Higher Education and Research Landscape of the Czech Republic – a personal view

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Higher Education

- system
- funding
- research

Research

- system
- governance
- international involvement
- funding
- evaluation

Challenges

Higher Education System

- **26 public and 2 State Universities** with about **300 000 students,** even the best, **Charles University in Prague, ranks around 300 in international rankinks** (THES, ARWU)
- **44 private Higher Education entities, all post 1989,** with about **50 000 students** mostly **bussiness oriented studies**, **none of them comparable** in quality to top public universities
- **Study programmes** at universities
  - Bachelor
  - Master
  - Doctoral, aprox. **27 000 PhD students**
- **Only universities** allowed to provide higher eductation, **no analog of Weizmann or IST in Austria**
- Universities have high level of **autonomy** and are essentially **self-governed,** but this **may not be advantage.**

Higher Education funding

- Government gives about **0.6 % of GDP** for education at public universities
- Education funded **separately from funding of research**, one of **fundamental flaws** of our system.
- Two components:
  - **per enrolled student**: still dominant
  - reflection of research results
- Efforts, so far unsuccessful, to introduce **tuition fee**

Higher Education and Research

- Before 1989 **limited research** at universities, R&D done predominantly **in the Academy of Sciences.**
- **Dramatic change after November 1989**, research acknowledged as integral part of university education.
- **Substantial and steady increase of core funding** of research at universities **since 2000**.
- **No formal definition of research university**, but out of 26 public universities **only about 6** carry out sizable and significant research:
  - **Charles Universtity in Prague**
  - **Czech Technical University in Prague**
  - **University of Chemical Technology in Prague**
  - **Masaryk University in Brno**
  - **Technical University in Brno**
  - **Palacky University in Olomouc**

Research System

Several types of research organisations (approx. 160 in total)

- **Public universities** (27)
  established by law
- **Public research organisations** (PRO)
  - 54 institutes established by **the Academy of Sciences**
  - 15 institutes established by various **Ministries**
- **State research organisations**
- **Organisational parts of the state**
- **Bussiness sector organisations**

A few words on the Academy of Sciences

Non-university research organization pursuing **basic and applied research** in broad range of research fields.

Similar to **non-university research organizations in Germany** combining the features of

- **Max-Planck-Gesellschaft**
- **Fraunhofer-Gemeinschaft**
- **Leibniz-Gemeinschaft**

Comprises

- **54** Institutes
- appr. **8000** employees
- including appr. **4000** researchers

Research Governance

Contrary to situation in most developed countries, **there is no Ministry** or other central **body responsible for funding and evaluating research** and setting government policy in R&D.

Ministry of Education is central government body responsible for research, but the crucial part of the responsibilities, namely the **preparation of budget, carrying out evaluation of research and setting the government priorities** have been transferred to nominally **advisory Council for Research, Development and Innnovations.**

On the other hand **we have no top level advisory body on Science, Research and Technology** analogous to german **Wissenschftsrat** or british **Council for Science and Technology**.

Correcting this unsustainable situation and creating well equiped executive government body for R&D is **of utmost importance**.

International involvement

Czech Republic is a member of several **intergovernmental research organizations**

- **CERN:** European Laboratory for Particle Physics
- **ESO:** European Southern Observatory
- **ESA:** European Space Agency
- **EMBL:** European Molecular Biology Laboratory

which is vital for the respective research fields.

Research funding

Resources for R&D in 2012	% GDP	% total
Total	1.88	100
Government	0.68	**36.8**
Public foreign (EU)	0.30	**16.1**
Bussiness domestic	0.68	**36.4**
Bussinnes foreign	0.19	9.9

Expenditures on R&D in 2012	% of total
Government sector	18.4
Higher Education sector	**27.5**
Domestic Bussiness sector	**53.6**
Non for profit sector	0.5

Government sector: Public Research Organisations
State Research Organisations
Organisational parts of the State

Basic features compared to EU or other technologically advanced countries:

- Total expenditures are **half of those of technological leaders**
- Mainly because **bussiness sector gives little on its own R&D**
- Government is **too generous to bussines sector**
- Whereas bussiness sector **invests negligible amount of its resources in R&D performed at universities and reaserch organisations.** Contract research is **almost absent.**
- **Increasing importance of funds from EU**, basically for new infrastructures like **ELI-Beamlines, BIOCEV and CEITEC**.

Summary:
investment in R&D is considered important for **international competitivness**, but **this requires substantial increase of bussiness sector investment in its own R&D**.

Research evaluation

We have developed and operate unique mechanism to evaluate research, which is reminiscent of the way **coffe grinder** works. .

Different types of coffee beans put in:

- Publications
- Conference proceedings
- Books and chapters in books
- Patents
- Breed (animals)
- Variety (fruits, vegetables)

are ground together. i.e. assigned **specified numbers**, which for publications reflect just Impact factors. These numbers are summed **to give single number** for the institution, which is converted linearly into the amount of institutional funding.

This mechanism is applied **to all research organisation**, **ignoring different conditions** in which different types of research organisations operate.

Remotly reminiscent of british RAE/REF, but the later is

- based of **peer review** of selected representative sample of outputs
- applied to teams from **universities only**
- for conversion into core funding takes into account **other aspects of the research**

For internal allocation of core funding between its Institutes the **Academy uses its own, quite different systém.**

Coffe grinder should in a few years be replaced by more standard way of research evaluation.

Challenges

- To change the fact that our Higher Education and Research landscape is still **little internationalized.**
- To bridge the gap **between universities and institutes of the Academy**, following examples of **Germany, France, Italy** and other countries with significant nonuniversity research sector.
- To secure **sustainable exploitation** of large infrastructures like

  ELI- Beamlines (Laser physics and applications)
  BIOCEV (Biotechnology)
  CEITEC (Technological Institute)
  IT4Innovations (Large scale computing)
  SUSEN (Sustainable power engineering)

  built from **EU money**.