

Subject: Referee report on the Interim Report of the International Audit of Research, Development and Innovation in the Czech Republic (7 pages)
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Introduction

Overall I find the content of the interim report (IR) promising one. It proves that during relatively short period of few months since the launch of the project experts of the consortium managed to grasp the key principles and complexities of the current R&D system and its historical roots. But the IR mainly presents more or less known facts and its major value added is that it explicitly highlights questionable and strange institutional arrangements vis-à-vis foreign experience. In my reflection and comments I focus primarily on the current Evaluation methodology (EM) of R&D evaluation and on the rules guiding allocation of institutional funding. I consider those two issues as the most problematic features of the current R&D system.

General observations

At various places of the report including appendices, the report is not carefully enough distinguishing between (i) methods used to evaluate scientific achievements (**Evaluation methodology - EM**) and (ii) rules guiding allocation of public funds (**Funds allocation methodology - FAM**). The distinction should be made very explicit throughout the whole discussion including the review of international practices. Also, many arguments are made about the past and current FAM, but it is not explicitly specified which dimension of allocation is being meant (across fields, across types of research, across ministries, across final recipients). This being left unspecified, the analysis and presentation sometimes becomes ambiguous and lacks clarity. Huge confusion among larger academic community is born by the existing EM which does not make clear distinction between orthogonal dimension of fund allocations since the rule-of-three-sum (trojčlenka = kafemlejnec) is being used to allocate funds across all dimensions.

It should be noted that the EMs up to the 2009 version did not say a word about allocation of institutional funds. Only the latest (current) EM2010 approved in July 2010 contains fresh new section #5 dealing with money allocation. In this respect, the IR is not detailed enough about rules guiding allocation of institutional funds. For example:

- As concerns allocations of the R&D inst. budget between providers, it is very vaguely guided by the Law 130/2002. It stipulates that the allocation should be based on¹ **(i)** evaluation of R&D results of research institutions during last 5 years (note that EM is not mentioned explicitly), on **(ii)** National Policy of R&D&I, and on **(iii)** international

¹¹ Law 130/2002, §5a (2b): Návrh výše výdajů podle § 6 odst. 2 písm. c) v členění podle výzkumných organizací; návrh vychází ze zhodnocení výsledků dosažených výzkumnými organizacemi v uplynulých 5 letech, z Národní politiky výzkumu, vývoje a inovací a z výsledků mezinárodního hodnocení výzkumu a vývoje v České republice.

evaluation of R&D in the CR. This very general legal wording allows for ad hoc funds allocations across providers and in the same time it makes the volume of annual institutional budgets allocations to providers highly unpredictable. The actual allocation of funds between providers is determined by a mix of the rule-of-three-sums (3 years transition by thirds from allocation by research intentions) and of ad hoc decisions (exceptions).

- As concerns funds allocation realized by providers among research institutions, the Law 130/2002 stipulates² in very detail that allocation has to be done by the rule-of-three-sums (but again, EM is not explicitly mentioned). According to this paragraph, providers are allowed to deviate from the allocation by the rule-of-three-sums only if they have their own research evaluation assessment outcomes. In contrast with that, the official document of the R&D Board “Preparation of Evaluation Methodology 2010” explicitly stressed that³ the purpose of EM is not to allocate resources (by providers) to research institutions (pointing to impossibility to compare points across fields), and it even discouraged providers to use the rule-of-three-sums. This is in strong contrast with the Law 130/2002 requiring that providers have to use results of the EM by the-rule-of-three-sums to allocate funds among recipients. It should be noted that largest providers (Ministries of Schooling and Industry) do not have their own R&D evaluation and are bound by the law to use the rule-of three-sums. Research achievements evaluation at the Academy is under preparation.

Several orthogonal dimensions of core-institutional funding allocations should be strictly distinguished whenever institutional funds allocations are discussed in the IR. At least following dimensions of allocation should be distinguished: (i) across fields or field groups, (ii) across recipient institutions (legal entities realizing R&D), (iii) to funds providers (ministries including the Academy), (iv) across workplaces and/or R&D teams (faculties within universities, teams within larger institutes at the Academy).

The purpose of evaluation (realized by the EM) should be also explicitly stated whenever it is discussed. The purpose could be allocation of funding but also other purposes like general information provision, support for strategic planning, etc.

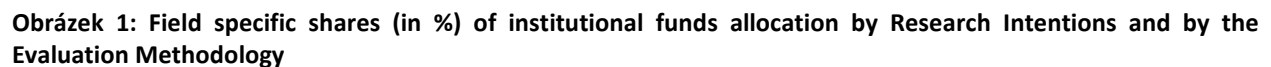
More attention should be paid to the evaluation of R&D achievements at larger recipient institutions like large universities and the Academy.

Recommendation no.1 presented at the very end of the IR (section 5.4) is very strong. I support the recommendation but it should be accompanied with explicit and straightforward arguments why any alternative temporary solution would be inferior one. It should be reiterated and stressed that funds allocation by the rule-of-three-sums across fields (and therefore across R&D

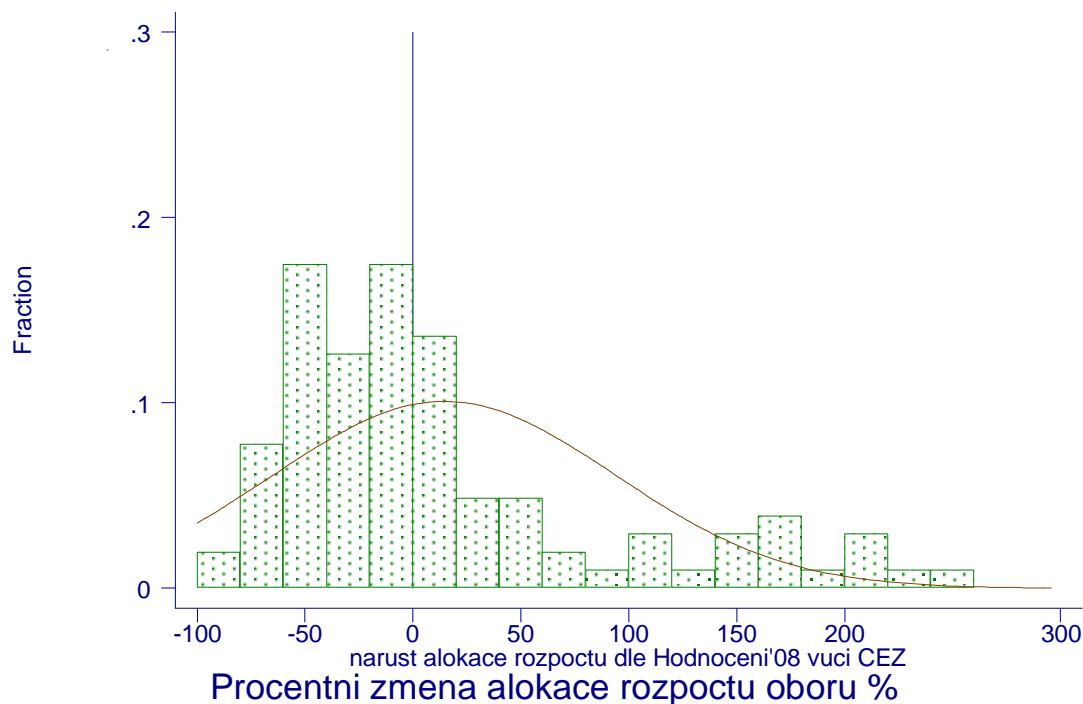
² Law 130/2002, §7 (6).

³ Page 4: 2) Rozdělení institucionálních výdajů výzkumným organizacím – toto není a ani v budoucnosti by neměl být účel kvantifikace výsledků, a to zejména u menších organizací. Na této úrovni se totiž projevuje oborové zaměření organizací a problémy s tím spojené (viz 4). Poskytovatelé by proto měli podle vlastního hodnocení rozdělení prostředků upravit.

Pp 20: It is mentioned that authors *do not know of anyone performing a simulation of the effect of the use of the EM for the distribution of institutional funding*. There had been simulation done by the RVVI secretariat and it appeared in the official document “Preparation of Evaluation Methodology 2010”. The simulation compared percentage allocations between several tens of scientific fields by the Research Intentions and by the EM (rule-of-three-sums). While those two allocations differ by few percentage points in most fields (see scatter plot Figure 1: for example, the share of field “DB” on funding via Research Intentions had been 3% and it dropped to 1.4% if funded via the rule-of-three-sums).



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Obrázek 2: Percentage difference in allocation of institutional funds in individual fields.

These within field differences in allocations are huge and have strong implications:

- i. this serves as an explicit evidence that allocation of funds across fields has no rational meaning,
- ii. some fields will be adversely hit while other will expand w/o any reason,
- iii. increase/decreases in funding will be even greater at the level of individual research institutes and faculties,
- iv. some fields (and their research institutes) will go bankrupt while other will expand, again without any rational grounds (research quality or productivity or based on strategic importance of the field).

Particular important observation

pp. 4, intro 2.2: The intro on bibliometric analysis should state clearly that it considers only output, not productivity and that citation impact provides very imperfect information about quality of research. Otherwise, most readers not familiar with bibliometrics will make wrong conclusions.

Bibliometric indices based on simple citations counts irrespective of the “quality” of citations are rather poor indicators of quality (impact). And this is especially the case if larger/smaller proportion of citations in some fields is due to presence/absence of IF journal published by Czech publisher, frequently an institute of the Academy or at an university. Self-citations of such journals (not self-citations of authors) can inflate simple citation indices irrespective of their quality (real impact) increase. Similarly, inclusion of new CZ journal into IF journals (as it

happened) leads to substantial growth of publications and citations counts but such journal inclusion have nothing to do with the growth of real academic production and of impact because those journals existed even before being included into the WoS database. It is very typical phenomena in all post-communist countries that research communities in some fields, social and human sciences in particular, work in isolation from the world research discussion so that researchers cite each other within domestic community and the interaction across borders (the one which can be more reliably verify the relevance and quality of research) is weak. This implies that presented indicators should be augmented by other one which overcome problems mentioned above. For example, indices like eigenfactors or measures reflecting impact factors of citing publications should be also presented

Attention should be given to past (maybe still in place) ruling that allows providers to use ~2.5% of institutional budget to cover costs of R&D evaluation. If it still applies, this amount could (should) be allocated centrally for centrally processed evaluations given that providers do not evaluate.

It should be reviewed in greater detail how much money is being spent on R&D evaluation at the level of providers and at the level of the R&D Board. Formal and real rules of evaluation should be distinguished. It is well known fact that there are almost no funds to perform even simple physical checks of R&D outputs entering evaluations by the EM. In the review procedure guided by the EM2010, a proposal was made to allocate 1-2 mil. CZK to realize physical inspection of several thousands books. This proposal had been rejected based on arguments that there are no funds available for such an exercise. In the same time, one book attracts state subsidy to research institution in the amount of up to 1 mil. CZK (during 5 years long window). It contrasts with hundreds millions of CZK provided via institutional funding for books not fulfilling definition of scientific book as stipulated in the EM. In the Summer 2008, three expert committees of the R&D Board for three broad field groups realized inspection of books entering evaluation in those times. Great deal of inspections was based on simple checks of database records only. Articles in non-IF journals were not subject to inspections. In summer 2009 no ad hoc physical inspections were done at all. During the Summer 2010 (now), some inspections are being done during very short time span (report lacks information on those inspections).

The part of the IR on R&D publication outcomes, does not explain carefully enough that evaluation of research institution or of a field within a country has to consider three fundamental entities together: (i) the volume of research output, (ii) average quality of research output, and (iii) inputs used to create those outputs. From those, quality weighted volume of output can be computed and divided by the volume of inputs, research productivity can be expressed and compared to the performance of fields and institutions abroad. Considering the volume and average quality (citation impact) of output separately does not provide information needed. For example, low number of highly cited articles leads to high citation impact of the country in given field. On the other hand, low number of highly cited publications accompanied by larger number of poorly cited articles (in local IF journals) gives low average citation impact of given field. Not being scaled down by the volume of inputs,

separate information about the volume and average quality (average citation impact) does not say anything useful about the quality and efficiency of research in particular field.

Pp 19, 28: In addition to what is mentioned, value added of the EM is that it evaluates all recipients of institutional support in the country and that it has helped to develop info system on research outputs. Among negative attributes of the EM it should be mentioned that it does not generate evaluations benchmarked to world quality standards in each field – at this moment, Czech Republic does not have any indicator which enable international comparison of fields (comparison of quality weighted volume of research outputs adjusted to the volume of inputs used). This implies that one key information needed to set policy priorities (allocation of funding across fields) is missing in the CR.

Pp 21: The IR reviews R&D evaluation and funding systems in the Netherlands, France and the UK. Since I know the UK system quite well, I find the overview (in Appendix 1, starting on page 90.) rather incomplete and sometimes even misleading. For example it states that in the UK: *Funding is allocated on the basis of a mechanism known as the Research Assessment Exercise, a peer review process which produces 'quality profiles' for each submission of research activity made by HEIs.* It is not true. RAE and REF is mere evaluation methodology and not a funding methodology. The method of funds allocation is something different and is called QR – Quality related funding and it have stayed more or less the same for many years and will use results of REF instead of previous RAE. Generally, the review of foreign practice is not detailed enough to clarify funding principles to allocate funds across key dimensions (allocation across sectors, across primary, applied research and experimental development, between recipients). For example, it is noted that the Dutch evaluation is not being used to allocate funding but allocation procedures used in the Netherlands is not described.

Less important observations

Pp 19: The Academy did not finish development of its own internal evaluation system yet – the system is still at the early stage of development. For example, the shape of the bibliometric support and its use is not finished. Evaluation methodologies and coordination of standards toward world benchmarks across panels is not guaranteed. The procedure to appoint external reviewers is questionable.

3: It should be clearly explained early at the beginning of the IR which Czech specific institutions are included into two broad R&D sectors discussed in the section. For example, *Government Sector* includes the Academy of Science (its institutes) but the footnote #1 mentions only *Public Research Organisations*. It is also not clarified why the Academy of Sciences is included into Government Sector and public universities into the HE Sector. Both (Academy and universities) are effectively non-governmental **public** institutions, both are run in highly autonomous mode. This is especially the case of the Academy whose position is similar to that of a ministry (institutional funds provider) but having central management appointed by democratic vote from down-up while the governance of ministries is appointed from above via political choice. I

understand that the terminology is born by definitions used by the statistical office, but it should be well clarified.

Pp 2-3: The whole description is not clear enough as concerns the original source of R&D funding, intermediate agencies and the type of institution where money are spent.

Pp 4, 24: It is becoming recognized in the literature and OECD publications too, that there is no strict line between fundamental (FR) and applied research (AR). This makes any comparison of funds allocations between FR and AR very questionable. Across countries different indirect country specific administrative criteria are being used and co-determine observed differences. In the Czech Republic, for example, in the new EM, fundamental and applied research are distinguished according to output types. Publications (journals, books, proceedings) are considered as outcomes of FR while other types of outputs are considered as outcomes of AR. In reality, both groups of results contain outcomes of both FR and AR. Therefore, value added of the comparison on pp.4 is questionable.

Pp 20: Other sources of university funding (not listed) are (i) funding of educational activities (notably greater funding pillar compared to R&D institutional funding), (ii) specific research funding of research related to PhDs, (iii) investment (maintenance and upgrades/expansions) funding chapter for education.