GIES 2008:

"Measuring Innovation"

European Commission
DG Enterprise and Industry
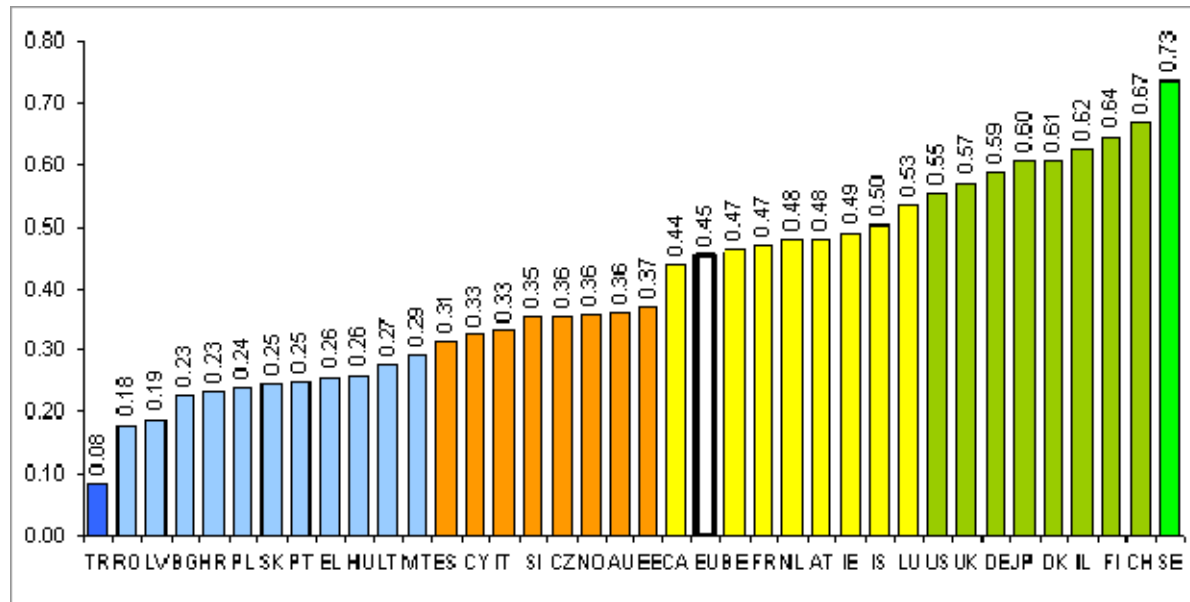## Innovation Policy

Tokyo, 14 March 2008

The European Innovation Scoreboard

Measuring innovation performance
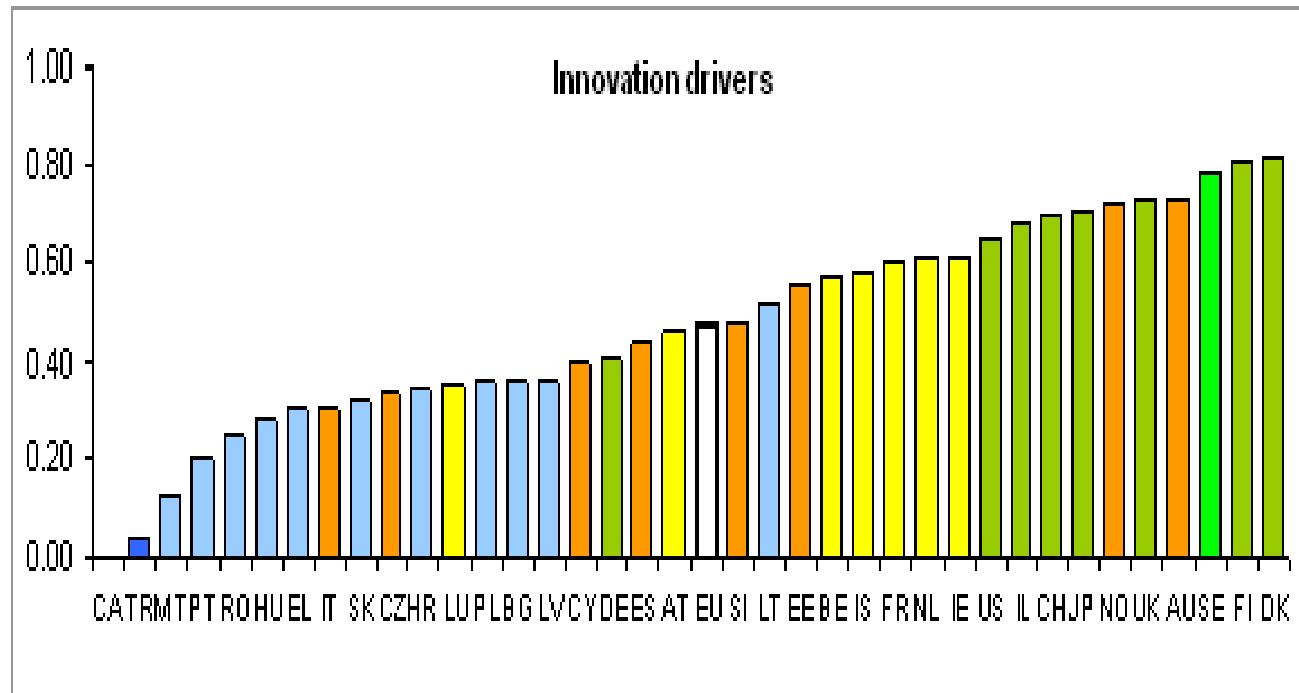
The 2007 Summary Innovation Index (SII)

- The SII is a composite indicator based on 25 individual indicators related to innovation

- For Japan, data are available for 14 indicators, for the US 15 indicators

- Methodology available at http://www.proinno-europe.eu/index.cfm

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The European Innovation Scoreboard
Innovation Drivers

• CA is not ranked due to missing information

Knowledge creation

The European Innovation Scoreboard
Innovation & Entrepreneurship
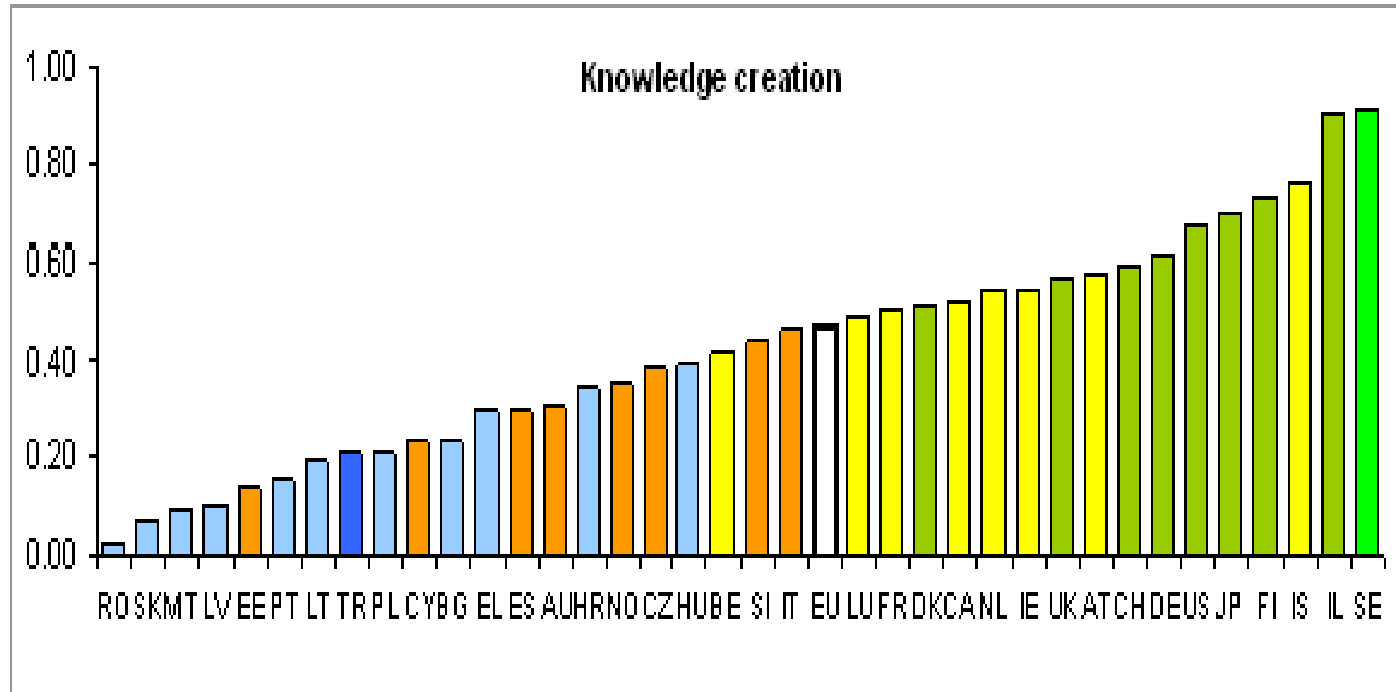
Innovation & entrepreneurship
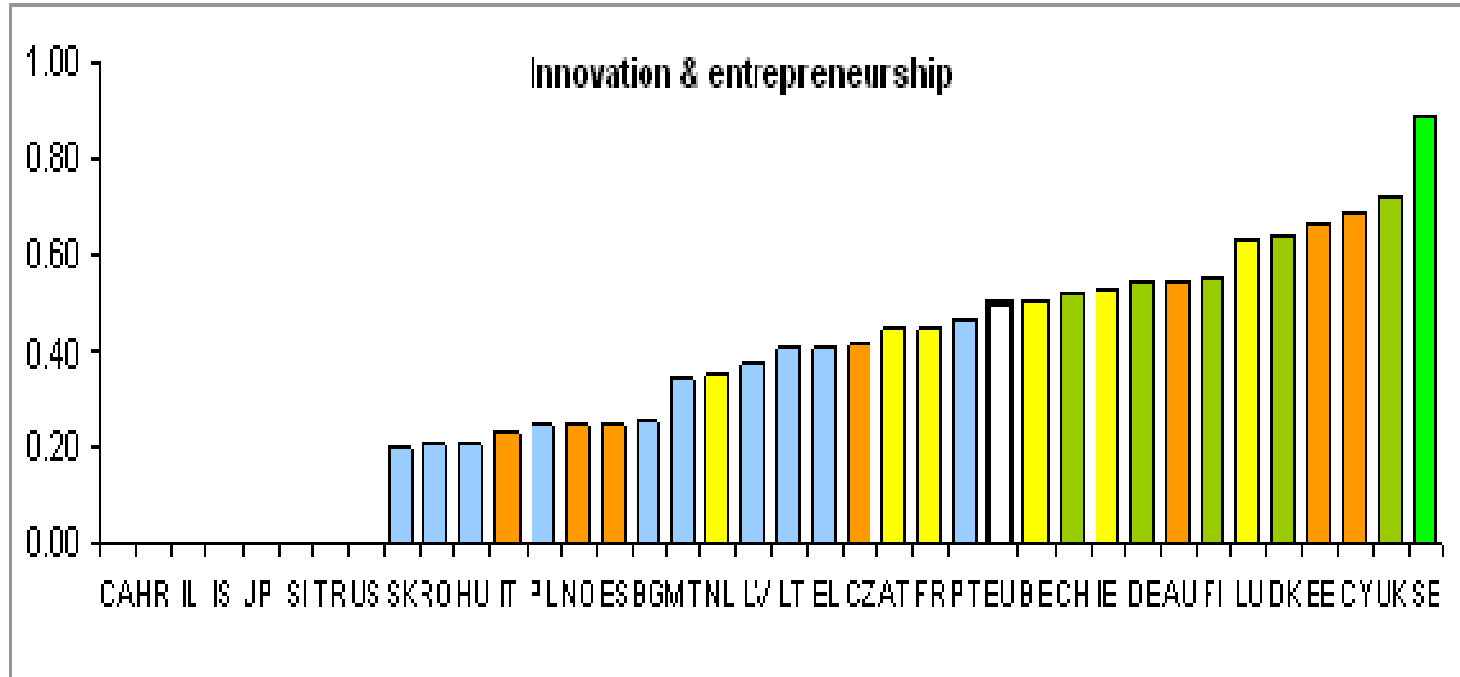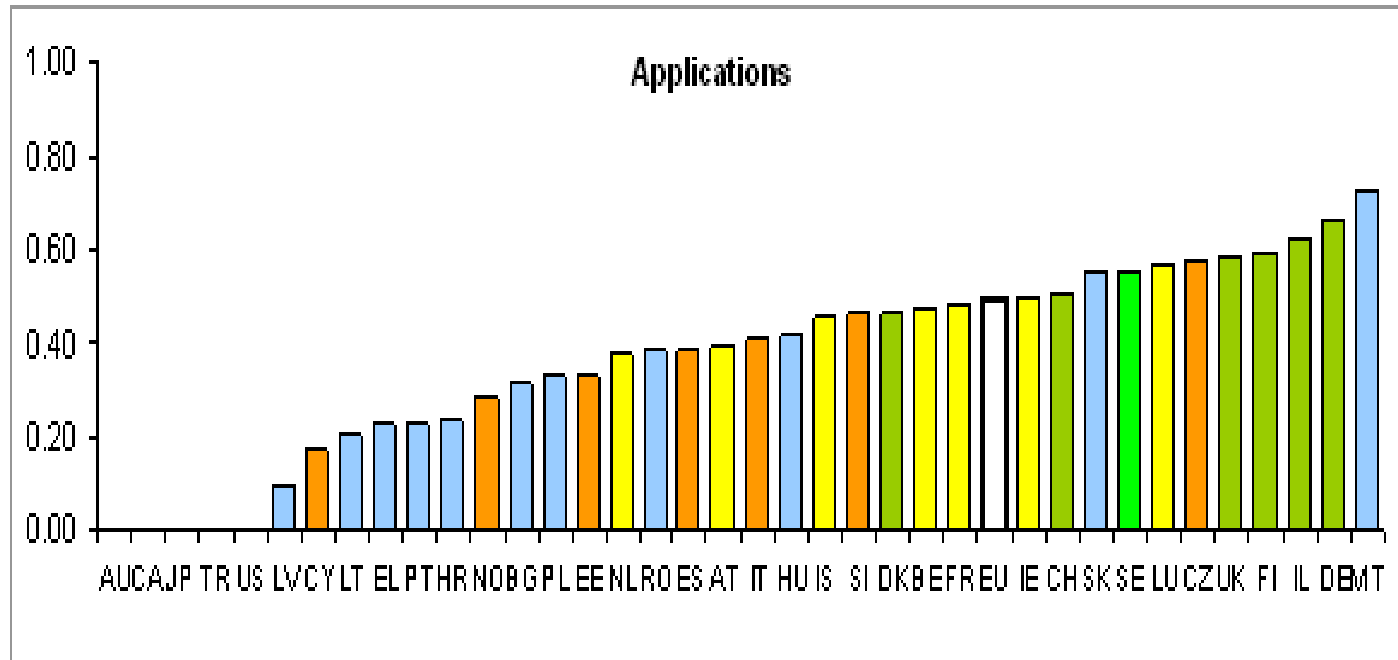
• CA, HR, IL,IS, JP, SI, TR and US are not ranked due to missing information

The European Innovation Scoreboard
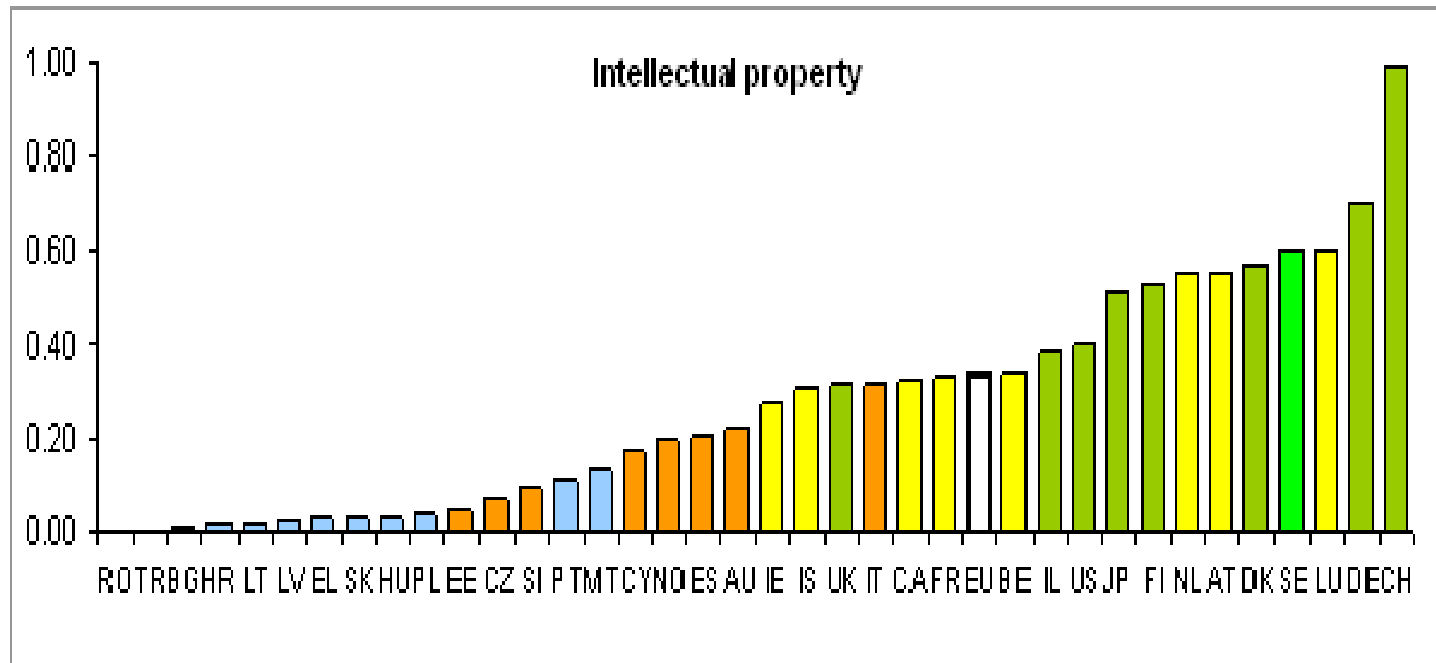## Applications

Applications

- AU, CA, JP, TR and US are not ranked due to missing information

The European Innovation Scoreboard
Intellectual Property

Intellectual property

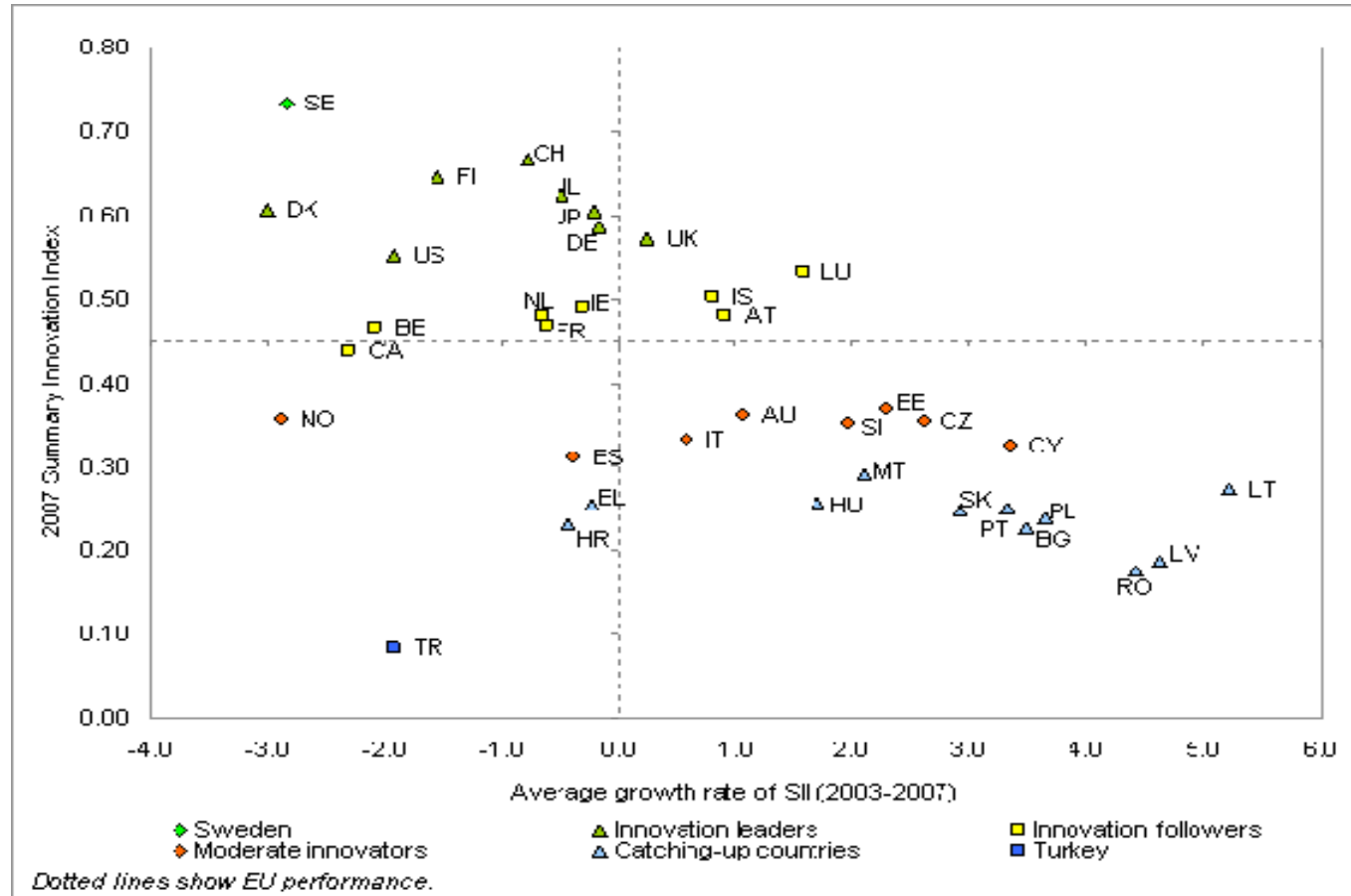• Scores for RO and TR are too small to be shown in the figure

EIS 2007 Indicators

- **EIS 2007 INDICATORS**
- **INNOVATION DRIVERS (INPUT DIMENSION)**
- 1.1 S&E graduates per 1000 population aged 20-29 EUROSTAT
- 1.2 Population with tertiary education per 100 population aged 25-64 EUROSTAT, OECD
- 1.3 Broadband penetration rate (number of broadband lines per 100 population) EUROSTAT, OECD
- 1.4 Participation in life-long learning per 100 population aged 25-64 EUROSTAT
- 1.5 Youth education attainment level (% of population aged 20-24 having
- completed at least upper secondary education)
- EUROSTAT
- **KNOWLEDGE CREATION (INPUT DIMENSION)**
- 2.1 Public R&D expenditures (% of GDP) EUROSTAT, OECD
- 2.2 Business R&D expenditures (% of GDP) EUROSTAT, OECD
- 2.3 Share of medium-high-tech and high-tech R&D (% of manufacturing R&D
- expenditures)
- EUROSTAT, OECD
- 2.4 Share of enterprises receiving public funding for innovation EUROSTAT (CIS4)
- **INNOVATION & ENTREPRENEURSHIP (INPUT DIMENSION)**
- 3.1 SMEs innovating in-house (% of all SMEs) EUROSTAT (CIS4)
- 3.2 Innovative SMEs co-operating with others (% of all SMEs) EUROSTAT (CIS4)
- 3.3 Innovation expenditures (% of total turnover) EUROSTAT (CIS4)
- 3.4 Early-stage venture capital (% of GDP) EUROSTAT
- 3.5 ICT expenditures (% of GDP) EUROSTAT, WORLD BANK
- 3.6 SMEs using organisational innovation (% of all SMEs) EUROSTAT (CIS4)
- **APPLICATIONS (OUTPUT DIMENSION)**
- 4.1 Employment in high-tech services (% of total workforce) EUROSTAT
- 4.2 Exports of high technology products as a share of total exports EUROSTAT
- 4.3 Sales of new-to-market products (% of total turnover) EUROSTAT (CIS4)
- 4.4 Sales of new-to-firm products (% of total turnover) EUROSTAT (CIS4)
- 4.5 Employment in medium-high and high-tech manufacturing (% of total
- workforce)
- EUROSTAT, OECD
- **INTELLECTUAL PROPERTY (OUTPUT DIMENSION)**
- 5.1 EPO patents per million population EUROSTAT, OECD
- 5.2 USPTO patents per million population EUROSTAT, OECD
- 5.3 Triad patents per million population EUROSTAT, OECD
- 5.4 New community trademarks per million population OHIM, EUROSTAT, OECD
- 5.5 New community designs per million population OHIM, EUROSTAT, OECD
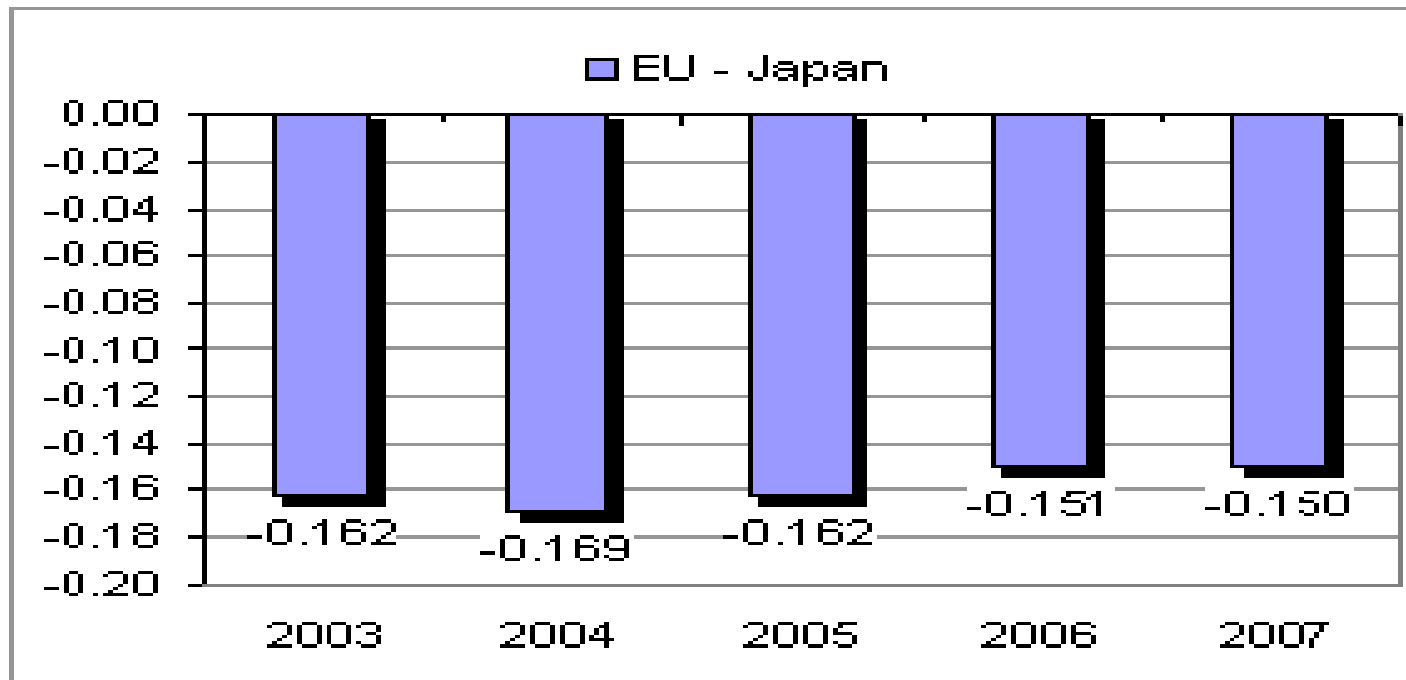
The European Innovation Scoreboard
Convergence in Innovation Performance

EU-Japan Innovation gap

The European Innovation Scoreboard

Increasing EU-Japan lead

Legend: Community trademarks, Community designs

The European Innovation Scoreboard

Decreasing EU-Japan gap

- S&E graduates
- Broadband penetration rate
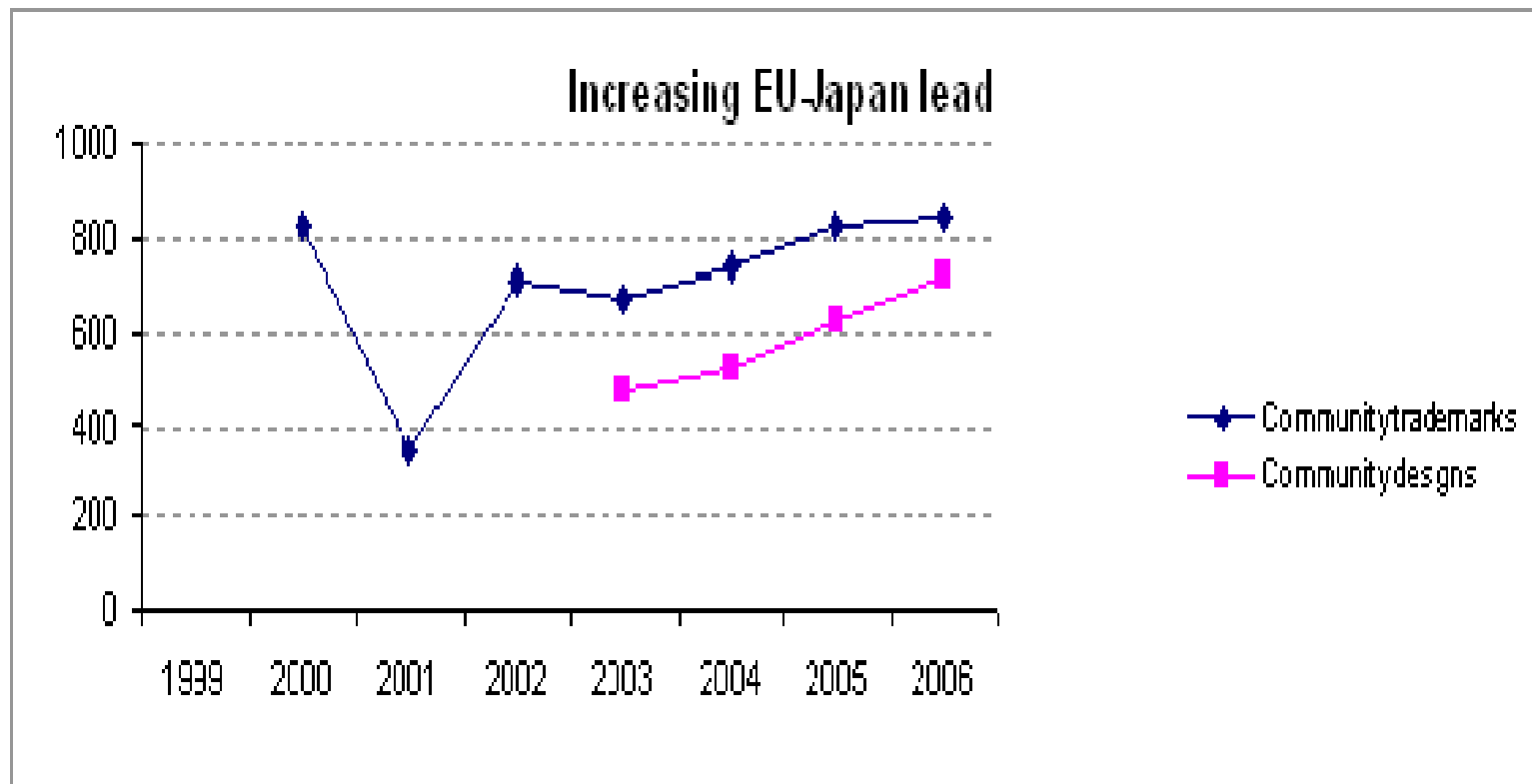
The European Innovation Scoreboard

The European Innovation Scoreboard

Increasing EU-Japan gap

Legend:
- Business R&D expenditures
- EPO patents
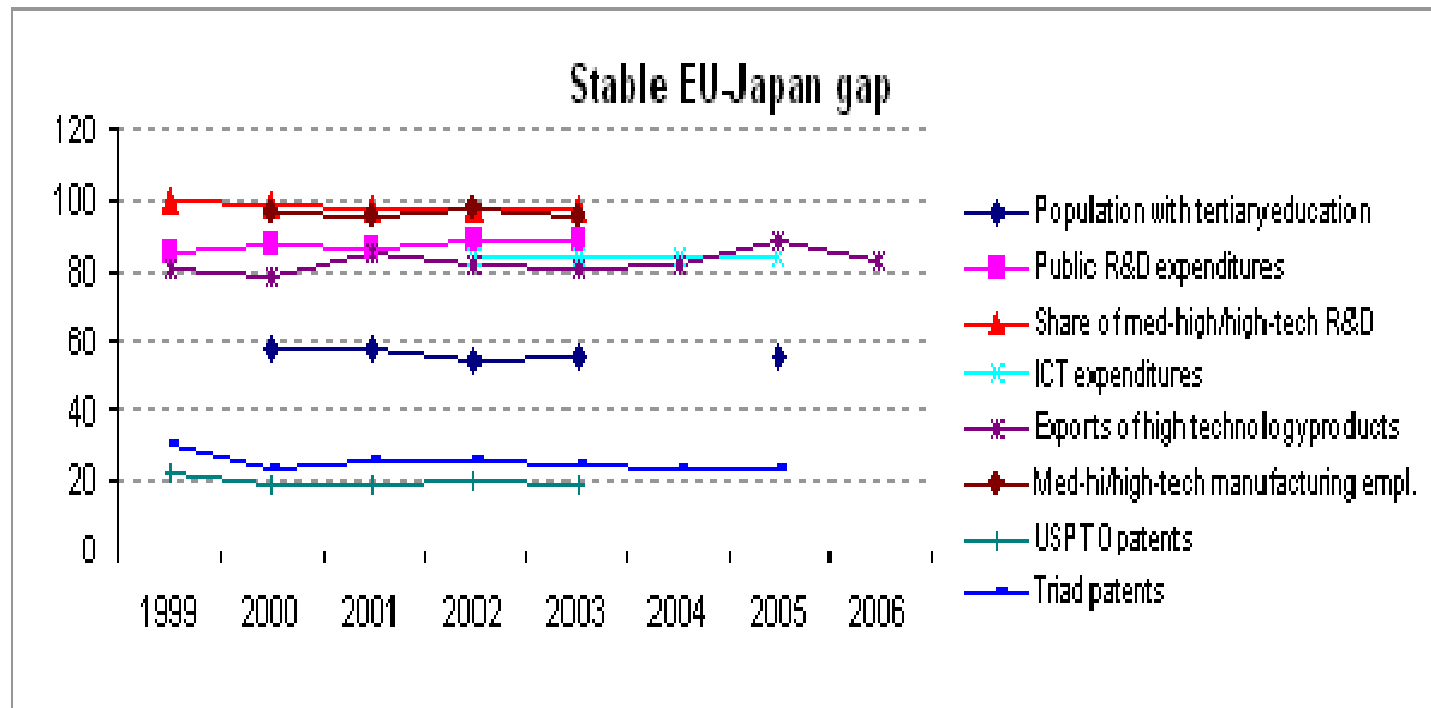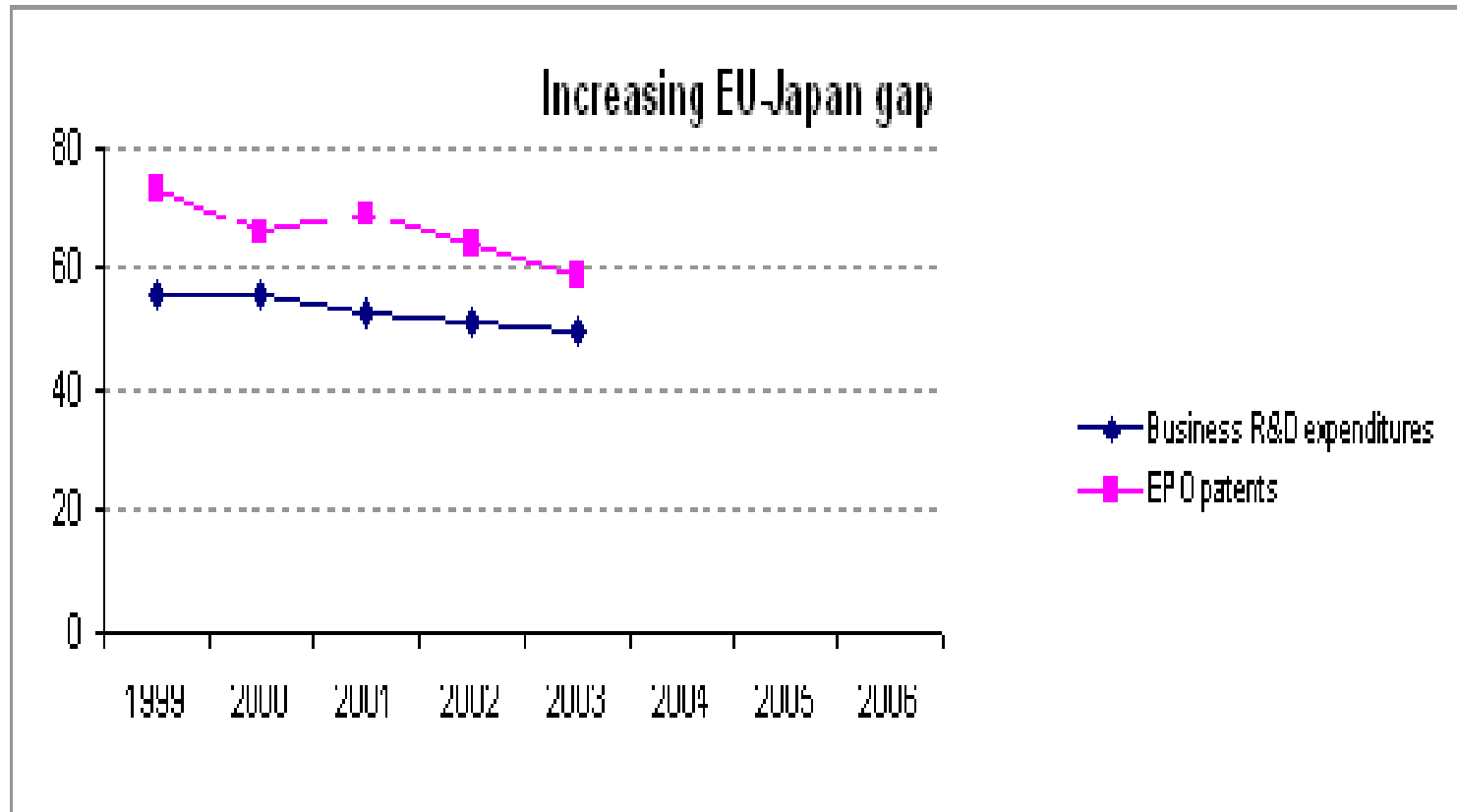
Service sector Innovation Indicators

- **HUMAN RESOURCES**
- **1.1 Share of firms engaged in training for innovation purposes**
- **1.2 Share of firms reporting lack of qualified personnel as an important issue –** *reversed*
- *indicator*
- **INNOVATION DEMAND**
- **2.1 Share of firms reporting uncertain demand as an important issue –** *reversed indicator*
- **2.2 Share of firms reporting no need to innovate because no demand for innovation –**
- *reversed indicator*
- **PUBLIC SUPPORT FOR INNOVATION**
- **3.1 Share of firms that received any public funding for innovations**
- **PRODUCT AND PROCESS INNOVATION**
- **4.1 Share of firms engaged in intramural R&D**
- **4.2 Expenditures in intramural R&D (% of total innovation expenditure)**
- **4.3 Share of firms engaged in acquisition of machinery etc.**

Service sector Innovation Indicators

- **PRODUCT AND PROCESS OUTPUTS**
- **5.1** Share of firms with highly important effects in reduced materials and energy
- **5.2** Share of firms with highly important effects in improved flexibility
- **5.3** Share of firms with highly important effects in improved quality
- **5.4** Share of firms with highly important effects in reduced labour costs
- **NON TECHNOLOGICAL INNOVATION**
- **6.1** Share of firms that introduced organisational and/or marketing innovations
- **6.2** Share of firms that introduced organisational innovations
- **6.3** Share of firms that introduced marketing innovations
- **NON TECHNOLOGICAL INNOVATION OUTPUTS**
- **7.1** Share of firms with highly important effects in reduced time to respond
- **7.2** Share of firms with highly important effects in improved quality
- **7.3** Share of firms with highly important effects in reduced costs
- **COMMERCIALISATION**
- **8.1** Turnover of new and significantly improved products only new to firm (% of total
- turnover)
- **8.2** Share of firms that have new or significantly improved products new to market
- **INTELLECTUAL PROPERTY**
- **9.1** Share of firms that applied for a patent
- **9.2** Share of firms that registered an industrial design
- **9.3** Share of firms that registered a trademark

Future challenges

- **Measuring new forms of innovation:**
    - **Services, user-driven innovation, open innovation**
    - **Bias towards R&D-based technological innovation?**
    - **How to capture non-technological innovation (organizational, marketing) and knowledge flows?**
    - **Should new indicators be developed?**

- **How to correctly assess innovation performance?**
    - **Input-output indicators. How useful is this, given that innovation is a non-linear process?**
    - **How to capture innovation efficiency (transformation of inputs into outputs)?**
    - **Should wider socio-economic factors be included (e.g. governance and economic indicators)?**

- **Is there real international comparability?**
    - **How to handle indicators that are subject to national contexts and perceptions? (e.g. education indicators, IP indicators…)**
    - **Hugely fluctuating indicators (e.g. Venture Capital). Stock approach better than flow approach?**
    - **Problems of data timeliness. Introduce time lags between input and output indicators?**

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Thank you

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