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Measuring Innovation and Intangible Assets

Dirk Pilat*

Head, Science and Technology Policy Division

Directorate for Science, Technology and Industry, OECD

dirk.pilat@oecd.org

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OECD work on innovation

- **Development of policy recommendations:**
 - For instance through the OECD Innovation Policy Reviews, that have been completed for Switzerland and are underway for China and many other countries.
- **Fostering international cooperation:**
 - OECD was asked by the G8 to help foster a dialogue between the G8 and O5 (China, India, Brazil, Mexico and South Africa) on protecting and promoting innovation
 - Countries work in the OECD to address common challenges, e.g. on how to develop policies for emerging technologies.
- **Analysis of innovation policies and performance:**
 - To improve the understanding of factors and policies driving performance
 - To identify good policy practices that may help to strengthen performance
- **Development of statistics, indicators and international guidelines to compare and benchmark innovation.**

Measuring innovation

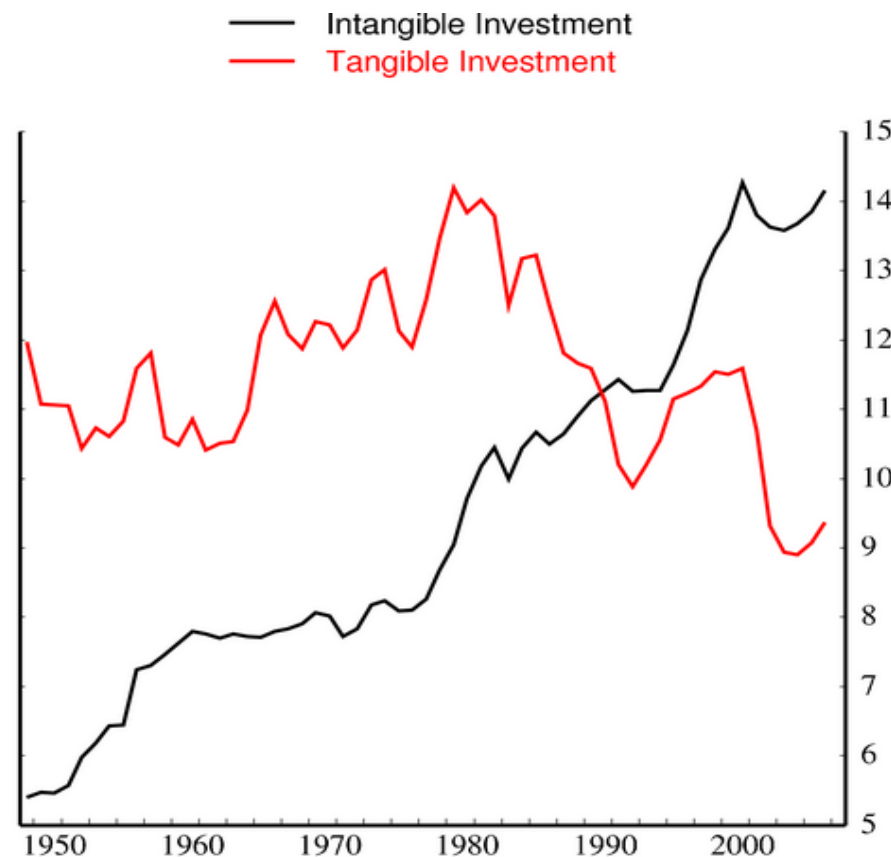
- Work on indicators and metrics underpins policy analysis and helps in comparing/benchmarking outcomes and experiences.
- OECD works closely with statistical offices and policy makers to develop new indicators, based on commonly agreed guidelines, for example:
 - **Frascati Manual:** Provides commonly agreed guidelines to measure expenditure on research and development – regularly updated (last in 2003).
 - **Oslo Manual:** Gives guidance to innovation surveys undertaken in many OECD countries (all EU countries, Japan, Canada, Australia, Mexico, etc) – updated in 2005
 - **Revision of the System of National Accounts:** Decision in 2007 that expenditure on R&D will be treated as investment in the SNA, instead of as current expenditure.
- The challenge: implementing the measurement of innovation and intangible assets in all countries and ensuring international comparability
- Measuring intangibles : a way to get to an aggregate measure of investment in innovation, which will help enhance understanding of economic performance.

Measuring intangible assets

- **Software and databases:**
 - Decision to capitalise in the SNA in 1993
 - 2002 OECD/Eurostat Task Force report: Large differences and problems in implementing the SNA decision: comparability is poor.
- **Research and Development:**
 - Decision to capitalise R&D in the SNA taken by the UN Statistical Commission in 2007
 - The situation is better as it was with software: OECD has provided standards to measure Research and Development for more than 40 years.
 - But problems remain; the Frascati measures are not fully adapted to the SNA.
- **Other intangible assets** (brand equity, firm-specific human capital, organisational investment):
 - No decision to capitalise in SNA
 - Experimental estimates have been made for the US, UK and Japan.

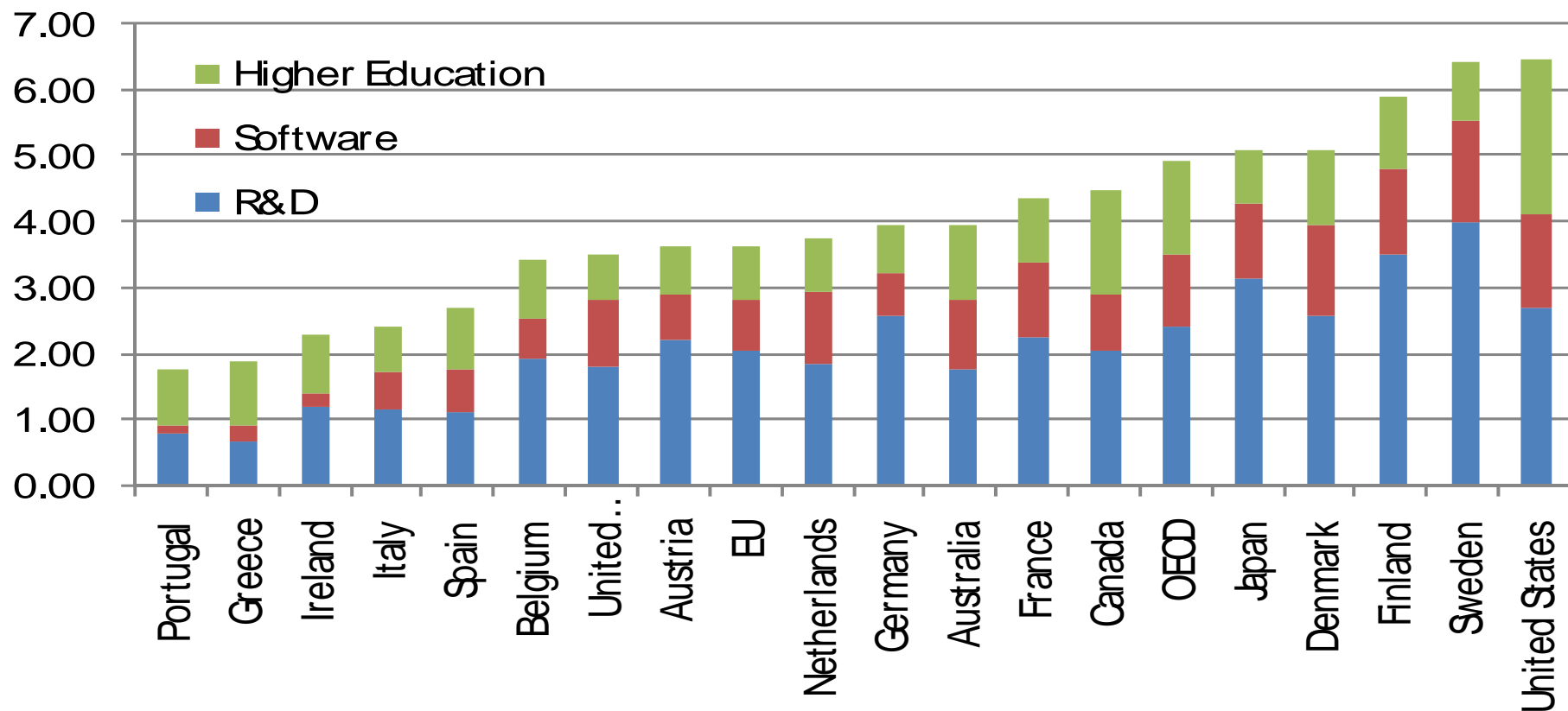
The US perspective

- Estimates by Corrado, Hulten and Sichel show that intangible investment surpasses tangible investment as % of output.
- The US estimates cover computerised information, scientific and non-scientific R&D, and economic competencies.
- Measuring intangibles can change the growth story – capital plays a larger role.



Source: Corrado, Hulten and Sichel (2007).

Some broad comparisons of knowledge investment have also been made (Expenditure as % of GDP, 2003)



Source: OECD, Science, Technology and Industry Scoreboard 2007, forthcoming.

Measuring software

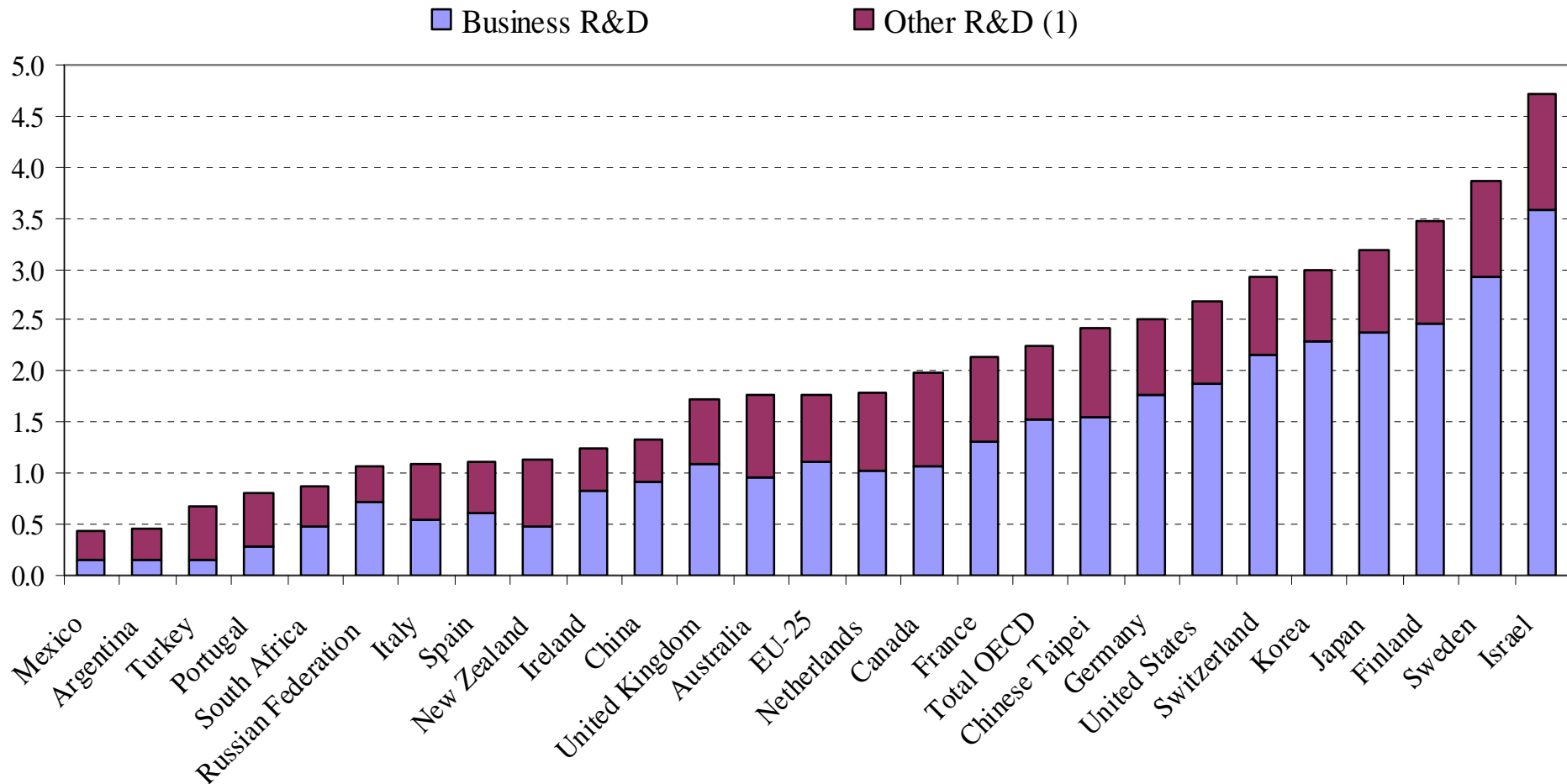
- The capitalisation of software in the SNA raised many problems, even for nominal estimates:
 - OECD countries had no uniform rules: some countries underestimate software investment by a factor of 2-3.
 - Firms used very prudent criteria on what to treat as investment.
 - Own-account software was not being counted.
- OECD/Eurostat Taskforce published a report in 2002 recommending on how to use the commodity-flow method, how to use the supply-based method, and how to treat own-account software in different countries.
- Most of these recommendations have been accepted by OECD countries and have been implemented.

Measuring R&D in the SNA (1)

- A better starting point than software:
 - OECD countries have measured R&D spending for a long time.
 - The OECD Frascati Manual provides a standard reference; the definition is commonly considered as appropriate for the SNA.
- But several problems for compatibility with the SNA:
 - Disentangling software R&D and software investment.
 - Distinguishing GFCF and intermediate consumption.
 - International trade in R&D between affiliated enterprises.
 - Price indexes.
 - Service lives of assets.

R&D investment will add significantly to GDP

(Expenditure on R&D as % of GDP, 2005)



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

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

Measuring R&D in the SNA (2)

1. Avoiding double counting and omissions, e.g.:
 - R&D undertaken in the course of producing software
 - Produced software in the course of undertaking R&D.
 - This is likely to be difficult for own-account R&D/software.
2. GFCF or intermediate consumption:
 - If R&D produces no future economic benefits for its owner it is not regarded as an asset – this may be the case for certain types of government R&D, or higher education and non-profit R&D.
 - This could be distinguished by asking R&D performers whether the R&D will form assets, or simply by excluding basic research from asset-forming R&D.
 - Such R&D should be included in satellite accounts, however.

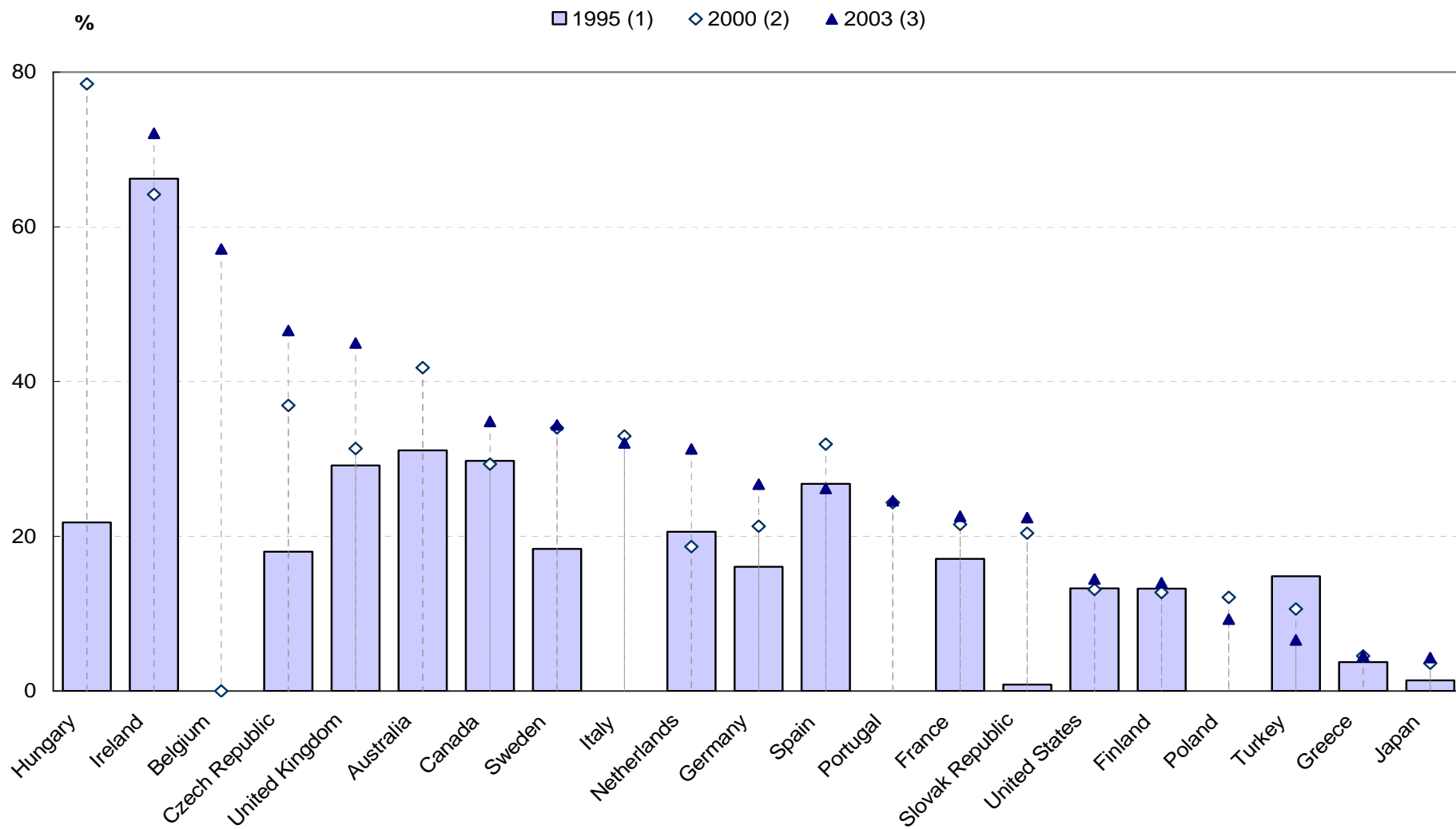
Measuring R&D in the SNA (3)

3. International Trade:

- A major source of R&D expenditure is accounted for by foreign affiliates – the question is how well the resulting imports and exports of R&D are accounted for in BOP statistics.
- A major problem is that much of the transfer of R&D within multinational firms is not priced.
- Currently only few countries (including the US) record outward flows (exports) of R&D.
- OECD has undertaken an exercise to compare outward and inward data for some volunteer countries.
- Possible sources include R&D surveys and foreign affiliate (BOP or direct investment survey) data.
- More work is underway to enhance consistency of data at the national and international level.

R&D by foreign affiliates

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



Source: OECD, Science, Technology and Industry Outlook 2006.

Measuring R&D in the SNA (4)

4. Price indexes and PPPs:

- Difficult: R&D is heterogeneous and much is own-account.
- Frascati Manual recommends input-cost indexes, but these are not very satisfactory as they lead to zero productivity growth.
- Alternatives are being developed, e.g. by ABS, ONS and BEA.

5. Service lives:

- Estimates of depreciation rates and asset lives have been based on patent renewals and econometric methods – estimated service lives lie between 10 and 20 years.
- Some direct survey information from major performers may be helpful; Israel is undertaking some work.

Measuring R&D in the SNA (4)

- Current state of work:
 - The Canberra II group (on the measurement of capital) and the OECD National Experts of Science and Technological Indicators (NESTI) have cooperated for some years to prepare the UN decision on capitalisation of R&D in the SNA.
 - The next step will be the development of an OECD Handbook on Measuring Intellectual Property, which will include a part on measuring R&D (also on software, mineral exploitation, etc.).
 - This Handbook will give guidance to countries on how to introduce various intangible fixed assets (including R&D) in the national accounts – it is to be released in 2008.
 - The OECD NESTI group and the Working Party on National Accounts will work in a Joint Expert Group on R&D.
 - OECD is also working with analysts on helping estimate intangible investment in various countries – beyond what is accepted in SNA context – as this helps enhance our understanding of innovation and growth.

Are estimates of intangible investment sufficient to underpin policies for innovation?

- The incorporation of R&D in the SNA will provide new insights in the role of R&D investment for productivity growth.
- However, analysis of innovation performance indicates that a wider range of factors affect performance:
 - Some innovation is non-technological – not involving formal R&D – this will not be fully addressed by the SNA.
 - Other intangible factors matter – organisational change, human capital, intellectual property.
 - Firm dynamics matter – firm exit, entry and growth influence overall innovation performance.
- The SNA metrics should therefore not be seen in isolation of other measures of innovation performance.

A complementary track: OECD work with micro data of innovation

- Cross-country analysis of firm-level data from innovation surveys based on OECD Oslo Manual, covering 4 major themes:
 1. The link between innovation and productivity, e.g. the impact of foreign ownership and other factors.
 2. Channels for international knowledge transfer
 3. Non-technological innovation.
 4. Innovation and IPR.
- Over 20 OECD countries participating; results by end-2007.
- Teams of researchers are addressing the same questions with confidential firm-level data based on innovation surveys.
- This work should lead to new insights in factors driving and affecting innovation performance and in cross-country differences.

Next step for the OECD: OECD Innovation Strategy and following up on the G8

- The OECD Ministerial meeting of May 2007 mandated the OECD to develop an OECD Innovation Strategy:
 - **New facts and evidence** depicting and comparing innovation performance in OECD countries, based on statistical, empirical and thematic analysis; this will also include more work on statistics and measurement.
 - **Explanations** for the differences in performance across OECD countries, pointing to the main policy considerations for enhanced innovation performance.
 - **A comprehensive and forward-looking policy strategy to strengthen innovation**, involving good policy practices, guidelines and policy recommendations to boost innovation performance. These can be tailored to countries in OECD's Innovation Policy Reviews.
- OECD has also been asked by the G8 to initiate a dialogue on protecting and promoting innovation policy with large non-member economies (China, India, Brazil, South Africa, ..)

Contact for further information:

dirk.pilat@oecd.org

Internet site:

www.oecd.org/sti/stpolicy

Thank you.