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**International Trends in Industry Research Incentives**

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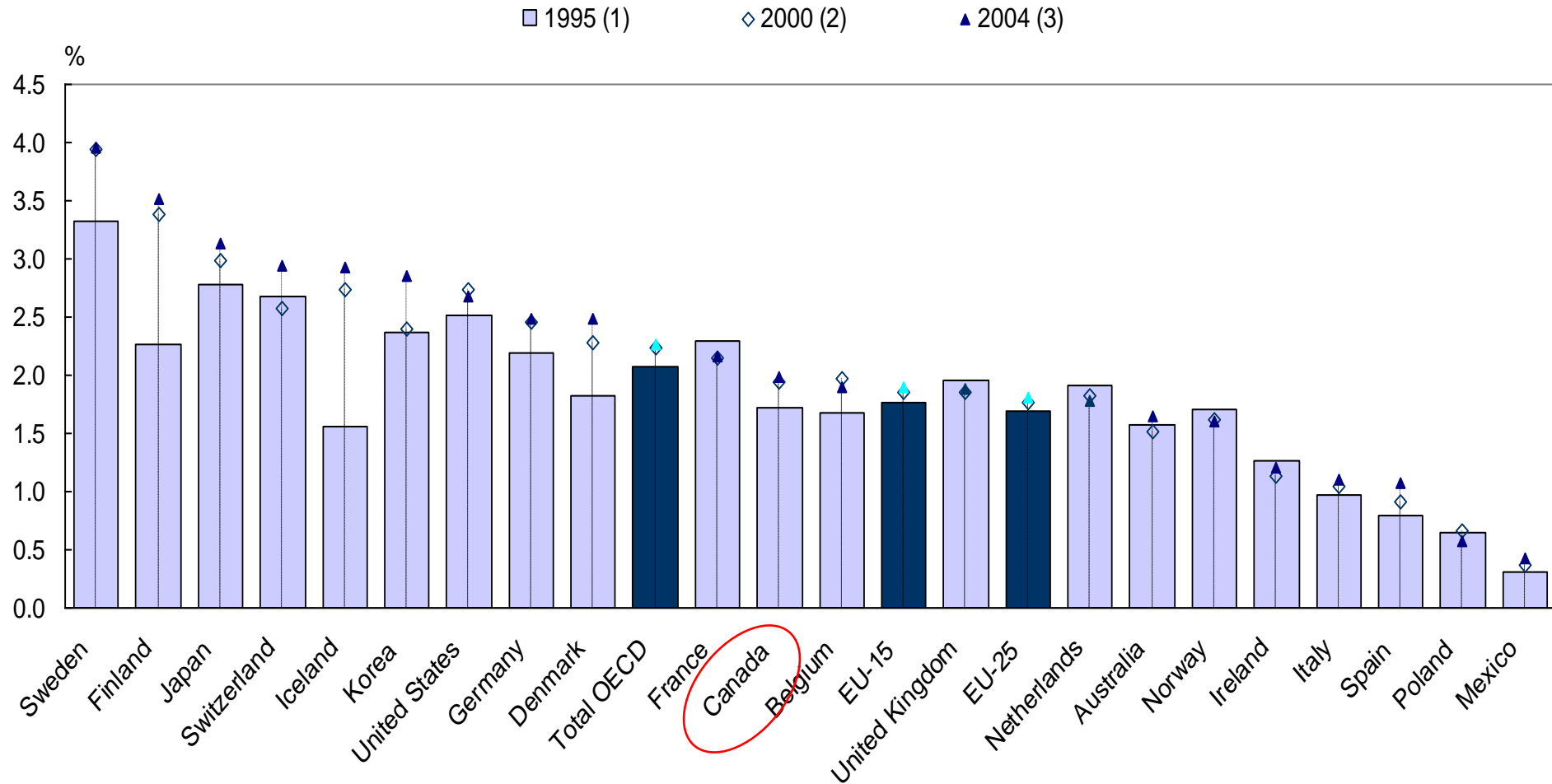
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# OECD work on science and innovation

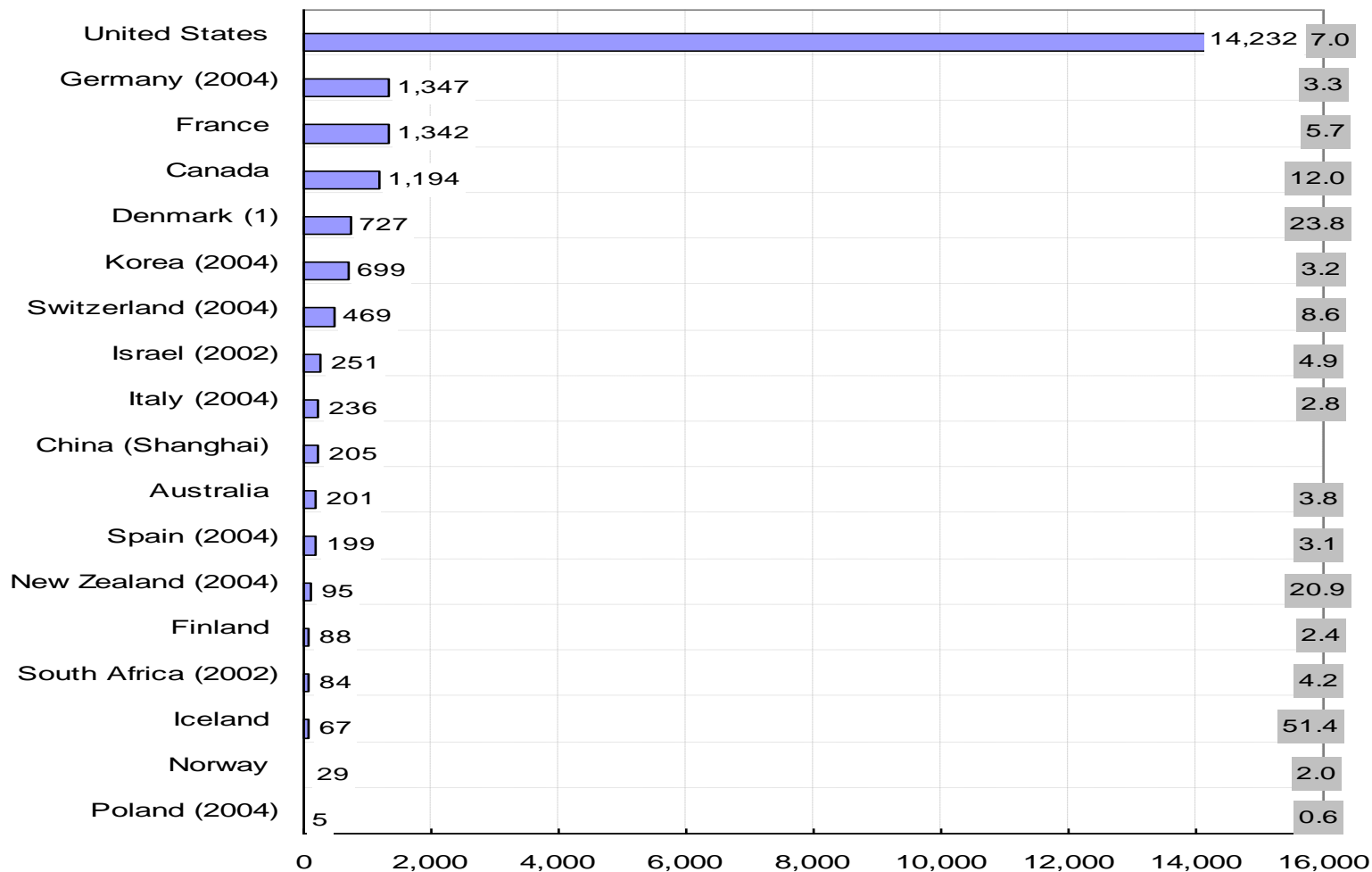
- OECD work on science and innovation is carried out in the Committee for Scientific and Technological Policy, made up of delegates from member countries.
- The priorities are established by countries in a 2-yearly work programme.
- The output of the work includes:
  - **Analytical reports**, *e.g.* on Public-Private Partnerships or Science-Industry Links.
  - **Policy reports**, *e.g.* country reviews of innovation policy.
  - **Policy guidelines**, *e.g.* on licensing of genetic inventions.
  - **Statistics, indicators and benchmarking reports**, *e.g.* OECD's bi-annual Science, Technology and Industry Scoreboard.
- In practice, a platform for exchange, analysis and discussion on good policy practices.

# Recent trends – Growing R&D intensity in several OECD countries (R&D as % of GDP)



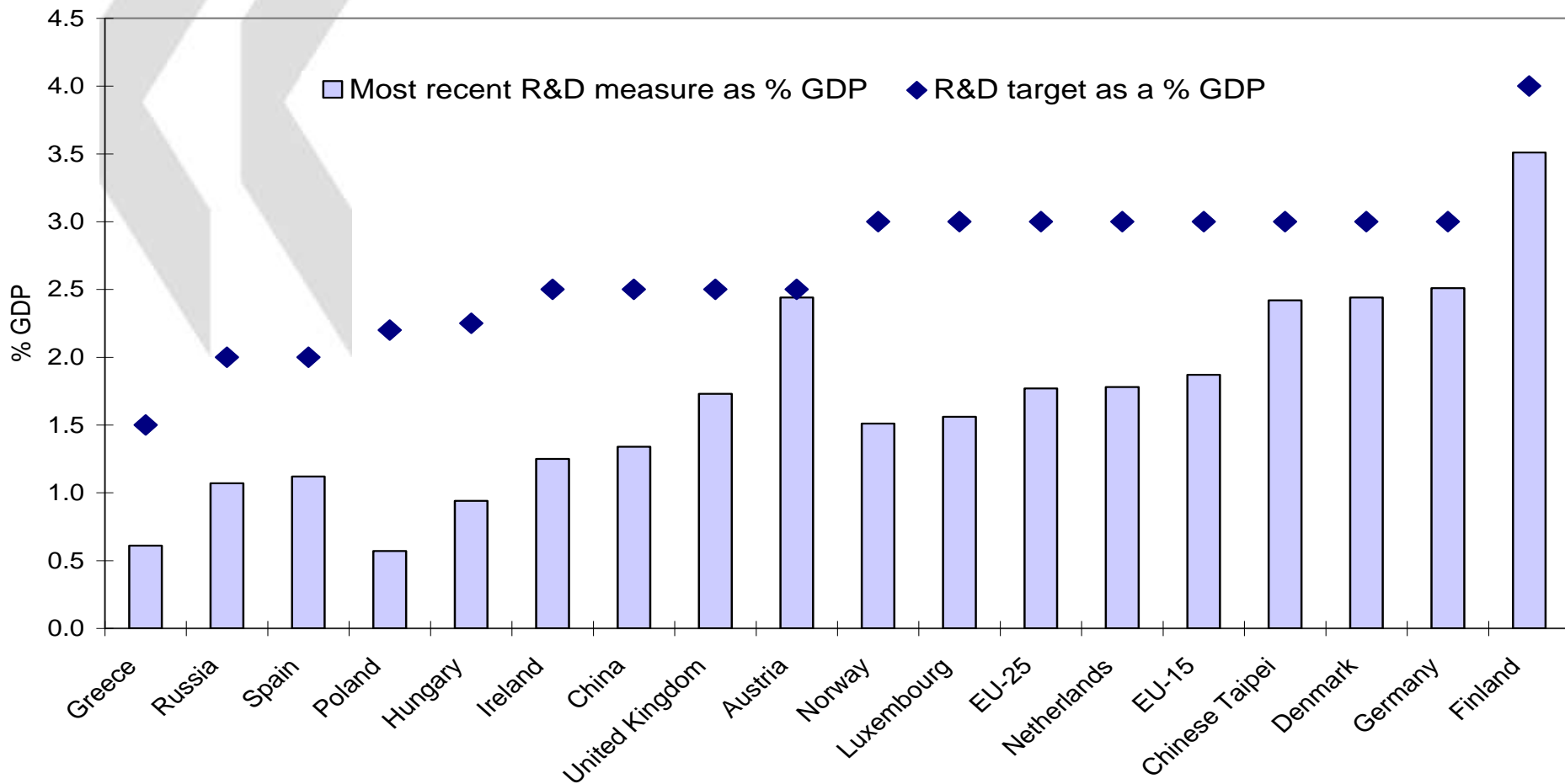
## Biotechnology R&D

Total expenditure on biotechnology R&D by biotechnology-active firms, Million PPP\$, 2003



# But R&D spending still falls short of national targets in most countries

(current R&D spending and official targets, as % of GDP, in %)



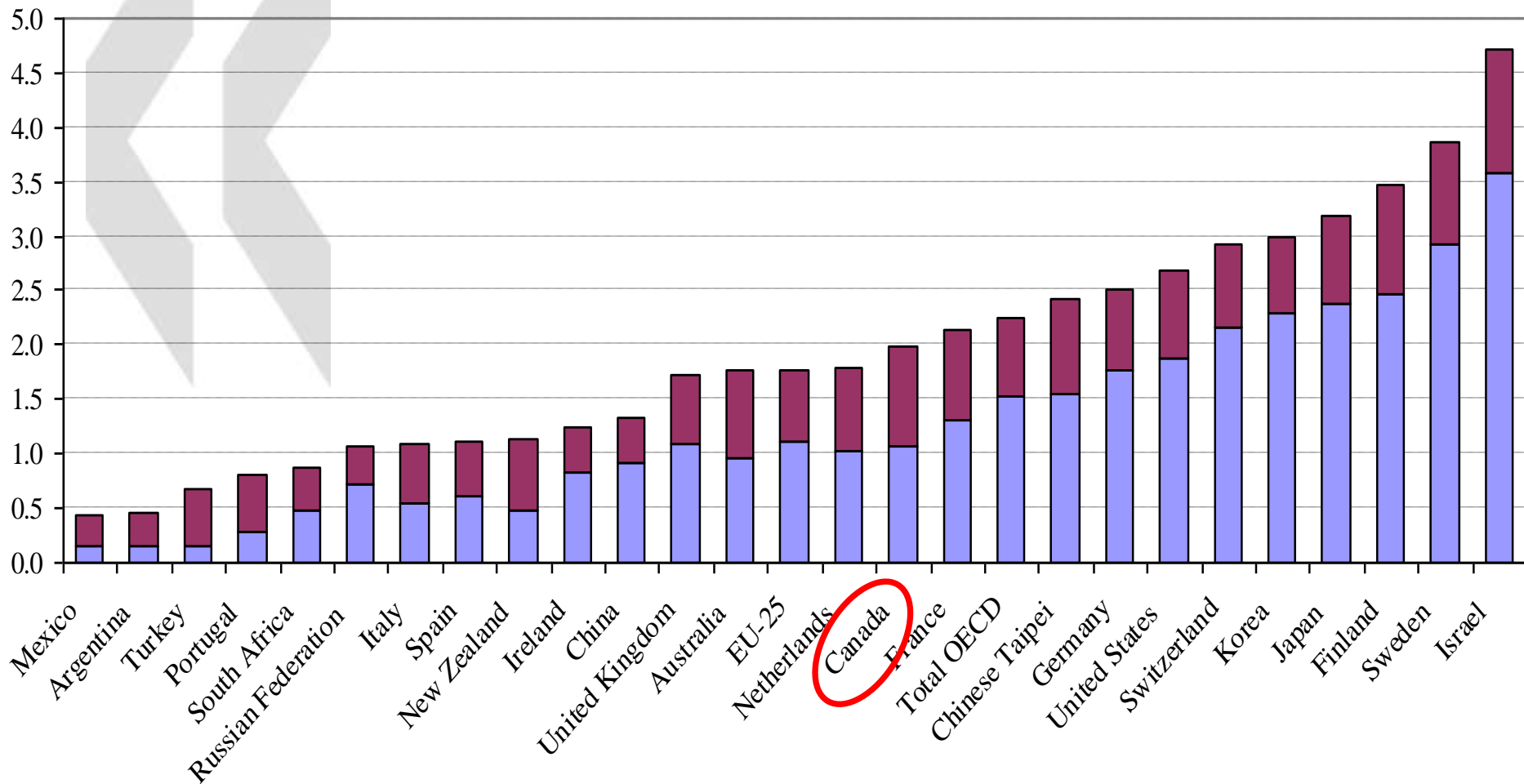
Note: Most national targets refer to 2010.

Source: OECD, Main Science and Technology Indicators, 2006-II, December 2006;

OECD, Science, Technology and Industry Outlook 2006, December 2006..

# Raising R&D intensity primarily involves greater investment in business R&D (R&D as % of GDP, 2005)

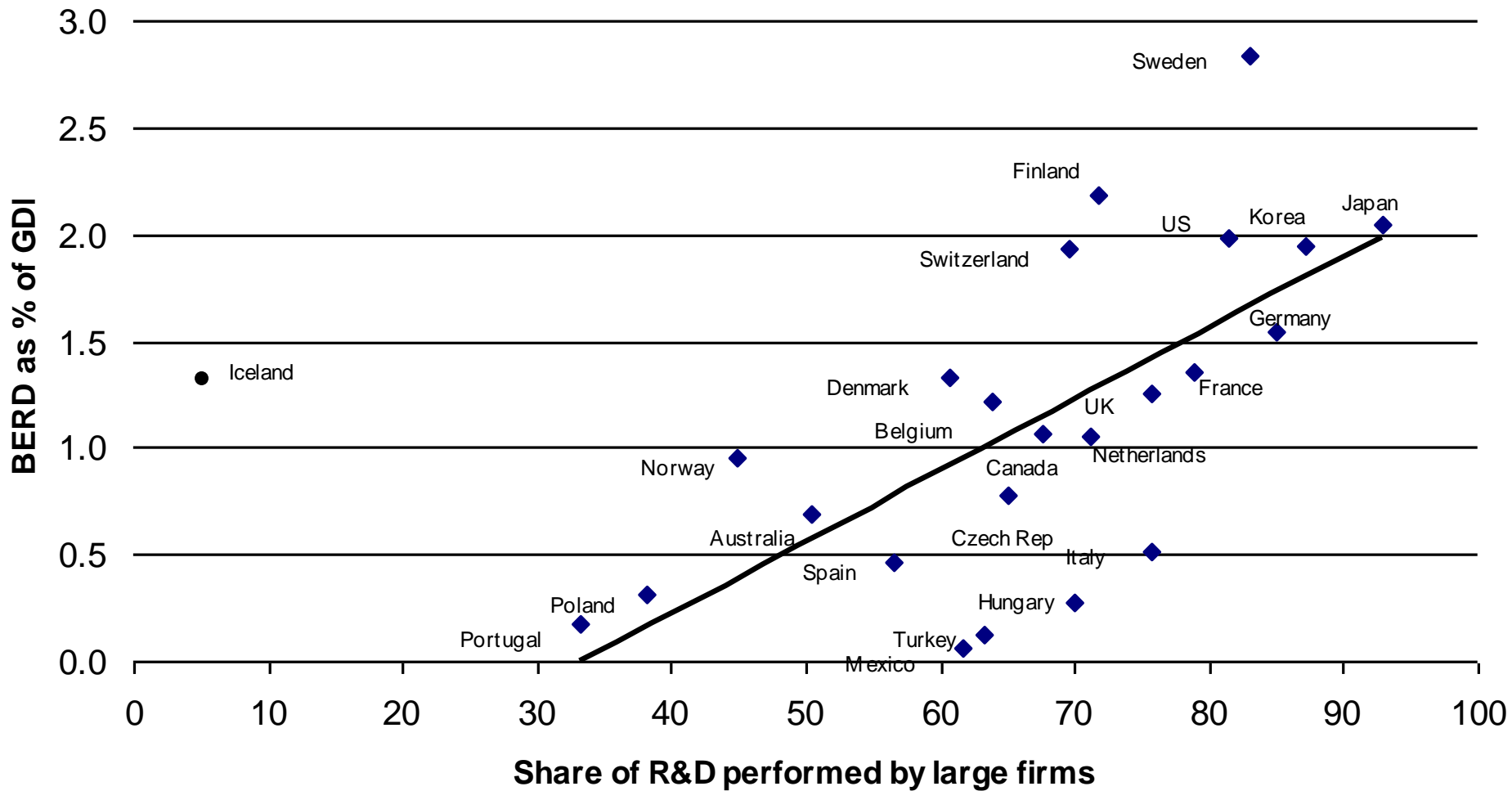
■ Business R&D      ■ Other R&D (1)



Note: (1) Other R&D includes government, abroad and other sources.

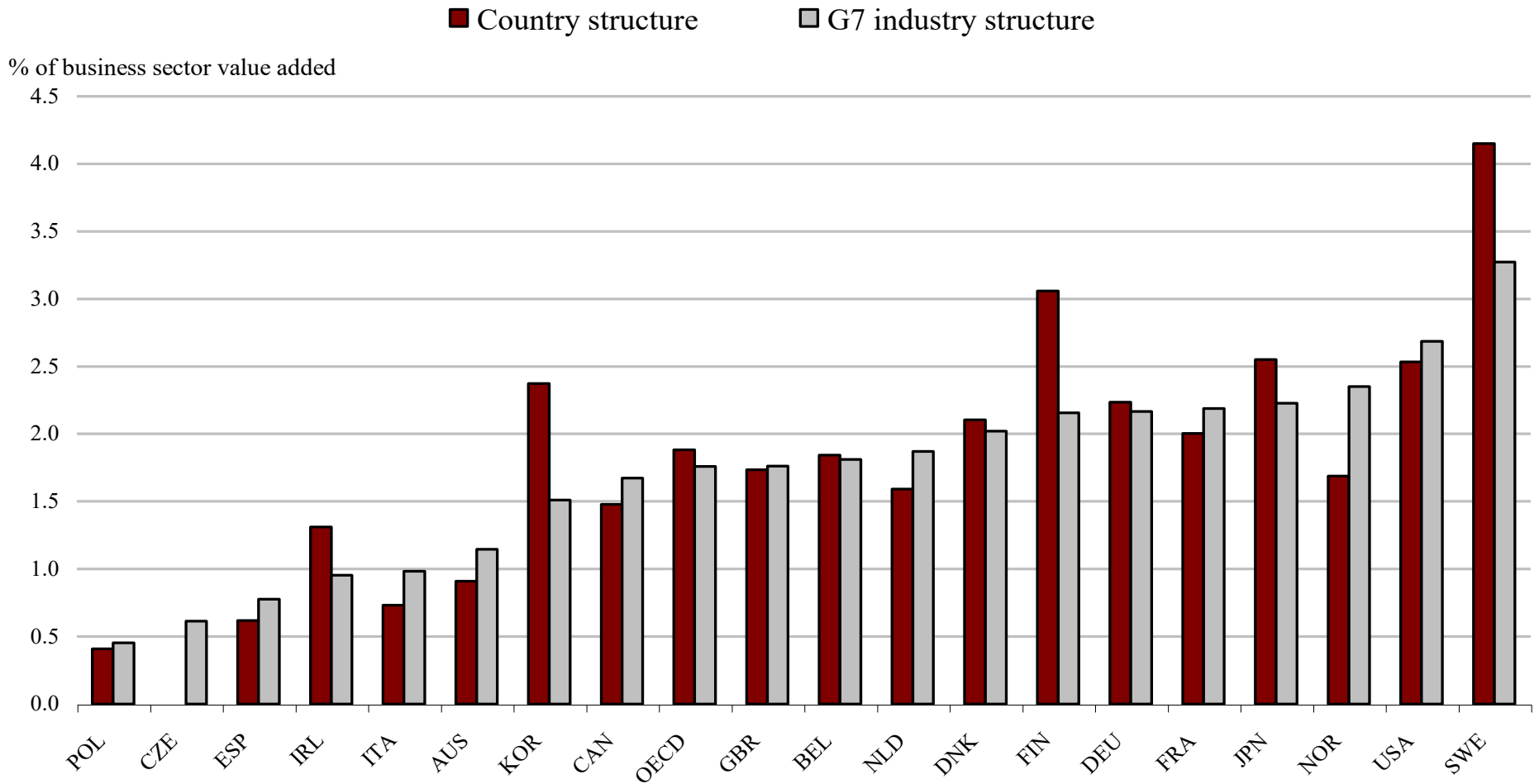
Source: OECD, Main Science and Technology Indicators, 2006-II, December 2006.

# But business R&D is influenced by structural factors, such as firm size ...



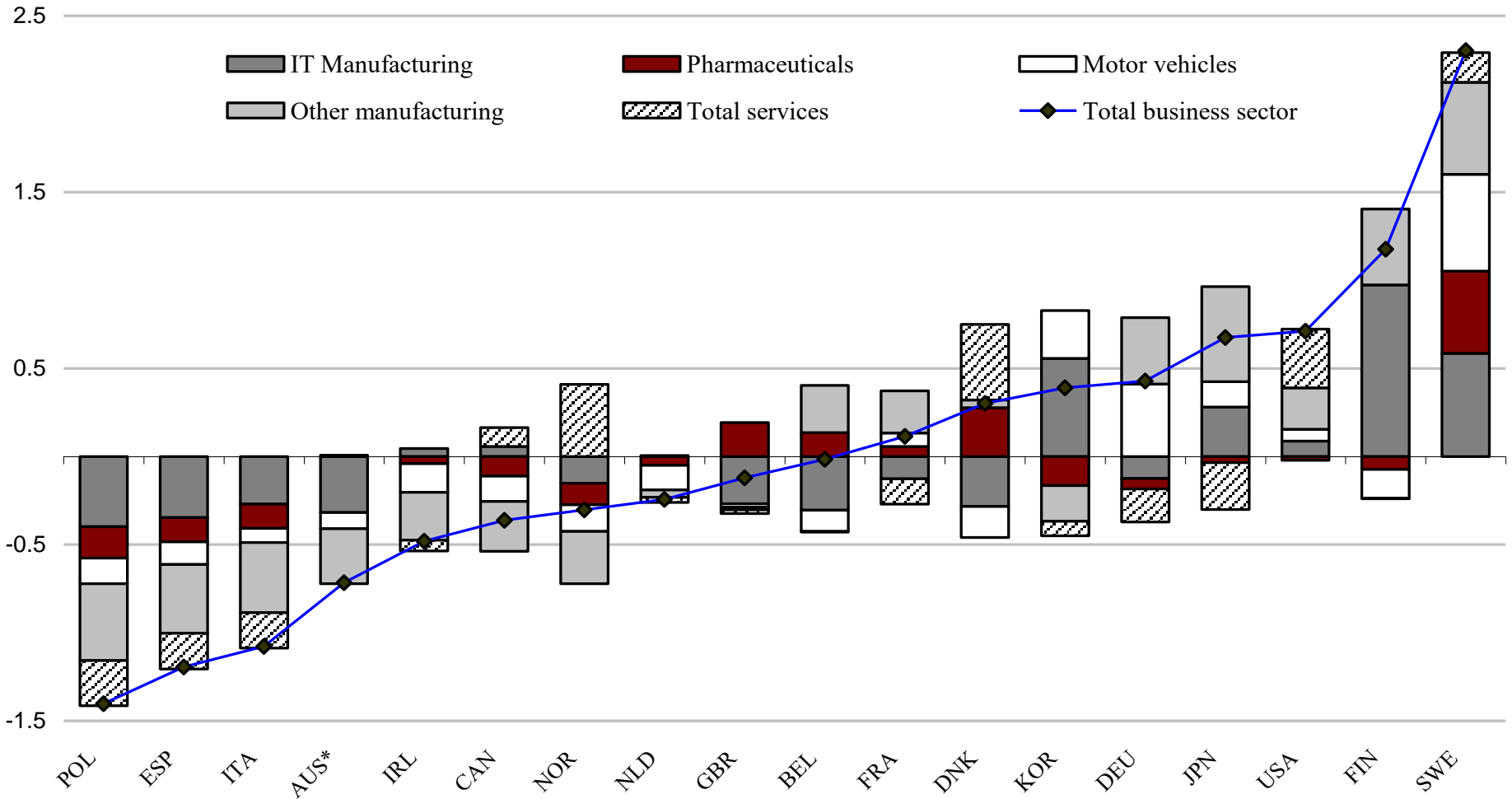
# .. industry composition ...

(R&D in the business sector adjusted for variations in industry structure)





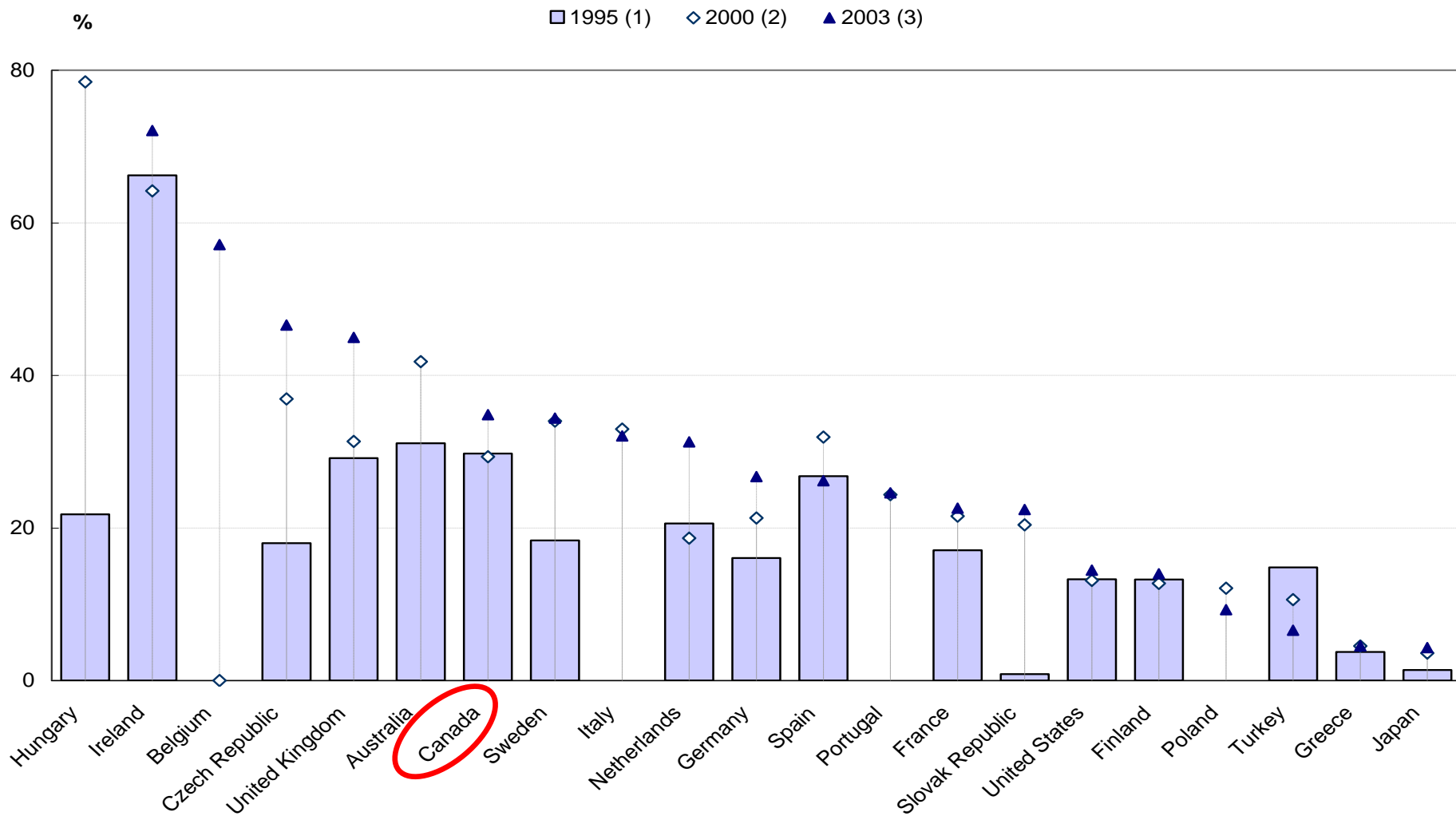
# The contribution of selected industries to aggregate R&D intensity in the business sector



Source: OECD, based on ANBERD and STAN Database

# .. and the contribution of foreign affiliates

(R&D expenditure of foreign affiliates as % of total business R&D)





The key policy question:

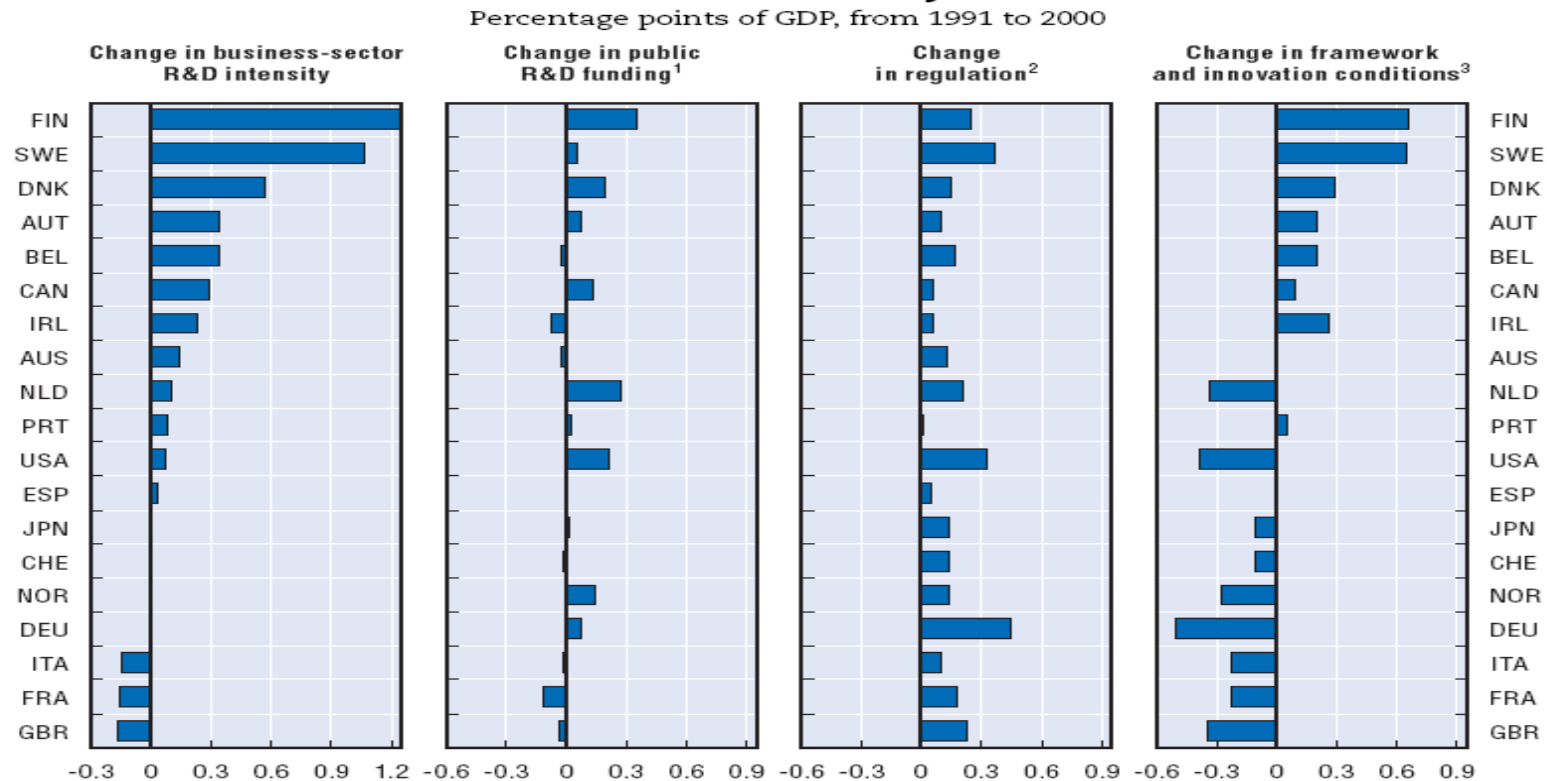
How to foster greater private investment in R&D

# What policies to foster business innovation?

- Providing good framework conditions for business:
  - Good infrastructure, highly skilled workforce, tax climate, etc.
  - Intellectual property rights – to provide incentives for investment
  
- Through support measures:
  - R&D tax credits
  - Direct support (grants, loans, etc.)
  - Public-private partnerships
  - Initiatives at the local and regional level.
  
- OECD countries use a mix of these instruments

# Reform of product market regulation has increased business R&D intensity in OECD countries

Figure 3.13. Contribution of policies and other factors to past changes in R&D intensity



1. Includes public financial support for private R&D (both grants and tax incentives), R&D performed in public institutions and the share of the latter that is funded by the private sector.
2. Includes product market regulation and the strength of intellectual property rights.
3. Includes indicators of a country's exposure and capacity to absorb foreign knowledge as well as of broad financial and economic conditions. Residual factors that cannot be accounted for by the statistical relation are also included in this category.

Source: Jaumotte and Pain (2005d).

StatLink: <http://dx.doi.org/10.1787/462688616478>

# Framework conditions are important determinants of business R&D ...

- OECD analysis shows that:
  - Reducing anti-competitive product market regulations stimulates business R&D, as it strengthens the incentives to innovate.
  - A low level of restrictions on foreign direct investment can improve cross-border knowledge transfers.
  - Stable macroeconomic conditions and low real interest rates help to encourage the growth of innovation activity.
  - The availability of internal and external finance is an important determinant of innovation expenditures.
  - Improved corporate profitability and higher stock market capitalisation both have a positive effect on innovation expenditures.

# ... as are innovation policies

- OECD analysis shows that:
  - Policies that help to make foreign knowledge more accessible can be very effective in fostering business R&D.
  - Expanding public research can support business sector research, but expanding both will require efforts to raise the supply of human resources.
  - Fiscal incentives can be effective, especially when firms face financial constraints. Tax reliefs for private R&D are found to provide a stronger stimulus to business R&D than direct government subsidies.
  - The case for further strengthening of intellectual property rights for patent holders in OECD countries appears weak. Excessively strong intellectual property rights can be counterproductive as it may reduce product market competition.

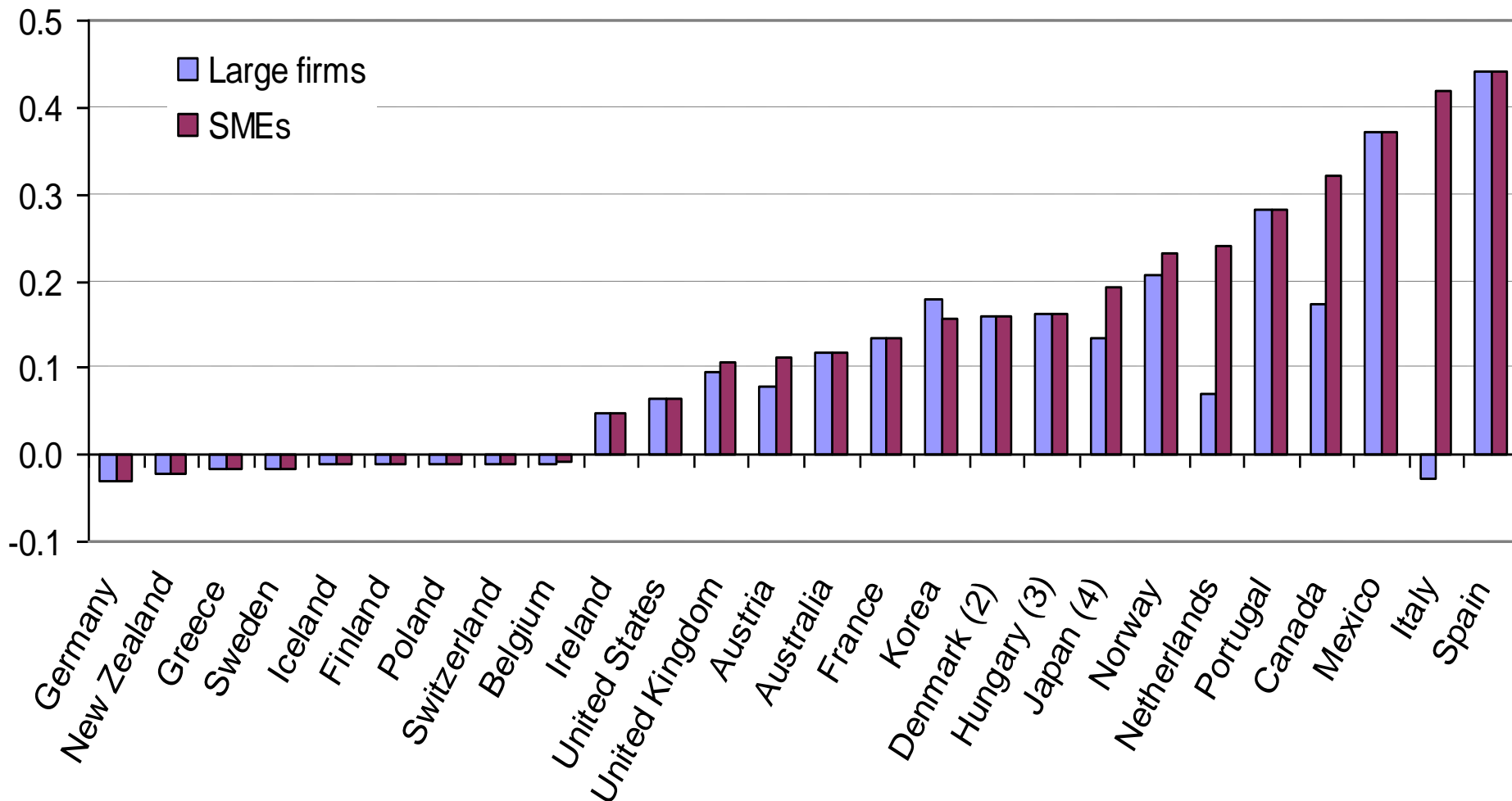
# Trends in OECD countries in the use of support measures for business R&D

- Some streamlining of support programmes:
  - Efforts to reduce the range of programmes
  - Growing focus on competitive-based and merit based competitive funding
  - Growing focus on innovation instead of R&D, greater attention for services
  - Growing focus on supporting networks and clusters, instead of individual firms
- R&D tax credits in search of more efficiency:
  - New R&D tax credits for labour charges in some countries (Belgium, Spain, Netherlands)
- Focus on leveraging government procurement policies to foster innovation and develop lead markets, in particular in Europe
- Overall: in search of “smarter ways” to support innovation



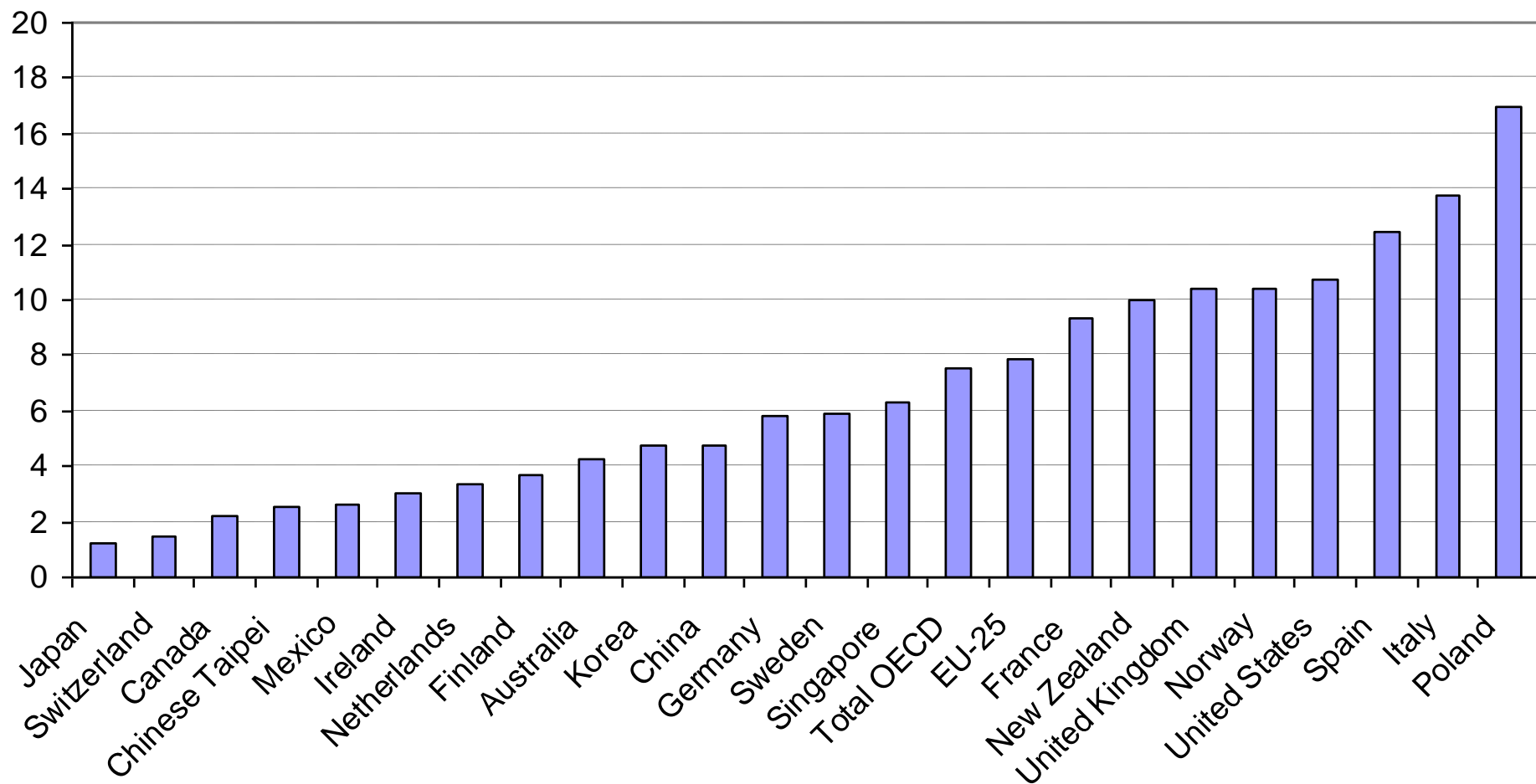
# Tax credits remain an important instrument

(Implicit tax subsidy for 1 USD of investment in R&D, 2005)



# Direct support for business R&D remains important

(share of government-financed R&D in total business R&D, 2004, in %)





# Adapting incentives to a changing business environment

## Elements of the changing environment for business innovation

- *Shorter time-to-market.* Greater competition, shorter product life-cycles, erosion of dominant positions.
- *Expanding technological opportunities*--Hard to maintain necessary competencies in-house; uncertainty about future technology & markets
- *Increased cost and risk.* Cost of innovation is growing, particularly in capital-intensive industries.
- *Globalisation* of markets, S&T capabilities, production.
- *Increased mobility* of S&T workers. Increases rate of diffusion of knowledge
- *User-driven innovation:* greater involvement of users.
- *Innovation in services:* Of growing importance to OECD countries.

# Changing Firm Strategies: From Closed to Open Business Innovation

## Old model: closed innovation

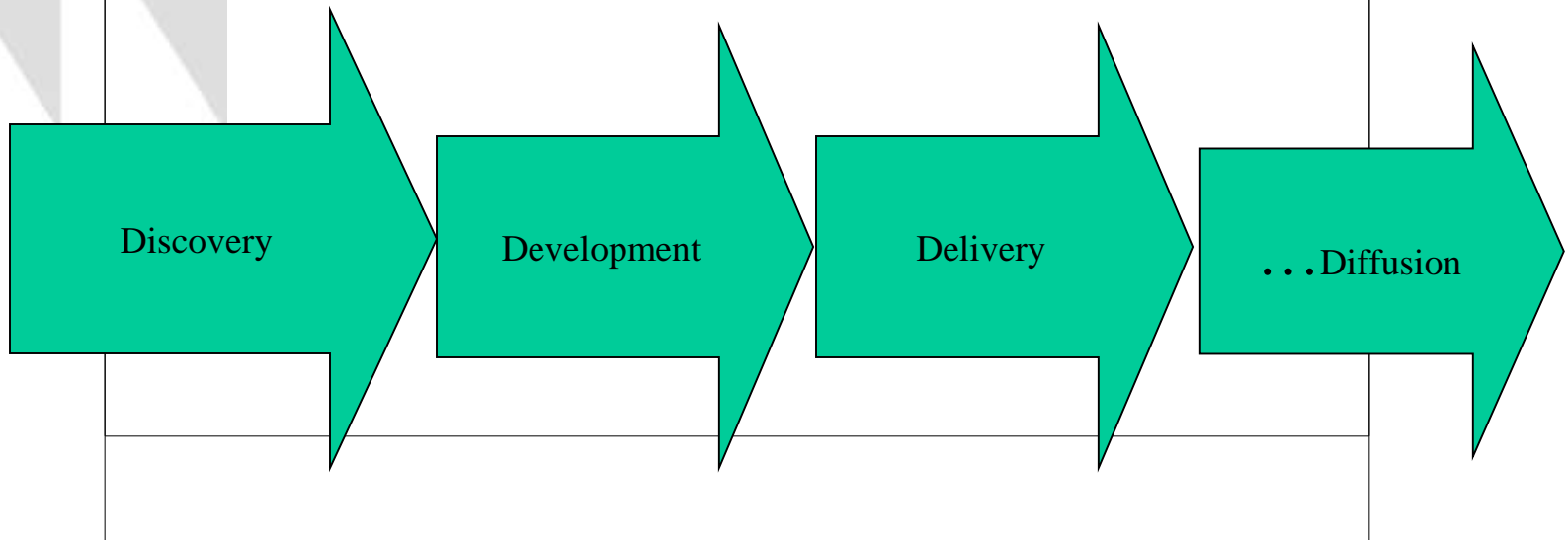
- Firms identify needed technological advances
- Firms conduct R&D internally, often in corporate laboratories
- Firms incorporate advances into new products & services
- Product revenues finance additional R&D

## New model: open innovation

- R&D linked to business strategy (new funding models, incentives)
- Acquisition of technology (licensing, corporate VC, M&A, collaborative research)
- Externalisation of R&D results (licensing, spin-offs)
- Globalisation to tap into world-wide knowledge and talent
- More diverse set of innovators (public sector, SMEs, services)
- Greater role of users

# Closed Innovation

A linear progression.....



Research Policy

Industry Policy

Match innovation and market needs

Enabling environment?

Policy Environment Energy etc (

Regulatory/ Legislative Policy Incentives?

RESEARCH

IDENTIFICATION of NEED

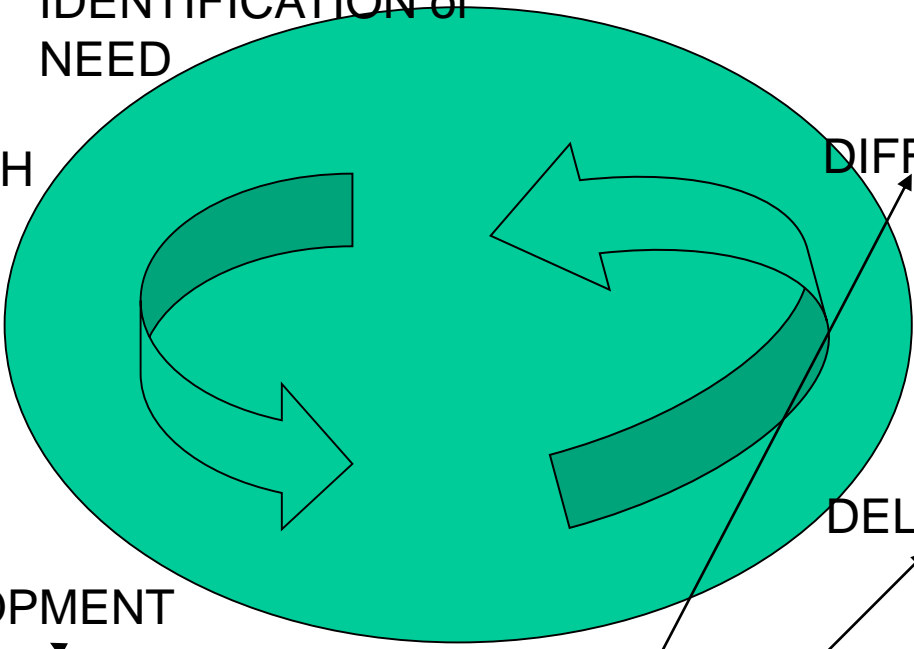
DIFFUSION

DEVELOPMENT

COMMERCIALISATION

DELIVERY

Decisions



# Some potential implications for innovation policy

- The role of public research organisations:
  - Less basic research in the business sector – a growing importance for *basic research* from the public sector
  - Focusing on scientific excellence and relevance/valorisation of public research
- Government support for business R&D:
  - Will direct support measures and tax incentives still be effective in fostering business investment?
  - Is the broader environment for innovation becoming even more important?
- Intellectual property:
  - Balancing incentives for innovation and diffusion
  - Using IPR to create value



## Collaborative mechanisms for IP .....

- The role of patent pools
  - Platform based technologies – DVD, MPEG
- Or Clearing Houses
  - SNPs Consortium
- Open source
  - software
  - Informatics

..... Models for success in technology convergence.....?

# What next for innovation at OECD?

- OECD Ministerial meeting in May will have strong focus on innovation.
- Policy interest in innovation is growing:
  - In the long term, innovation is the main source of sustainable growth
  - Innovation may help in addressing other global challenges, such as climate change, the environment, energy needs, etc.
  - Globalisation and the emergence of new global competitors is pressuring OECD countries to move up the value chain and strengthen innovation.
- But despite growing importance, little progress in many OECD countries.
- Possible reasons for lack of progress:
  - Innovation depends on a wide range of factors: business-friendly environment, strong education and science system, good links between science and business.
  - Coordinating policies across a wide range of policy domains can be difficult.
  - Innovation may not always be the most attractive policy goal: it is not often a priority for the general public.
  - Improving innovation is challenging, as it requires a long-term commitment.

# A possible next step for the OECD: development of a comprehensive OECD Innovation Strategy

A coordinated effort to support policy development:

1. **Policy recommendations** to boost innovation performance, both general and country specific. This would include the identification of good policy practices, and where appropriate, the development of policy guidelines.
2. **Improved frameworks** to monitor and review the innovation environment and the performance of the innovation system.
3. **Strengthened mechanisms and forums** for international discussion and co-operation, including with emerging economies.
4. **Improved analysis** clarifying the links between policy domains, such as those between innovation and entrepreneurship and how innovation contributes to achieving economic, social and environmental goals;
5. **Development of better metrics** to identify and benchmark innovation performance and the factors and policies influencing it.



**In sum: OECD is there to help countries and governments improve innovation policies and innovation outcomes**

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Thank you.