



**UNECE**  
**Conference on Technological  
Readiness for Innovation-based  
Competitiveness**

**Fostering Innovation for  
Sustainable Growth in  
a time of Economic Crisis –  
Importance of the ICTs**

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# OECD Ministerial Council Meeting 24-25 June 2009

**Road to  
Recovery:  
OECD strategic  
response to the  
economic crisis**

- OECD Innovation Strategy, policies for boosting productivity, innovation and growth, and for helping countries address global challenges

**ICT as  
horizontal element**

**OECD  
Declaration on  
Green growth**

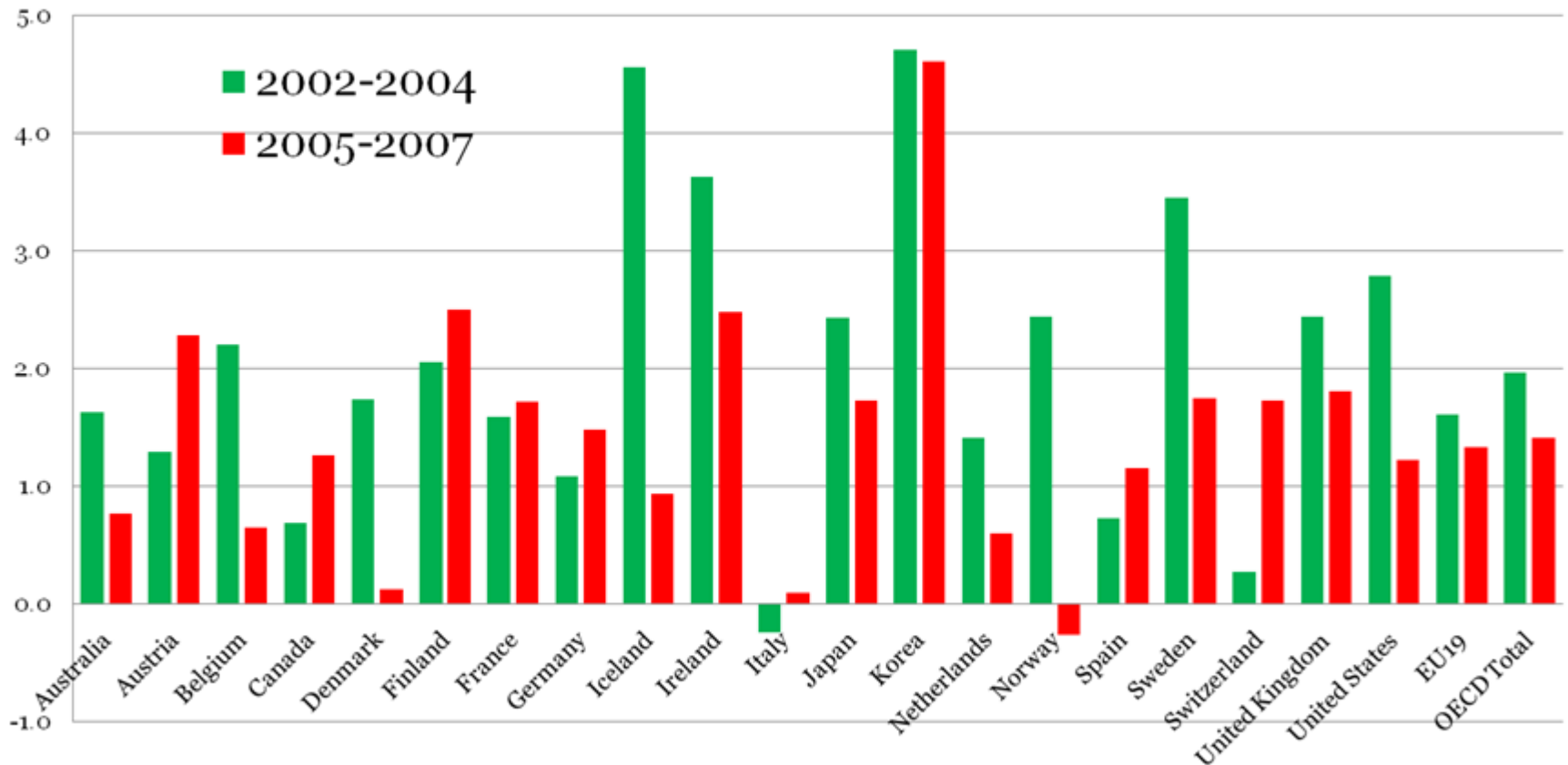
...to pursue green growth as part of our response to the economic crisis, acknowledging that "green growth" can go hand-in-hand

# 1) “*ISSUES*” BEFORE THE CRISIS

- Our growth path before the crisis was not sustainable:
  - We need stronger productivity growth to address ageing, enhance efficiency and move up the value chain.
  - We need to address global problems, e.g. climate change, food security, health, energy.

# The challenge: Reviving productivity for recovering growth

**Productivity Growth (GDP per hour worked; average yearly growth rate; %)**



# The declining contribution of ICT capital to GDP growth

## Where are

Telework?

Teleconferencing?

Tele-education?

and more advanced broadband applications?

intelligent transport systems

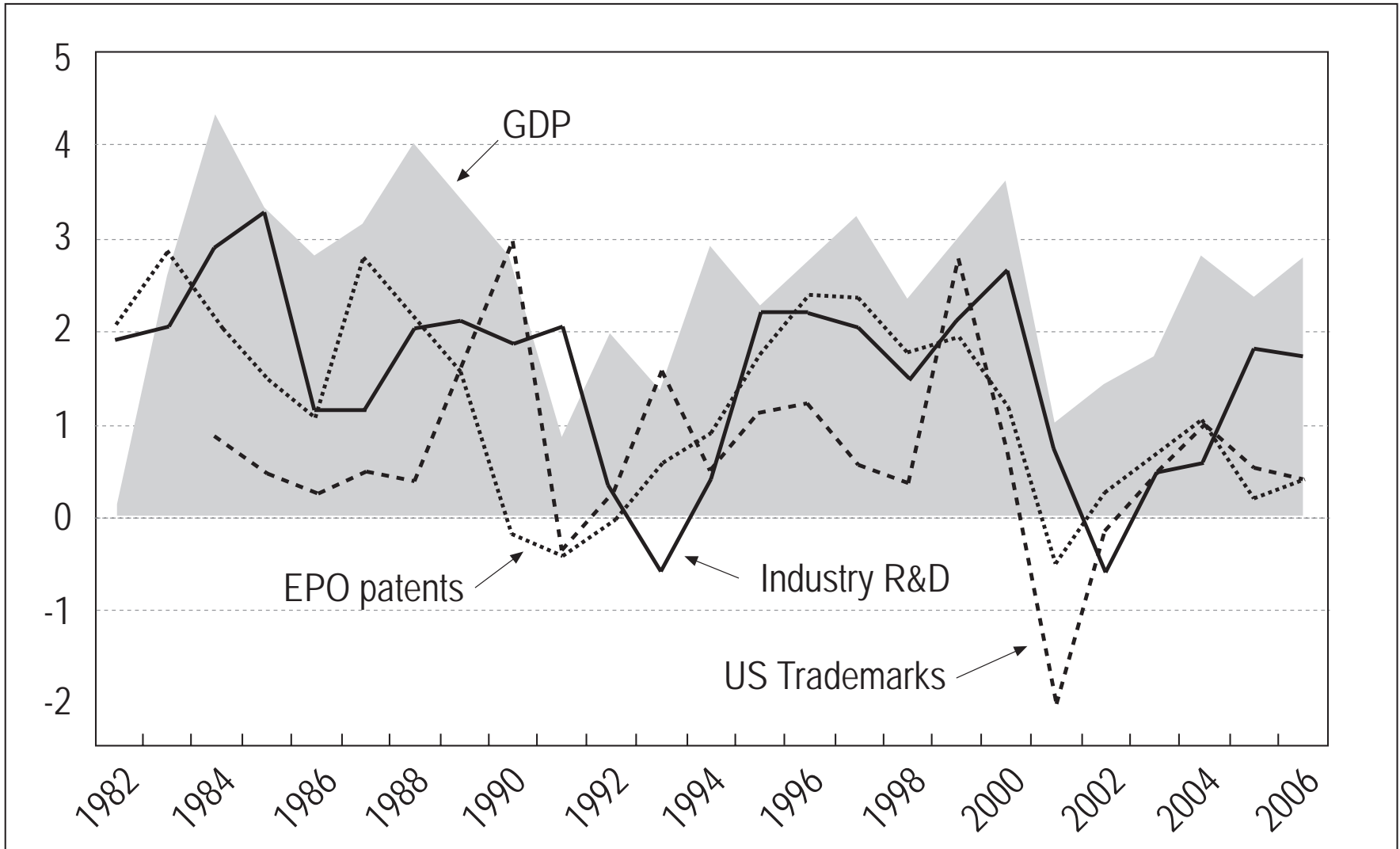
e-health

etc.

*Source: OECD Broadband Growth and Policies, OECD, 2008.*

## **2) INNOVATION, ICTS AND THE CRISIS**

# Innovation will be one of the keys to emerging from the current crisis, but it risks being hit hard by the downturn



# The cyclical view of Innovation

- Innovation or the implementation of new ideas, will be postponed in a recession till the boom period (Shleiffer, 1986 and Francois and Lloyd-Ellis, 2003)
- The so-called innovation acceleration hypothesis whereby radical innovation would be favoured in recessions/depressions out of despair has been rejected (Clark, Freeman and Soete, 1981).

# ICT sector opportunities and challenges

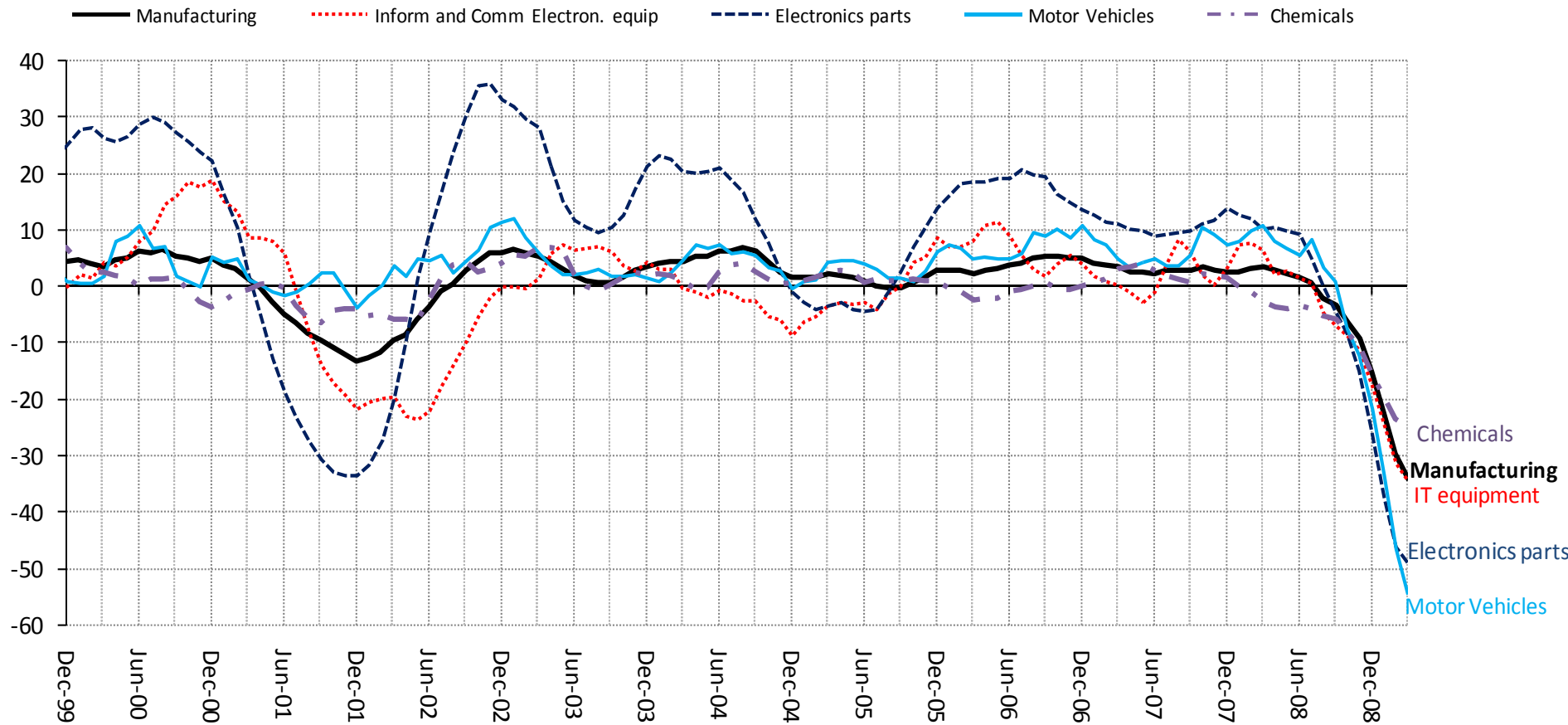
	<b>Opportunities</b>	<b>Challenges</b>
<b>Short- to medium-term</b>	<p><b>ICT budgets harder to compress</b></p> <p><b>Restructuring and cost-cutting in other sectors leads to more use of ICTs</b></p> <p><b>More outsourcing of services, software-as-a service, open source software, etc.</b></p> <p><b>Public sector and emerging economies continue to invest</b></p>	<p><b>Declines in R&amp;D and innovation activities</b></p> <p><b>Decreasing access to capital investments</b></p> <p><b>Pressures on IT budgets in all sectors</b></p> <p><b>Declines in ICT trade</b></p> <p><b>Fall in consumer ICT spending</b></p> <p><b>Fall in demand from emerging economies</b></p>

# ICT industry developments, 2008-09

- ICT industry has had a tough start to 2009, almost all first quarter indicators declining, often sharply.
  - In some sectors, performance is testing lows of 2001-2002.
  - ICT goods production in some areas worse than 2001
  - Strong fall in exports for Asia
- Computer and IT services are slowing, but are retaining positive growth (better than telecom)
  - Demand for IT and Business Process Outsourcing persists
- Internet firms such as Google having a one digit growth rate for first time since IPO in 2004
- ICT employment has trended downwards, but not as rapidly as in some other sectors
  - announcements of major lay-offs; over 10% of their workforce

# The challenge: ICT goods supply is plunging with the economic crisis – Japan

December 1999–January 2009. Year-on-year % change, volume index, seasonally adjusted, 3-month moving average, December 1999 – March 2009



Source: Information Technology Outlook database.

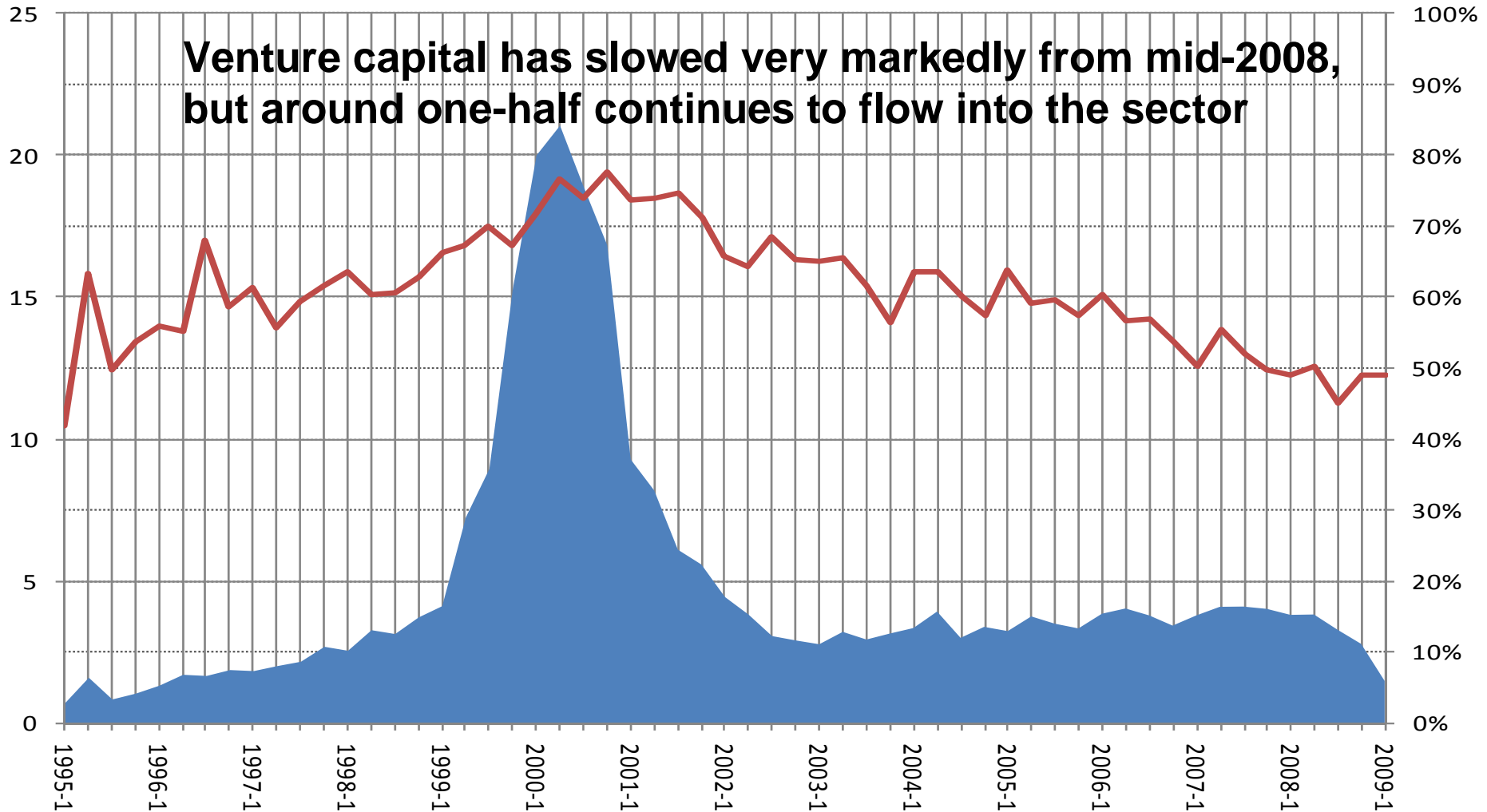
# R&D ICT spending pattern

- Software and internet are the only sectors where quarterly R&D spending has been increased in Q1 2009, however, at falling growth rates.
- R&D expenditures fell deeply in semiconductors
- Trends suggests that R&D spending could start to fall in the internet and software sector in Q2 2009.
- Yes: Better net cash position and finance (shows as R&D expenditure reaction in no way as strong as in 2001)
- Among the top-10 firms of each ICT sectors, R&D “champions” exists (e.g. Amazon: 18%, Apple: 17%, STMicroelectronics: 9%, Microsoft: 9%).

# Venture capital

■ Amount of ICT VC investments (billion USD)
 — % of ICT VC Investments on Total

**Venture capital has slowed very markedly from mid-2008, but around one-half continues to flow into the sector**



# ICT sector opportunities and challenges

	Opportunities	Challenges
Longer-term	<p><b>New ICT R&amp;D and innovation priorities</b></p> <p><b>Growth in digital content applications</b></p> <p><b>Green IT as growth drivers</b></p> <p><b>Socio-economic challenges as driver: health &amp; aging</b></p> <p><b>Consolidation and globalization of value chains and back-office operations</b></p> <p><b>Spending on ICT security up</b></p>	<p><b>Dropping ICT R&amp;D priorities and weakening ICT innovation and value chain networks</b></p> <p><b>Prolonged ICT sector financing problems</b></p> <p><b>Less ICT professionals / skills</b></p> <p><b>Resistance to change and decreasing trust</b></p> <p><b>Fall in business / consumer ICT spending</b></p> <p><b>Underinvestment in ICT infrastructure</b></p> <p><b>Backlash to globalisation</b></p>

# **3) INNOVATION, ICTS AND POLICY RESPONSES**

# Economic stimulus packages: size

The absolute size of fiscal packages (revenue and spending measures)

2008-2010, in absolute USD million

- Unprecedented fiscal stimulus
  - mixture of financial bail-outs, tax cuts and extra-budgetary spending
- Virtually all OECD countries have package, some several

United States	804,070
Germany	107,789
Japan	99,992
Canada	61,551
Spain	56,754
Australia	45,673
Korea	42,667
United Kingdom	38,003
France	18,568
Netherlands	13,367
Sweden	13,109
Denmark	8,668
Finland	8,575
Belgium	8,016
Czech Republic	6,500
New Zealand	5,404
Poland	5,145
Austria	4,600
Switzerland	2,486
Luxembourg	1,968
Portugal	1,963
Slovak Republic	35

- 
- Size of packages (2009/10):
    - **USD 500 million to 790 billion**
    - as share of GDP: **0.3% to 5%**
    - total of **USD 1.4 trillion**
  - OECD-non members:
    - China USD 580 billion (13% of GDP)

# ICT in non-ICT industries and the economy

## **Measures fostering demand for ICTs**

- Supporting infrastructure investment, either in unserved or underserved areas or fostering next-generation networks
- Upgrading ICT infrastructure in schools, public sector, health, etc.
- Introducing “smart” and “green” ICT-related infrastructure (e.g. health IT)

## **First and second order effects / ICT-enabled innovation**

- Creates demand for ICT industry products and services
- Rise of new specialised hardware, service and consultancy providers (smart grid, health IT, etc.)
- Preservation & creation of ICT technical jobs in other sectors
- ICT contributing to overall capital deepening /labour productivity
- Reorganisation of sectors and productivity impacts
- New products /services (distance education, online medicine, etc.)
- Demand for infrastructure or servicing that infrastructure
- New skills



# "Networked recovery": Investing in ICT infrastructure (examples)

	<b>Planned investment</b>	<b>Goals</b>
<b>Australia</b>	AUS 40 billion (USD 33.4 billion)	fibre all the way to the premises
<b>Canada</b>	CAD 225 million (USD 211 million)	extending broadband coverage to un-served rural and remote communities
<b>France</b>	n.a.	Development of broadband network in small or medium-sized cities, extending (fixed / mobile) broadband.  Internet on TGV Est lines (EUR 15 million), and development of networks for education and research
<b>EU</b>	EUR 1 billion (USD 1.46 billion)	extending and upgrading high-speed Internet (focus on rural communities)
<b>Germany</b>	an estimated EUR 150 million (USD 219 million)	accelerating the spread of broadband networks. By 2010 all unserved areas connected. nationwide capable broadband access by no later than the end of 2010
<b>United Kingdom</b>	to be announced	universal service commitment for broadband
<b>United States</b>	USD 7.2 billion (EUR 4.9 billion)	to foster broadband service to unserved / underserved areas, promote broadband in schools, libraries, health-care providers, and other entities.

## Remaining To do's

- must be accompanied by regulatory frameworks which support open access to networks and competition in the market.
  - meaning network providers offer access or capacity to all market participants at cost-based, non-discriminatory terms.
- Linking ICT investment with other large physical infrastructure investment.
- Governments, both central and municipal, can play an important role by facilitating investment through public-private partnerships

# Innovation and growth measures

**Improving the infrastructure (e.g. roads, transit, broadband)**

**Support for R&D and innovation**

**Investment in human capital, education/training**

**Green technologies and energy-efficiency**

**Support for innovation and entrepreneurship (incl. support for SMEs, venture capital)**

# Weights of measures

	Infrastructure	Science, R&D and innovation	Education	Green Technology
<b>Australia</b>	AUD 9.7 billion	AUD 2.9 billion	AUD 15.7-17 billion	AUD 5.7 billion
<b>% of GDP</b>	0.82%	0.25%	up to 1.4%	0.48%
<b>Canada</b>	CAD 20.3 billion	CAD 800 million	1.9 billion	CAD 2.8 billion
<b>% of GDP</b>	1.27%	0.05%	0.12 %	0.18%
<b>Finland</b>	EUR 910 million	EUR 25 million <sup>1</sup>	EUR 30 million	EUR 38 million
<b>% of GDP</b>	0.48%	0.01%	0.02%	0.02%
<b>France</b>	EUR 4.7 billion	EUR 46 million <sup>2</sup>	EUR 731 million	EUR 30 million
<b>% of GDP</b>	0.24%	0.00%	0.04%	0.00%
<b>Germany<sup>3</sup></b>	EUR 11.5 billion <sup>4</sup>	EUR 1.4 billion	EUR 14.5 billion <sup>5</sup>	EUR 5.7 billion
<b>% of GDP</b>	0.5%	0.1%	0.6%	0.2%
<b>Korea</b>	KRW 50 trillion (USD 36 billion) of green investments (5.14% of GDP) – distributed throughout these categories although a detailed break-down is not yet available.			
<b>Norway</b>	NOK 3.8 billion	NOK 170 million <sup>2</sup>	NOK 270 million	NOK 1.6 billion
<b>% of GDP</b>	0.16%	0.01%	0.01%	0.06%
<b>Sweden</b>	SEK 8.6 billion	SEK 9 billion	SEK 500 million	SEK 2 billion
<b>% of GDP</b>	0.27%	0.29%	0.016%	0.06%
<b>Poland</b>	PLN 91,3 billion	PLN 16,8 billion	n.a.	PLN 2.5 billion
<b>% of GDP</b>	0.072%	0.013%	n.a.	0.002%
<b>Portugal</b>	EUR 50 million	EUR 224 million	EUR 682 million <sup>6</sup>	EUR 260 million
<b>% of GDP</b>	0.03%	0,13%	0.41%	0.16%
<b>US</b>	USD 100 billion	USD 16 billion	USD 83 billion	USD 59 billion
<b>% of GDP</b>	0.70%	0.11%	0.58%	0.41%

**Orange** is most important item. **Blue** is second most important.

OECD estimates.

# *Networked recovery: ICTs in economic stimulus packages*

- ***Targets involving ICTs***
  - Modernising research institutions and facilities
  - educational and training institutions.
  - public services (including e-government).
  - the healthcare sector.
  - transport infrastructure (intelligent transport systems)
  - Developing the energy infrastructure (e.g. smart electrical grids)

# OECD Ministerial Declaration on Green Growth (run-up to COP15)

- **Clean technologies** and smart ICT applications are key to effectively fight climate change, protect biodiversity and manage our water resources.
- Smart ICTs are key to drive systemic change towards **low-carbon economies**.
- International co-operation will be crucial in the application of **green ICT** for raising energy efficiency and as part of efforts on developing clean technology

## Questions for discussion

- **How does the economic crisis change existing ICT policy** ('pre-crisis' OECD ICT policy framework)?
- **Are there ICT policy levers that are particularly important during the economic downturn?**
- **Balance between acute short-term problems (financial sector, unemployment) and longer-term e.g. healthcare, environment, energy supply which are major ICT applications?**

# ANNEX

# The 'pre-crisis' OECD ICT policy framework: Government ICT policy priorities 2008

1. Government online, government as model users

2. Broadband

3. ICT R&D programmes

4. Promoting IT education

5. Technology diffusion to businesses

6. Technology diffusion to households

7. Industry-based and on-the-job training

8. General digital content development

9. Public sector information and content

10. ICT innovation support