

Notes on the First Interim Report

I think the Report contains very interesting and very important information. I think a lot of work has been done in a relatively short period of time.

In the same time I think that it could contain even more information, as the statements are sometimes too general or too polite and diplomatic. I would appreciate very much if the authors of the Report are more concrete in their statements (I specify particular cases in my notes below).

I was asked to express my opinion on whether the Report satisfies the criteria specified in the contract, as to what must be contained in the First Interim Report. According to that, it should contain (I rephrase the requirements briefly as I understand them from the Czech document):

- evaluation of the “Evaluation Methodology” (or “Evaluation Guidelines”) by the R&D&I Council, including its SWOT analysis,
- evaluation of research performed at various types of institutions, comparison with the situation abroad, taking into account financial requirements, efficiency of the research funding, applicability of the results, international collaboration, etc., and comparing results of this evaluation with the results by the “Evaluation Methodology”,
- intellectual property rights - SWOT analysis of the situation in the Czech Republic.

In a very broad sense, the Report does contain the required information. However, I am missing the SWOT analysis of the “Evaluation Methodology”. It also seems that the authors of the Report only studied the 2009 version of the “Evaluation Methodology” (the authors say in Sec. 4.2.1. that only the 2004 and 2009 versions have been translated into English), although the new version 2010 with important changes has been passed this year (although a few words are devoted to the 2010 version in Annex 1, the text there does not contain correct information). I think, if very strong recommendations are given, they should be based on the knowledge of the last version of the “Evaluation Methodology”.

With respect to the second point, an overall research evaluation has been provided. However, I believe that the Report could contain more specific data and their interpretations. I specify that in my notes below.

There is not much of the third point contained in the Report, however, as I have learned, it has been agreed that the first two points have top priority and the third point can be shifted to the next Interim Report.

As a whole, I think that the Report can be approved, however, I would appreciate very much if the authors elaborate more on the specific notes below.

Specific notes

It would be useful if all claims in the Report cite particular data in the Appendices. I would appreciate links to the specific sections in the Appendices, which would make the reading more efficient.

Recently, quite detailed analysis of the Czech R&D system has been published by the Czech Statistical Office (CSO), containing quite a lot of information of the similar kind as this Report and its Annexes (economic data and their comparison with the situation abroad, bibliometric results, statistics of citations, etc.). I would appreciate if the authors mention the main similarities and differences between

their results and those by the CSO.

Sec. 2.1.3

„Compared internationally, the share of Business Enterprise R&D funded by the Government is rather high: 6% above the EU-27 and EU-15 averages. With 39% of Business Enterprise R&D funded by the Government, Romania takes the highest position – which is not necessarily one that should be emulated.“

The relatively high proportion of Government funding of business research is something that has been catching the eye here for some time. I would expect that the report would be more specific in commenting this fact: is it good or bad? Why the high proportion „should not necessarily be emulated“? What exactly happens with the public money that goes to the industry here and in the countries with the high proportion of government funding of research in the private sector? The opinion here is split between those who want to support especially industrial research and development (claiming that this will help the economy in the end) and those who are strongly against it saying that this is an unfair support of private sector by public money and that this money is missing to support fundamental research. The Report should contain more detailed analysis that could help with making decisions in this issue.

Sec. 2.1.4

„Regarding the type of Research conducted, in 2007 the share in expenditure for fundamental research, applied research and experimental development was 30%-25%- 45%. This meant (since 2003) an increase in share for fundamental research from 25% to 30% and a drop for applied research from 30% to 25%.“

I would appreciate more elaboration of this division: how do these numbers look like in other countries? What can be the explanation of this shift? Could it be that the same activity that has previously been described as „applied research“ is now in grant applications described as „fundamental research“? It is generally accepted that the boundary between fundamental and applied research is very fuzzy. Moreover, the regulations based on the „Community framework for state aid for research and development and innovation“ specify the proportion of allowed public support which is higher for fundamental research than for the applied research. Perhaps this could motivate some researchers to describe their activity as fundamental research rather than applied. Can the authors exclude this possibility?

„Although the Higher Education sector has by far higher shares in Engineering than the Government sector, it is in particular the Higher Education Sector that so far has failed to attract significant amounts of R&D funding from the Business Sector.“

It would be useful to hear some more discussion of why it is so: is it because of the inability of Universities to offer interesting results to the business or because the business enterprises are not motivated to go to the Universities with their requests? What should be done to change this situation?

Sec. 2.2

„The data used for the analysis were retrieved from the Web of Science...“

Sometimes it is criticized that WoS is taken as the only source for evaluation of scientific productivity (e.g., even in this Report the authors criticize the Evaluation Guidelines as „it systematically discriminates against non-ISI indexed fields, primarily in the arts, humanities and parts of the social sciences“). Are the authors convinced that WoS alone is reliable enough to get qualified conclusions? Should other databases (Scopus, etc.) not be taken into account? Is it not dangerous to endorse only the WoS position at the bibliometric market?

Sec. 2.2.1

„The output in the journals processed for the Web of Science of the Czech Republic has nearly tripled over the period 1993-2009, while the number of citation received (which are indicators of impacts) by researchers from the Czech Republic is more than six times higher in 2005-2009 than in 1993-1997.“

Do the authors have any idea what was the main cause of this dramatic change?

It would be interesting to see what are the contributions of the Higher Education Sector and of the Government Sector to this change.

Sec. 2.2.2

It would be useful to give reference where are the data on which the conclusions are based: is it Appendix E od Annex 2?

At the end of Sec. 2 I would appreciate some synthesis of the “input” and “output” data and their comparison with other countries, especially the benchmark ones. How much money (measured in EUR and in fractions of GDP) and how much human resources are necessary to produce a scientific paper in the Czech Republic and elsewhere? What is the impact measured by citations generated by a unit of input resources here and elsewhere? How do these figures differ for different research fields and for different types of institutions? What are the trends?

The text contains some phrases that are very nice, very diplomatic and very general (*“The comparison with the benchmarking countries makes it clear that the Czech Republic still has a long way to go”*, etc.), but I would appreciate very much if the report contains more concrete statements and recommendations - even though they will be less diplomatic.

Sec. 3.4.1

„The Technology Agency and Grants Agency operate both at the policy-making level that is normally the preserve of ministries and as agents, without at the same time having the same responsibilities as ministries do for a sector of society.“

To be honest, I am not sure if I understand this statement. The Grants Agency (official English translation is the Czech Science Foundation) is just funding projects of basic research, the newly established Technology Agency is going to start funding projects of applied research, I suppose, in the same way as standard science and/or research foundations do. What are these two levels (later in the text compared to the „Academies of Soviet bloc Science“) in particular?

Later in the text the authors claim about these agencies that *„without principals they risk being forced to try to make policies without the benefit of the type of connection to societal needs or strategic intelligence that is normally found in ministries.“*

However, the programmes of the Technology Agency (as well as of any other providers) must be approved by the R&D Council that should take into account the societal needs and strategic intelligence. With respect to the basic research (supported by the Czech Science Foundation) it is widely believed that the scope should not be enforced by ministries but should come „bottom up“. Do the authors believe that the philosophy behind these two agencies should be changed? In which way in particular?

Sec. 3.4.2.1

It would be nice if the author elaborate more on the statement *„The Czech R&D&I Council benefits from the presence of the Prime Minister.“* Actually, in the law it is only said that „a minister“ is the chairman of the Council, not necessarily the Prime Minister, and only the last two former Prime Ministers (Topolánek and Fischer) chose to be chairmen of the Council. However, since the Prime Ministers often have other things to do, the Council tends to be orphaned for a considerable time. I

would appreciate if the authors consider the pros and cons of the participation of the Prime Minister in more detail.

Sec. 3.4.2.3

It would be useful to specify the mentioned „*direct resources of the institutes*“ in more detail.

„The trend analysis that we performed on the funding structures of the Academy (covering the time period 2000-2009), indicate that the Academy and its institutes are taking steps into becoming a more commercial-oriented research institution, in line with the developments abroad.“

I would appreciate more details on how the authors came to this conclusion: is it based just on the bulk economic data covering the Academy as a whole or does it reflect the situation of most institutes? Could it be that the effect of a few strongest institutes makes the picture, while the majority of the institutes are much weaker and do not contribute to this trend? It would be useful to be more concrete about the phrase „*in line with the developments abroad*“ saying how close or how far from the „abroad benchmark“ the Academy stands.

Sec. 3.4.3

„We notice also the constant increase in the share of targeted funding allocated to the Ministry of Industry and Trade, despite the creation of the Technology Agency.“

Many other people here noticed that as well, quite often with mixed feelings.

It would be useful if the authors elaborate on this topics, saying more about their views on the usefulness of this fact.

Sec. 3.5.1.2

„The impression is, however, that the priorities were set so broadly that any field of research could find its place. The definition of research priorities is a dilemma for policy-makers in most countries, each approach taken having advantages and disadvantages.“

Yes, this general statement is certainly true. I hope that at some later stage the Report will contain a more specific information that would help a little bit in solving this dilemma.

Sec. 3.5.1.3

I think this is a useful feedback. I would appreciate if the authors could specify here those „*sporadic exceptions*“ as particular examples of a good practice.

Sec. 3.5.2

„The Law provides a very detailed and strict description of the procedures to be adopted for public tenders and project appraisals, including deadlines and measures to ensure fairness in the project proposal assessments. The information currently at our disposal confirms that all ministries rigorously applied the prescribed processes.“

I would be interested whether the authors are aware of the practice of the Ministry of Industry and Trade which recently decided against the recommendations of the Expert Advisory Body in 10 cases out of 80 (to approve proposals not recommended by the Body). Although the law says „The grantor may decide against the recommendations of the Expert Advisory Body, provided that it explains the reasons in writing in the protocol and publishes such decision on the Internet,“ this statement is generally perceived as an exceptional measure which should be applied very carefully and if applied, the explanation should be detailed and convincing. I would appreciate an independent opinion on this issue by the authors of this Report. Do they think that the explanation published on the web of the Ministry of Industry and Trade is sufficient for understanding the necessity to use such a measure?

Sec. 4.2.2

This section is more or less just a collection of opinions on the Evaluation Methodology. I would appreciate if the authors of the Report comment more on their relevance. For example, the remark *„The Evaluation Methodology stimulates fields to compete against each other, instead of competition between researchers in the same field“* is not valid any more, since the Evaluation Methodology 2010 recently approved by the Government fixes the relative shares of 10 research fields on the budget allocated by means of the Methodology, etc.

I would appreciate some more comments on this issue: *„Also it is expected that the Academy of Sciences will face a decrease in funding, as it for instance does not have the additional sources of funding that universities have through teaching.“*

This argument is used quite often. On the other hand, one hears quite often that the universities are heavily under-financed, and only the research faculties do not face serious budget problems since they have access to the research money as well. So the Academy complains that the research faculties have advantage over them because of the teaching money, and the non-research faculties complain about the advantage of the research faculties for their research money. But the research faculties must do both jobs: teaching and research. So should this be viewed as an unfair advantage of the research faculties, or rather as a good synergy that enables a more efficient spending of public money?

Sec. 4.2.3

It is good to offer a comparison of evaluation systems in different countries. I would appreciate more details in this comparison, especially, e.g., the comparison of costs of these systems (what are the costs of evaluation per million EUR of public money distributed under the influence of the result of the evaluation in different countries). Since Denmark was chosen as one of the benchmark countries, and in Denmark a new system of institutional research money allocation has recently been introduced, I would appreciate also a few words summarizing the Danish experience.

Sec. 4.2.4

This section contains rather general statements. I would appreciate if concrete arguments are applied to support them.

„The application of the Evaluation Methodology for the allocation of institutional funding on an annual basis creates instability of funding and makes long-term planning difficult“

Long term planning is difficult for many more reasons (economical crisis, election results and the uncertainties with the state budget, existence of competitive funding with uncertain results of the grant proposals, brain drain, etc.). Could the authors try to quantify the relative contribution of the Evaluation Methodology to the overall sources of uncertainty?

„The Evaluation Methodology does not consider input factors, i.e. the different starting positions of the institutions are not taken into account“

Is that complaint meant that, say, a newly founded institution should be granted a head-start? How is the different starting position taken into account in other systems?

„The Evaluation Methodology is based entirely on countable research results, i.e. on past achievements – the related funding system leaves no leeway for funding decisions based on future-orientated considerations, e.g. development plans, as for example the Dutch system does.“

The future-orientated considerations are important for the targeted funding where projects are financed.

This targeted funding was meant to gain higher proportion compared to the proportion of institutional funding based on the Evaluation Methodology, so the past achievements influence on funding is less than the future-orientated considerations. What proportion of the past/future (sometimes translated as deeds/promises) aspects would the authors consider as good?

„The Evaluation Methodology is set at too high a level of aggregation compared to the level at which level research is taking place. As a consequence, good researchers may go unnoticed, not getting rewarded for the quality of their work.“

Do the authors know of any particular example? Perhaps it is the opposite way: since it is possible to trace from which result each CZK comes, at some institutions motivation rewards are based on counting results in a similar way as the Evaluation Methodology does. It would be good if the authors supply more arguments for their belief that if somewhere good researchers go unnoticed, the Evaluation Methodology is to blame.

Sec. 5:

„...while the research assessment exercise for 2010 (which is intended to affect the allocation of up to two thirds of the institutional funding of research performers from 2011) has the valid intention of reallocating resources towards those who perform the best, its implementation in the present form involves major risks to the research system. Both the scope and the method need significantly to be refined if the Republic is not to take the chance of unintentionally damaging significant and high-quality research resources.“

The authors should be more specific: do they know of particular high-quality institutions that score low in the evaluation system and would be unjustly under-financed and do they know of particular low-quality institutions that would get the money since they score high? Which „significant and high-quality research resources“ in particular are endangered?

„There remains considerable distance to go before Czech Republic could contemplate approaching the levels of the leading small countries such as Finland, Sweden or the Netherlands. “

A more specific statement would be helpful: Just comparing the trends and assuming them stable, how long would it take for the Czech Republic to catch up?

„The W European models all rely on the integration of teaching and research in the university system. In some (eg Germany) a number of significant fundamental research institutes co-exist with the university system (though they are increasingly working more closely with them). In others (eg the UK, Sweden, Finland) fundamental research is almost entirely performed by the universities. In the S European systems (France, Italy, Spain) that have maintained large academies, these are increasingly integrated with the university system but this has been a slow process. After a long period of cohabitation in ‘unités mixtes’, the French CNRS finally decided in 2009 to transfer its research-performing activities to the universities.“

I consider this issue extremely important, especially in connection with the debate about the Czech Academy of Sciences. Some people have the opinion that this institution should be completely transformed as they consider it obsolete and inefficient, whereas others claim that the Academy is the most efficient research organization in our country and should be saved from insensitive interventions. I would expect that the Report should give us a detailed analysis of what would be the advantages and disadvantages of various models of coexistence of the Academy and Universities and would appreciate hints of what could be the best for the future of the Czech research. I would also appreciate a more thorough comparison of the performance of the Czech Academy of Sciences with its counterparts in other countries (especially the Max Planck Society in Germany): comparing their budgets with respect

to GDP, human resources with respect to the country population and their results (high quality papers) per unit of resources.

„Feedback is urgently needed about the connection between funding and the achievement of these wider societal objectives.“

I strongly agree with this statement. But I miss some hint as how to accomplish such a feedback.

„... this allocation of resources takes place at the level of the budgets of ministries and the Academy, leaving these organisations free to use other evaluation systems to allocate the budgets obtained. While the Academy has chosen to do so, others have not – presumably because the use of any other evaluation system to allocate resources would risk favouring entities deemed under the current Evaluation Guidelines to be poor performers, leading to a vicious circle of declining scores and reducing resources.“

Although it is well known that the Academy uses its own evaluation system, I am missing an independent analysis of how good the system is. I would appreciate if the Report contains more information about the results of the latest evaluation of the Academy (2005-2007) with respect to its objectivity, fairness, reliability, etc. Reading the results of the last evaluation, some can get the feeling that all the institutes are if not world-class excellent, then at least very good (41 of them being evaluated in the “A” category, 15 of them in the “B” category, no one in “C” or “D”). Could the authors confirm such conclusions or do they have a different opinion? Do the authors of the Report have the opinion that the evaluation of the Academy and its results are sufficiently transparent?

There are several objections mentioned concerning the resource allocation system based on the Evaluation Guidelines. Let me comment some of them:

„It is inconsistent with the time constants involved in R&D, which are multi-annual not annual“

There is a five-year averaging window during which each item in the databases is kept. This should provide a sufficient inertia to the system. What would be the other options? The money could be fixed for several years and then adjusted. But this would again create discontinuities which we have witnessed when Research Intention money were allocated: some good institutions were suddenly without resources.

„While it takes account of journal rankings within different fields, it is not field- specific in the sense of taking account of crucial differences among fields, such as the propensity to publish (the best scientists in some fields publish many times as many articles as the best scientists in other disciplines)“

Curiously, no objections of this kind were raised when the authors of this Report used the bibliometric data to compare the publication output.

However, the new version of the Evaluation Methodology 2010 has fixed the ratios between the 10 fields so, e.g., the best scientists in Mathematics will **not** compete with the best scientists in Agriculture, etc.

„It systematically discriminates against non-ISI indexed fields, primarily in the arts, humanities and parts of the social sciences“

Again, if this is a seriously taken objection, why was it no problem when using the ISI data to compare the research performance by the publication output in Sec. 2?

„It lacks information about inputs and therefore cannot discriminate on the basis of efficiency“

Tables with the institutions sorted into green, gray, yellow and red groups according to the ratio between the output points and the input money (ISR, the so called index of state budget) have been used in the Evaluation Methodology till 2007. However, there was some criticism that the „winners“ typically were low-budget institutions with sufficiently high point score which occurred to be „most efficient“. Only later on, simple summation of points has prevailed as this occurred to give better information about the institution performance.

Recommendation 1.

The authors provide us with a very strong recommendation regarding the Evaluation Methodology. However, it seems that the authors only know the 2009 version and are not aware of the 2010 version of the Evaluation Methodology that has been approved this year. I think recommendations like that should be based on more recent data.

I would appreciate if the authors would be more specific about the „significant risk“ and the expected „damage“ that would result from application of the new allocation system. Which excellent institutions in particular could be harmed since they score too low in the point system, and which bad institutions in particular would unjustly benefit from the reallocation as they score too high?

The authors claim: *„It is better to do nothing at this point than to use a tool that seems likely to do damage. It should be replaced by a more nuanced and robust system, whose likely effects are better understood. The existing division of institutional resources should therefore continue to apply until such time as a robust system can be implemented.“*

It would be good if the authors comment more on the costs and risks of such a „do nothing“ approach. Let me mention here just a few:

- The “two thirds“ rule in 2011 is presently in a law (110/2009 Sb). To change it would require a quick change of legislation which is not trivial and even with good intentions to move fast typically brings unexpected risks.
- The “existing division of institutional resources” is based on flawed principles. When deciding on the “Research Intentions”, sometimes who claimed high financial requirements received a big budget and who was modest received less, although a more just and a more efficient proportion would be opposite. Some research groups - although not worse than other - simply did not get the “Research Intention” since there was not enough money in the overall budget.
- Some institutions have been actively preparing for the new system, many research groups which were not lucky in getting the „Research Intention“ but which are productive enough, await the new system impatiently expecting the possibility to evolve.
- Especially during the crisis, the policy makers do not like spending public money without visible outcomes. Some of them feel that the research system here is not efficient enough and expect that a thorough reform is necessary. Some of them think that the result-based funding system could enable survival of the fittest and elimination of the inefficient. If, just at the beginning of the reform of the funding system, we stop and „do nothing“ for the next 5 years or so which are necessary to create and implement a completely new system, it is quite possible that they will not like to spend more money on research at all.

Personally I feel that the research funding system in this country needs a change. Although I do not know what steps exactly to do, I expect that good hints should emerge from the Audit. I understand that some measures would be painful and extremely unpopular and I would expect that the Audit should

provide courageous policy makers with strong arguments with which they would be able to persuade the public and move things forward. In this context, getting the recommendation to „do nothing“, is a bit surprising for me.

Recommendation 2.

I completely agree with this recommendation. However, in the present form I find it rather general and vague and would appreciate if the authors in some later stage of the project provide us with more detailed suggestions.

Some questions and comments regarding the Appendices:

Annex 1:

Sec. 4:

„Most interestingly, funding flows from the Business Enterprise Sector towards the Higher Education Sector are still at very low levels and show little development since 1999, which is a confirmation of rather weak science-industry linkages in the Czech Republic.“

It would be useful to hear more discussion why is it so: is because of the inability of Universities to offer interesting results to the business or because the business are not motivated to go to the Universities with their requests? What should be done to change this situation?

p. 85, Sec. 333

The information about the Evaluation Methodology 2010 is not completely correct, e.g.: *“However, another change was proposed as well, but it was not approved in the final version and therefore not included in the valid methodology. It is described in chapter V of the original version ‘Metodika 2010-12 III vlastni_metodika’. This unapproved change concerns new rules restricting large shifts in funding among fields and results categories: - Between basic and applied research (limit 1.5% change from the previous year), - Among 10 large research fields (limit 15%), -Among various categories of results with exception of Jimp and Jneimp (limit 1.5%)”*

Actually, the complete chapter V with these and some other very important changes has been approved as a part of the Evaluation Methodology 2010 (including fixing the ratio of 10 research fields, etc.). The table with points is also not completely correct (PNAS is not for 500 points any more, only Nature and Science are).

p. 117:

Table 17 should be directly accompanied with a brief explanation of the abbreviations. It is claimed in the text that *„An extensive explanation of the indicators is given in Appendix B“*, however, Appendix B in this Annex has nothing to do with bibliometry as it deals with R&D&I Governance & Management; one should go to Appendix B of Annex 2.

Tomáš Opatrný

Olomouc, August 22, 2010