# International Trends in Business Innovation Policies and How Canada Measures Up

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# This presentation:

- Highlight some salient findings from the 2010 study entitled ‘Business Innovation Policies : Selected Country Comparisons’.

- Comparative statistics on Canada.

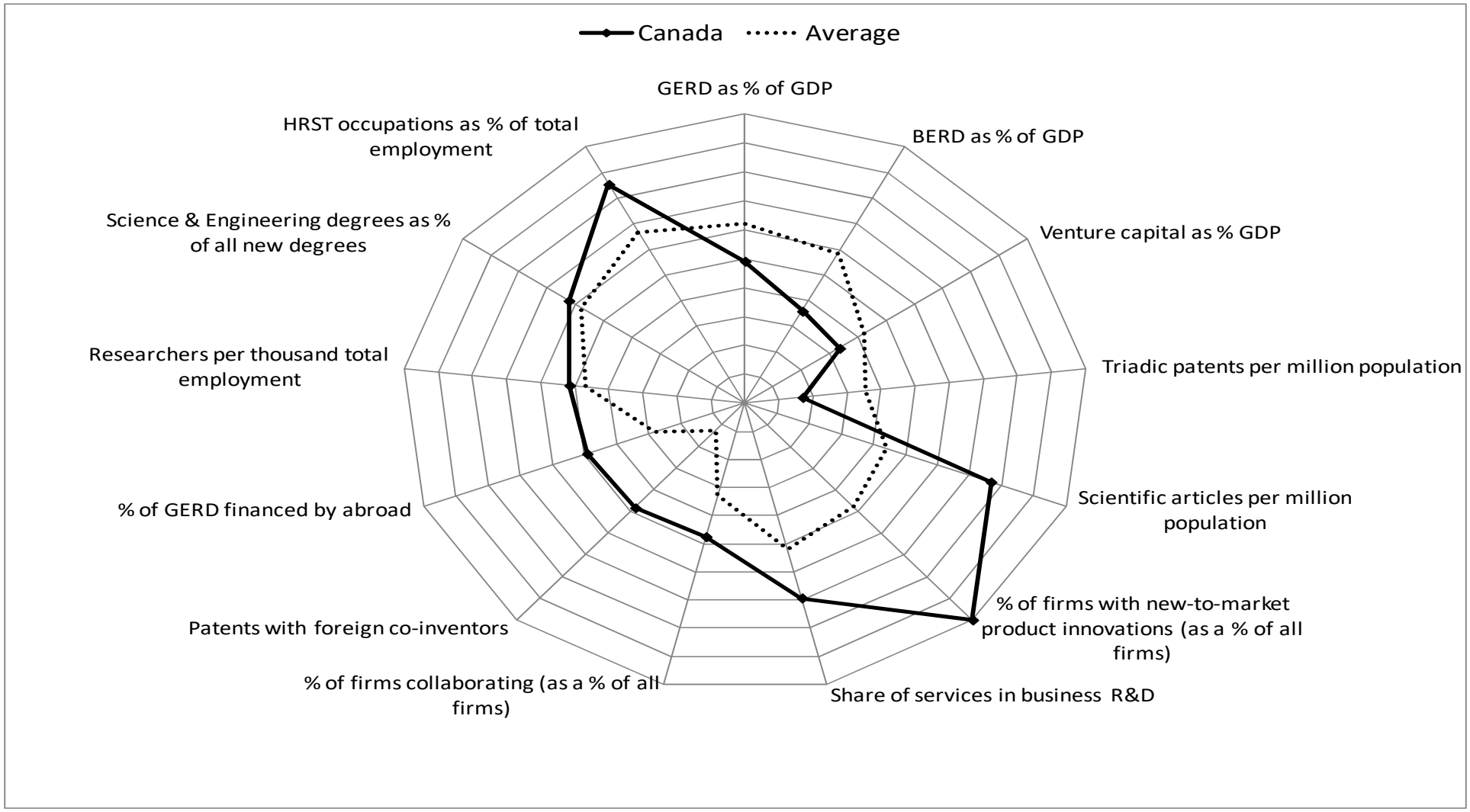
- Discuss a selection of good practices in innovation support, including demand-side measures and the evaluation challenge.

- Close with a few open questions on Canada.

# General trends in business innovation policies

- Growing attention to the demand side:
  - Public procurement and regulations
  - Crafting policy interventions that work with the market
- Growing use of indirect support and increasing generosity of tax credits in some countries
- Shift in direct support – less defence R&D – more to key enabling technologies (health, energy, environment, ICTs).
  - Direct support much more networked: public-private actors working together; support instruments such as SBIR grants etc.
- Growing focus on evaluation and value for money, but:
  - Limited evaluation of small (direct support) programmes
  - Very little evaluation of demand-side policies

# Key features of Canada's Science and Innovation System

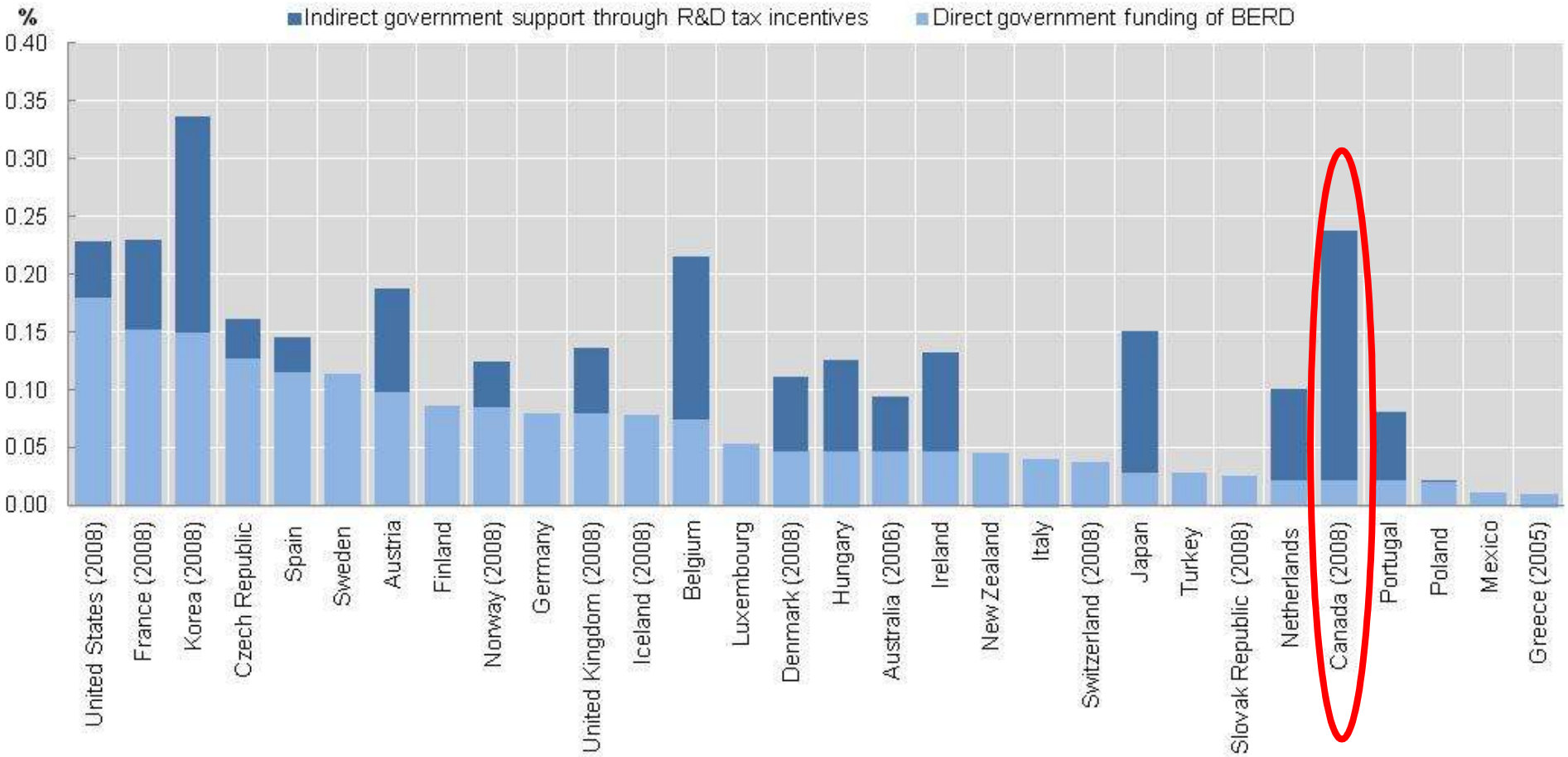





Source: OECD (2010), Science, Technology and Industry Outlook, chapter 3.

# Direct and indirect government funding of business R&D and tax incentives for R&D, 2007 or latest available year

## As percentage of GDP




*Source:* OECD (2010), *Measuring Innovation: A New Perspective*, OECD, Paris based on NESTI 2009 R&D tax incentives. questionnaire

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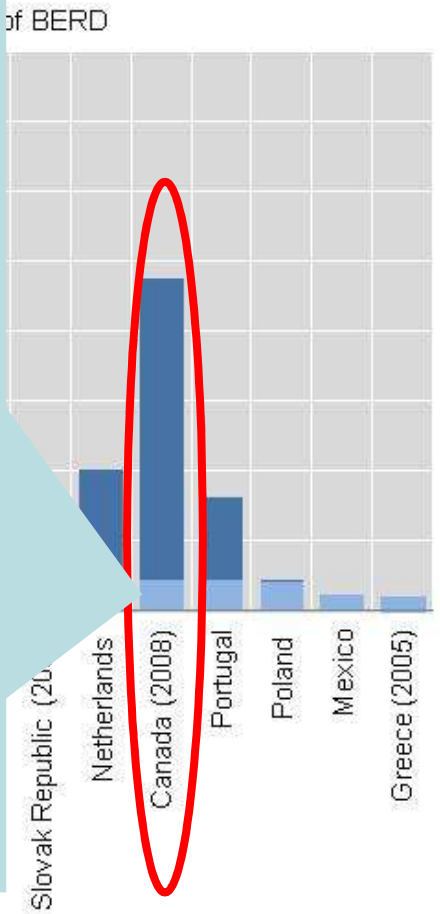
**Direct support for business R&D**

-Can be targeted on potentially high social returns (e.g. the environment - *Australia – Green Car Innovation Fund*).

-But danger of 'picking winners'. So, many governments allocate to pre-competitive ventures and research partnerships (e.g. *UK Innovation, Research and Development Grants*).

-Need proper design of award processes (e.g. competitive selection).

-Can also use generic (non-targeted) forms of direct support (such as innovation vouchers). Low admin. costs, but risk of deadweight.




*Source:* OECD (2010), *Measuring Innovation: A New Perspective*, OECD, Paris based on NESTI 2009 R&D tax incentives. questionnaire

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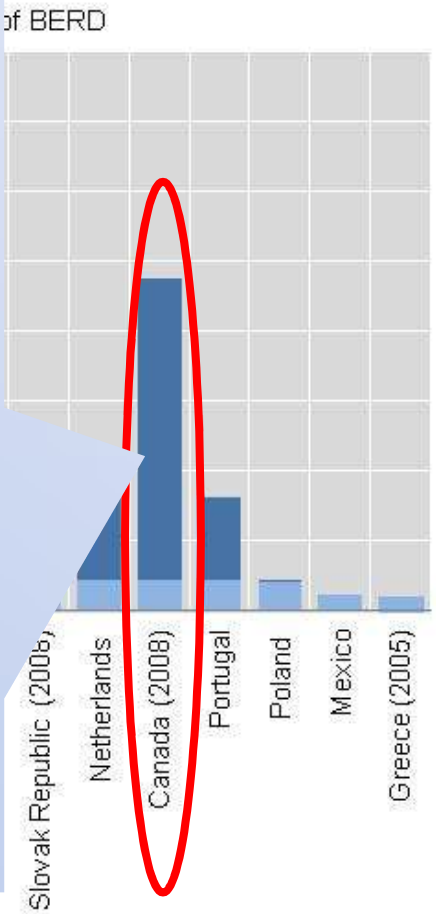
**Indirect support for business R&D (e.g. tax credits)**

- Non-discriminatory and relatively easy to implement.
- May be more accessible for some firms.
- Neutral with respect to the type of R&D performed, so conforms to market rationality.
- But may also have high deadweight, and/or support R&D with limited social returns.
- Schemes have been evaluated in a number of countries and their role (and impact) is relatively well understood – although more evidence is needed.




*Source:* OECD (2010), *Measuring Innovation: A New Perspective*, OECD, Paris based on NESTI 2009 R&D tax incentives. questionnaire

# Other (non-R&D-based) forms of public support for business innovation

Much emphasis now in many countries on:

- Measures to facilitate access to early-stage finance, particularly for equity
- Initiatives to assist the commercialisation of innovation
- Support for the development of networks of different sorts
- Programmes to promote regional innovation hubs
- Initiatives – such as voucher programmes – aiming to ease access to information, expertise and advice.

# Other (non-R&D-based) forms of public support for business innovation

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**Thoughts on good practice**:

-These initiatives should work with market mechanisms/demand where possible. e.g.

-Venture finance
-Business networks
-Incubators

- Should carefully consider programme logic, as the nature of the alleged market failure can be directly relevant to the form that public intervention should take.

# Demand-side Policies

"A set of public measures to increase the demand for innovations, to improve the conditions for the uptake of innovations or to improve the articulation of demand in order to spur innovations and facilitate their diffusion" (Edler, 2007).

Many OECD countries and the EC giving greater emphasis to demand-side innovation policies.

Motivated by:

- Greater awareness of supply-demand feed-back in the innovation process.
- A generalised perception that traditional supply-side policies – despite many refinements – have not brought the desired improvements in innovation and productivity.
- Pressures on governments' discretionary spending - how to foster innovation without new programme outlays?

# Demand-side policy - Innovation-oriented regulations

Regulations can affect the performance (quality, compatibility) or consequences (health, environment, etc.) of products or services, thus having a direct impact on demand for innovative goods and services. E.g.

–E.g. The Promotion of Renewable Energies Heat Act (2009) in Germany promotes diffusion of innovation. Owners of newly-constructed buildings must use renewable energies. Those using particularly efficient innovative technologies receive financial support.

–Japan's Top Runner programme adopts a dynamic process of setting and revising performance standards by taking the current highest energy efficiency rate of products as a benchmark in 23 product groups.

# Innovation-oriented regulations (cont.)

Positive evidence that regulatory change can induce innovation (e.g. asbestos product development; SO2 removal technologies). But:

- Impacts likely to be highly technology and industry specific (six year lead period in the ammonia industry).

- Effects can be ambiguous *a priori*. Nemet (2009) examined demand-inducing policies in California for wind-power technologies and found no significant innovation, in part because a dominant industry technology had already been identified.

- Need to ask if the market would introduce the right level technology in the absence of the regulation – which has industry-specific considerations (e.g. fuel economy technologies for vehicles).

# Innovation-oriented regulation (cont.)

- The precise form of regulation will affect its impact on innovation.
  - United States, Corporate Average Fuel Economy (CAFE) regulation (1978): increases in average vehicle fuel efficiencies could be achieved through manufacturers changing relative car prices so as to sell fewer large cars and more small cars.
  - Regulations in the US in the 1970s governing energy efficiency in refrigerators increased efficiencies, but only to levels already existing in Europe. No technological innovation was seen initially.
- Even in cases where regulation spurs innovation, it might be cost-ineffective overall.
- Difficulties isolating the specific effects of regulation from other influences.

# Demand-side policy - public procurement

Rationales for using procurement as a policy tool:

- Because of their purchasing power, governments can shape innovation directly and indirectly.
- The delivery of essential public services might be made more cost-effective.
- Procurement from small firms, may help counter problems in access to finance.
- Governments may want to create markets for technologies in order to meet policy challenges that are time-bound.

# Challenges in using public procurement to stimulate innovation

Procurement often fragmented across local, regional and national government agencies.

- Sub-national governments account on average for 64% of public investment in OECD countries.

Many agencies with responsibilities for public procurement operate separately from line ministries or agencies with a remit to foster innovation.

Specialised procurement agencies are mainly responsible for the efficiency of purchasing, and expertise in the respective fields of innovation may be lacking

Entails distinct risks, including technological and organisational risk.

# Public procurement of R&D: Small Business Innovation Research-type programmes

Innovative small firms often face difficulties in attracting investors - especially at the seed stage.

This has incited governments to play a role in funding development of new technologies in small companies through R&D contracts.

The Small Business Innovation Research (SBIR) programme - introduced in the United States in 1982.

SBIR inspired similar programmes in Japan, Australia, the United Kingdom and the Netherlands.

# SBIR-type programmes (cont.)

SBIR-type programmes must finance proposals not likely to receive funds from private sources, if additionality is to be maximised.

SBIR funding has led to increased growth, employment and venture financing (Lerner, 1999), but others cast doubt on additionality (Wallsten, 2000).

# Standard methodological challenges to policy evaluation

The ultimate aim is to attribute changes in a target group (usually firms, but also institutions and sometimes individuals) to the effect of a given programme.

But simply comparing the situation of target groups before and after a programme is insufficient. The observed change in state in the target group is a result of three sets of influences:

- The impact of the programme.
- Unrelated factors.
- How the programme is observed

Important distinction between evaluation and monitoring/audit approaches.

# Evaluations essentially take three generic forms.

- Experiments
- Quasi-experiments
- Participant opinion

# Drawbacks to using performance standards as a measure of programme impact

- Administrative performance standards - their use has become more prevalent since the 1990s (particularly important in the United States as a consequence of the Government Performance and Results Act (GPRA) of 1993).

- Reliance on performance standards as a proxy for impact estimates requires evidence of a systematic relationship between the two.

  - But there is no reason why such a relationship should exist.

- The choice of performance standards for pro-innovation programmes will create incentives that shape the behaviour of programme providers (SBIR example).

# Evaluation: selected policy lessons

- **Overt recognition of the importance of evaluation by senior policy makers is essential.**
  - Institutional resistance to evaluation is not uncommon.
  - Program managers and implementing agencies might fear that support will be withdrawn if programs receive a negative assessment.
  - Helpful if regular government reporting of performance draws extensively from evaluation results.
- **Encourage greater openness to evaluation by making clear that the aim of evaluation is to improve the quality of public policy.**
- **Plan evaluation at the inception of programs.**

# Evaluation: selected policy lessons (cont.)

**Take a strategic approach to evaluation.**

- A few long-term well-designed evaluations and sectoral studies using controlled samples likely to yield more generalisable policy-relevant results than multiple evaluations of varied quality employing disparate methods.
- A need to standardise evaluative work around good practice.
- Have grant agencies establish data collection and programme design features that facilitate impact assessment – and link national datasets where appropriate.
- Time evaluation to coincide with the need for information in decision making cycles.
- Some programmes are notably under-evaluated.

**Frequent changes of policy direction will also hinder evaluation.**

**Make evaluation data public**.

# Finally: the policy mix for business innovation - some considerations for Canada

Compared to other countries:

– strong emphasis on indirect support (R&D tax credit), with some direct support for venture capital and commercialisation.

– little emphasis on demand-side policies.

Some issues to consider:

– should policies be more focused on specific areas that could have high social returns?

– is the policy mix too much focused on technology and R&D-driven innovation?

– what role for demand-side policies?

# For further information

OECD website

www.oecd.org/innovation/strategy

Or contact:

Alistair.Nolan@oecd.org

**Thank you**

# Using regulation to promote innovation (cont.)

Take account of the specific design characteristics of different instruments (market-based or regulation-based):

Stringency – that is, how ambitious is the policy target?

Predictability – what effect does the policy have on investor uncertainty?

Flexibility – does the innovator identify the best way to meet the objective?

Incidence – does the policy target the externality directly ?

Depth – that is, do incentives exist to innovate through a range of potentially ascending objectives?

The ideal instrument will be: sufficiently stringent to encourage an optimal level of innovation; stable enough to give investors adequate planning horizons; flexible enough to encourage creation of novel solutions; closely targeted to the policy goal; and give incentives for continuous innovation

# Rationales for non-R&D-based public support for business innovation

- Early-stage equity finance:
  - *Industry learning*
  - *Market gaps*
- Access to information, expertise and advice:
  - *Supply constraints for small firms – and/or demand-side constraints for new services ?*
  - *Entrepreneurs don't know what they don't know ?*
- Development of networks of different sorts:
  - *Lack of awareness of opportunities offered by networks*
  - *Co-ordination constraints*
- High-tech entrepreneurship *per se:*
  - *Imitation and demonstration effects*

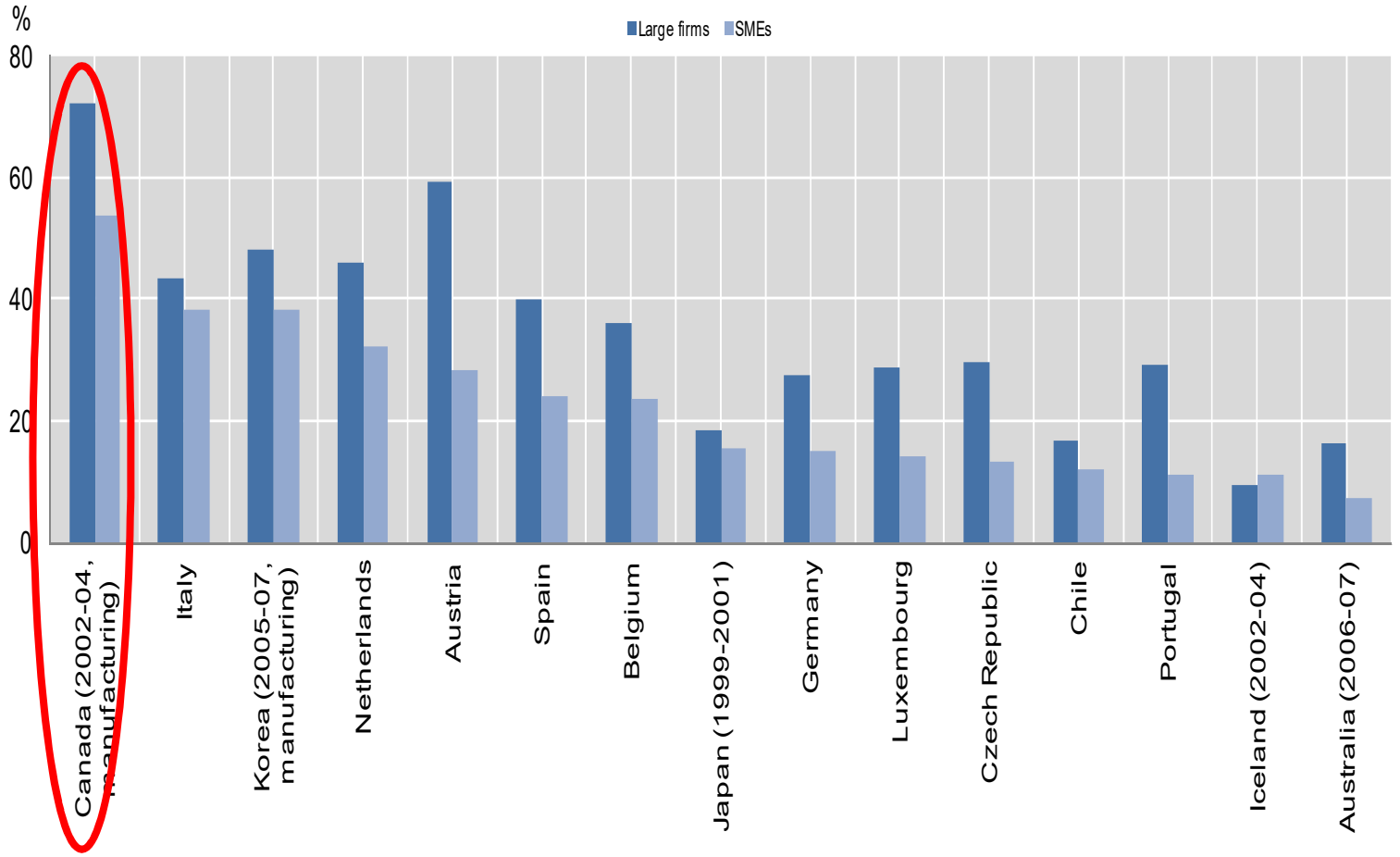
# Demand-oriented policies take various forms

- Innovation-oriented public procurement
- Innovation-related regulations
- Technical standards
- Tax and other policies (e.g guaranteed tariffs for renewable energy) to raise investment and/or consumer demand.
- Targeted information for consumers

With some exceptions, demand-side policies typically target specific sectors (e.g. the energy sector).

# Firms receiving public support for innovation by size, 2004-06

## As a percentage of innovating firms






*Source:* OECD (2010), *Measuring Innovation: A New Perspective*

# Other (non-R&D-based) forms of public support for business innovation (cont.)

Venture finance:

- Need programme designs that reward good decisions by good fund managers (simulations by Murray (1999)).
- Make support time-bound.
- Importance of scale – small regional funds unlikely to have impact and also entail high risk.
- Work with business angels too.

Business/technology incubators:

- Aim for scale…..don't become a landlord.
- Foster networking/information exchange among incubated firms.