Measuring ICT for Policy
Some thoughts from the OECD perspective

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Outline

• ICT impacts
• ICT policy approaches
• Review of the main issues
• Some final thoughts
Did you say “impact”? 

**ICT as an output:**
- From ICT production sectors
- To the whole economy

**ICT as a production input:**
- Investment
- Intangibles

**ICT as an enabler of “innovation” in:**
- Business
- Government
- Society
Did you say “policy”?

**Policy approach**
- Does it make a difference?
- How big?
- What factors matter? Policy targets

**Accounting approach** (= after crisis)
- What is the return from 1 € public expenditure on ICTs?
ICTs are a major driver of GVA growth in OECD

- ICT manufacturing has been growing faster than non-ICT until 2001
- ICT services continue to grow faster
- Similar trend for employment growth
Multiplier effects

- **Final demand**: ICT offers new goods and services for consumers;

- **Demand multiplier**: ICT supply increases demand for the output of other industries;

- **Supply multiplier**: ICT supply creates new opportunities for production in other industries.
Multiplier Effects of ICT on Growth 2001-06

Largest in UK, Finland and Sweden
Large also in US and Belgium
Small in France and Italy
ICT as an Output

- Both the policy approach and the accounting approaches are feasible
- Policy channels are clear: final demand, ICT producing sectors
- “The future like the past” is a strong assumption
ICT as an Input: Growth Accounting

*What is the contribution of ICT investment to growth?*

\[ \text{GDP} = \text{Labour} + \text{ICT capital} + \text{Non-ICT capital} + \ldots \]

- Solow’s paradox / large MFP
- Progress in measurement: Hedonic prices, Capital services, Software, Output in services, STAN Database, Productivity database
- OECD Manual on Measuring Capital
ICT and Productivity

- ICT investment matters more than non-ICT...
- ...but MFP growth remains the main driver
- ICT investment has no impact on MFP growth since 1995 (Van Ark, 2007)
## Intangibles

**The Knowledge Capital of the Firm**

<table>
<thead>
<tr>
<th>Type of intangible investment</th>
<th>Includes the following intangibles</th>
<th>Treatment in SNA</th>
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| Computerised information     | (1) Computer software  
(2) Computer databases                                                        | Both now treated as investment                        |
| Innovative property          | (1) Scientific R&D  
(2) Mineral exploration  
(3) Copyright and license costs  
(4) New product development costs in the financial industry  
(5) New architectural and engineering designs  
(6) R&D in social science and humanities | Only (2) and (3) treated as investment                                 |
| Economic competencies        | (1) Brand Equity  
(2) Firm-specific human capital  
(3) Organisational structure                                                    | None of these treated as investment                      |
Intangibles explain much of MFP

- Similar results in the UK and Japan
ICT as an Input: Education

Computer use increase students’ performance

[Bar chart showing computer use frequency in different countries. The chart compares the percentage of students who use computers 'once or twice a week' and 'almost every day' across various countries such as Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Finland, Germany, Greece, Hungary, Ireland, Italy, Japan, New Zealand, Norway, Poland, Portugal, Republika, Slovenia, Spain, Sweden, Switzerland, Turkey, Bulgaria, Croatia, Lithuania, Macao, China, Serbia, Thailand.]
ICT as an input

- Production function useful for other fields, eg: health
- Policy approach: feasible
- Accounting approach: feasible
- It relies on strong assumptions, eg: no ICT-enabled innovation
- Policy channels are clear: ICT investments
Should policy promote ICT investment?

ICT investments are lower in some countries because of:

• Financial markets: difficult access to credit
• Product regulation: low competition
• Labour regulation: high costs for failure
Product Market Regulation and ICT Investments

Source: Conway and Nicoletti (2006) OECD
ICT-enabled Innovation

Innovation: product, process, organisation and marketing (Oslo Manual, 2005)

ICTs have the potential to increase firms’ innovation capabilities by:

• speeding up the diffusion of information
• favouring networking among firms
• enabling closer links between businesses and customers
• reducing geographic limitations
• increasing efficiency in communication
Innovation capabilities

*ICT use increases the probability to innovate*

![Manufacturing bar chart](image)

![Services bar chart](image)
ICT use increases the probability to introduce a new product both in manufacturing and services.
Innovation capabilities

*ICT use has a significant effect on the probability to introduce a process innovation*
Innovation capabilities

**ICT use increases the probability to introduce a new organisation**

**Manufacturing**

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<th>Country</th>
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<th>web2</th>
<th>web3</th>
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**Services**

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Innovation capabilities

*ICT use increases the probability to innovate in *marketing*

**Manufacturing**

**Services**
Other “non” results

**ICT use does not increase the probability:**

- to introduce a product new-to-the-market
- to develop new product/process in-house
- to cooperate in innovation
ICT-enabled Innovation

• In government:
  Lack of statistics on e-government

• In society:
  Little theory & statistics on social networks

• Policy approach: feasible
• Account approach: difficult
• Policy channels are not well-defined
Some final thoughts

- ICT impact means different things
- Some are more relevant for policy
- ICT-enabled innovation needs a policy-relevant measurement approach
- Both statistics and theory are needed
If you would like to discuss it more:  
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Thank you!