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## Country Perspectives of ICT R&D Challenges in EEMS: Hungary

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ICT Research and Innovation Challenges in Eastern European Member  
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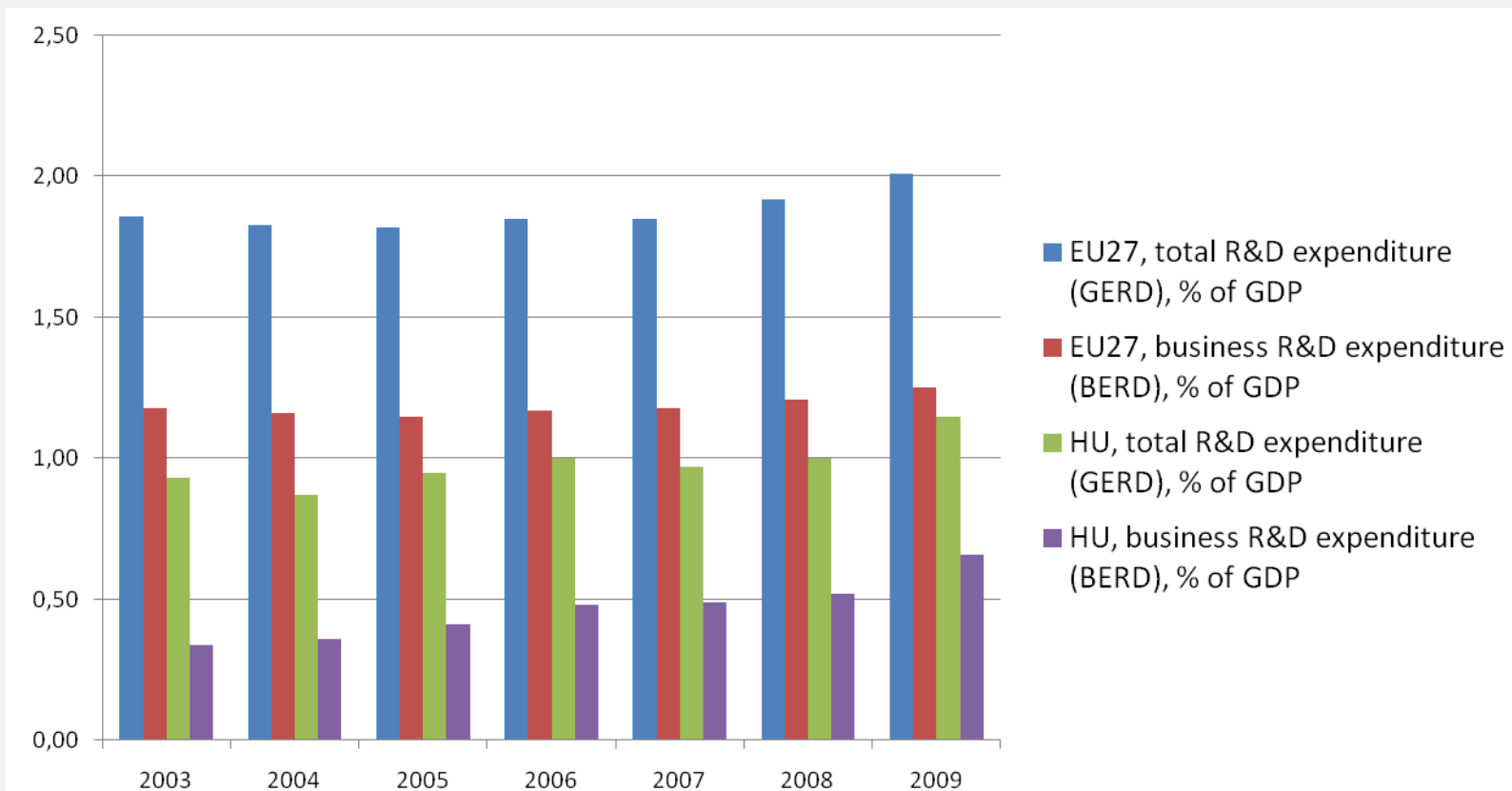


## The role of Hungarian R&D in the EU27: GERD and BERD (Eurostat)

	<b>EU27, total R&amp;D expenditure (GERD), mEUR</b>	<b>HU, total R&amp;D expenditure (GERD), mEUR</b>	<b>EU27, business R&amp;D expenditure (BERD), mEUR</b>	<b>HU, business R&amp;D expenditure (BERD), mEUR</b>
<b>2003</b>	<b>188 534</b>	<b>693</b>	<b>119 816</b>	<b>255</b>
<b>2004</b>	<b>193 996</b>	<b>721</b>	<b>123 004</b>	<b>297</b>
<b>2005</b>	<b>201 905</b>	<b>838</b>	<b>127 079</b>	<b>362</b>
<b>2006</b>	<b>216 266</b>	<b>900</b>	<b>137 301</b>	<b>435</b>
<b>2007</b>	<b>229 234</b>	<b>977</b>	<b>145 912</b>	<b>492</b>
<b>2008</b>	<b>239 702</b>	<b>1 059</b>	<b>151 592</b>	<b>557</b>
<b>2009</b>	<b>236 820</b>	<b>1 067</b>	<b>146 937</b>	<b>611</b>

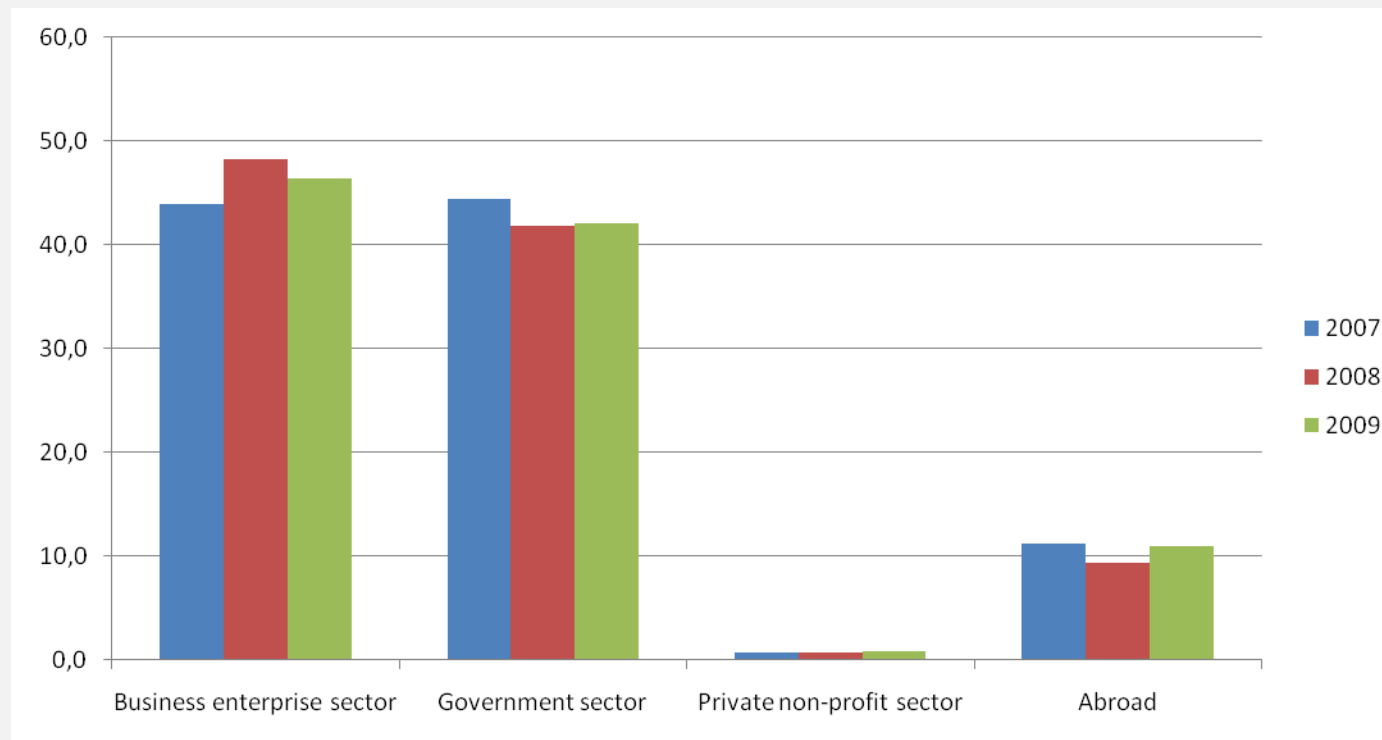


## The role of Hungarian R&D in the EU27: GERD and BERD in % of GDP (Eurostat)



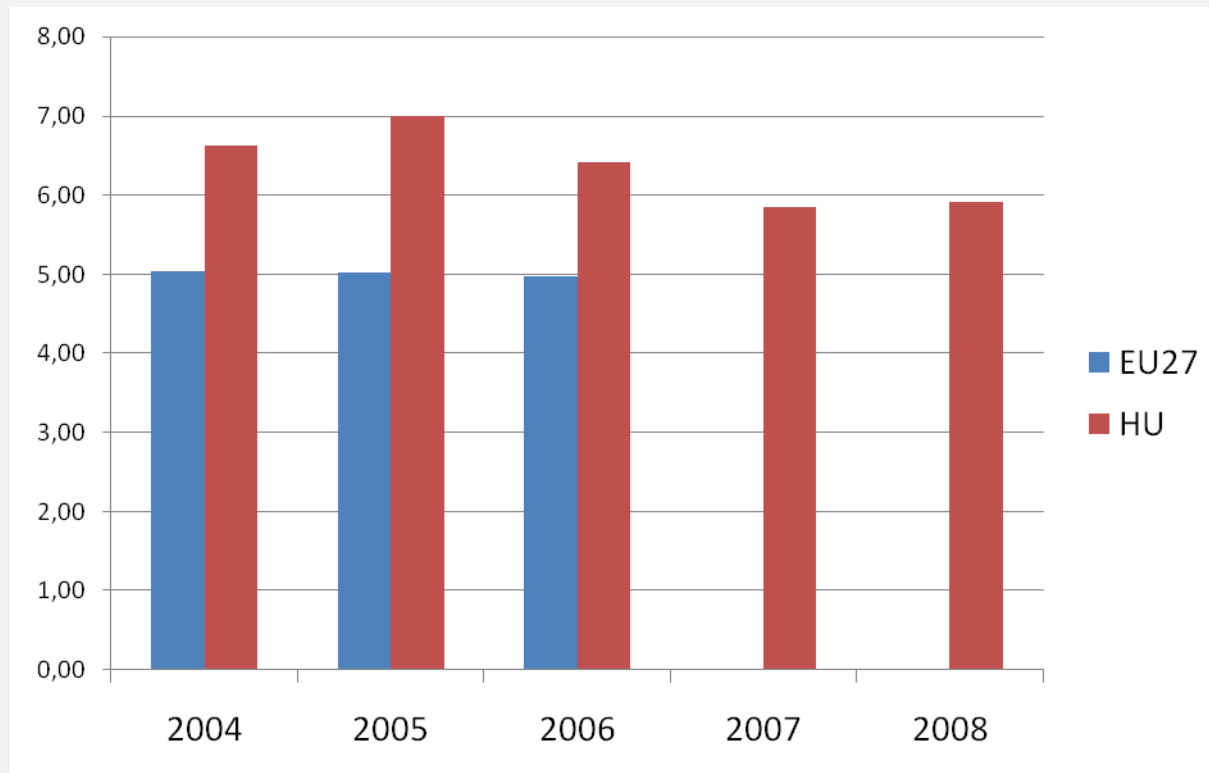


## Hungarian GERD by source of funds (%), 2007-2009 (Eurostat)



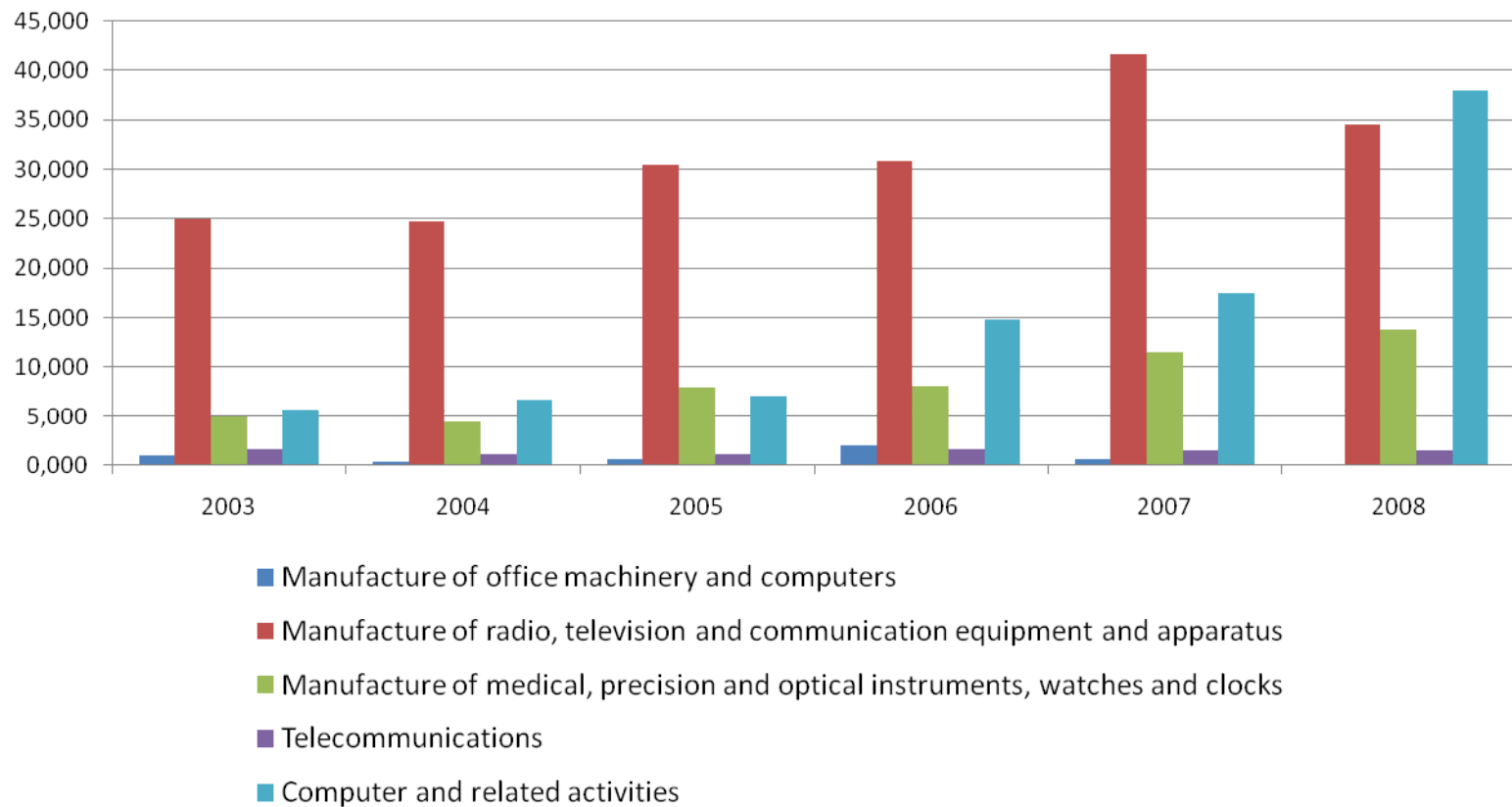


## The role of the ICT sector: Percentage of the ICT sector on GDP (Eurostat)



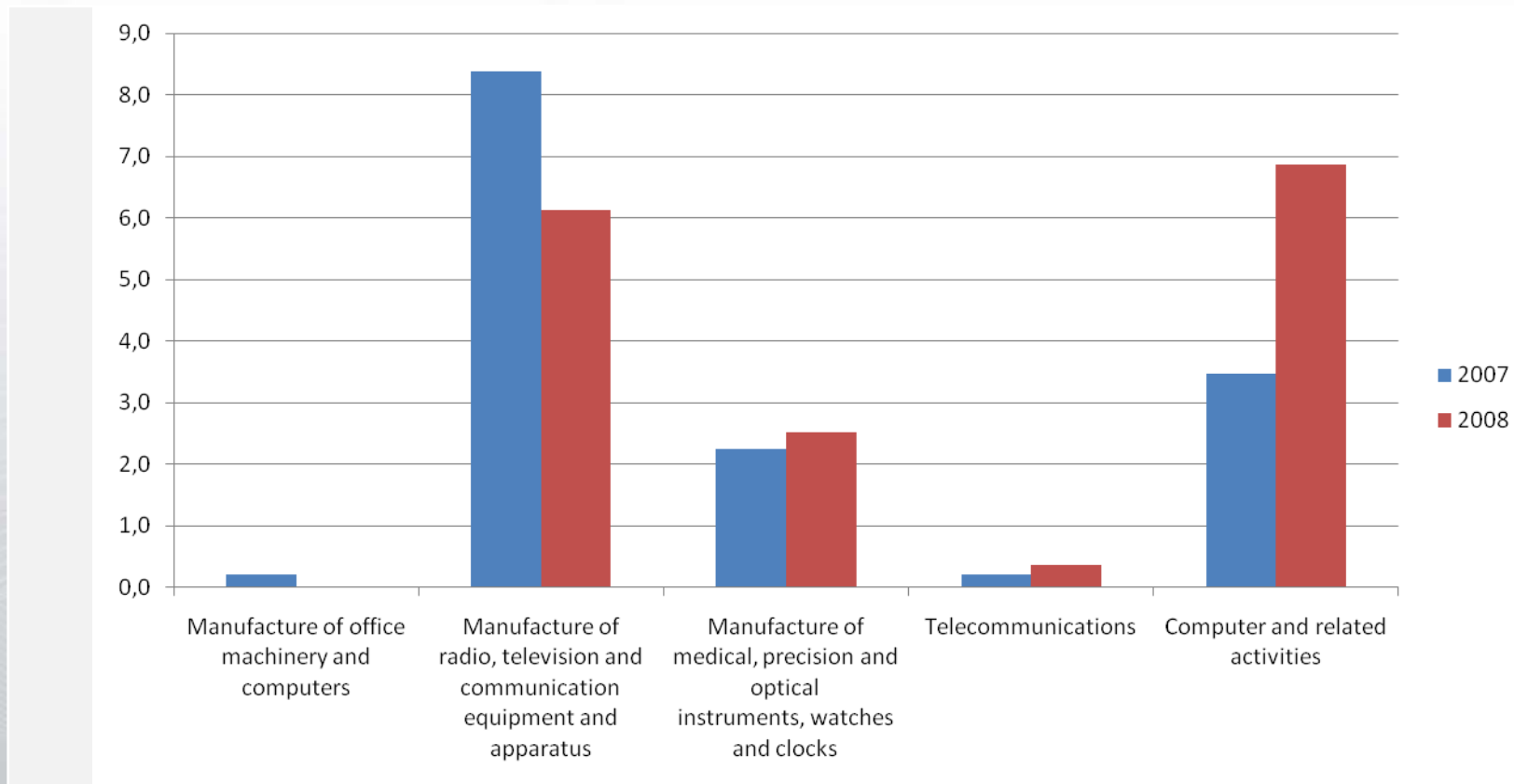


## BERD in selected HU subsectors , million EUR (Eurostat)





## % of selected HU subsectors BERD in total HU BERD (based on EUR per inhabitant, Eurostat)





## ICT BERD picture: case study series with companies (OISTU project, ICT industry report for IPTS)

The task was to collect the 13+13 leading ICT R&D actors in manufacturing + software

Among the interviewed ICT Industry companies were

- IT Hardware companies
- Telecommunication operators
- Professional IT suppliers e.g. system integrators, IT consultants
- Automotive companies carrying out partly ICT-related R&D
- Software companies

Basis of selection for interviews:

- data from the Hungarian Registry Court , newspapers, media, expert assessments, suggestions
- The list included foreign owned affiliates of the biggest ICT industry R&D spenders and some smaller actors, SMEs as well
- The selected companies were from various ICT fields but the dominance of telecommunication operators and automotive industry was explicit, it can be explained by their rapidly growing R&D activity





## Selected findings, manufacturing 1.: (OISTU project, ICT industry report for IPTS)

- Ten of the estimated first thirteen are foreign owned companies (although includes former state-owned, later privatised companies), and only three of them are Hungarian owned
- The main motives of foreign companies to establish Hungarian affiliates in R&D were mainly the high quality expertise of Hungarian employees
- The main destinations of ICT R&D results/output:
  - a.) Mother company and other affiliates of it (Knorr Bremse, Audi, AVL Autókut, NI Hungary) - export/sales ratio is between 70 to 100%. , important: vertical nature of these projects and the fact that R&D activities in Hungary are highly embedded into the “R&D-network” of the parent company.
  - b.) Domestic market (Magyar Telecom Plc, Bull Hungary Ltd, Externet,) - more of horizontal nature and carry out R&D mainly with the aim of adaptation of the products of the given company to the local market
  - c.) Clients from all over the world (GE) - the Hungarian R&D unit can be considered as a globally oriented plant where certain R&D activities of the multinational company are concentrated



## Selected findings, manufacturing 2.: (OISTU project, ICT industry report for IPTS)

- Internationalisation of R&D : mainly through exports
- Only some examined companies had foreign direct investment such as establishment of foreign affiliates e.g. Magyar Telekom Telecommunications Plc. in Macedonia and Montenegro.
- As an example, a medium sized Hungarian company also set up a small affiliate in another country (Slovakia) but not internationalising R&D, rather for more business-friendly environment.
- The number of patents and applications is also important during the internationalisation of R&D, Nokia Siemens Ltd, Knorr Bremse Ltd and Meditech Ltd. have registered patents among the examined companies
- Participation in the National Innovation System: relatively weak, existing cooperations: multinational – higher edu , SME – higher edu (spinoffs)



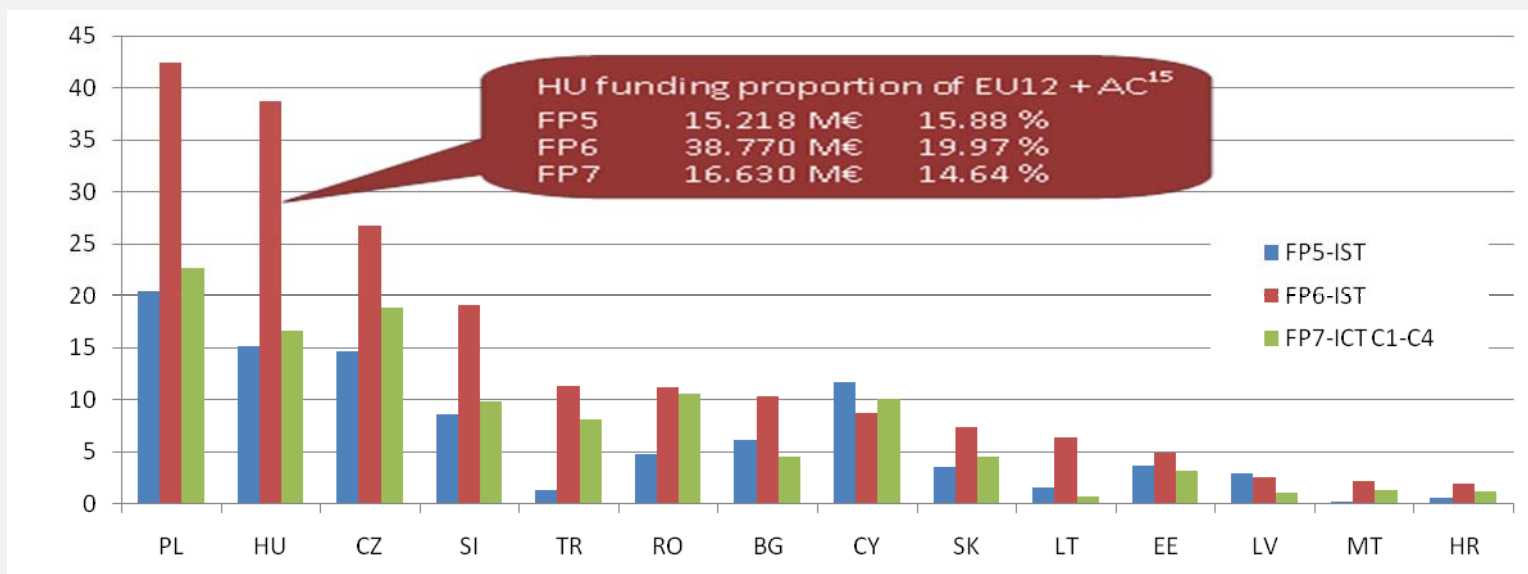
## Selected findings, software (OISTU project, ICT software report for IPTS)

- Eight (including the largest ones) of the estimated first fourteen are foreign owned companies.
- Dual structure:
  - a.) affiliates of large multinational firms (mainly of German and Dutch origin) with a high number of employees and high turnover. Often with very high export/sales ratio . For foreign owned companies, their contacts with the local economy are quite limited though almost all of them seem to maintain extensive links with universities and research institutes.
  - b.) smaller sized Hungarian owned companies, which either concentrate on the local market, and are less active in R&D, or operate in a smaller market niche and thus are able to create a competitive advantage (may also allow for internationalisation)
- Exports and internationalisation: mainly intra-EU internationalisation of software R&D



## Hungarian participation in FP. 1. (ICT RTD Technological Audit, by CHIC, lead expert: Lajos Nyiri)

History of FP participation of Hungary compared to EU12 and AC<sup>[1],[2]</sup>



[1] Based on data provided by the ICTC & NCP office of Hungary including FP5, FP6 and FP7 Calls 1-4.

Only newer AC (TR, HR) are taken into consideration in this calculation

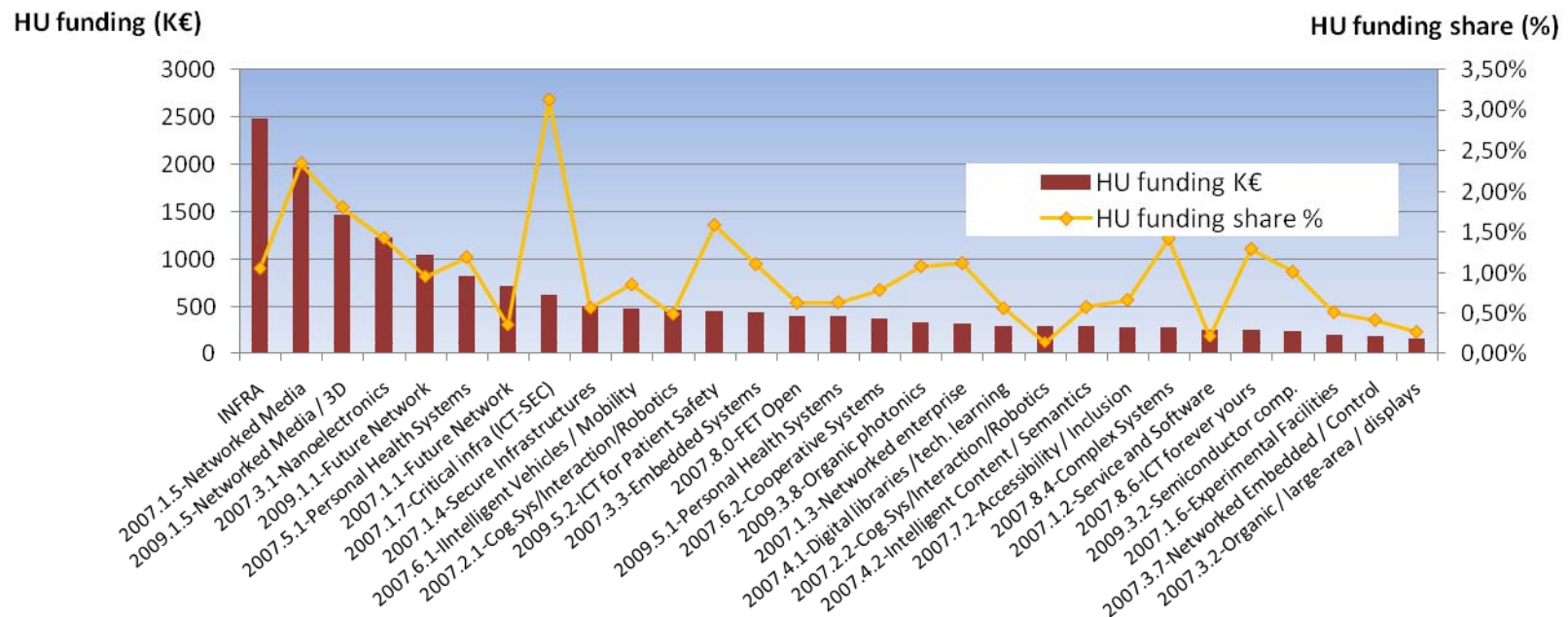
[2] The abbreviations used for countries throughout this study are based on the ISO 3166-1-alpha-2 code.

Source: ICTC & NCP office of Hungary, special thanks to Edina Németh and Sándor Bottka



## Hungarian participation in FP. 2. (ICT RTD Technological Audit, by CHIC, lead expert: Lajos Nyiri)

Hungarian funding and funding share in FP7 ICT per research objective (partial list)- in order of decreasing absolute funding<sup>[1]</sup>



<sup>[1]</sup> Based on cumulative data provided by the ICTC & NCP office of Hungary, special thanks to Edina Németh and Sándor Bottka



## Identified HU ICT RTD capacities (ICT RTD Technological Audit, by CHIC, lead expert: Lajos Nyiri)

### High competence in HU and high participation in FP:

- Internet of Things and enterprise environments
- Trustworthy ICT
- Networked Media & 3D Internet
- Nanoelectronics Technology
- Embedded Systems Design
- Organic photonics
- Personal Health Systems
- ICT and Ageing
- Complex system
- ICT Forever yours
- ICT for Governance and Policy Modelling

### High competence in HU while lower share in FP:

- The Network of The Future
- Cognitive Systems and Robotics
- Internet of Services, Software & virtualization
- Language-based Interaction
- Flexible, Organic and Large Area Electronics
- Microsystems and Smart Miniaturised Systems
- Digital libraries and Digital preservation
- Technology Enhanced Learning
- ICT for Patient Safety
- ICT for Safety and Energy Efficiency in Mobility

- Special thanks to Edina Németh and Sándor Bottka
- Final report available:  
[http://www.imntp.hu/\\_user/HU\\_ICT%20RTD%20Technological%20Audit\\_Final%20report.pdf](http://www.imntp.hu/_user/HU_ICT%20RTD%20Technological%20Audit_Final%20report.pdf)



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# Used NACE codes

- **Manufacturing**
- 3000 Manufacture of office, accounting and computing machinery
- 3210 Manufacture of electronic valves and tubes and other electronic components
- 3220 Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy
- 3230 Manufacture of television and radio receivers, sound or video recording or reproducing apparatus, and associated goods
- 3312 Manufacture of instruments and appliances for measuring, checking, testing, navigating and other purposes except industrial process control equipment
- 3313 Manufacture of industrial process control equipment
  
- **Services**
- 6420 Telecommunications
- 72 Computer and related activities