

**Evaluation of the Technopolis First Interim Report
within the framework of the project
“International Audit of Research, Development and Innovation
in the Czech Republic”**

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1. Documents received

This evaluation was prepared in response to a request made by the chief coordinator of the project entitled “International Audit of Research, Development and Innovation in the Czech Republic”, Prof. Ing. Jitka Moravcová, CSc., on 20 July 2010. As material for the evaluation I received the following documents on 16 August 2010:

- 1) First Interim Report, August 15, 2010, Technopolis
- 2) First Interim Report – Annex 1: WP reports, August 15, 2010
- 3) First Interim Report – Annex 2: Appendixes on Bibliometrics
- 4) Brief instructions for evaluating the Technopolis First interim report sent by the chief coordinator of the project and including part of the text of the instructional guideline material for the public tender for the project (chapter 2.1.1., point d, i-ii-iii), relevant for preparing the evaluation (hereinafter “the instructional guidelines”).

Note: I did not have at my disposal the full text of the instructional guideline material for the public tender.

2. General character of the report

Taking into consideration that this is the first interim report on the ongoing audit, the conclusions of which, according to its authors as well as the chief investigator (as expressed in document 4) above) are not definitive, one can state that the conception, general level and information value of the text as a whole, including the way in which it was executed and the extensive contents of the annexes, are of a very high quality.

The quality of the material is especially evident in the treatment of the central key point d), i) of chapter 2.1.1 of the instructional guidelines (chapter four of the report), dealing with assessment of the Methodology for Evaluating the Results of R & D in the Czech Republic in the context of findings within the framework of the audit (hereinafter “the Methodology”). The conclusions and recommendations describe the conception and realization of the evaluation of the results of research and development in the Czech Republic very well. In its

main points the report does not differ from the basic objections raised within the framework of the comment procedures relating to the Methodology in the period of its existence from 2004 to 2010.

The second chapter of the report is clearly only a first step towards meeting the requirements of point d), ii) of chapter 2.1.1 of the instructional guidelines, carried out so far at the level of comparing the inputs and output of R&D in the Czech Republic and suitable selected control countries, both in the area of financial support for R&D and from the point of view of a preliminary comparison of the most important publishing outputs through the help of bibliometric parameters. The third chapter is, from the point of view of the whole report, a useful critical survey – compact, complex and above all objective – of the development of the system of research, development and innovation and of science policy in the Czech Republic from 1990 to the present, with a look at the prospects to 2012.

The report does not include treatment of the conclusions of the audit in relation to point d), iii) of chapter 2.1.1 of the instructional guidelines, which deals with the protection of intellectual property. According to the chief investigator – “... points i) and ii) take priority; the protection of intellectual property will be the subject of a later report” – see document 4) – the instructional guidelines were slightly modified in the course of the audit.

Quite independently, the report issues in virtually the same key critical conclusions as those that have been voiced since 2004 by officially approved commenting institutions in the Czech Republic within the framework of comment procedures for documents relating to legislation and to the financing and evaluation of research and development in the Czech Republic (I assume that the authors of the report did not have these comment procedure materials at their disposal, or that in any case they did not study them). This indicates that the academic community in the Czech Republic has developed sufficient expertise to be able to devise proposals of this kind itself ¹.

More detailed comments on individual aspects of the report can be found in the following material.

3. Evaluation of the individual thematic fields (chapters) of the report

3.1 Chapter 1 – Introduction

This chapter presents a clear description of the contents of the report.

3.2 Chapter 2 – R&D Inputs and Output in the Czech Republic

The first part of the chapter, including the relevant part of Annex 1, gives what it essentially the most concise possible account of:

- a) the distribution of expenditures on research and development and used for research and investment by the three major performance sectors in the Czech Republic –

¹ For example, there are the materials for the currently ongoing evaluation of the Czech Academy of Sciences, or the comments of the Czech Rectors' Conference on financing and the evaluation of results dating from September 2009, formulated on the basis of the conclusions of the activities of a working group, which might have drawn on the document entitled “Principles, procedure and timetable for the creation of a conception for evaluating research and development”, now available at <http://cms.jcmf.cz/osov/> or http://cms.jcmf.cz/osov/odborne_akce.html.

- business enterprises (BE), government (G) and higher education (HE) – in 1999 and 2008;
- b) the distribution of expenditures according to individual types of research and development (fundamental research, applied research and experimental research) in 2007;
- c) the distribution of expenditures on research and development in several dozen particular fields.

For the purposes of this report, this rough survey is quite adequate. However, the data found here can be easily accessed in far more detail both in source materials (Eurostat, OECD) and in the materials prepared annually in the Czech Republic on the basis of them (the annual “Analysis of the Existing State of Research and Development in the Czech Republic and a Comparison with the Situation Abroad”). The report limits itself to presenting the conclusions on the percentile shares of the individual types of funding following directly from the tables contained in Annex 1, and in some cases to the formulation of qualitative conclusions, without any analysis of positive and negative aspects or any analysis of the reason for the negative aspects. Since in the case of c) not even the source of the data, the period they refer to or the methodology for obtaining the data are given, it is not possible to judge how reliable they are ².

The second part of the chapter, together with Annex 2 and the relevant part of Annex 1, focus on the basic Czech bibliometric data and their comparison with data of several aptly chosen control countries ³. As the importance accorded these data is judged correctly in the report and annexes – that is, they are not overestimated ⁴ – it is not necessary to dwell here on errors and inconsistencies, which can be easily corrected in a later version of the report ⁵. Already in this part of the report, and also through the structure of the bibliometric data, it is evident that the qualitative and quantitative level of publication and citation outputs must be evaluated according to individual disciplines ⁶.

The structure of the report is such that one would expect this chapter on “R&D Inputs and Output in the Czech Republic” to include material dealing with point d) ii) of chapter 2.1.1 of the instructional guidelines. However, the report does not include a comparison of the three major performance sectors (BE, G and HE) in the Czech Republic with the corresponding groups of research institutes abroad, whether in terms of the distribution of expenditures on

² For example, “... there is a structural mismatch in scientific orientation of the Business Enterprise Sector R&D and the Government and Higher Education Sector R&D. 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 Business Sector” (page 4 of the report).

³ Austria, Denmark, Finland, Germany, Hungary, Netherlands, Slovenia, Sweden.

⁴ “... Although this classification is far from perfect...” (Annex 2, page 9).

⁵ Examples: 1) The reversed headings for the columns for CPP/JCSm and CPP/FCSm in comparison with JCSm and FCSm. 2) The contradictory commentaries regarding the inclusion of self-citations in CPP on pages 9 and 10 of Annex 2: “The fourth indicator is the average number of citations per publication with exclusion of self-citations (CPP)” – Annex 2, page 9; “As discussed above, self-citations are included in the calculation of the ratio’s CPP/FCSm and CPP/JCSm” – Annex 2, page 10, whereas the CPP data do not include self-citations, while the JCSm and FCSm data clearly include all citations. 3) The unclear meaning of the statement “... the huge shift from publications with no collaboration at all, towards publications resulting from national cooperation, thereby showing that internal cohesion has improved in the Czech Science system” (page 6 of the report) in the context of the tables in Appendix F and Appendix G of Annex 2.

⁶ “This indicator CPP/FCS is our ‘crown indicator’, because it emphasizes the position of an institution within worldwide, ‘field-normalized’ perspectives” (Annex 1, page 9).

research and development or of the quantity of outputs achieved (bibliometrics), or of their quality and the effective and efficient use of funding. This is, however, a first interim report. The rather sophisticated analyses required by the instructional guidelines will clearly follow as a further step; many necessary data are available in the relevant sources (for example Eurostat).

3.3 Chapter 3 – Governance and Management of the Research System

Only at first sight does it appear that this chapter goes beyond the scope of the key points d), i) and d), ii) of chapter 2.1.1 of the instructional guidelines. It is a compact and complex critical resumé dealing with the history, current state and prospects for development of the system of research, development and innovation and science policy in the Czech Republic since 1990. An objective outside view of the organization of research and development in the Czech Republic is essential for the deeper analysis to be expected in connection with point d) ii) of chapter 2.1.2 of the instructional guidelines.

Avoiding unnecessary details, the report and the relevant part of Annex 1 map and, objectively and with insight, evaluate the key changes in the history of the development of the system of organizing research and development in the Czech Republic and their causes, as well as the structure for management of and support for research and development in the Czech Republic. Comparing this with the well functioning organizational structure of the system for research and development that exists at the present time in, for example, the countries of the OECD, it points to atypical anomalies in the Czech Republic (grant agencies, the role of the R&D&I Council and the problematic nature of its independence as an advisory body to the government, a view that is expressed very decently, but quite clearly⁷). Even though all the facts concerning the organization of R&D in the Czech Republic are well known and easily accessible in official materials (which the authors of the report clearly drew on, among other sources), the chapter has the benefit, as has been stated, of presenting a trenchant summary marked by clearly critical judgements.

3.4 Chapter 4 – Evaluation and Resource Allocation

This chapter of the report and the relevant part of Annex 1 present the interim results of the audit in relation to the key point d), 1) of chapter 2.1.1 of the instructional guidelines. It deals with the issue of institutional financing, with an emphasis on an analysis of the current Methodology for Evaluating the Results of R & D in the Czech Republic and its suitability for the purpose of institutional financing. Though the authors of the report themselves refer to the conclusions presented in the report as a “first analyses of observations and concerns” (page 19, point 4.2.2) and “observations and preliminary conclusions” (page 22, point 4.2.4), they clearly have good insight into the whole issue of the evaluation of research and development in the Czech Republic and the objectivity of their approach is clear from the fact that, in addition to mentioning a number of demonstrably negative features of an expert character in

⁷ “The technology agency and Grant 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 ...” (page 11 of the report). “The R&D&I Council plays an unusual role in operating almost as a **virtual science ministry**, coordinating R&D&I Policies top-down and having a strong say in budgeting ...” (page 11 of the report). “The Czech R&D&I Council benefits from the presence of the Prime Minister. However, the absence of other ministers combined with the fact that it seeks to influence the R&D&I policy of those absent ministers risks undermining its work...” (page 13 of the report).

the Methodology, they also point out certain other, more general features that they regard as positive⁸. Basically none of the key conclusions reached by the authors of the report independently of the results of the comment procedures relating to the Methodology in the Czech Republic are not present as basic observations in the materials from these comment procedures⁹. A brief overview of R&D evaluation in a number of countries is a welcome addition to the chapter.

4. Advisable improvements for subsequent versions of the report

- 1) Include the data, analyses and conclusions that are needed for meeting the remaining part of the requirements of point d), ii of chapter 2.1.1 of the instructional guidelines: “... comparison of the level of the R&D groups of institutions in the Czech Republic that are entitled to seek R&D support from public sources with that of advanced European institutions ...”
- 2) Include data analyses and conclusions for meeting point d), iii) of chapter 2.1.1 of the instructional guidelines (protection of intellectual property).
- 3) Formulate definitive conclusions with regard to point d), i) of chapter 2.1.1 of the instructional guidelines (methodology for evaluating the results of R&D).
- 4) Remove formal and minor errors.

5. Conclusion

From the point of view of both the requirements expressed in points d), i) and d), ii) of chapter 2.1.1 of the instructional guidelines as well as the explicit statement that these “are not definitive conclusions”, the contents, conclusions and recommendations of the report are in line with its purpose of its being a “first interim report”. Therefore I do not propose that the analyses should be immediately supplemented and reworked in order to satisfy the instructional guidelines in full, but instead

recommend that the “first interim report” should be approved as it is and that its final recommendations should be accepted as being well-argued,

with the proviso that the necessary data and their evaluation, together with conclusions and recommendations, will form part of a further report

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⁸ It is not possible to agree with all the features identified here as positive. For example, the conclusion that “The Evaluation Methodology is better than no counting at all” would be acceptable only if the Methodology did not contain serious shortcomings of an expert character.

⁹ Examples show that the Methodology is not a suitable mechanism for distributing funding: 1) The creation of the Methodology was not preceded by the relevant analyses, in particular of foreign experience with evaluating research and development;

2) It is not possible to assess the quality of research at an institution through a single numerical parameter located on a universal scale;

3) The Methodology does not take into account the specific features of research in different disciplines;

4) The Methodology provides information concerning at the very most large units;

5) Financing on the basis of the Methodology leads to instability, etc.