European Long-term Competitiveness: A European Leader or a Global Laggard

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Firms from EU are strong in traditional fields such as automotive, machinery and equipment, chemistry + biotechnology; EU underperformer in ICT, but is set to improve if adequate policies are adopted
Introduction

- **Globalization** continues, China’s catching-up process continues

- Problems with **financial market globalization; financing R&D more difficult**

- **Digital expansion/ICT growth strong** = global competition in markets with economies of scale

- **US technology dynamics relatively strong** – investment-GDP is high

- **EU15 has comparative advantage in medium technology fields, capital-intensive goods and research-intensive goods (Europ. Com)**
Introduction: EU15/eastern EU

- EU benefits from catching-up in Eastern Europe: real exchange rate appreciation = pressure for upgrading of products/technology (FABRIZIO/LEIGH/MODY, 2009)

- Western Europe is rather divided into
  - Strong Scandinavia+Germany+France+Benelux+Ireland
  - Weak southern EU countries; lack of ICT innovation dynamics= insufficient growth, government budget problems= creating new risks
2. Medium Term Innovation Trends

- **ICT Technology Dynamics strong** in OECD + BRICs

- Pressure for energy innovations: post-Fukushima adjustment in many countries – raises demand for **EU energy technology+smart energy sector/e-mobility**

- **Ratio of R&D expenditures to GDP** will increase in the world economy
  - EU did not match the 3% goal of the EU 2010 programme; new programme EU 2020 better & has sustainability element
  - **Techno-globalization**: MNCs with R&D abroad, 20% of EU R&D is international
EU with strong knowledge basis, but new problems

- Multinational firms (MNCs) and technology-oriented newcomers + hidden champions

- **US MNCs with strong presence** in EU

- **Government R&D expenditures and education expenditures** under pressure in EU countries after the public debt crisis/banking crisis

- **EU specialization** is often in line with global demand/growth of demand in Asia: machinery & equipment, automotive, high-tech chemicals, air & space

- **Chinese firms as new MNCs** in EU and Asia
New Challenge in Science is China: Has Increased Number of Publications & Citations

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Source: Royal Society, 2011

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3. EU Innovation Dynamics

- About 50% of trade is trade in intermediate products; export+import side

- High-tech industries import more intermediate goods than other sectors: imported intermediate products represented about 55% of total inputs in high-tech manufacturing industries

- Share of imported intermediate goods is much lower in services; 26% is top: transport serv.
Biotechnology

- In EU Germany is No. 1 in absolute terms
- In relative terms Denmark and Netherlands (plus Switzerland) top in Europe:
  - Relative position = patent applications relative to GDP; biotechnology = rejuvenation of pharmaceutical companies
  - Across all six enabling key technologies German applicants=43% of all EU international patent appl., France 15%, UK 11%
<table>
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<th>Technology</th>
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<th>Expected size in 2015 (around 2012/15; USD)</th>
<th>Expected compound annual growth rate</th>
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*Source: Background study, Confindustria (2009).*

Quoted from EU Commission 2010, p. 176
EU weakness

- High-tech sectors of EU underperform relative to US in terms of sectoral R&D intensity
  - *Medical precision and optical instruments in the US = half of value-added to R&D*
  - EU only about 12%; however, one should accept international differences in specialization & innovation intensity
EU is good in networking/cluster initiatives

- Cluster has several dimensions
  - (1) Joint patent application
  - (2) Mobility of inventors within region = flow of tacit knowledge across firms = reinforcing region’s (and sector’s) competitiveness
  - (1)+(2) = regional relationship network
ICT Regional Network Dynamics: ICT Cluster Initiative in the Vienna Region

Relationship network ICT – Vienna Region 2000-2007

Relationship network ICT – Vienna Region 1992-1999

Source: EIIW Calculations
ICT Network Dynamics: London


Source: EIIW Calculations


Source: EIIW Calculations

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ICT Regional Network Dynamics: "Philips Land" = excellent networking


Source: EIIW Calculations
Firms from EU Leader in Certain Fields

ICT is most innovative sector in EU and USA; how strong is EU vs. How strong are EU firms (conducting R&D in EU and outside EU)
4. Policy Perspective: EU could do much better

More EU leadership possible

- R&D promotion in member countries could be improved: tax breaks instead of subsidies = more effective promotion (not discriminating SMEs)

- Incentives for retraining should be reinforced = problem with globalization as tenure of workers/employees in firms is falling = lower incentive to invest in training

- Raise volume of venture capital = growth+

- Stimlate EU foreign direct investment inflows = technology transfer; however, risk of € instability
References

- WELFENS, P.J.J. (2011), Innovations in Macroeconomics, 3rd revised and enlarged edition
- See also Journal International Economics and Economic Policy (e.g. article by DACHS; and M. GRAHAM on foreign direct investment in China; GRUPP on pharmaceuticals)
Appendix

- Analysis of Revealed Comparative Advantage
- Analysis of Export Unit Value
Revealed comparative advantage in EU15 single market; NACE 32: Telecomms equipment

Source: EIIW Calculations
Revealed comparative advantage (RCA) for NACE 30 in EU15 market: ICT Equipment

Source: EIIW Calculations
Export Unit Values for NACE 30

Source: EIIW Calculations
Export Unit Values for NACE 32

Source: EIIW Calculations

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European Institute for International Economic Relations (EIIW)/University of Wuppertal; more than 15 years of excellence in research
Many thanks for your kind attention