COMPETITIVENESS CONTEXTS OF HUNGARIAN INNOVATION AND SCIENCE POLICY

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PLAN OF THE PRESENTATION

- 1. Issues of competitiveness in R-D-I
- 2. The European landscape
- 3. Regional differences in R-D-I within Hungary
- 4. Europe's position in international R-D-I competition
- 5. Explaining Europe's lag as compared to North America and Asia

WHY IS INNOVATION IMPORTANT TO THE COMPETITIVE PERFORMANCE OF THE ECONOMY?

"middle income trap"

- Continuous and significant FDI inflows, but low value-added high-tech manufacturing
- National Innovation System (NIS) not powerful enough to massively generate competitiveness-enhancing innovations
- Connections between NIS and firms often too weak and sporadic

THE GLOBAL COMPETITIVENESS INDEX 2014-2015 (WEF) – THE EUROPEAN LANDSCAPE



Competitiveness



INTERNATIONAL COMPETITIVENESS IN INNOVATION

Research and development (R&D) - innovation

Krugman (1994) – rejection of the idea of understanding competitiveness at the macro level

- The Krugman-debate: is international trade a cooperative or a non-cooperative game?
- TBN: WHAT IS international trade? Goods and/or services or both?

Supply-side and demand-side approaches

Product competitiveness depends on competitiveness of R&D?

- Scientific excellence
- Academic performance
- Success in generating funding

R&D AND INNOVATION IN THE EUROPEAN UNION

Measure the international competitiveness of R&D and innovation – GERD/GDP – BERD/GDP

Lisbon Agenda: 3% (2010: 1,9%) - caveats:

- Deteriorating or unstable fiscal situation
- Economic slowdown

EU2020: 3% (Hungary: 1,8% - 2020)

New methods of measurement would be welcome

European Innovation Scoreboard

- Certain elements of an optimal set of the synthetic indicators of innovation performance
- Good proxy of a competitiveness ranking

EUROPEAN INNOVATION SCOREBOARD (2014)



Source: Innovation Union Scoreboard, 2014

REGIONAL INNOVATION PERFORMANCE (2004)



REGIONAL INNOVATION PERFORMANCE (2006)



REGIONAL INNOVATION PERFORMANCE (2008)



REGIONAL INNOVATION PERFORMANCE (2010)



REGIONAL INNOVATION PERFORMANCE (2014)



Map created with Region Map Generator

Source: Regional Innovation Scoreboard, 2014

REGIONAL INNOVATION GROWTH PERFORMANCE (2004-2010)



Source: Regional Innovation Scoreboard, 2014

HUNGARY: R&D EXPENDITURES PER COUNTY(2011, HUF THOUSAND)



TOTAL INTRAMURAL R&D EXPENDITURE (GERD) (EURO PER INHABITANT)



TOTAL R&D PERSONNEL AND RESEARCHERS (PERCENTAGE OF ACTIVE POPULTATION)



Source: Eurostat, 2014

PERSONS WITH TERTIARY EDUCATION (ISCED) AND/OR EMPLOYED IN SCIENCE AND TECHNOLOGY (THOUSAND)



Source: Eurostat, 2014

PERSONS WITH TERTIARY EDUCATION (ISCED) AND/OR EMPLOYED IN SCIENCE AND TECHNOLOGY (PERCENTAGE OF TOTAL POPULATION)



PERSONS WITH TERTIARY EDUCATION (ISCED) AND/OR EMPLOYED IN SCIENCE AND TECHNOLOGY (PERCENTAGE OF ACTIVE POPULATION)



CHANGES IN INNOVATION PERFORMANCE – EU27 AND HUNGARY (%, 2008-2012)



THE EU'S COMPETITIVENESS IN R&D AND INNOVATION

The "European Paradox"

- the EU lags behind the US (plus South Korea and Japan) in terms of R&D and innovation
- EU spends relatively much on science and R&D, but it only has a limited effect on increasing competitiveness output appears more in publications than in patents
- Output appears more in publications than in patents

GERD/GDPvariesbetween0,48%(Romania) and 3,55% (Finland)

Calderini et al. (2007) – patenting and publishing results are often alternatives to each other

GERD AND BERD AS A PERCENTAGE OF GDP (2012, %)



Source: OECD MSTI, 2014

NUMBER OF SCIENTIFIC PUBLICATIONS (1998-2013)



Source: SCImago. (2007). SJR — SCImago Journal & Country Rank. Retrieved August 25, 2014, from http://www.scimagojr.com

SCIENTIFIC PUBLICATIONS - CITABLE AND NON-

CITABLE PUBLICATIONS (1998, 2013)

Publish or perish?



Source: SCImago. (2007). SJR — SCImago Journal & Country Rank. Retrieved August 25, 2014, from http://www.scimagojr.com

CITABLE DOCUMENTS - ARTICLES, REVIEWS AND

CONFERENCE PAPERS (1998, 2013)

China pushing ahead. 1998: 38 370 – 2013: 416 292



1998

2013

CITATIONS – WHOLE PERIOD CITATIONS TO DOCUMENTS PUBLISHED DURING 1998 AND 2013

Peer-review and citation rings – co-operative games to increase impact factor (of journal, not of author!!!!)



1998

2013

CITATIONS PER DOCUMENT (1998, 2013)

Small countries perform well ?- Santa Lucia, 1998: 4 documents, 577 citations = 144,25 citations per document - statistical illusion!





HIRSCH INDEX (1998, 2013)

Problems of co-authors (more than 100 authors), problems of citations





SELF-CITATIONS (1998, 2013)

Dominance of US, but measurement problems: e.g. citations by co-authors?



1998

2013

WORLDWIDE PATENT APPLICATIONS (DIRECT AND PCT NATIONAL

PHASE ENTRIES, TOTAL COUNT BY FILING OFFICE)



REASONS UNDERLYING THE LAG

- Strong US dominance in international higher education
 - Ranking lists of universities (ARWU, TIMES) a complex problem of competitiveness analysis
 - Johns Hopkins University (2012 \$2 106 185 000), University of Michigan (2012 - \$ 1 322 711 000), Harvard (2012 – \$799 432 000)
- English as a *lingua franca*
- US one national market of scientific output
- Institutional differences

THANK YOU FOR YOUR KIND ATTENTION!