



● České fórum pro výzkum, vývoj a inovace 2011

Alokace veřejných prostředků a hodnocení výsledků
vědy, výzkumu a inovací

**Czech Research, Development
and Innovation Forum 2011**

Allocation of public resources and research assessment

Mezinárodní konference organizována Ministerstvem školství, mládeže a tělovýchovy v rámci projektu Mezinárodní audit výzkumu, vývoje a inovací v ČR a implementace jeho výsledků do strategických dokumentů.

● Sborník přednášek

13. 10. 2011

Praha

Místo konání:
budova Autoklubu ČR,
Opletalova 29, Praha 1



INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ



Erik Arnold is co-founder and Chairman of the Technopolis Group and is additionally Extraordinary Professor in International Innovation Policy at the University of Twente. He has worked in research and innovation policy and evaluation since 1980, covering work in a wide range of disciplines handling research and innovation policy. His work spans over 30 countries as well as the European Commission and a range of international organisations including the OECD, World Bank, Nordic Council of Ministers, ESF and COST. He is expert in the design, management and implementation of large- as well as smaller-scale evaluations of research and innovation

organisations, programmes and policies. He has particular expertise in integrating peer review and social-scientific evaluation methods.

Erik Arnold teaches evaluation at masters' level at the Universities of Manchester, Sussex and Twente as well as various short courses in evaluation. He is a Trustee of the Fraunhofer-ISI institute, a member of the scientific committee of the Institut für Qualitätssicherung und Forschungsinformation of the DFG and a member of the editorial board of the journal Research Evaluation. He holds a BA(Hons) degree in English Literature, an MSc in History and Philosophy of Science and a Doctorate in Science Policy and Microeconomics, all from the University of Sussex. He worked formerly at the Science Policy Research Unit, the University of Sussex, the European Commission and as a management consultant with Booz.Allen & Hamilton.



Bea Mahieu joined Technopolis as a senior consultant in September 2009 from Databank, Milano, where she was a senior consultant and Head of the International Business Unit. Databank (now Cerved Group) is a leader in market research and competitive intelligence in the Italian market. She works in the area of public policies related to R&D, information society, economic development, and systemic innovation – at European and regional level. Her specific expertise is in the field of evaluation, benchmarking, and ex-post socio-economic impact analysis, as well as the assessment of the efficiency and effectiveness of public governance organisations and systems.

She worked formerly in Prague at Inventa Consulting, a leading Czech management consultancy, where she was director of the international programmes department and acted as trainer-consultant in Database Marketing techniques. Bea holds a BA (Hons) in Slavic Philology from the University of Ghent (Belgium) and a Postgraduate Certificate in Czech Literature from the Charles University in Prague (Czech Republic).



Brigitte Tiefenthaler is a senior consultant at the Vienna office of Technopolis joining in February 2007. The focus of her work so far has been on performance contracts, evaluation, benchmarking and monitoring of national and regional public policy, gender issues in research, and strategy design.

Brigitte holds a Dipl.-Ing. in Materials Sciences from the University of Leoben. Before joining Technopolis she worked for nearly six years as an expert for the Austrian Council for Research and Technology Development, which advises the Austrian Government on research, technology and innovation policy. She was involved in the development of strategies and recommendations in fields including science-industry collaboration, sustainable development, nanotechnology, and gender issues. She has extensive knowledge of the Austrian research and innovation system and policy. Prior to this Brigitte worked as a head of unit for industrial technologies at the Bureau for International Research and Technology Cooperation in Vienna (now part of FFG), and a project leader at the Institute for Polymer Technology at Joanneum Research where she performed research about the long-term properties of recycled polymers. Brigitte is fluently bilingual in German and English and has a basic knowledge of Italian.



Wolfgang Polt is a head of Center for Economic and Innovation Research and a coordinator of main international (OECD and EU) projects, current focus of research: evaluation of research, technology and innovation policies; current trends in research and technology policies; science-industry relations and networks

Wolfgang Polt finished his studies in Economics at the University of Vienna in 1985. From 1985 to 1992 he worked as a researcher at the Institute for Socio-Economic Research and technology Assessment of the Austrian Academy of Sciences. From 1992 to 1999 he was at the Department of Technology Studies of the Austrian Research Centers Seibersdorf. From 1996 to 1998 he held a post as full time consultant to the Directorate for Science, Technology and Industry/Division for Science and Technology Policy of the Organisation for Economic Co-operation and Development (OECD) in Paris.

Since February 2000 he is heading the Viennese Office of the Institute for Technology- and Regionalpolicy of JOANNEUM RESEARCH.

He won Research Scholarships at the Institut für Angewandte Systemanalyse (IIASA) in Laxenburg/Vienna and at the Research Institute of the Finnish Economy (ETLA) in Helsinki.

In the past, Wolfgang Polt was a lecturer for Macroeconomics at the University Linz. Currently, he lectures in Industrial Economics at the Vienna University for Business and Economics.



Barbara Good joined Technopolis in February 2007, from the Socio-Economic Institute at the University of Zürich, Department of Innovation Economics and Innovation Policy, where she worked as a lecturer and researcher. Her areas of specialisation are innovation policy, economics of innovation and evaluation. She has co-authored several books on the Swiss innovation system and Swiss innovation policy and worked as an evaluator for the Swiss federal government. Barbara also worked as a researcher at the ETH Zürich, at the Department of Environmental Sciences, Institute of Environmental Policy and Economics, and at the Institute of Political Science, at the

University of Zürich.

Barbara holds a PhD in Political Science with Economics and an M.A. in Political Science and Economics, both from the University of Zürich. In addition, she has a degree in applied modern languages.

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On Research and Innovation Systems

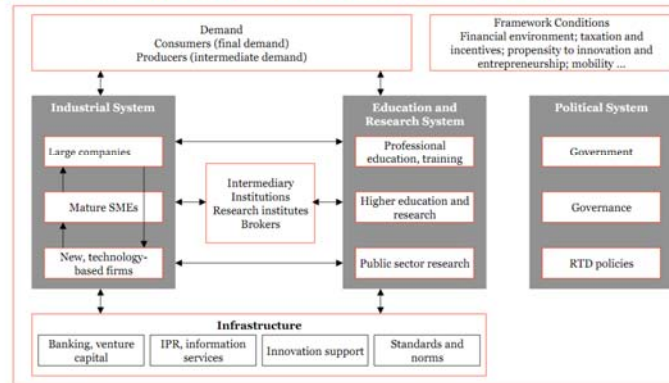
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13 October 2011

Erik Arnold
technopolis [group] UK

The closer you get to the systems level, the more
important context becomes

Intervention + Context = Impact

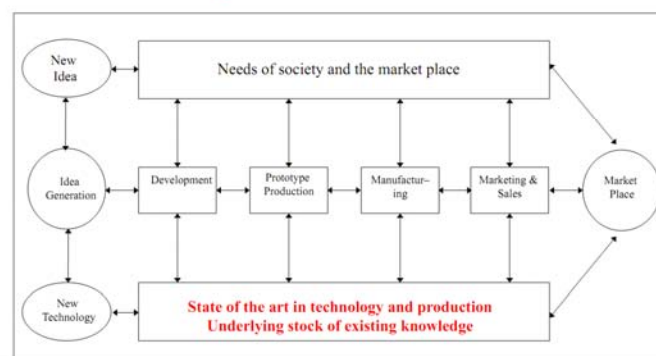
Overall, the Audit is about improving the role of research in the National Research and Innovation System



Source: Erik Arnold & Stefan Kuhlmann, 2000

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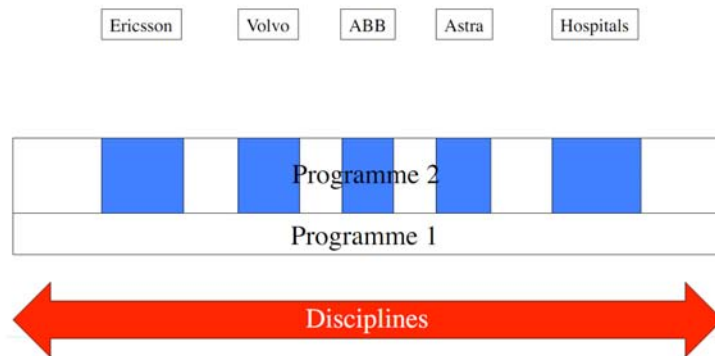
In a catching-up economy, it's especially important to understand how research fits into the innovation process



Adapted from Roy Rothwell, "Towards the Fifth-generation Innovation Process" *International Marketing Review*, 11 (1), 1994, 7-31

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R&D&I policy is about getting the balance right, not about warfare between the 'basic' and 'applied' tribes



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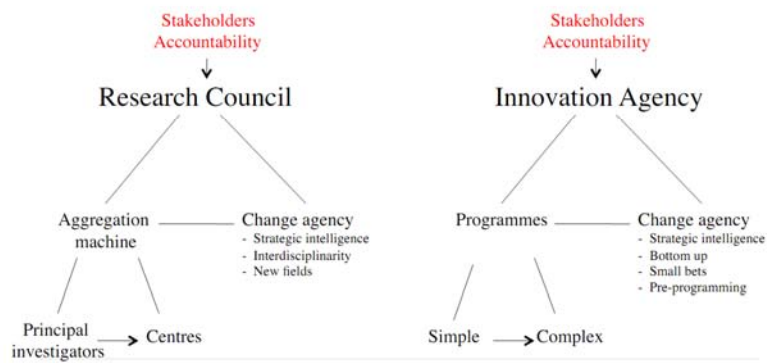
Balance – why we mix institutional and project funding



- Competitive project funding
 - *Short term competition*
 - *Only the already good get it*
 - *Can signal or respond to signals*
 - *Both bottom-up programmed*
 - *Short time constants*
- *Centres of Excellence or Competence*
- Core, block or infrastructural funding
 - *Stability and planning*
 - *Make sure institutions don't disappear*
 - *Investment and development*
 - *Long time constants*

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Ideally, our agencies are active, not passive implementors



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Let's pause for an illustration ...

- How to become a world-beater in mobile telephone systems ...
- The GSM Story (from a Swedish perspective)

You can download the full GSM Story from

http://www.technopolis-group.com/resources/downloads/820_The_GSM_story.pdf

Or

<http://www.vinnova.se/upload/EPiStorePDF/va-08-04.pdf>

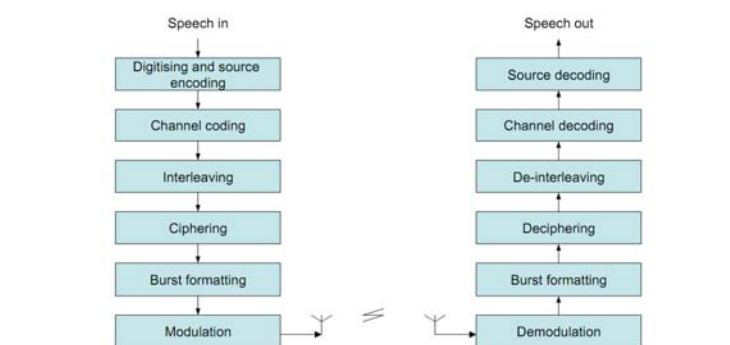
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Developing GSM depended on solving 6 problems in the radio access link

1. How to convert and code speech into digital form, using as little bandwidth as possible while maintaining acceptable speech quality
2. Coding multiple conversations into a single channel
3. How to protect the coded signal from fading and noise in the radio channel
4. How to modulate the resulting digital signal over radio waves while maintaining high bit rates
5. A particular problem was 'inter-symbol interference'
6. How to implement the solutions to these problems in electronic components

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(By the way, this was the answer ...)



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Mobilising research to help solve the problems

- Building on SRA capabilities developed to serve military needs
- Sven-Olof Öhrvik engages the research community through the 'radio club': Lund, Linköping, CTH, (KTH)
- STU supports the work via bottom-up project funding
- Universities launch new research agendas
- SRA runs internal problem-solving R&D projects that link with but do not wholly depend on university projects
- SRA moves Öhrvik to LTH; builds factories outside the university gates

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Initially, the interaction involves only a handful of key university researchers

	Speech coding	Channel coding	Modulation	Propagation, equalisation	Components
Per Hedelin	X				
Lars Zetterberg	X				
Tomas Ericsson		X			
Rolf Johannesson		X			
S-O Öhrvik		X			X
Jens Zander		X		X	
Lars Ahlin		X		X	
Björn Gudmundsson				X	
Carl-Erik Sundberg			X		
Tor Aulin			X		
Arne Svensson			X		
Mats Torkelsson					X
Sven Mattisson					X
Claes Hammar					X
Lars Wanhammar					X

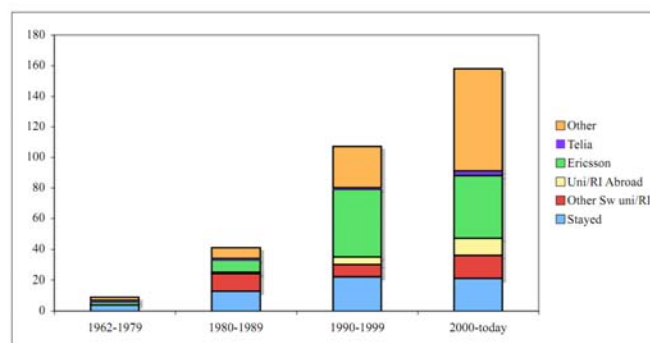
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The transition involved no fundamental research

- Our study found not a single case of 'linear model' ideas transfer. The developments all depended on refining the stock of existing knowledge
- David Roessner has the same result for the 1G-> 2G transition in the USA: the NSF played no role at all

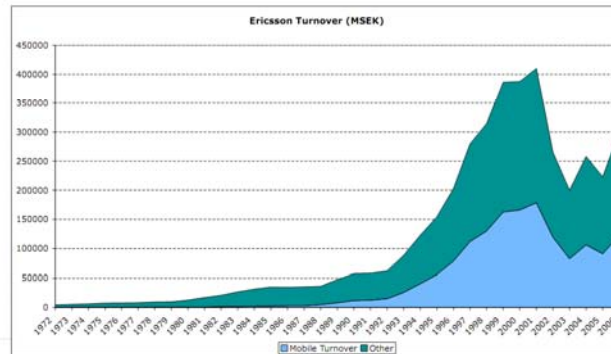
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Scaling up human capital production to meet system needs underpinned Ericsson's success (PhD, lic)



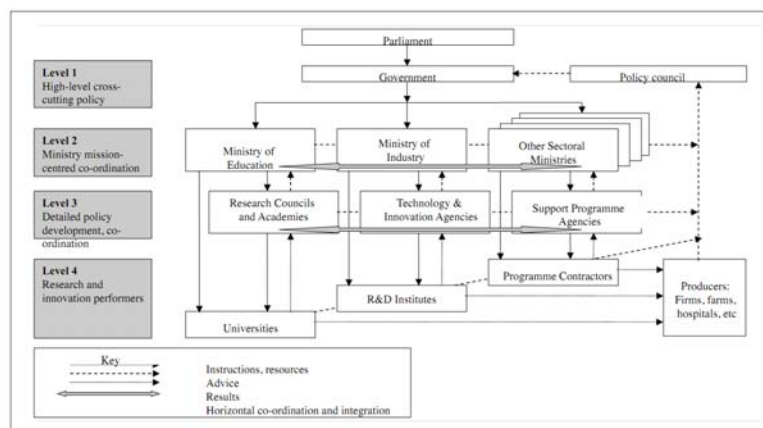
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GSM transformed Ericsson from a small player to global dominance in digital mobile systems



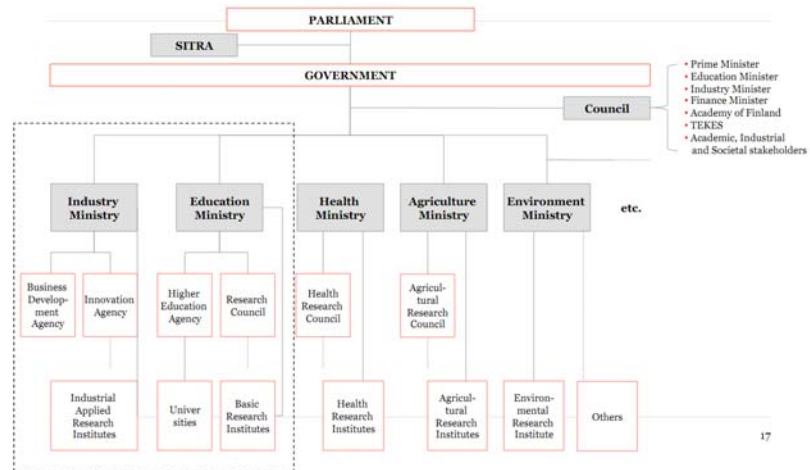
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All countries struggle to govern the state's role in the NIS

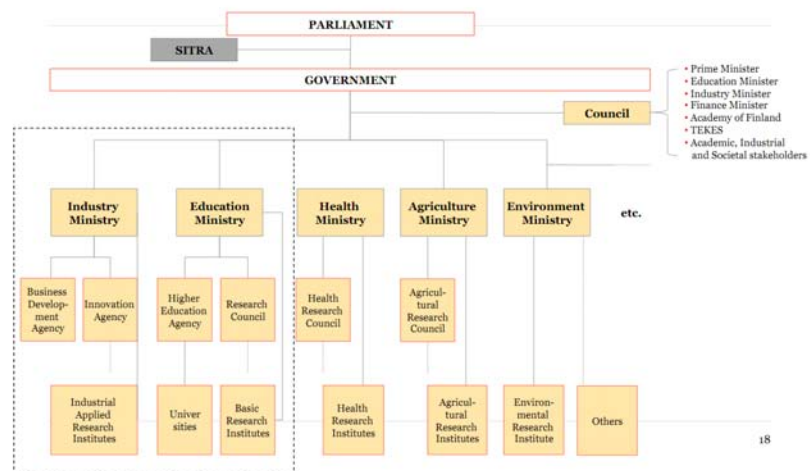


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The 'two pillar' model in Finland is highly effective



Where's the strategic intelligence in Finland?



Emerging ideas on running a good NRIS

- Since innovation, applied and basic research are interdependent, all three need to be healthy and interlinkages among them and the institutions that perform and fund them must be strong
- Scientific performance must converge towards global levels and exceed this in selected areas of national or industrial importance
- Since a lot of important innovation involves adapting and using existing knowledge, there must be strong capabilities for accessing global knowledge, including through FDI, connecting MNCs to domestic supply chains, reverse engineering and 'unbundling'
- It is important to have broad capabilities in basic research in order to keep university teaching up to date, ensure there is scientific capability available in most fields to meet policy and societal knowledge needs and to provide a point of growth when it turns out that increased capacity is needed

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- A significant proportion of basic and applied research should be directed towards areas of national and industrial priority – not only to make knowledge but also educated and trained people
- Links between industry and the research and higher education system (including the applied research institutes) are important both for 'advanced' and less advanced companies, though the type of link and the right counterpart will depend upon the absorptive capacities of the individual firms
- NRIS governance needs to include a transparent 'arena' in which stakeholders and decision-makers can debate and establish broad R&D&I priorities, leaving the budget to the government and the details of implementation to others
- Members of the arena should act as experts and not as representatives, and should not be incentivised by the process to represent their own or other organisations

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- The strategic intelligence needed should be created and analysed in a distributed way across the institutions of the NRIS
- Evaluation is a key component of strategic intelligence and requires the same 'intervention logic' at its heart as programme design. The overriding purpose of evaluation is to understand the degree to which interventions tackle and solve societal problems. Evaluation of outputs alone has limited value
- R&D&I policy should be implemented according to the principle of subsidiarity: decisions should be made as low down as possible in the hierarchy of organisations involved
- The organisations involved, not least those responsible for funding R&D&I, need appropriately skilled and experienced people and should use transparent, efficient and rational programming practices that take account both of national priorities and the needs of stakeholders

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- Mechanisms are needed to articulate demand for technology and research, not only supply. The knowledge and experience of stakeholders is needed in order to do this effectively
- The state's role in governing the parts of the NRIS under its control must include the ability to act as a 'change agent' – overcoming lock-ins where these have a negative effect on the NRIS. It needs to be able to tackle systemic failures as well as the traditional market failures involved in funding research
- More broadly, the state must have the capacity to do 'bottleneck analysis' in the NRIS, generating strategic intelligence about performance, problems and opportunities for change
- The NRIS must be internationally open, both in industry and in the research and higher education system, linking the Czech communities to global sources of knowledge and to the quality demands of the global science and technology systems

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technopolis_{group}

Thank you

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technopolis **group** has offices in Amsterdam, Ankara, Brighton,
Brussels, Frankfurt/Main, Paris, Stockholm, Tallinn and Vienna

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Performance of the Czech Research and Innovation System – a summary of main findings

*České fórum pro výzkum, vývoj a inovace 2011
13 October 2011*

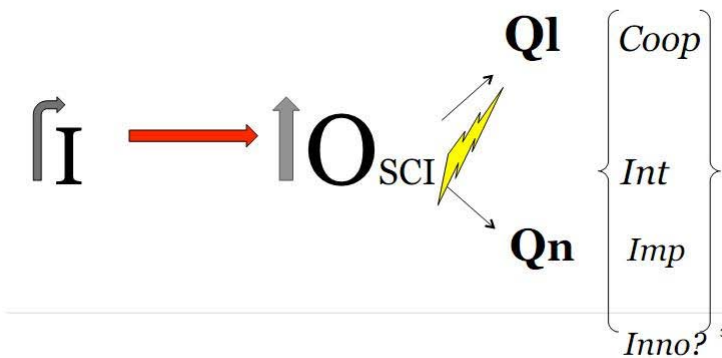
Wolfgang Polt
POLICIES – Centre for Economic and Innovation Research
JOANNEUM RESEARCH
Vienna/Graz

Dimensions of Performance

- Publications
- International cooperation
- Research management
- HR development
- Science-Industry Links
- Business Sector
- IPR

2

The synthetic formula of the performance of the Czech Research System

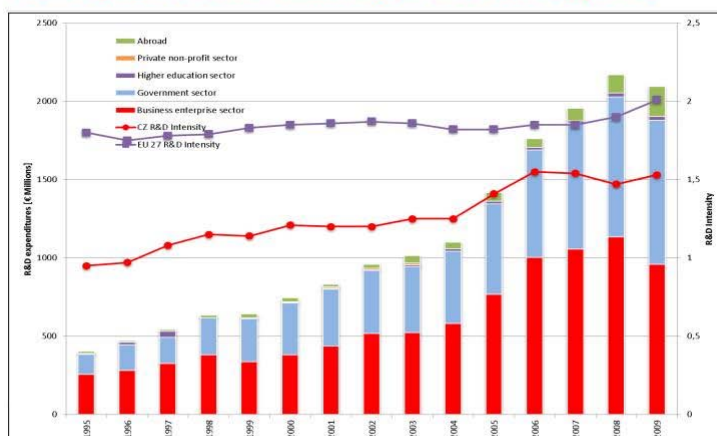


Distribution of Public R&D support

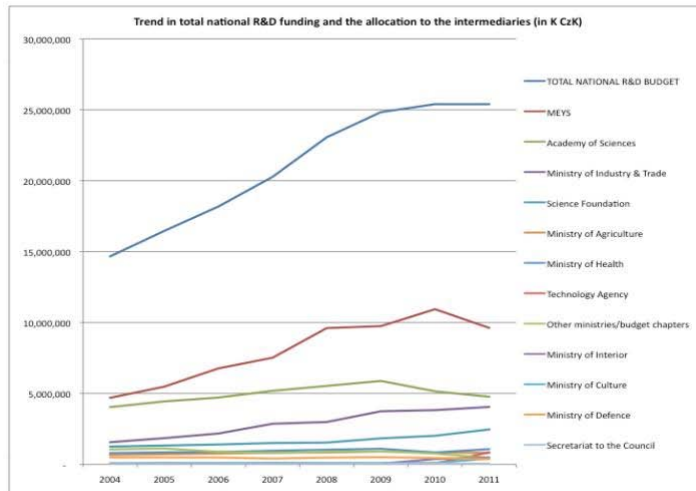
- All R&D performing sectors receive substantial public support:
 - *Higher Education Sector: 90% of R&D activities financed from national public sources*
 - *Government Sector: 87% of R&D activities financed from national public sources*
 - *Business Enterprise Sector 14% of R&D activities financed from national public sources*
- R&D funding level of Business Sector is high in international comparison but can be explained by institutional factors:
 - *Some RTOs having form but not function of private enterprises, receiving also institutional financing*

4

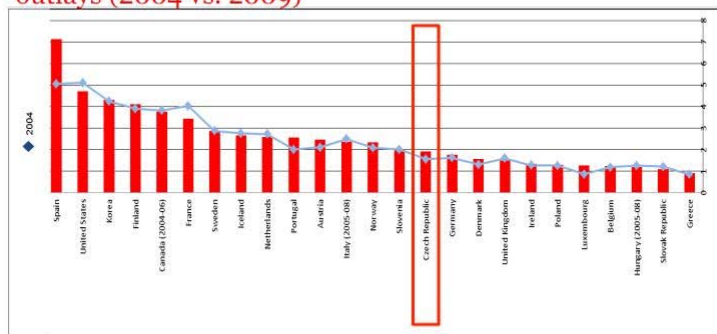
Development of R&D financing in the Czech Republic



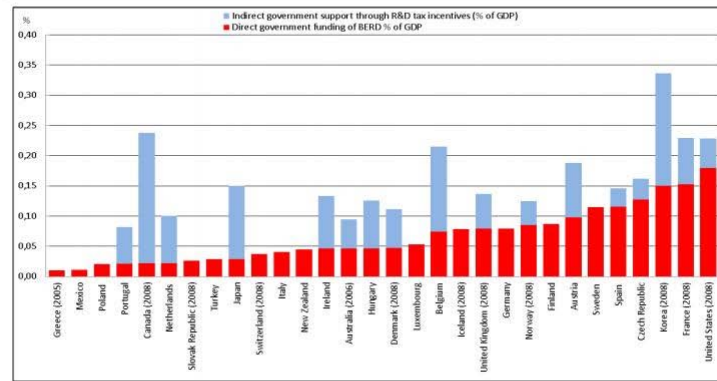
Development of R&D Funding



Government R&D expenditures as % of total government outlays (2004 vs. 2009)

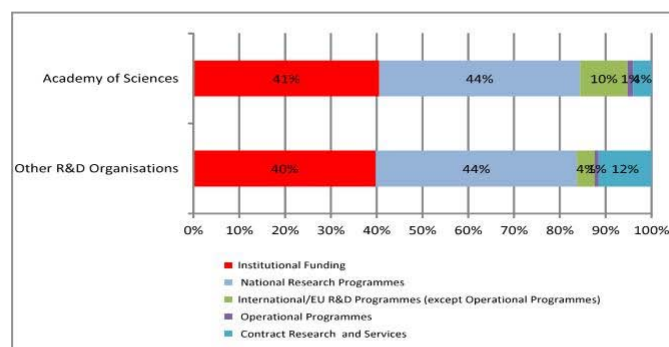


R&D support to industry (2009)



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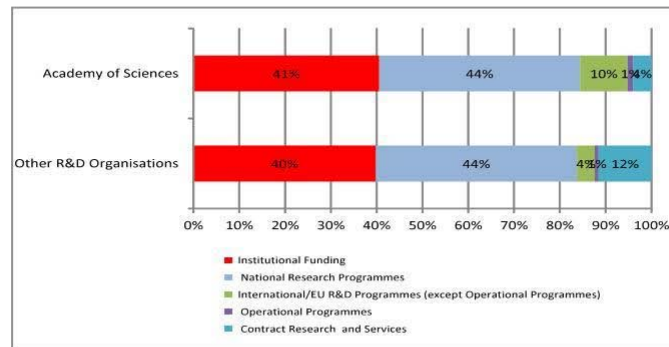
R&D support for the Government Sector: Institutional Funding vs. Project Funding



Source: Survey

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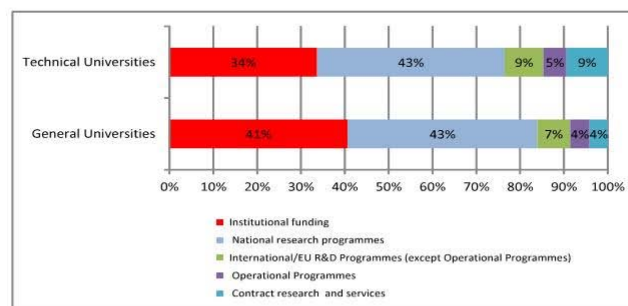
R&D support for the Government Sector: Institutional Funding vs. Project Funding



Source: Survey

9

R&D support for the Higher Education Sector: Institutional Funding vs. Project funding



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R&D Performance: The Public Sector

- The Higher Education Sector:
 - Increased R&D capacities since the transformation process in the mid nineties: 18.1% of total R&D expenditures
 - Relative specialisations in Engineering, Agricultural Sciences
 - Low interactions with the Business Enterprise Sector
- The Government Sector:
 - Strong decline in the early nineties, stabilized since then: 21.4% of total R&D expenditures
 - Dominated by the Academy of Sciences, small RTO/PRO sector
 - Relative specialisations in Natural Sciences, Humanities, Social Sciences
 - Low-moderate interactions with Business Enterprise Sector, but high licences revenues through some R&D results with high commercial relevance
- The Public Sector overall:
 - Increasingly complementary specialisations of the Higher Education Sector and the Government Sector, but low level of structural interaction with Business Enterprise Sector
 - Large share of R&D services to be found in the Business Enterprise Sector, for which no overview on relevance and tasks, and no public strategy for future development exists

Publications at international level

- Performance of Czech research has been steadily improving (as measured by number and quality of publications)
 - ...though it still remains below (world/EU) average levels
 - Traditionally strong focus on natural sciences & mathematics
 - Increasingly larger role (bio)medicine & health sciences, but coming from comparatively low level of performance internationally
 - International collaborative papers –highly concentrated:
 - 4/5 with European countries – also US major partner
 - Dominated by ASCR and Charles University
 - Internationally collaborative papers tend to be of distinctly higher quality
- **Highly important to improve performance in EU FP & increase international collaboration throughout the system**

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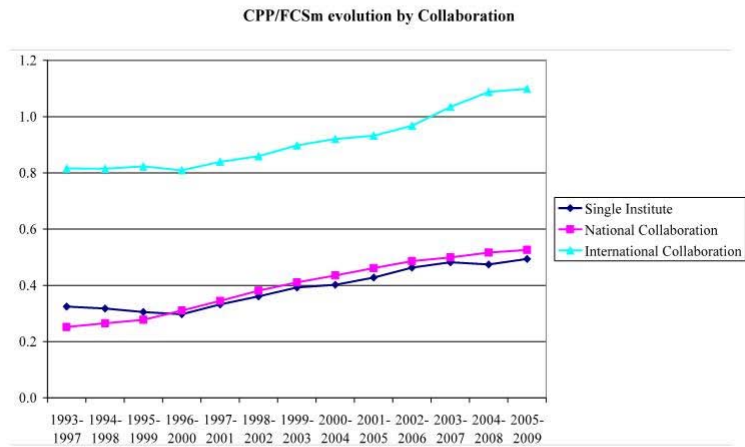
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Bibliometric statistics for Czech Republic and the eight benchmark countries, 1993-2009

	Productivity 93-09	CPP/FCSm 93-09	Productivity 05-09	CPP/FCSm 05-09	Delta P	Delta I
AUSTRIA	0.0010	1.05	0.0012	1.18	27.07	11.91
CZECH REPUBLIC	0.0005	0.64	0.0007	0.79	47.95	24.94
DENMARK	0.0016	1.27	0.0019	1.36	20.36	7.86
FINLAND	0.0015	1.19	0.0018	1.20	19.03	0.32
GERMANY	0.0009	1.06	0.0010	1.16	18.56	9.50
HUNGARY	0.0005	0.78	0.0007	0.92	58.03	18.77
NETHERLANDS	0.0014	1.30	0.0017	1.34	22.58	3.83
SLOVENIA	0.0008	0.72	0.0013	0.78	58.97	8.10
SWEDEN	0.0018	1.20	0.0020	1.25	14.11	4.29

CPP/FCSm indicates the (field-normalised)
impact of the institute's/groups articles compared to world average

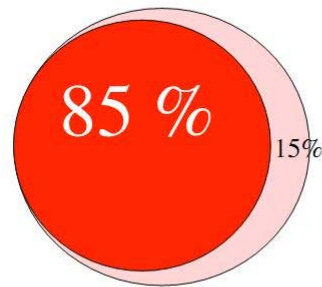
Development of Impact of Publications by Collaboration Type



International co-operation

- ...signs of a lack of “a culture of openness”...
- Less than 10% of researchers in CR are foreign, and half is Slovak
 - *Barriers: teaching language requirements & immigration requirements*
- Poor return from the Framework Programme – few coordinators
 - *Easier to get national funding & no career or funding incentives*
 - *Lack of an overall internationalization strategy*

HR and R&D management – some other telling relations



96 : 0

percent of directors claiming to have a gender policy vs. # of female scientist our team encountered at site visits

In-bred vs. external/international recruiting of scientific staff

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Problematic research management at the institutional level (1)

- Small size of research groups:
 - Often dependent upon single director, sometimes as result of comparatively fragmented university organisation with highly autonomous professors
 - *Limited interdisciplinarity*
 - *Tended to lock groups into existing research trajectories*
- Little awareness of HR issues
 - *Succession often not tackled*
 - *Many were in-bred*
 - *Low international mobility*
 - *Under-exploitation of opportunities for collaboration Academy-universities (even though improving)*

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Problematic research management at the institutional level (2)

- Reduced fragmentation & boosting of output if
 - *Better HR planning*
 - *More explicit strategies*
 - *Key for improvement: reduction in funding uncertainties, to allow institutions to set & deploy longer-term strategies*
 - *Implies reforming the EM*

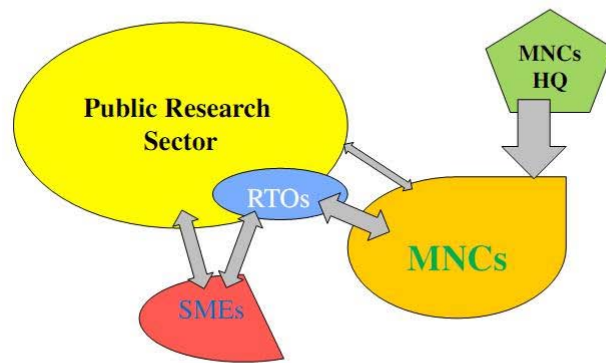
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Human Resources management

- Old-fashioned style of institutional governance & organisation promotes fragmentation of research
- Need for stronger central responsibility for HR management taken by public research organisations
 - *Enabling career pathways to become more flexible (e.g. joint appointments)*
 - *Make use of career development plans*
 - *Reducing degree of in-breeding*
 - *Reducing fragmentation through devices such as local and international graduate schools*
 - *Correct imbalances related to career progression (50% of senior scientists is over 50)*
 - *Correct imbalances related to proportion of women (half the EU 27 average)*

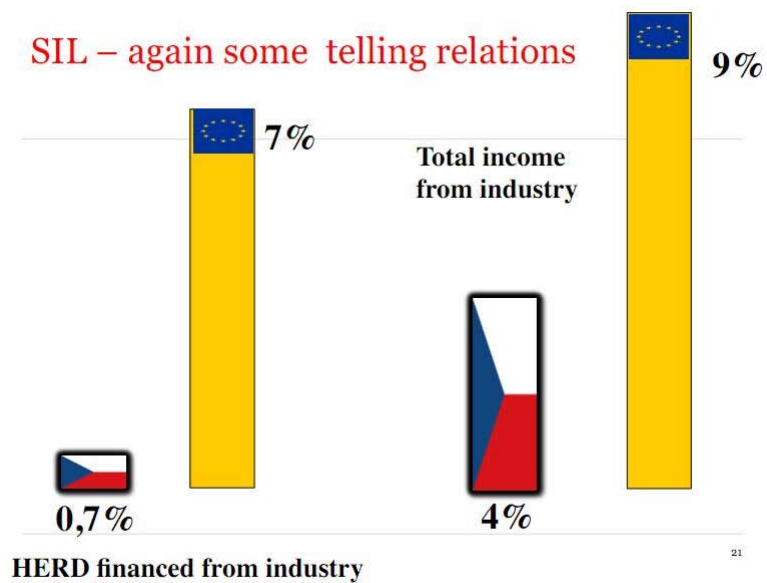
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The landscape of Science-Industry-Links (SIL) in the Czech Innovation System



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SIL – again some telling relations



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Science-Industry Links

- A number of informal but little formal linkage science-industry
- HERD funded from industry is low in international comparison
- Current incentive system works against SIL, support measures are small or in their infancy

Background:

- Low-value activities of many MNC - little embedded in the Czech NRIS
- Many existing links are with medium-sized firms, many are through RTOs
- Lack of skilled personnel = one of the factors hampering innovation
 - *OP R&D&I = opportunity to support development in regions outside core region of Prague*

Measures needed

- *Better to embed the multinational in the Czech research system*
- *To provide the appropriate level of coordinated support to less capable firms at national & regional levels*

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R&D Performance: The Business Enterprise Sector

- Accounts for 60% of R&D performance in the Czech Republic, characterised by high levels of experimental development, low applied and basic research activities:
 - *Innovation activities based upon adaption of knowledge developed abroad, technology upgrading through purchase of machinery etc.*
- Large enterprises with 500 and more employees account for 55% of total R&D expenditures in the sector
- R&D activities concentrated in the Manufacturing Sector: Motor vehicle industry: SKODA-Volkswagen and first and second tier suppliers (23.2%), Machinery and equipment (8.1%), Precision instruments (4.7%) of total
- R&D activities in the Service Sector, dominated by former and partly state owned institutes (16.6%), i.e. the atomic research institute owned by CEZ

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The largest R&D spenders in the CR 2005-2009

Company	Million Euro				
	2009	2008	2007	2006	2005
Skoda Auto AS **	...	203.4	205.3	170.8	186.4
Komerční banka	7.0	...	29.9	28.1	...
Zentiva (now part of Sanofi-Aventis)	...	22.8	20.5
Cez	20.6	0.8	21.8	12.2	8.0
AERO Vodochody **	...	2.5	5.4	5.2	...
Trinecke Zeleznary	...	2.2	3.4	4.6	4.1
Unipetrol **	...	0.8	4.6	4.4	0.4
Spolchemie (Spolek Pro Chemickou a hutní výrobu)	...	0.7	0.7	1.0	0.8
Paramo As **	...	0.3	0.3
Ceske drahy	0.01
Telefonica O2 CR **	0.6	...
Deza	0.4	...
Vitkovice Steel **	0.3	...
Oskar Cesky Mobile **	0.3
Cesky Telecom **	0.2
NKT Cables **	0.1

Note 1: This table also includes foreign subsidiaries (marked with two stars **). All the rules for inclusion in the scoreboard are applied (i.e. availability of accounts and disclosure of R&D). ... = no information

Note 2: Cesky Telecom is by now merged with Telefonica O2

Source: EU Industrial R&D Investment Scoreboard 2006-2010.

National support programmes for SIL

Programmes being phased out

- TANDEM (2003-2010)
- IMPULS (2003-2010)
- Research Centres 1M (2005-2011)

Most relevant planned and newly implemented programmes

- programme TIP (2009-2017) by MIT
- ALFA programme by Technology Agency
- Centres of Competence by Technology Agency

IPR

- Little use of formal IPR instruments
 - *Consistent with importance of technology adoption & use rather generation of new-to-the-world innovations*
 - *Reflects traditions & habits & the fact that the European Patent Office and system has been irrelevant for Czech industry*
- IPR legislation is state of the art – outside small community little understanding
 - *Management in industry & research sector tend to lack knowledge & experience of IPR management*
- Technology Transfer Offices are in their infancy
- In many situations an open innovation approach or strategic partnerships can be more effective ways to obtain social returns on investment than formal mechanisms

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Thank you for your attention !

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Evaluation Culture

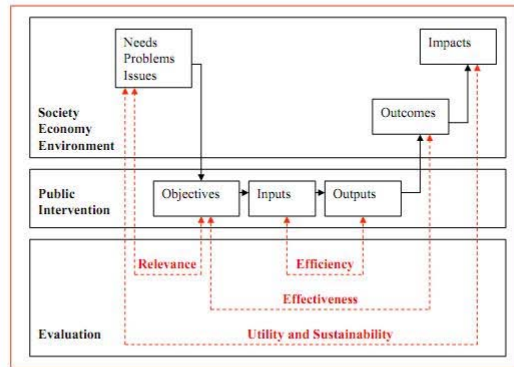
České fórum pro výzkum, vývoj a inovace 2011
13 October 2011

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What is evaluation? Answers from international practice

- Definition of evaluation
 - *"Evaluation is the systematic acquisition and and assessment of information to provide useful feedback about some object" (Bill Trochim)*
 - *Evaluation = Evidence + Judgement*
- Objectives of evaluation
 - *To monitor the progress towards objectives*
 - *To assess the achievements of the objectives*
 - *To act as a tool for policy learning*
- Main types of evaluation
 - *Formative evaluation: geared towards learning and improvement (of programme, policy or institution)*
 - *Summative: aimed at accountability. Examines the outcomes and impacts of of an object (policy, programme, institution) for different groups of people*

Evaluation and the Intervention Logic



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Evaluation and evaluation culture

- Evaluation culture
 - *Shared understanding of what evaluation is, what it can be used for, how it has to be done in order to be a useful instrument*
 - *"[...] evaluation culture is a way of looking at the world – a broad-based, forward-looking point of view that sees the crucial evaluation feedback function as an integral part of our everyday life." (Bill Trochim)*
- Evaluation is part of a wider performance management frameworks
 - *Part of policy cycles*
 - *Tool supporting the development of (research) organisations*

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Evaluation practices in the CR

- We have assessed Metodika hodnocení (EM) in its two functions
 - *Evaluation of results of **research organisations***
 - *Evaluation of results of completed **research programmes***
- Main driving forces behind EM
 - *To de-politicise and to de-personalise, i.e. use objective criteria for the allocation of funding*
 - *To increase the production of concrete R&D results*
- EM fails to meet international good practice in evaluation in both cases and threatens to harm the Czech RDI system
- Alternative evaluation methods are used in institutional evaluation
 - *Academy of Science of the CR*
 - *Operational Programme R&D for Innovation (selection of Centres of Excellence and Regional Centres)*

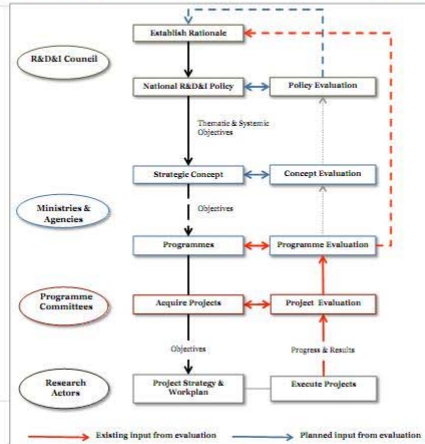
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Programme evaluation in the CR

- “Collective evaluation” looks at efficiency only
 - *Ratio: total points of all F&D outputs reached in a given programme/ total funding provided from the national budget*
 - *Core criterion average SR value of a given programme*
 - *Completed programmes ranked into three groups*
 - Above-average programmes (SR Index > 130%)
 - Average programmes (SR between 70% and 130%)
 - Below-average programmes (SR < 70%)
 - Comparing apples with pears
- Conclusions drawn from findings often not justifiable
- No recommendations to policy-makers, value for policy learning practically nil

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Evaluation in the Czech system – plans for the near future



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What does programme evaluation tell us about the prevalent evaluation culture in the CR?

- Evaluations are predominately monitoring exercises
 - *Absence of ex-post evaluations at all levels*
- Programme evaluations dominated by Evaluation Methodology
 - *Over-accentuation on measurement of outputs*
 - *Over-accentuation on proving efficiency in implementation*
- Changes foreseen in the near-future based on the National Policy 2009-2015 in line with the prevalent evaluation culture
- Credibility of evaluations undermined by each level in the hierarchy evaluating its own activities
- Current evaluation practice does not – and cannot – reflect the concept of policy cycles

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Institutional Evaluation: Differences EM – Informed Peer Review (i)

Scope and content covered

- *EM: one-dimensional. Numbers of defined research outputs in some 20 categories*
- *Informed peer-review: multidimensional. Structured quantitative & qualitative information*
 - research programme
 - critical infrastructure
 - staff (numbers, composition, qualifications, roles)
 - strategic partnerships
 - achievements and users of results
 - management and HR policy
 - research funding
 - perceived barriers to development
- *Compared to informed peer-review, the EM looks at a tiny section of a research organisation's reality*

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Institutional Evaluation: Differences EM – Informed Peer Review (ii)

Type of feedback given

- *EM: assigns a defined number of points to each output and adds points to a total point score per unit of evaluation; output is **not** assessed against objectives*
- *Informed peer-review: structured written report, typically several pages long, containing verbal feedback on each of the evaluation dimensions; output and achievements are assessed against each organisations mission and objectives*
- *Compared to informed peer-review, EM provides no feedback in support of learning and institutional development*

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Why are these differences a problem?

Key challenges for the development of Czech research organisations

- Lack of focused, coherent research programmes
- Low research productivity
- Dominance of supply-side orientation vis-à-vis poor understanding of the target group
- Overly complicated management and governance models.
- Underdeveloped human resource policies.
- Limited awareness for organisational and managerial issues as one of the major bottlenecks and shortcomings

→ EM does not provide the information needed in order to understand and address these challenges

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How to evaluate? Some recommendations

- Discontinue the Evaluation Methodology
- Institutions: introduce informed peer-review to develop research organisations
 - *No mechanistic link from evaluation to allocation of funding*
 - *The issue of research institutes with low productivity can be addressed with informed peer-review*
- Programmes: develop common evaluation standards
 - *Look beyond R&D outputs and focus on the outcomes and impacts of projects, programmes, departmental policies and national policies*
 - *No mechanistic link from indicator value to (funding) decisions*
 - *Apply „waterfall principle“*
- Build up an evaluation culture ...

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How to build an evaluation culture? Some recommendations.

- “Just do it” – focus on formative evaluation.
- Build on existing experience nationally and internationally
- Get and share information – do not reinvent the wheel, but build one that fits the track gauge in your country
- Train: policy makers, administrators and research managers – basics about principles and standards of evaluation
- Share experience as you move along!
- Developing an evaluation culture for the best means embedding it in a quality culture

Evaluation can be useful to individuals and institutions – provided it is understood, executed and embedded properly!

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Thank you!

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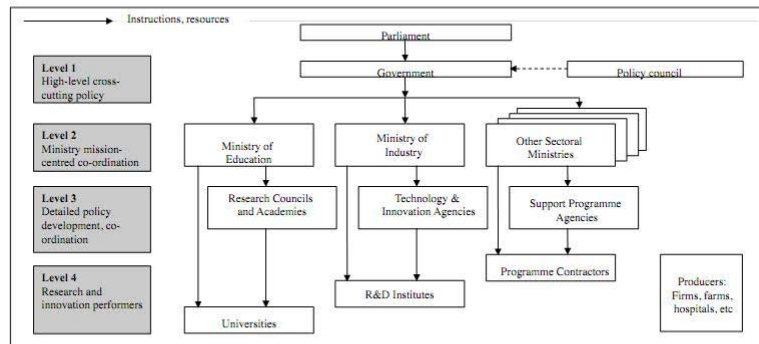
Governance & the role of the R&D&I Council

České fórum pro výzkum, vývoj a inovace 2011
13 October 2011

Bea Mahieu
technopolis |group| UK

Conceptual Framework

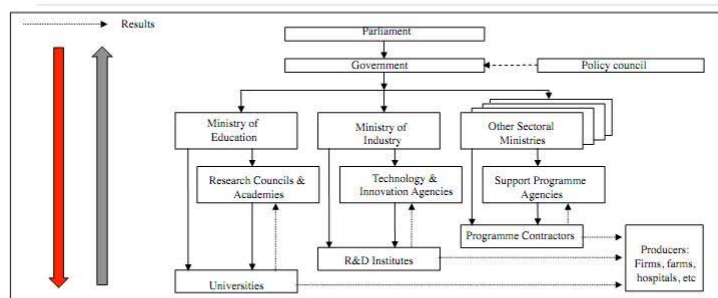
R&D Governance Structure



Governance has vertical & horizontal dimensions

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Key axis = vertical steering

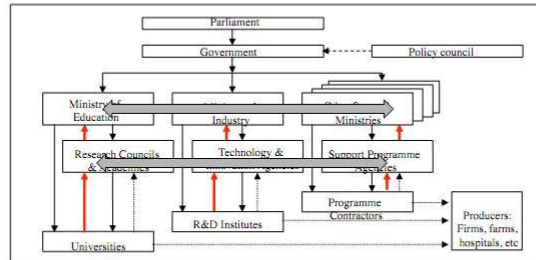


Hierarchy of 'steering levels' & Creation of arenas

Key = distributed strategic intelligence & constant use of knowledge

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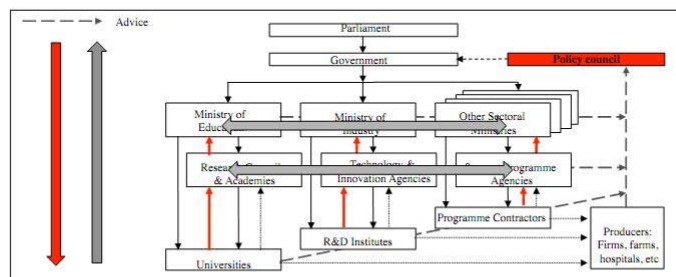
Horizontal Co-ordination



Involvement of all actors in society
 Coherent policies across institutional boundaries
 Governance mechanisms that are reflexive, handle change, ensure effectiveness

5

R&D Councils as co-ordinators & contributors of strategic intelligence



6

International experience suggests that a research and innovation council should

- Function as an open **arena** for **consensus** and **coordination**
- Set **long-term strategic directions**, not micro-manage
- Be **legitimate** in scientific, industrial and political terms
- Collate and publish **strategic intelligence** when needed, within a system of distributed strategic intelligence
- Bridge between the long-term nature of research and innovation policy and the short-term incentives of the political system
- Be independent enough to be a **change agent**

7

Governance structure: the need for co-ordination

Various models: co-ordination at the level of ministry, agency, or two-pillar model – none is perfect

- Having **multiple ministries** responsible for research increases the need for coordination among sectors
- But the '**science ministry**' approach makes it the enemy of the rest, and reduces the number of voices speaking for research

Information asymmetries between principals and agents (ministries and agencies; agencies and beneficiaries/stakeholders) reduce the quality of centrally designed policies & interventions

8

R&D&I Governance in the CR – key findings

9

Trends in R&D&I Governance in the CR

1. 1990-98: institutional readjustment
 - *De-centralisation of responsibilities to Academy and Ministries*
 - *Unconditional funding*
 2. 1998-2003:
 - *Institutional funding based on strategic intentions*
 - *Co-ordination under leadership of the MEYS: National R&D Policy and Programmes*
 3. 2004 onwards:
 - *Reorientation NRIS towards innovation & applied research*
 - *Increased use of evaluation - help development of the system & guide aspects of resource distribution*
 - *2008 Reform: simplify and modernise the system*
 - *European Structural Funds: invest in research infrastructures & innovation support measures in the regions*
-

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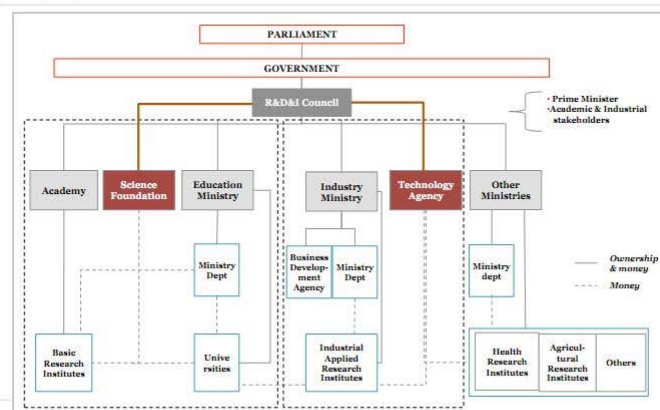
The background: the CR a very difficult place in which to make & implement a consistent R&D&I policy

- Political instability
- R&D has become more politicised
- Discussions often dominated by interest groups rather than strategic vision
- Persistent disputes in R&D&I policymaking are symptoms of lack of trust – especially in government

Recent reforms = *flawed* attempts to cope with instability & perception that neither government nor civil service can be trusted

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A system in transition



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Vertical Steering (1)

Hierarchy of steering levels

- Fair consistency & coherence in policy priorities at the different R&D governance levels (multilevel thematic priorities)
- Combination of formalised model & space for autonomous decision-making ('tailoring' of priorities to sectoral needs)
- Increasingly 'hard' top-down steering, with ever-growing number of control mechanisms

Creation of arenas

- Strong involvement of stakeholders at ministry/agency levels
- Under-estimation of importance of consensus-building at higher policy level
- General lack of attention for transparency

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Vertical Steering (2)

Strategic intelligence

- Strong use of stakeholders as sources for sectoral knowledge at ministry/agency levels
- Limited involvement / consultation of stakeholders at R&D&I Council level – especially institutional ones
- Little analytic support – at all levels
- No formative evaluation (ex-post impact analyses) – at all levels
- Over-centralised & simplified approach to strategic intelligence
 - *Loss of strategic intelligence about needs and opportunities*

14

Vertical Steering (2)

Strategic intelligence

- Strong use of stakeholders as sources for sectoral knowledge at ministry/agency levels
- Limited involvement / consultation of stakeholders at R&D&I Council level – especially institutional ones
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14

Horizontal co-ordination (1)

Coherent policies across institutional boundaries

- Positive trend in collaboration among research communities & institutions
- Increasing level of inter-ministry collaboration

At higher policy level

- Under-estimation of importance of open dialogue with policy implementing bodies, stakeholders & citizens
- Insufficient co-ordination of policies
 - *regional, innovation, international*
- Rigid application of the two-pillar model (basic/applied research)
 - *disconnectedness & gaps in the system of R&D&I funding*

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Horizontal co-ordination (2)

Reflexive governance mechanisms

- Formalised model for evaluation from 'complete' model to evaluation conceived as accountability & 'counting outputs' only

Governance mechanisms ensuring effectiveness

- Formalised model → overly focused on processes at the expense of capabilities
- Lack of implementation of civil service law → no central training policy, no de-politicised civil service

Governance mechanisms capable to handle change

- Set-up and governance style of the R&D&I Council hinders its role as change agent

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The Czech R&D&I Council is shifting from an advisory to an executive role as a 'virtual science ministry'

- Principal to the Science Foundation and Technology Agency
- Micro-management of broad range of governance tasks, i.e.
 - *Decision-making on budget allocations*
 - *Monitoring & evaluation*
 - *Control on programming & sectoral strategy development*
 - *Long-term strategy development*
- Unsustainable pressure on Council members & secretariat in terms of time & especially expertise
- Governance style: 'hard steering', centralisation, simplification & de-personalisation

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Public R&D&I Funding

- Two typologies:
 - **'Institutional' funding** provides a stable institutional base & opportunities to invest in new capacity and activities
 - Complemented by **project-based funding**, intended partly to quality-assure the work funded by institutional funding
- Policy trend:
 - Reduction proportion allocated to institutional funding
 - Aim of 40% is already reached - In few countries less than 50%
- Performance-based Research Funding system (PBRF)
 - Internationally: long multi-year time constants, small proportions
 - EM: preceding 5 years, entire flow of institutional funding

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Governance style: centralisation and de-personalisation

The CR is centralising and depersonalising decisions that other countries take de-centrally and in trust-based partnerships with stakeholders

Directly or indirectly, it has led to :

- Increased distance between decisions on R&D&I funding and the stakeholders affected
- Loss of strategic intelligence about needs and opportunities
- 100% contestable and inherently unstable public national R&D funding
- International funding initiatives such as the OPR&D&I becoming a threat rather than an opportunity
-

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The R&D Audit: Conclusions and Recommendations

České fórum pro výzkum, vývoj a inovace 2011
13 October 2011

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A core problem is lack of trust

- High levels of cynicism and instability in political life
 - Low level of trust – especially of government – a major block to development of the R&D&I system
 - Leads to attempts to use rule-based methods to overcome governance and processes that are seen as untrustworthy
 - Level of trust in government is low, partly because civil service reforms have not been implemented
 - Leads to over-centralisation of governance and attempts to replace societal and stakeholder interaction with the expertise of researchers
 - Need checks and balances and stability – combined with public and humiliating punishment for those who break trust
-

2

Conclusions ...

- Opportunities further to improve cooperation among the universities, the Academy and the RTOs
 - *Do we have the right division of labour in an increasingly interconnected innovation system?*
 - Better links needed between the research system and industry
 - *Governance*
 - *Day to day cooperation*
 - *Signalling, development of human capital*
 - *Industry may need help to articulate needs*
 - Excessively rule-based efforts to improve governance. The key need is to develop capacity
-

3

Conclusions ...

- Too high a proportion of research funding seems to be subject to competition – this is risky
 - *A better balance is needed among the forces that promote quality, stability and restructuring*
 - Progress in governance
 - *Shift from research focus to be more inclusive of innovation*
 - *Over-centralisation at the cost of stakeholder involvement*
 - *Strategic intelligence needs to be more distributed*
 - *R&D&I Council should set broad directions, not micro-manage or haggle about money*
 - Evaluation is broken
 - *EM is not fit for purpose*
 - *Evaluation more broadly counts the wrong things*
-

4

Conclusions ...

- Research output is improving
 - *More, better publications*
 - *International cooperation as a driver of quality improvement*
 - *Underlines the importance of engaging with the FP and the World*
 - *Internationalisation strategies are needed at both national and institutional levels*
 - Research management is problematic
 - *Fragmentation, old-fashioned structures, over-dependence on key individuals, in-breeding*
 - *Human resource development needs modernisation, eg carer planning, succession, gender*
-

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- Science-Industry links are poor
 - *Volume of joint activity is small (though informal links are better)*
 - *Need to address the activities of the MNCs*
 - *Need a mix of support to 'catch-up' and generation of original research capabilities*
 - *Regional pattern of assets is improving via Structural Funds but needs national coordination*
- IPR law is state of the art
 - *But almost no-one understands it or exploits it*

Recommendation 1

- Building trust in government and among members of the R&D&I community is a precondition for successful performance in the NRIS. Such trust is based on fair principles transparently and impartially implemented combined with conspicuous punishment for those at any level who break the rules.
 - *The promised civil service reforms should urgently be carried out*
 - *The state's organisations that aim to manage the NRIS – from the R&D&I Council, the Ministries, the Science Foundation and the Technology Agency – should be required to make details of decisions and reasons for making them public*
 - *Oversight processes, including the use of international peers, should be in place so that there are credible guarantors who can test and vouch for the independence and objectivity of decisions.*

Recommendation 2

- The size and quality of the Czech R&D&I system have been increasing for a number of years but remain below international levels
 - *The state should continue to increase its investment in R&D, in line with the policy of spending 1% of GDP on R&D by 2020*
 - *Measures need to be in place to encourage industry to spend a further 2% of GDP on R&D by that time, in line with the expectations of the former Barcelona Goal and the new Horizon 2020 policy of the EU*

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Recommendation 3

- There are signs that the division of labour and institutional boundaries among the universities, ASCR and RTOs are not optimal and that opportunities for more closely working together are being missed. Outdated forms of organisation and management appear in some cases to impede effectiveness
 - *The R&D&I Council should launch an inquiry into the organisation, performance and division of labour among the universities, ASCR and RTOs with a view to proposing measures to modernise and potentially reallocate roles among these organisations*
 - *Updating human resource and research management practices should be key elements of the resulting reforms*
 - *Measures should urgently be introduced to combat the shockingly low level of female participation in research, which represents a massively inefficient waste of talent*

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Recommendation 4

- Recent reforms have tried to combat lack of trust in government, perceived improprieties in decision-making and perceived lack of capabilities in the Ministries by centralising responsibility for R&D&I budgets and policy in the R&D&I Council
 - *Alongside the civil service reforms, Ministry capacities should be strengthened and the Ministries re-empowered to act in R&D&I by having their own budget lines*
 - *The R&D&I Council should refocus on setting broad strategic directions rather than budget allocation and micro-management*
 - *The Science Foundation and Technology Agency should be given principals in the form of Ministries. Multiple Ministries should be able to use them as funding agencies for their R&D&I activities.*
 - *They should have performance contracts and be managed by objectives, not micro-managed by the R&D&I Council or others*
- *Steering should therefore shift towards soft steering with the involvement of relevant stakeholders*

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Recommendations 5, 6

- Good international practice in R&D programming is to involve stakeholders, so as to ensure a fit with needs and opportunities
 - *This is of course subject to checks and balances and the planning and implementation processes must be transparent*
 - *Czech R&D programming practice should respect the international tradition of stakeholder involvement combined with scrutiny to ensure objectivity and independence*
- The proportion of research funding in the Czech Republic that is delivered under competitive conditions is too high, exceeding levels that many countries regard as dangerous
 - *Institutional funding should comprise at least 50% of research funding*
 - *It should be quality-assured but on a slow (5+ year) cycle that creates stability and opportunities to plan rather than on an annual basis*

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Recommendations 7, 8

- The Evaluation Methodology is not fit for purpose
 - *It should be replaced by a system of performance contracts that have both prospective and retrospective components, supported by a combination of objective indicators and international peer judgement*
- The system of R&D evaluation in the Czech Republic more broadly focuses on counting outputs at the expense of understanding policy interventions and their impacts. It therefore provides information that is at best of limited relevance
 - *Evaluation practice should be the subject of root and branch reform, refocusing on outcomes and impacts in addition to outputs and contributing to policy and programme development and planning*
 - *This will involve implementing the 'waterfall principle' that involves levels in the steering hierarchy using independent expertise to evaluate levels hierarchically below themselves but not in effect being able to do self-evaluation*

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Recommendations 9, 10

- The Czech NRIS lacks an Internationalisation strategy. This inhibits its development
 - *The R&D&I Council should launch a consultation and study to generate a Czech R&D&I internationalisation strategy.*
- Intellectual Property Rights (IPR) are poorly understood in the Czech Republic. Few understand the breadth and usefulness of a proper IPR strategy
 - *The employers' organisations or chambers of commerce should launch a campaign of IPR education for industry*
 - *The universities and institutes need to develop clearer IPR strategies*
 - *This does not mean that there should be further pressure to patent the irrelevant – rather, understanding IPR properly allows rational decisions to be made about what not to patent and how best to share knowledge with industry and other organisations outside the research and higher education sector*

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Thank you

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