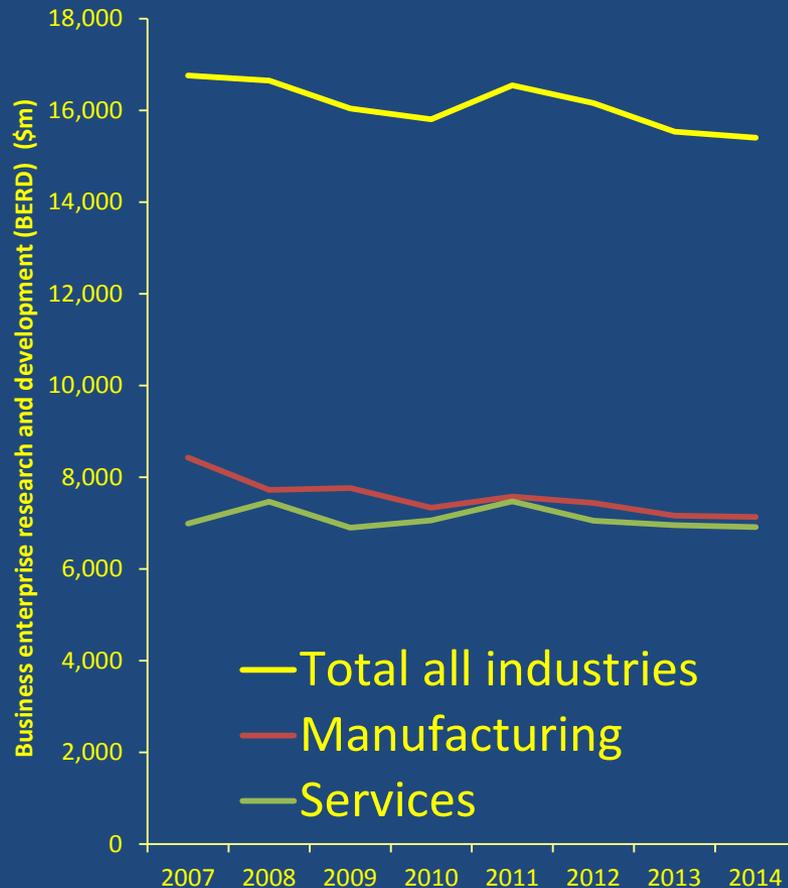
# What are the data on ICT?

- In separate NAICS industries
- Data talk to industry performance as a whole, not individual companies
- Draw lessons from Canada's overall R&D performance
- Data inhibits closer look at some aspects of ICT R&D

# Statistical challenges

- Timeliness (nominal GDP, OECD)
- Assignment of firms to NAICS industries (wholesale trade, R&D services)
- There are detailed data on patents. Reinforce view of Canadian strength in ICT

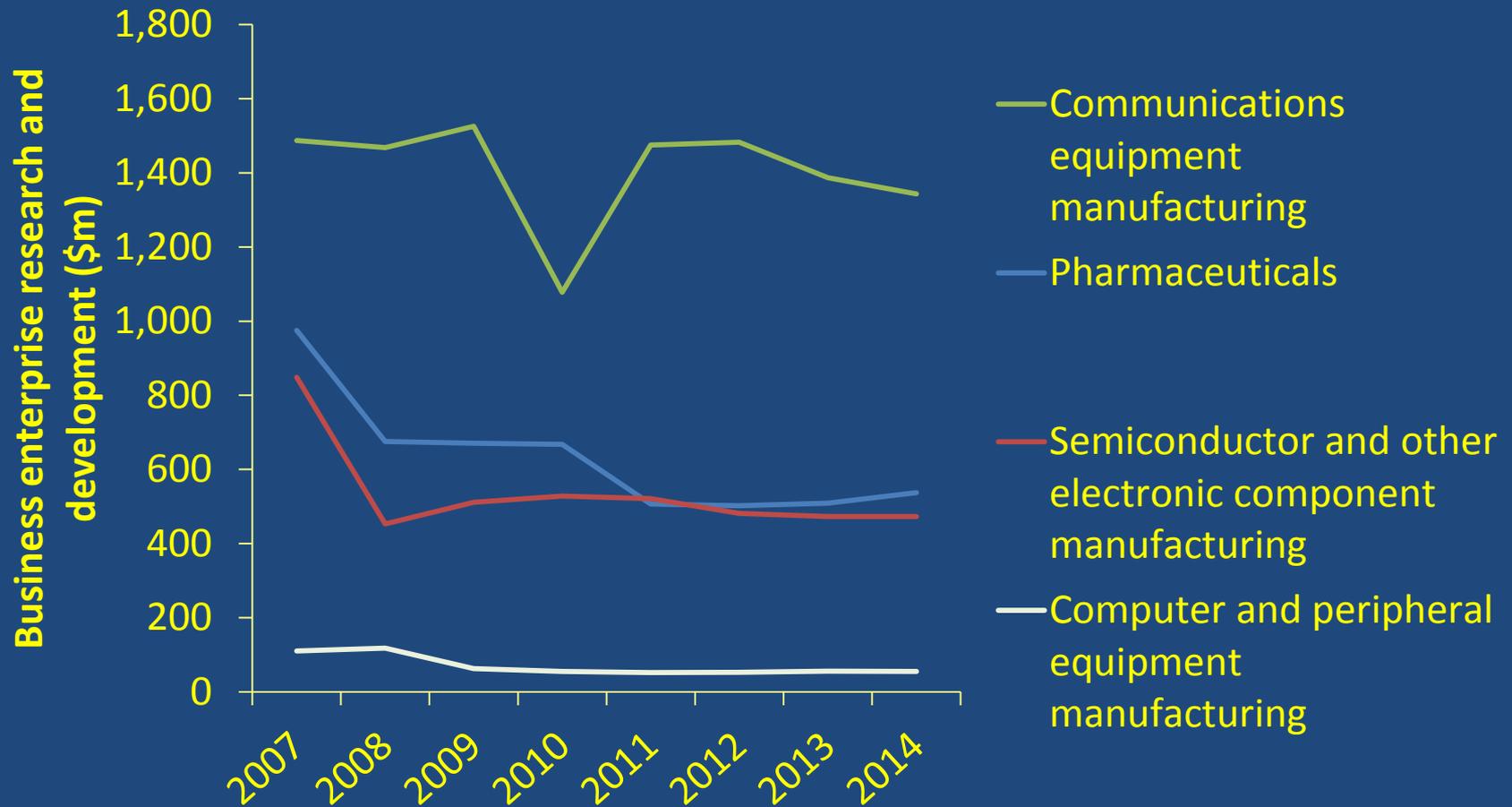
# What were the findings of the CCA?



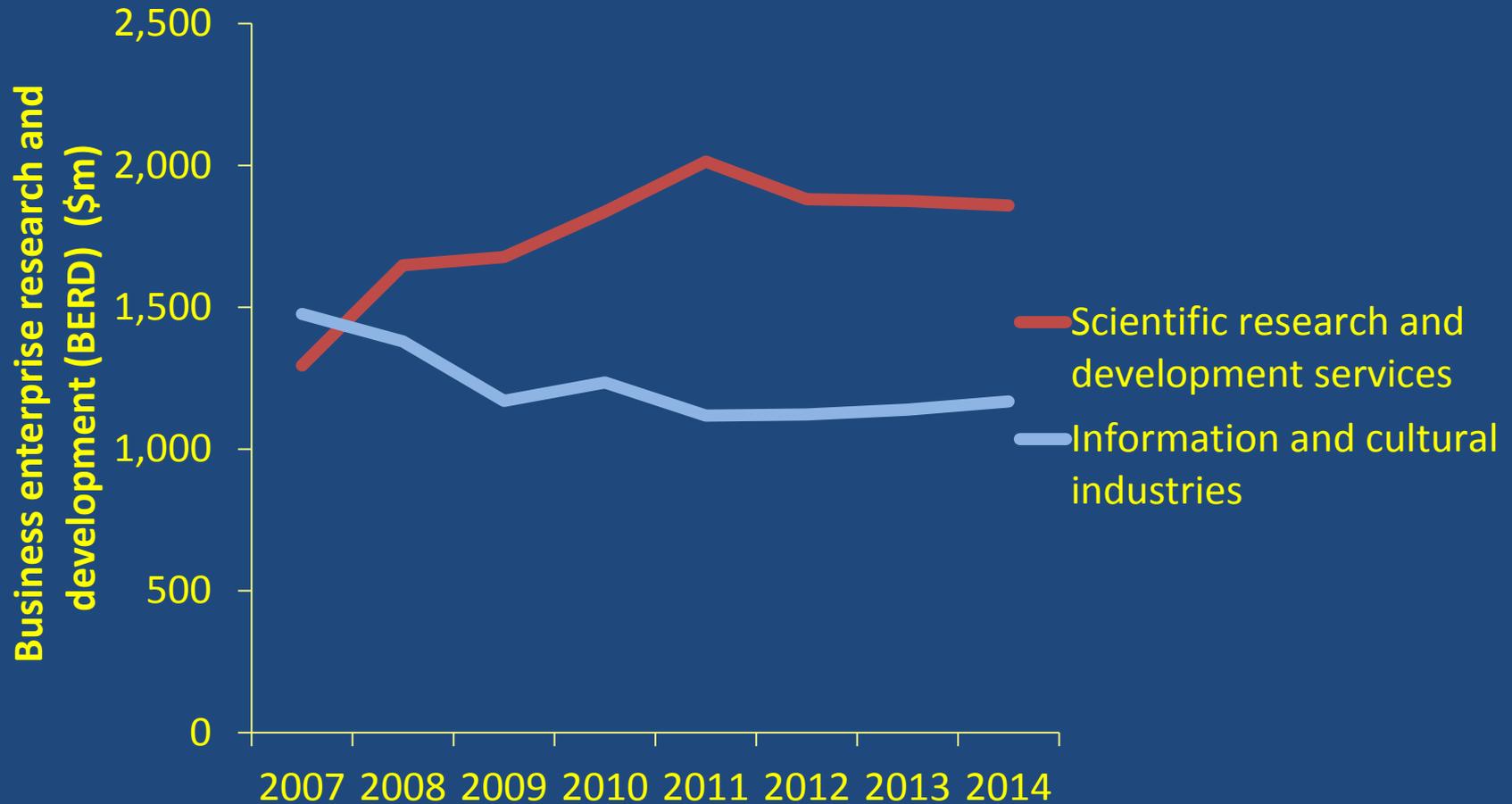
For R&D as a whole:

- Concern over trend
- Proportionately less R&D in manufacturing than in other countries
- R&D intensity in Canadian manufacturing overall is lower than in U.S.

# Evolution of R&D in “ICT manufacturing” and pharma.



# Evolution of R&D in “ICT services”

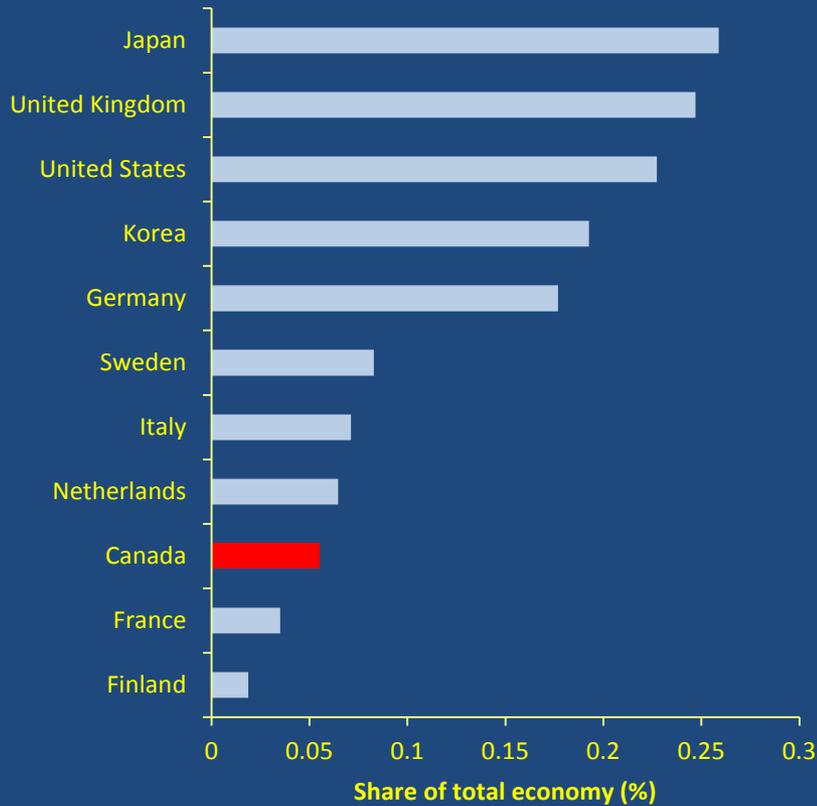


# Reasons for gap with U.S.

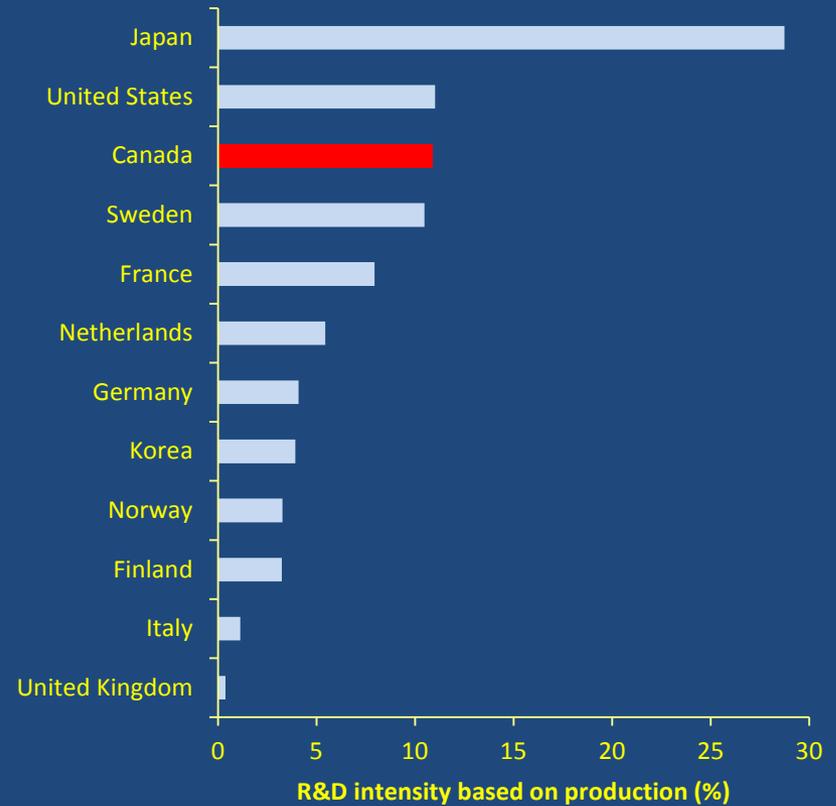
- Smaller R&D-intensive industries
- Larger share of Canadian manufacturing in paper, wood products, non-metallic minerals, etc.
- Autos ??
- Data are increasingly difficult to compare with U.S. on an industry basis

# R&D Intensity and size: Office, accounting and computing machinery (2006)

## Relative size

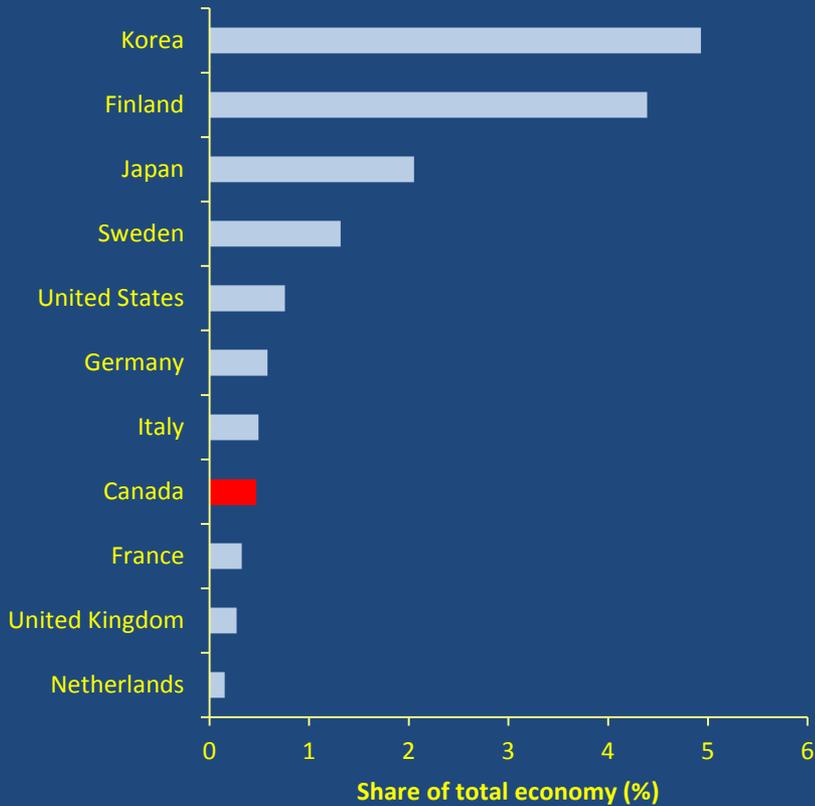


## R&D intensity

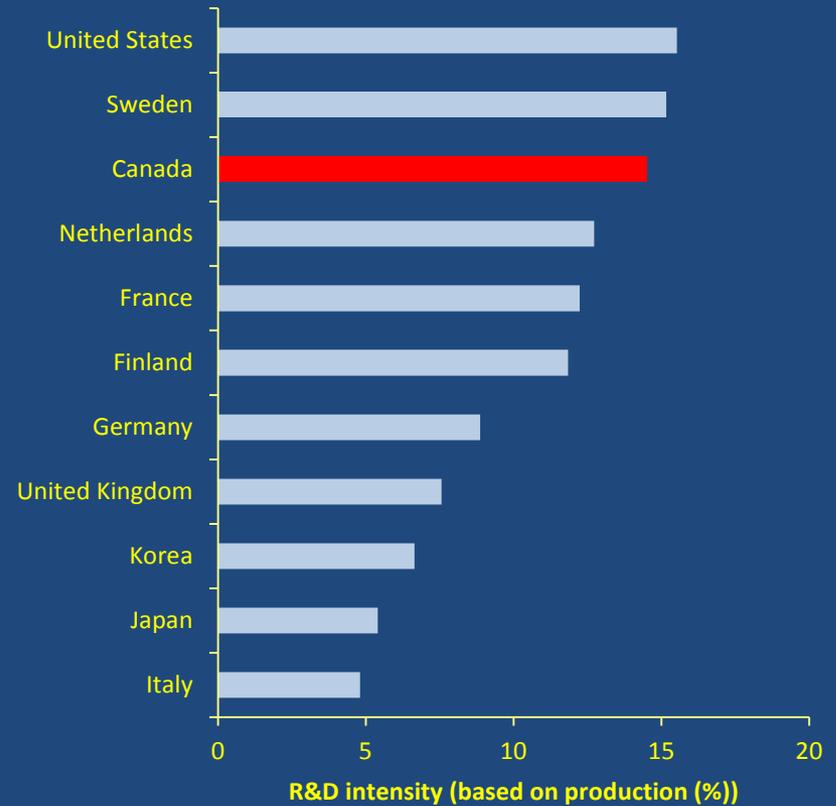


# R&D Intensity and size: Radio, television and communication equipment (2006)

## Relative size

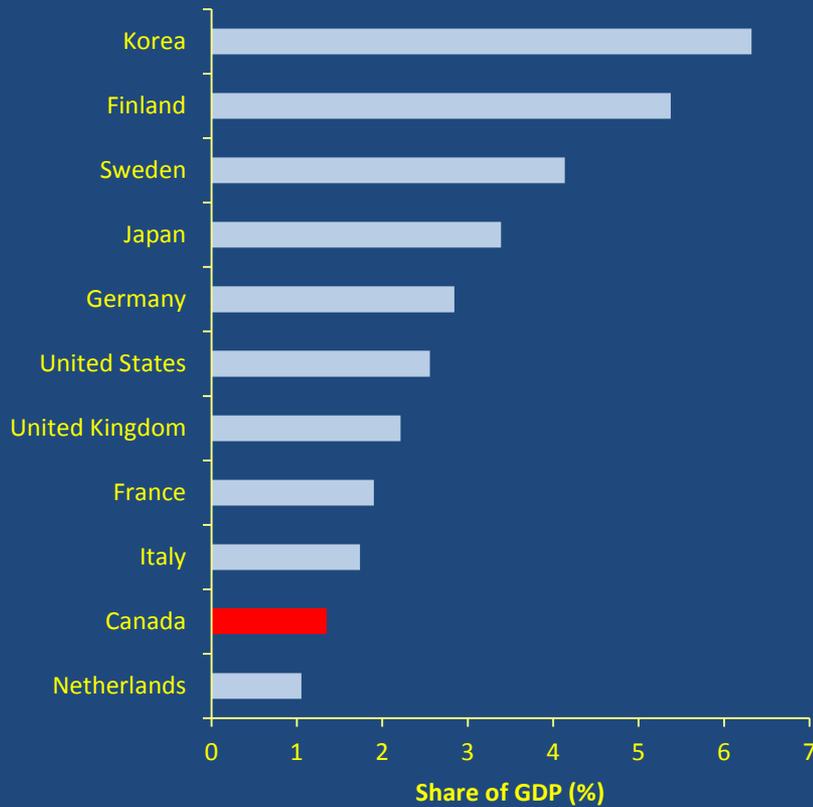


## R&D intensity

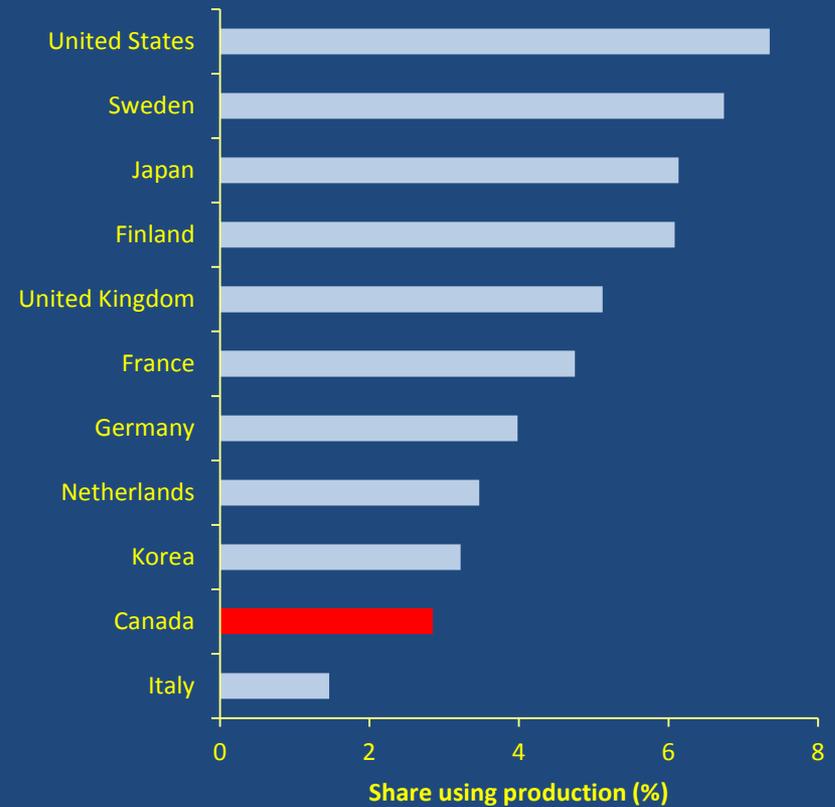


# R&D Intensity and size: High-technology manufacturing industries

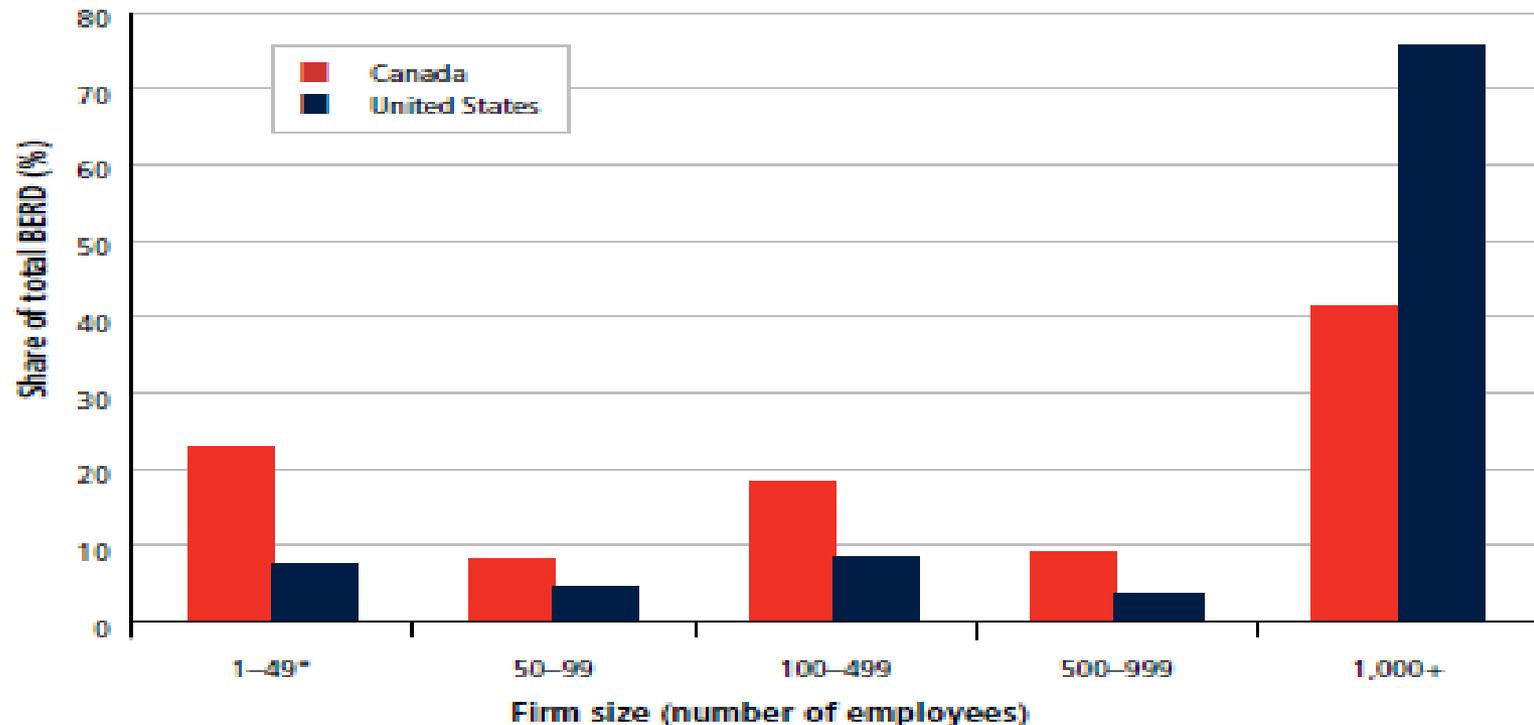
## Relative size



## R&D Intensity



# R&D by firm size, all industries



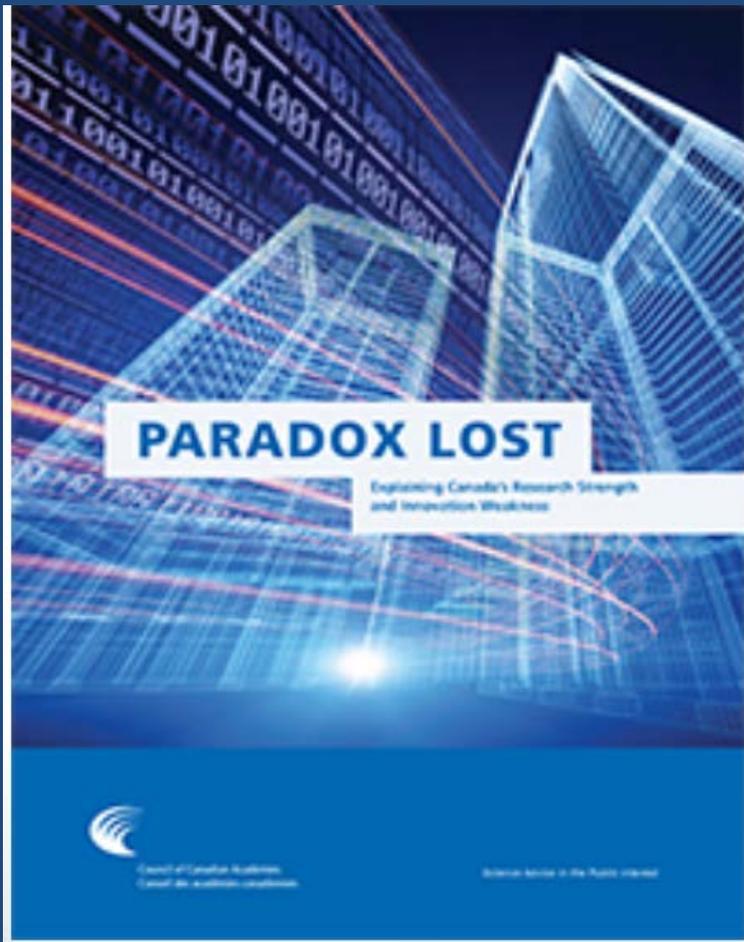
\*Canadian data are for firms with more than one employee. U.S. data are for firms with five or more employees.  
Data source: Panel calculations based on Statistics Canada (2012b) and Rausch (2010)

*Figure 2.8*

## **BERD by Firm Employment Size in Canada and United States, 2009**

The figure compares the distribution of BERD across different firm sizes in Canada and the United States. A greater share of IR&D expenditures tends to take place in larger firms in the United States.

# Paradox Lost



“[A]s more Canadian firms, out of sheer necessity, develop strategies that focus on innovation, they will create a much more powerful ‘business-pull’ on Canada’s strong S&T capacity.”

# Implications for ICT

- Canadian firms in ICT are highly R&D intensive
- Statistics suggest high rate of patenting
- Relatively a small part of the economy
- Proportionately smaller firms (?)