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TOPIC

How to evaluate funding systems. The example of the FFF/FWF evaluation

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Preface

When, in the first half of 2004, the evaluation of the Austrian Science Fund (FWF) and the Austrian Industrial Research Promotion Fund (FFF) was completed, one of the most ambitious evaluation tasks of the past decade had been accomplished. Not only because of its sheer size but also because of the fact that the two funds had never been evaluated ever since their introduction in 1967 gave this evaluation the potential to place a landmark in Austria's RTD evaluation landscape.

However, there was even more to underline the pivotal role the project was about to adopt: at the time the evaluation was carried out a major political reform proposal was underway aiming at a comprehensive reorganization of Austria's RTD funding system. Of course also the evaluation was triggered by that process, driven by a then common discontent with how the funding system had developed into – as it was put by one of the evaluators off records – "a mess" of systematically incongrous funding agencies and programmes.

The limitations of that situation were so obvious that the need for change could no longer be avoided. Since also the reasons for this "messy" structure seemed to be quite obvious – the spread of collaborative multi-actor RTD programmes together with a virtually complete lack of incentives for the two funds to adapt accordingly – an evaluation was seen primarily as useful input rather than necessary prerequisite for political and legislative reform. At the same time also an examination by the court of auditors was pending, competing for the policy makers' attention. In light of these developments the question of the role of the funds in future scenarios was addressed in the terms of reference.

Inevitably as a consequence of the constellation described above the question of how to deal with the evaluation during the process of political decision making arose. This lead, if only rather by coincidence, to an intense integration of the evaluators' expertise into the political process as they became involved in substantial discussions with reform stake holders. Key reform issues such as the question of whether or not to merge the funds or the degree of autonomy they should continue to enjoy were able to gain input directly out of the evaluation as it evolved.

This clearly contradicted the rules of a "wait and see" approach yielding, however, the benefit of better information as a basis of political debate. Thus, some of the findings of the evaluation directly influenced political decisions, at the same time prevailing over the opinions expressed by the court of auditors. As the flipside of the coin further attention for the results of the evaluation ceased once the political and legislative decisions were made, a collateral damage being the fact that it took more than one year to gather the Platform's professional audience around the table to discuss the evaluation again. Indeed, given its comprehensive scope the evaluation of FWF and FFF still holds many treasures yet to be made use of.

In the first contribution to this Newsletter Michael Stampfer sketches the historical background of the two funds against which their achievements must be seen. This paves the way for the following contributions by the

Evaluation team:

To begin with, Klaus Zinöcker tries to sum up the central arguments and positions of this evaluation exercise. In his first article, Gerhard Streicher weighs the importance of FWF and FFF for the Austrian Science System. Leonhard Jörg's article discusses the project assessment procedure of FFF and illustrates nicely the scope of evaluation questions that can be tackled when evaluators have access to detailed project assessment information. The main problem which shall be addressed in the next two contributions, first by Martin Falk followed by Gerhard Streicher's second piece, is the additionality of R&D subsidies. Streicher's focus is on input additionality: Do public contributions to private research boost total private R&D expenditures - and if so, do they boost them by an amount which is larger than the amount of taxpayers' money which was used in this way? Beside that, Martin Falk presents some new findings on "output additionality" in an European context. Finally, Rudi Novak (FWF) and Michael Binder (FFG) present the latest developments in their institutions.

Please also devote some attention to Oliver Pfirrmann's overview on recent trends in evaluating public support programs: A task force of the German Ministry of Economics and Labour tried to collect, systemise and prepare all relevant knowledge on evaluation within the ministry and to compare it with international standards in evaluation practice. Pfirrmann presents and discusses the key findings of this report.

Finally, a review reviewed: The Austrian Mathematical Community was subject to an Evaluation to its research and teaching activities. In his article, Klaus Zinöcker sums up the main findings of the evaluating peer group and critically comments the methods chosen. As the report is in German, the review is in this language, too.

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If you are interested in the presentations of the FFF&FWF event, that took place on 13 September 2005, please follow the link above:

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At the item *"Evaluierungsstudien"* you have a wide choice of conducted evaluation studies over the last years. The latest studies concentrate on the evaluation of the FFF and the FWF and their impact analysis.

Michael Stampfer

How These Things Came About: A Short Note on the Early Years of FFF and FWF

2005: LOOKING FORWARD, LOOKING BACK

For nearly forty years, the two research funding institutions FFF and FWF[1] have been (the) two dominating and highly independent actors in the Austrian research and innovation system. While FWF as a funding institution for scientific research still exists as an autonomous Research Council, FFF has been merged with three other institutions into the new large innovation funding agency FFG[2]. The latter is now organised as a limited liability company, so applied research / innovation funding comes nowadays without handing over the money and all discretionary power to a completely industry-governed institution.

The reform has come after a long lasting and intense debate about "bottom up" vs. programme funding and coupling vs. uncoupling policy design and funding mechanisms. It was triggered by a kind of Austrian "parallel action": On the one hand a policy debate – reaching back to the late 1990s – culminated finally in a law-making process in 2003 / 2004. On the other hand the Federal Government commissioned a big international evaluation of the Funds. The evaluators had to hurry to finalise their work before the new law came into being. A benevolent Hegelian Weltgeist nevertheless provided a mainstreaming of ideas in both strands of activities, so in the end a new era of the Austrian RTDI policy could begin, with an integrated agency, more strategic capacities, new governance principles for the still autonomous FWF and a few tasks for the ministries still to install.

How and why did the "old era" come into life? Why did research policy in the late 1960s create two Funds of high autonomy with strong performance but rather little incentives to adapt and evolve in the following decades? Let us take a look.

1945 – 1967: SORRY, NO POLICY

Post-war Austria could serve as a blueprint for a "Non Innovation System[3]": Weak institutions in our field, universities with few bright people left, no research labs, an industrial sector betting on very basic products and services, no responsible policy actors. New technologies came in mostly via imitations or licences. While the universities tried to recover in a kind of splendid isolation, public policy put emphasis on growth and macro stability. This strategy paid off, leading to an impressive economic catching-up process. The world was fine until the 1960s, when the limitation of imitation became more obvious and the R&D / GDP ratio was still 0.3 %, i.e. one sixth to one tenth of other smaller European countries. In these first two decades research funding was scarce, scattered and divided into political claims. Funding of industrial R&D was to be found in some areas like energy or agriculture; or in the nationalised industries.

[1] FFF stands for Forschungsförderungsfonds für die gewerbliche Wirtschaft (Industrial Research Promotion Fund) and FWF for Fonds zur Förderung der Wissenschaftlichen Forschung (Austrian Science Fund).

[2] Which stands for Forschungsförderungsgesellschaft

Funding of scientific research – besides the slowly rising General University Funds – can for this era only be identified in some embryonic forerunners of FWF, one with the telling name "Notring" ("emergency ring"). The immediate predecessor of FWF was the "Österreichischer Forschungsrat" ("Austrian Research Council") with little budgets available; another funding institution was the Ludwig Boltzmann Society with even less money available. While the former institution was close to the conservative People's Party, the latter had stronger links to the Social Democrats. An idea to install a real and independent Research Council with strong funding and advisory functions was brought forward by emigrants returned from UK or USA already immediately after the war when a first legislative proposal was put forward in 1949 which never made it.

When talking to people with a long record in this field or analysing ministerial files, one gets the impression that nearly nobody was interested and few were informed these days. This situation changed in the mid-1960s, when a critical OECD report, an alarming brain-drain and rising concerns about the viability of the "smart follower" situation started to wake up policy actors.

1967: CREATING THE FUNDS

The year 1966 saw a conservative government in power – instead of the usual "grand coalition" between the two big parties, further a rising interest in "scientific policy making" and a more concrete policy debate[4] about the role of research for economic growth. In 1967 this debate led to a legislative process with the Research Promotion Act (FFG[5]) and the creation of FWF and FFF as results. The issue of science funding was traditionally the turf between champions of institutional independence and advocates of the status quo minimalists. Here the Social Democrats had argued for a long time – but with varying intensity – for an independent research council with a strong role, but also with a mix of scientific and political representatives in the boards, thus linking it back to politics in order to safeguard an appropriate level of politicians' attention. The Conservatives - among whom, ironically, the universities in the first place - had first been sticking to the status quo and later changed to the concept of a funding council with scientists only. Contrary to the socialist proposal the conservatives strongly opposed the introduction of planning and coordination capacities of the new institution. The reasons for this positioning can most probably be found in a few persons with a strong lobbying power, in the growing conviction that some reform was necessary and in the consciousness that most representatives of the scientific communities stood in their camp anyway. FWF was created as a highly independent research council with a pure funding agenda, relying on reviewed bottom up project mechanisms, which could and can also be found in a large number of other countries. The representatives and trustees of the Fund were (and still are) nominated and elected by the scientific community via a kind of university-nominated parliamentary structure.

But how and why did the twin sister FFF come into life? Some sources indicate a deal within the ranks of the Conservative Party, with the influential Chamber of Commerce giving their

[3] Which does not stand for the acronym „NIS"

[4] Of course we do find a lot of similar debates in the twenty years before – but (i) without resonance and (ii) without any impact.

[5] Which stands for Forschungsförderungsgesetz and should not be confounded with the new innovation agency mentioned above …

consent to the creation of FWF only if also a similar institution for the promotion of industrial research and development was to be created. Nevertheless, ideas to create a fund for industrial research promotion also date back to the first half of the 1960s. "Similarity" to FWF was obviously taken literally: (i) Autonomy of the Fund was also high, the responsible ministry had – as with FWF – only a role as a rather loose legal supervisor. (ii) The representatives and trustees in this case were nominated mostly by the Chamber of Commerce, with a few votes controlled by the Chamber of Labour in the tradition of Social Partnership. (iii) The instrument of choice consisted of bottom up projects, proposed by individual firms, in this case with an in-house review system. Contrary to FWF, this Fund was an exceptional case in an international comparison.

After a controversial parliamentary debate, both parties agreed on the new law, the Social Democrats (rhetorically) insisting on their own, farther reaching proposal but consenting due to pragmatic reasons. The organisational boldness did not include budgetary issues: Both Funds started with small budgets, getting more money only incrementally over the following decades. They stuck to their legal agenda and helped to induce a positive quality staircase both for Austrian scientists and firms. Both institutions had a weak and pro-forma umbrella in the form of a Council of their two presidents to co-ordinate funding and give advice to the government.

The conclusion of the FWF / FFF evaluation reads as follows: "The Funds were created … 1967 and were then very modern institutions. They were given a strongly 'autonomous' status, which is to say that they were given governance structures that were dominated by their beneficiaries, rather than by ministries. This reflected a lack of confidence that they could be kept free from inappropriate, detail-level interference within a more conventional system of governance, and this worry is still very evident in discussions about the Funds today" (Arnold et al., 2004, p. 3). From the contemporary sources this verdict can be confirmed, perhaps with the addition that there was not only a lack of confidence but also to some degree a lack of informed policy making. But even so, policy makers must have been very well aware of this deficit as they were willing to embark on long and tiresome legislative struggles in order remove the competence to decide upon individual research grants from the ministry and entrust the Funds with that matter which obviously exceeded the expertise of ministerial bureaucrats. This remainder of a "sorry, no policy"-approach made it rather easy for a far reaching proposal to be realised after a long deadlock and no-go situation before.

1970 ONWARDS: PARALLEL LINES

Perhaps the most interesting thing happened a few years later. The Social Democrats, who had always wanted a more politically co-governed research funding system, won the next general elections in 1970 and 1971. With an absolute majority of seats – as had the Conservatives in the term before – they created for the first time a Federal Ministry for Science and Research (BMWF[6]). What they did though was not touching the autonomy of the Funds at all. Instead a number of ministerial strategies and top down funding programmes were designed in the 1970s and 1980s, leading over the years to a large third Fund of BMWF commissioned research for scientists and sometimes for firms, either in the form programmes or as bottom up funding, but generally reviewed with much less

[6] This acronym stands for „Bundesministerium für Wissenschaft und Forschung".

rigour by a now very substantial staff of civil servants in BMWF disposing nonetheless of a much higher level of expertise than in the 1960s.

Based on that development of parallel lines, a sometimes bitter antagonism between the ministerial bureaucracy on the one hand and the two Funds, namely FFF and its patrons on the other hand, arose. We can track this dual system from the "Forschungsschwerpunkte" via the ITF[7] to policy debates in the late 1990s. Only in the last years a kind of new, innovation system based paradigm, new actors, the rising role of RTD policy in general and the 2004 law led to a new equilibrium in this policy field.

References

AK Wien (1965), Forschung und Entwicklung in Österreich, Wien

Arnold, E., et al. (2004), Evaluation of the Austrian Industrial Research Promotion Fund (FFF) and the Austrian Science Fund (FWF). Synthesis Report, Vienna

Ehrfeld, C. (2002), Forschungsfinanzierung und Forschungsförderung in der Zweiten Republik. Eine kritische Bestandsaufnahme, PhD Thesis, Vienna (www.mnemopol.net)

Fröschl, E. (1976), Vom Forschungsnotstand zur Forschungspolitik, PhD Thesis, Salzburg

Goldmann, W. (1990), 20 Jahre Forschungspolitik in Österreich. Rückblick – Ausblick, in: Österreichische Zeitschrift für Politikwissenschaft 19, Nr. 3, pp. 267 ff.

Klappacher, W. (1966), Lage von Forschung und Entwicklung in Österreich 1963/64, Wien

Melchior, J. (1990), Zur österreichischen Forschungs- und Technologiepolitik, in: Österreichische Zeitschrift für Politikwissenschaft 19, Nr. 3, pp. 245 ff.

OECD (1963), Science, Economic Growth and Government Policy, Paris

Sandgruber, R. (1995), Ökonomie und Politik. Österreichische Wirtschaftsgeschichte vom Mittelalter bis zur Gegenwart, Wien

Stampfer, M. (2003), Sprachbilder des Fortschritts: Die Gründung von FWF und FFF, in: Pichler, R. (Ed.), Innovationsmuster in der österreichischen Wirtschaftsgeschichte, Innsbruck – Wien – München – Bozen; pp. 271 ff.

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[7] The Innovation and Technology Fund was a notoriously underfinanced 1990s top down industry funding instrument, with some ministries designing programmes, some Chambers giving advice and FFF (plus another institution) running day to day business. Harmony was not guaranteed always.

Klaus Zinöcker

Main Results of the Evaluation of FFF and FWF – an Overview

In 2004, The Austrian Industrial Research Promotion Fund (FFF) as well as the Austrian Science Fund (FWF), were evaluated for the first time on an institutional level since their foundation 40 years ago[8]. This article is a short overview about the main results of this evaluation exercise.

The evaluation team, an international group consisting of 20 Evaluators working with Technopolis, Joanneum Research, WIFO, ETH Zurich (KOF) as well as University of Twente was headed by Erik Arnold. (See also the Evaluator's table on the next page.)

The team met the challenge to judge the role of the funds in the Austrian innovation system, their standing in the international comparison, the processes within the institutions. Their task was to check their level of efficiency and impacts as well as to summarise the results in conclusions, options and recommendations. To fulfil this mission a wide range of qualitative and quantitative methods were used.

FRAMEWORK CONDITIONS AND CONCEPT EVALUATION

The context and the framework conditions for the challenge of the Austrian RTI (Research Technology and Innovation) politics are widely known and have been continually researched (e.g. in the last years research and technology reports[9]): The Austrian subsidy landscape is fragmented, the industrial structure shows a relatively small proportion of R&D intensive sectors, a high proportion of state R&D subsidy flows as a fixed budget into the scientific sector (General University Funds - GUF). There are also unclear and non-transparent responsibilities found in strategy planning. The government has set itself an ambitious goal to reach a research rate of 2,5% in 2006 and 3% in 2010.

Both funds play (in 2004 as well as today) an important role in meeting the challenges of the RTI politics. At the time of their foundation both funds were regarded as modern and were a milestone in the Austrian RTI politics. The ex post analysis also showed that the particular subsides had an important positive effect on the clients' side. The autonomous status however caused lacking adaptation to the challenges in the financing of research as well as insufficient consideration of new mechanisms in the innovation and research process. The synthesis report of the evaluation (*Arnold et al.,* 2004) states: "*What they* [FFF and FWF] *do is to strengthen 'business as usual' within the research and innovation system. What they do not do is to offer mechanisms for increasing the rate of change beyond that which is already experienced*."

[8]) The Synthesis report and all background reports are downloadable on www.fteval.at

[9] e.g. Research and Technology Report 2004, The Report can be downloaded on www.bmbwk.gv.at

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DESIGN EVALUATION

Today's role of both FFF and FWF is still shaped by the setting within which they were formed in 1967: project-based aid for research and development, with due regard to strict quality criteria and structures marked by autonomy. In the context of the international development in research, technological development and innovation, issues and aid schemes to strengthen scientific and technological transfer as well as making it more efficient were of high importance. In addition to including knowledge and technology transfer into the mission of public research institutions, established instruments in Finland, France, the United Kingdom and also in Germany include the establishment of research centres jointly by science and business, and the promotion of compound projects. For the Finnish Tekes technology programmes, R&D co-operation through associations between corporations and public research facilities has meanwhile become the rule rather than the exception. In contrast and strengthened by their autonomy, the two largest Austrian promotion facilities have so far shown little activity towards reducing barriers in the co-operation between science and business.

Although the funds have added to their sets of instruments since their respective formation, the evaluation team pointed out that the funds were still rather narrow compared to others on an international stage (in 2004). Still, this is not entirely due to these autonomous funds alone for as long as FFF and FWF depend on the ministries for their budgets. Thus, any reform of the funds needs to be accompanied by a reform of their governance structures on the one hand and their (budgetary) relationship to ministries on the other. A desirable change emphasised by them is to obtain financial planning security.

PROCESSES AND GOVERNANCE

The team of evaluators rated the performance of the funds very highly. Concurrently they point out that if their roles were to be enlarged they would have to increase their strategic analytical capacity and thus their administrative costs.

They also state that the FWF is highly efficient and effective, but has insufficient capacities to manage the subsidiary landscape, although the governance structure of the FWF is characterised as oversized. The evaluation team came to the conclusion that the component of the research funding that is granted according to quality criteria should be increased proportionally to the fixed budget (GUF). Furthermore the general recommendation is given to increase the budget of the FWF, if their responsibility level is to be widened in order to position the FWF as an important driving factor to increase the needed basic research on a pan-European level. For a stronger proactive role within the reform of the Austrian scientific system (towards thematic and application orientated research) it is necessary to build up and to apply existing analytical competence. Moreover the evaluation team recommends including the overhead costs in the subsidies to be and most of all remain an attractive partner for universities.

The evaluation study portrays the FFF as an efficient and speedy processor of its core business - the granting of project and company related research subsidies. To date the start-up subsidy has demonstrated a high effect in most cases where (mostly small) companies had deficits. As with the FWF, it is criticised that the FFF couldn't manage to install enough analyti-

cal competence in order to be a proactive innovations agency. *"It* [FFF] *is today largely reactive, and does not have a strategy in a meaningful sense."* (*Arnold et al.* 2004). If the FFF wants to use its potential to improve the research subsidy a prerequisite thereof is to increase its strategic competences as well as to reform the governance structures.

IMPACT ANALYSIS – FWF

The FWF is the most important promoter of basic research in Austria, and thus of special relevance for Austrian universities. A background study (Streicher et al. 2004) performed within the scope of the evaluation produced quite positive results. Fully 85 percent of project applications came from co-ordinators of Austrian universities. With this, FWF financing provides about a third of the total third-party funding, although this needs to be seen against the background of the high share of the General University Funds (GUFs) and the resultant minor role of direct research promotion in the science sector. When accounting for the projects and research networks (SFG, FSP), which together make up some 90 percent of the regular FWF budget, the average acceptance rate for projects was 51 percent (41 percent of funds applied for) in 1998–2003. Applications focused chiefly on the natural sciences, followed by human medicine and the humanities.

Quantitative analyses showed that funds were awarded with no bias between male and female applicants: in other words, the FWF is guided in its decisions solely by the quality of project applications.

Funding by the FWF impacts positively on outputs, and in particular publications of all kinds and shapes (Streicher et al., 2004): an average FWF project achieves 4.6 citations in peer-reviewed journals and 1.2 in non-peer-reviewed journals. Obviously, such figures will vary considerably between scientific disciplines.

The evaluators established that participation in FWF projects has a positive effect on the career of participating scientists: "*The perception of the impact of FWF funded projects on the scientific career of project coordinators and team members is quite positive and helps to strengthen their position in the scientific community and are used to establish important contacts*" (Streicher et al., 2004).

A surprising finding is that some 40 percent of the scientists polled perceive their research results to be relevant for business but do not feel any need (or have no opportunity) to get into contact with companies.

IMPACT ANALYSIS - FFF

The impact analysis of the FFF paints the following picture (*Schibany et al.,* 2004): the average subsidy during the time 1995 to 2003 summated up to 45% of the entire project costs having a cash worth of 22% considering complete project costs. The average proportion of the FFF subsidy lies at just 4% of the entire R&D costs and appears to be continually stable. Among the very small or very young companies (up to 10 employees or less than 5 years old) the proportion of the FFF subsidy, which is allocated for internal costs, is higher in comparison to larger or more established enterprises.

The FFF subsidy shows a positive leveraging effect on the internal company R&D expenditures: The subsidy unit's investment cash worth causes an additional R&D investment of 0.4 units. The leveraging effect therefore is 40% and is higher within very small and very large companies compared to medium sized compa-

nies. The subsidy of companies that only sporadically carry out research is also higher, compared to companies, which carry out R&D on a consistent basis.

Besides a positive effect of the FFF development on the work productivity, there were also found considerable indications of behavioural additionality. In 80-86% of the cases the project would have been stopped or only carried out in a severely modified form if it had not been funded by the FFF.

CONCLUSIONS AND OPTIONS

The evaluation states that both funds carry out good and efficient work. In order to use the existing potential more effectively and to create a modern Austrian framework for subsidies the evaluation sees potential for improvement:

- Additional means for the build-up of strategic competence to be able to implement political goals adequately. The creation of the strategy on a political level could thus find its strategic counterpart on the operative side. At the same time this creates the necessary basis for a better communication and cooperation between the singular players within the RTI system.
- The respective governance structures have to be more streamlined. This especially means decreasing the role of the subsidy receivers within the decision process as well as a clearly defined role sharing with the ministries. These groups as well as the politics should definitely not have an influence on the operational subsidy decisions.
- A prerequisite for an expansion of the funds' role is to change them from autonomous institutions into "Agencies". At the same time to expand their role means also to think about whether merging with other institutions of the Austrian subsidy framework would bear positive synergy effects.

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This summary was also published in the Austrian Science and Technology Report 2004.

Gerhard Streicher

FWF, FFF, and the Austrian University System

The following analyses are based on the "Reports of the Heads of Institute" (*Arbeitsberichte der Institutsvorstände, ABIV*), which were collected by the "Austrian University Council" (*Österreichisches Universitätskuratorium Oe-UK*). All scientific institutes and Universities (as opposed to teaching or artistic Universities) participated in this annual survey on a mandatory basis. Besides external funding, the survey included questions on publications, staff, and teaching. Since 1997 it had been conducted on an annual basis and was discontinued in 2002 with the coming into effect of the University Reform.

FWF & FFF AS SOURCES OF EXTERNAL FUNDS

An analysis of application data for FWF funding shows that some 85 % are submitted by coordinators which are affiliated with an Austrian University. This already hints at the eminent relevance of the FWF for the University system in Austria. A look at the ABIV corroborates this result from the perspective of the University institutes. Figure 1 shows the structure of external funds[10] for faculty groups of Austrian Universities[11]. Six sources of external funding are distinguished: FWF, FFF, European Union (EU), Government (on the national, regional, or local level), other public funds, and "other sources" (private research contracts). Private charitable endowments, which in other countries, notably the USA, are of some importance, are almost non-existent in Austria.

On average, Austrian institutes rely on the FWF for more than a third (34.3 %) of their external funding ("other sources", with close to 25 %, have the second-highest share). Not surprisingly the FFF is the least important source of external funding to *industrial* R&D, providing only 3 % to this sector. As often happens, the mean tends to obscure the finer picture. For example, the engineering faculties (and Law) draw on the FWF for only 10-15 % of their external funding, whereas the FWF's share is more than half of all funding for the faculties of *Natural Sciences*, *the Humanities*, and *Theology*.

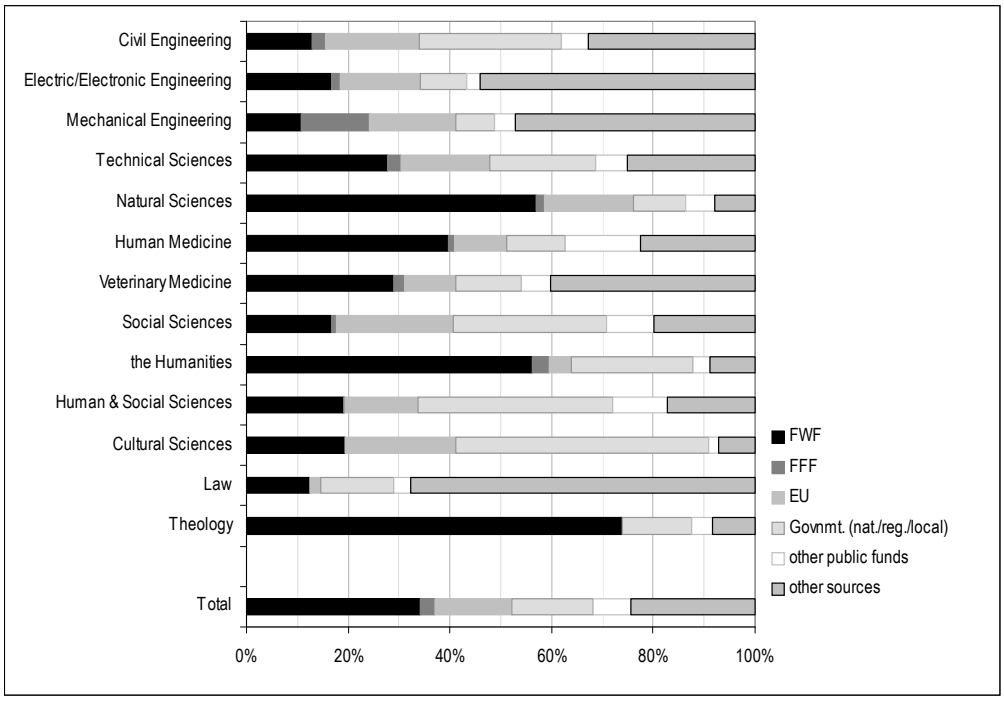
The unimportance of FWF funding for the faculties *Social Sciences* and *Human & Social Sciences* might be a consequence of the existence of the Austrian Central Bank's 'Jubiläumsfonds', which focuses exclusively on projects in the Social Sciences, the Humanities, and Medicine[12]. Figure 1 reflects this arrangement, demonstrating that the other faculties' average share of "other public funds" (which includes the 'Jubiläumsfonds') is about 5 %, whereas the "target faculties" for the 'Jubiläumsfonds' (*Social Sciences*, *Human & Social Sciences*, *the Humanities*,

[10] i.e., funds other than General University Fund, GUF

[11] At Austrian scientific Universities, institutes are organised into faculties whose scientific "themes" broadly coincide with one of the six 1-digit fields of science as defined by Statistics Austria (see http://www.statistik.gv.at/fachbereich_forschung/systematik.shtml). In total there are 18 different faculties plus 4 Universities which are not organised along faculty lines (Montanuniversität Leoben, Universität für Bodenkultur, Wirtschaftsuniversität Wien, Veterinärmedizinische Universität). These 22 units were aggregated into the 13 "faculty groups" used in this chapter.

[12] In 2002, the Jubiläumsfonds disbursed some 12.4 Mio €, as compared with 66.7 Mio € which were granted by the FWF (for projects only - excluding all scholarships, mobility grants, etc.).

Figure 1: University Faculties: Structure of external Funding, ϕ 2000-2002



Source: ABIV (OeUK), own calculations

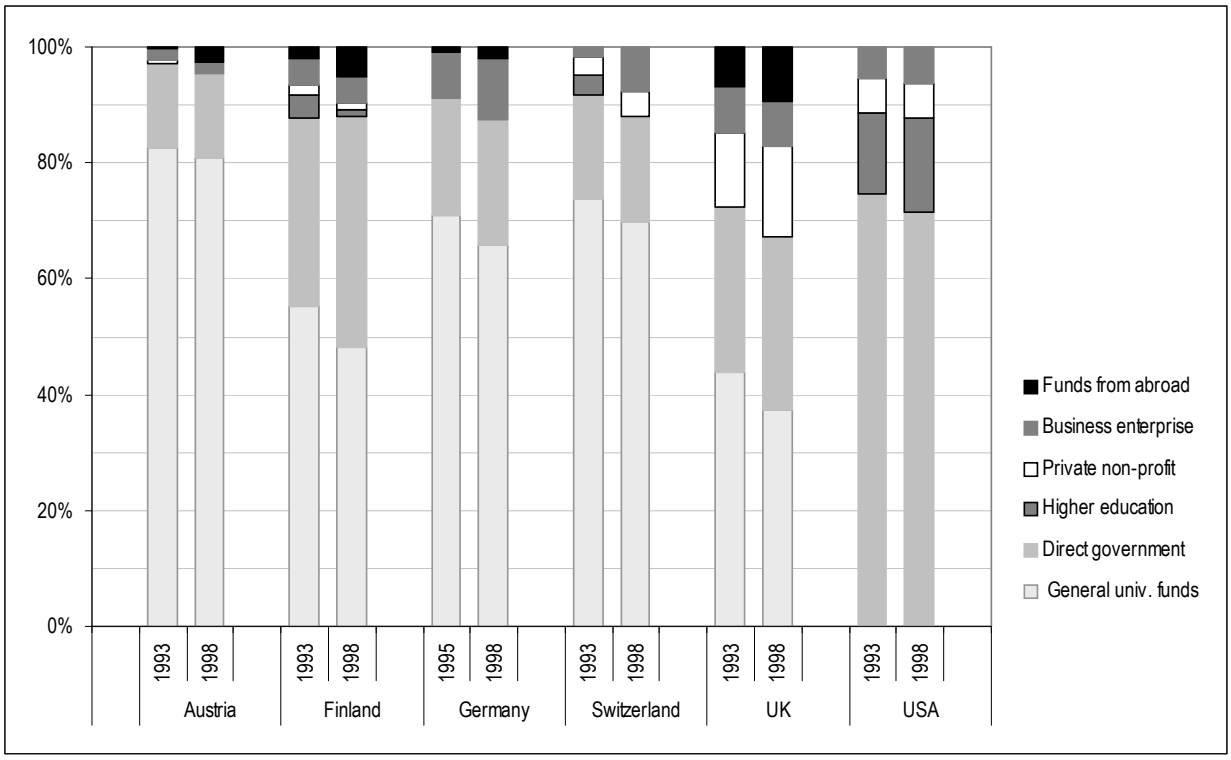
Human Medicine) on average get more than 12 % of their external funding from these sources.

Summing up the FWF is an important source of external funds for the Austrian university system. External funds, however, are of less importance than would be expected as highlighted by the following international comparison.

The share of external funds (i.e., funds other than the *General University Fund*, *GUF*) is rather low. Although somewhat diminished in 1998, *GUF* still represented more than 80 % of HERD (Higher Education Expenditures on R&D), a higher share than in all OECD countries with comparable data. Adding external funds from public sources (*direct government*: public research funds, public research contracts) raises the HERD's "public share" to 95 %, a higher share than in any OECD-country barring Slovakia (and on a par with Denmark). In Germany, Finland and Switzerland, the respective public share is between 80 and 90 %, which, though substantially lower than in Austria, is still markedly above Anglo-Saxon values of 70-75 %.

Similarly skewed is the composition of public sources, i.e. the mix between *GUF* and *direct government* (which can be employed in a much more targeted fashion than *GUF*). In Austria, the proportion between those two sources of funding is about 85:15; among OECD countries with comparable data, typical rates would be 50 to 80 % for *GUF* (only the Netherlands exhibit a higher GUF share, of some 90 %). On the other hand, the Netherlands' total public share, at 83 %, is much lower than Austria's 95 %.

Figure 2: Sources of HERD[13], 1993[14] und 1998



Source: OECD; own calculations

"OUTPUT EFFICIENCY" OF FWF AND FFF FUNDING

The database mentioned above, the *ABIV*, puts us in a position to estimate the effect of FWF funding on a major aspect of scientific output, publications. The ABIV not only contains data at the institute level, on various types of publications (monographs, original articles, SCI/SSCI/AHCI-publications, research reports, patents, presentations at scientific symposia, other scientific publications), but also information about external funds and their sources: European Union (Framework Programmes), FFF, FWF, other public funds, natl/regl/local Government, other sources (i.e., non-public funds: private research contracts, charitable endowments). The data are available for some 980 institutes from all 12 scientific Universities.

[13] Higher Education Expenditures on Research and Development

[14] Germany: 1995; Switzerland: average 1992/1994

There are a couple of problems with this data base. First of all, it does not contain institute-specific information on "basic" funds (General University Funds – *GUF*). On average this "basic subsidy" provides for almost 85 % of *HERD*, a higher share than in almost any other OECD country[15]. The second problem is a certain lack of enthusiasm by the participants in this survey. Although institutes of scientific Universities are required to participate, the reports they finally deliver are not checked for plausibility. As a result, there is some evidence that, especially in the early years of the survey (as an annual institution, it was started in 1997), the data are somewhat less than complete. This shortfall seems to vanish (or, at least, diminish) in more recent years.

The last problem has to do with the definition of the data on external funds. Two different numbers are requested, none of which is well suited for efficiency analyses. The first number is the "total financial volume of projects which were *finished* in the reporting year, the other is "annual payouts, averaged over the last three years". The first of these variables is clearly of limited value as the duration of the projects is not taken into account. The other's drawback is that it cannot be attributed to a specific year.

Despite these caveats the data base provides valuable institute-level information. In the following report we aim at identifying the effects of the various types of external funding on publication output. To allow for different responses due to scientific peculiarities the institutes were manually assigned to one of six broad fields of science: Natural Sciences, Technical Sciences, Human Medicine, Agriculture, Forestry, Veterinary Science, Social Sciences, and the Humanities.

Given the qualifications concerning the quality of the data base we employed simple pooled regressions. The dependent variables were the 7 types of publications plus a weighted sum of all publications, the so-called "publication activity". The weights in this activity index are intended to reflect the relative "values" of the different types; following the OeUK, this index was calculated as:

Activity index = 3 · # monographs + 1· # original articles + 3 · # SCI/SSCI/AHCI-publications +

1.5 · # research reports + 2.5 · # patents + 0.5 · # (presentations + other publications)

The independent variables included the 6 different sources of external funding along with dummies for the 6 broad fields of science. The external funds were included in their "annual payouts, averaged over the last three years" form. The implicit uniform time lag between funding and publication, of approximately 1.5 years (the mid-point of the 3-year averaging period) is not perfect, however, whereas for SCI publications and patents, this time lag might be considered adequate, research reports or presentations are typically published shortly after the end or even during the project.

To somehow correct for the endogenous problem, the lagged endogenous variable was included as well. This endogenous problem derives from a kind of circular causation: is it that external funding positively influences the publication activity, or is it rather that a good publication record attracts external funding. Typically it might safely be conjectured that both causal paths are at work simultaneously making their

[15] The lack of this data is however understandable: as institutes are not organised as "profit centers", it is next to impossible to break the GUF down to the institute level.

separation tricky. The chosen "short-cut" to solving this problem, the inclusion of the lagged endogenous variable, is far from adequate. However, given the limitations of the data base (especially the definition of the funding variable as 3-year average); a methodologically immaculate approach seemed something of an overkill. Therefore, a strict causal interpretation ("1 € of additional funding induces x publications") is not really legitimate. Rather it is "associations" which should be deduced from the results ("1 € of funding is associated with x publications").

On average the regressions show a reasonable but not overwhelming fit (the R^2's range from 0.27 to 0.68). In all regressions the lagged endogenous variables are significant as are the majority of the other coefficients. The dummies for the 6 fields of science reflect the "publication preferences": SCI-publications are important in the Natural Sciences and Medicine, whereas monographs can mostly be found in the Social Sciences and the Humanities, along with Medicine. Patents are the preserve of the Natural and Technical Sciences. For the Technical Sciences presentations are of only marginal importance and again it is Medicine which dominates this type of publication.

As for the different sources of funds almost all significant coefficients have the expected sign (a positive association with the number of publications), the exception being monographs which seem to be negatively correlated with FFF funding. This might, however, be a statistical artefact. The overall importance of FFF funding is very low (only 4 % of all external funds are provided by the FFF, which is not surprising, as the FFF's target group is industrial firms). Additionally, in fields where monographs are an important type of publication, Medicine, Social Sciences, and the Humanities, FFF funding is virtually non-existent.

The following Table presents a summary of the results of the pooled regressions (in interpreting the data it has to be borne in mind that the unit of analysis is the institute).

Table 1: Results of pooled regressions for the different types of publications

		field of science						source of funds [1000 €]						
Type of Publication	lagged endogenous	Nat.Sciences	Tech.Sciences	Human Med.	AgSciences/VetMed	Social Sciences	Humanities	EU	FWF	FFF	other public funds	gvmnt (nat./reg./local)	other sources	R^2
SCI-Publications	0.61	3.37	-0.32	10.78	1.72	0.06	-0.20	0.0093	0.0138	0.0064	0.0274	0.0019	0.0096	0.50
Monographs	0.41	-0.07	0.04	1.43	0.14	0.89	1.04	0.0010	0.0011	-0.0041	0.0076	0.0016	0.0024	0.27
original articles	0.77	3.52	1.65	7.61	2.80	3.90	3.27	0.0098	0.0087	-0.0078	0.0121	0.0043	0.0125	0.68
Research Reports	0.57	1.54	1.39	0.67	1.24	1.14	0.48	0.0018	0.0039	0.0073	-0.0002	0.0027	0.0034	0.45
Patents	0.48	0.10	0.15	0.05	0.05	0.00	0.00	-0.0002	0.0004	0.0011	0.0004	-0.0001	0.0005	0.29
Presentations at sc. Symposia	0.74	3.80	0.84	17.09	2.74	3.70	3.88	0.0084	0.0139	-0.0278	0.0590	0.0135	0.0249	0.66
other scientific Publications	0.81	0.33	-0.17	6.50	0.52	1.10	1.51	0.0085	0.0023	-0.0152	0.0261	0.0009	0.0046	0.61
Index "Publication Activity"	0.86	9.08	0.32	30.47	6.10	2.35	2.22	0.0055	0.0374	-0.0505	0.1324	0.0351	0.0349	0.66
n = 979 cross-section units; t = 1997-2002					significant at 90% level						significant at 5% level			

Source: ABIV; own calculations

The FFF, on the other hand, has the highest coefficient in the equation for patents, which is very plausible, although the coefficient, at 0.0011, is not significant at the 90 % level (its prob-value is 87 %). Additionally (and plausibly), FFF funding positively and significantly influences the number of research reports.

Along with “other sources”, FWF funding seems to bear positively on all types of publications. Only “other publications”, although positive, seem not be significantly linked to this source of external funding. EU funding is mainly connected with scientific articles and their subset, SCI publications.

The coefficients for FWF funding tend to be among the highest of all sources of funds, implying quite strong “efficiency of funding” (i.e., a high number of publications per Euro of funding). Typically, it is only “other public funds” which surpass the FWF in this respect (these are very focused funds as opposed to the “broad” FWF. They are especially important in the Social Sciences and Medicine, cf. Figure 1).

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Towards good practice in project assessment. Some inspirations from the evaluation of FFF

This article discusses the project assessment procedure of FFF. We take the results of the evaluation of FFF and FWF as our starting point. After outlining the basic functioning of the project assessment scheme, we use the produced data to look at the project portfolio in more detail. The motivation of this exercise is twofold. First, it is to illustrate the scope of evaluation questions that can be tackled when evaluators have access to detailed project assessment information. Second, the analysis outlined in this paper should give some guidelines on how to further develop the assessment scheme. The later seems especially relevant in the context of the wider funding portfolio of FFG.

THE EVALUATION FRAMEWORK

The evaluation of FFF's project assessment procedures was one aspect alongside a wide range of questions the evaluation has looked into. The overarching challenge was to position FFF within the broader context of the Austrian funding system and to identify governance structures that influence how efficiently and effectively allocated funds are used. Against this background the project assessment scheme deployed by FFF can be seen as the fingerprint of the funding model in use. In the last instance it is the assessment scheme where objectives and strategies of the funding agency are translated into funding practice. Having said this, the evaluation tried to answer three basic questions:

- What is the underlying funding rational behind the deployed assessment scheme?
- What can be said about the functionality of the assessment scheme with respect to transparency, flexibility and usability?
- How does the project assessment translate into selection practice and application of funding instruments available?

As for the methodological approach the evaluation benefited hugely from the fact that FFF has implemented a software solution that supports and documents the whole assessment process. FFF provided the evaluators with the respective dataset containing the results of the project assessment for the years 1995 to 2003. With this data on hand the evaluation could trace the assessment process in great detail and map the portfolio of funded projects alongside the used funding criteria. Before we come to the main results of the evaluation the following part outlines the project assessment scheme.

FUNCTIONING OF FFF'S ASSESSMENT SCHEME

FFF assesses incoming project proposals along four basic dimensions: On one hand it differentiates between technical and economical evaluations. On the other hand the assessment is carried out on two levels; the level of the project itself and the level of the submitting firm. In each of those four dimensions a set of criteria is used (see Exhibit 1).

Exhibit 1: FFF, funding criteria

	Technical evaluation	Economic Evaluation
Project	1. Novelty 2. Technological challenge 3. Practical value / benefit 4. Environmental effects	1. Market prospects 2. Commercialisation 3. Market experience 4. Social impacts (implications) 5. Other external effects (e.g. job creation)
Firm	5. Increase of know-how 6. R&D dynamics 7. Feasibility	6. Financial performance 7. Management

For further clarifying the rational of used criteria a checklist of stylised project characteristics has been produced. For example, the assessment of "novelty" of the submitted project is split into 5 dimensions[16] that have to be checked. With this checklist in hand the assessment officer assesses the novelty of the project within the given range. Possible scores are preset including one knock-out possibility ("0" = KO!). This allows using different weights across the set of 14 different criteria. The four basic dimensions are balanced out as the maximum scores available for each is the same (50). The highest ranking criteria are "financial performance" (max. 30 scores), "increase of know-how" (max. 25 scores), "technical challenge" (max. 20 scores) and "management" (max. 20 scores).

[16] In the case of "novelty" FFF lists following dimensions; a) novelty with respect to state of the art; b) handling of intellectual property rights; c) expected competitive advantage; d) potential for future, e) showcase for other sectors

WHAT DOES THE ASSESSMENT SCHEME TELL US ABOUT FFF?

One asset of such a differentiated assessment scheme is that it makes funding decisions transparent and uncovers the underlying funding rational. With the establishment of a highly formalised assessment scheme FFF has made some clear decisions on what it stands for and where it positions itself within the funding system.

For example, the first telling observation is that only one ("technical challenge") of the four highest rated criteria relate to the project itself.

The remaining dimensions refer to the importance of the project for the company and its financial and managerial ability to eventually tap the economic potential of the proposed research work. Behind this setting stands a clear statement of priorities. The obvious part of the statement is that FFF supports innovative firms doing innovative projects. Less obvious is the attention FFF draws on the financial situation of the submitting firm and the capability to master the economic exploitation of project results.

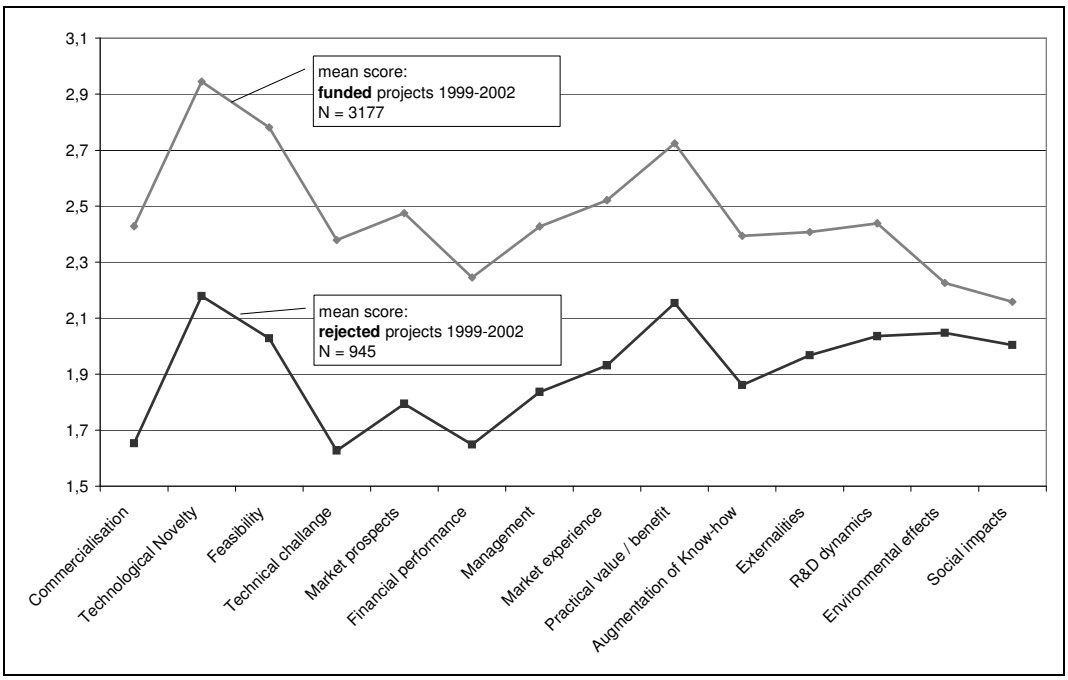
At first sight the emphasis on the economic dimension of the funded projects brings FFF fairly close to the applied side of industrial research. Furthermore it underlines FFF's sensitivity to economic risk, both at the level of the project as well as that of the firm. Given the fact that FFF has been a fairly independent fund steered by its beneficiaries this approach is comprehensible. In its self-perception FFF has been established to target the broad mass of Austrian companies. The dominating goal has been to expand the innovation base of the Austrian industry. That implies that the FFF aims to take the firms from the current level and help them to make the next feasible step. Against this backdrop the challenge of designing the assessment scheme was most of all to create a balanced assessment model able to handle a wide range of criteria such as technological challenge, economic risk or the technical capability of the applicant. On the downside, this broad funding approach necessarily leaves only little room for targeting specific groups, project types or technology fields.

SOME REFLECTIONS ON THE PROJECT PORTFOLIO

The evaluation looked into the portfolio of funded projects. This should reveal some of the selection patterns the assessment scheme produces. The analysis was done in three steps. First, we tried to work out what eventually distinguishes funded projects from rejected projects. More precisely we investigated what criteria had the most influence on the funding decision. Second, we tried to zoom into different aspects of the funding rational. This was done by mapping the project portfolio along selected core criteria. Finally, the results of the project assessment were used to test the degree of overlapping between different criteria. The aim here was to test whether the number of criteria used is adequate. In the following we focus on the main results of the first two steps in the analysis.

Exhibit 2 compares the mean score of funded projects and rejected projects for all 14 criteria used by FFF. The criteria are listed in decreasing order of difference between mean scores (from left to right).

Exhibit 2: Mean scores of rejected and funded projects, [scale: 0 – 4]

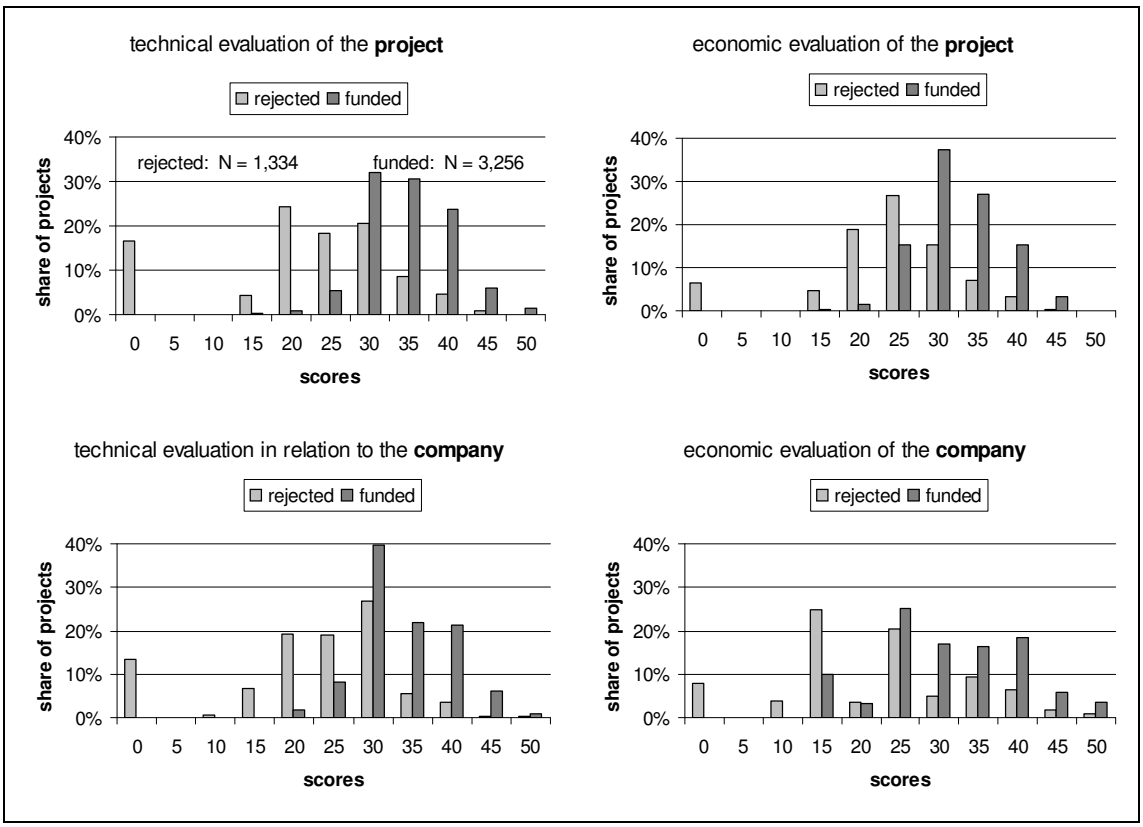


Source: FFF, own calculations

The top three criteria with the most impact on the funding decision (highest difference of mean scores) are “commercialisation”, “technological novelty” and “feasibility”. Interestingly, funded projects seem to be less risky in terms of “commercialisation” and “feasibility”. The result again underlies the broad funding approach of FFF with a clear emphasis on commercially promising projects.

Exhibit 3 looks at the same question from a different angel. It shows the distribution of projects along the range of feasible scores in each dimension of project assessment. The result indicates that FFF has introduced a threshold in at least three dimensions. Almost all funded projects overcome the 20 score mark in the technical and economic evaluation at the project level as well as the technical evaluation at the firm level. Only in the economic evaluation at the firm level the range of tolerance does the score seem to be higher.

Exhibit 3: Distribution of scores in four dimensions, 2000 – 2002,



Source: FFF, own calculation

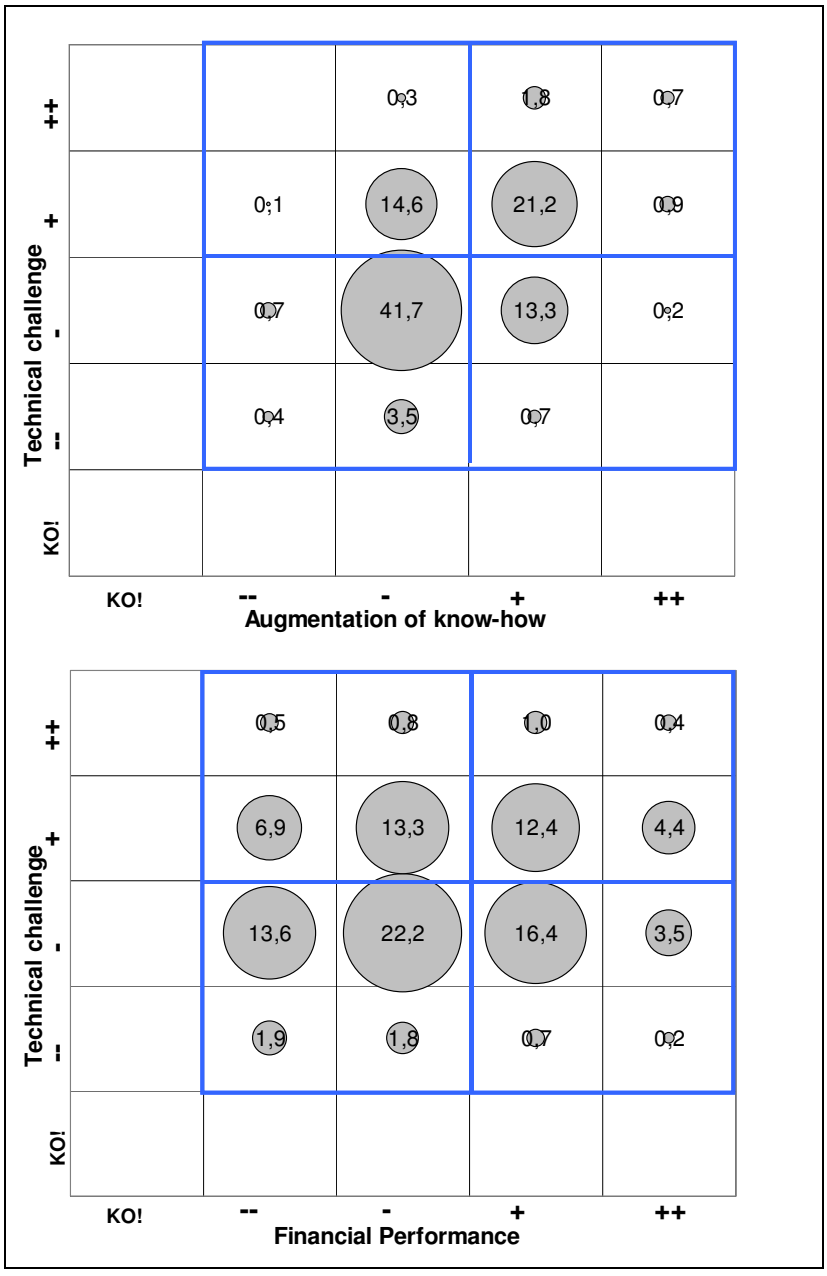
What implications does the observed threshold have? First of all it puts the scoring system into perspective. The scores have no influence on funding decision as long as they overcome the observed threshold. On the face of it the funding decision is based on negative selection. Project assessment is used first of all to weed out bad projects rather than identifying the best ones. This again has to do with FFF's position within the funding system. Targeting the broad innovation base of the Austrian industry with historically low rejection rates leaves little room for selectivity. However, it is important to acknowledge that the rate of rejection has been increasing lately[17]. If this trend continuous the score scheme will become more relevant in the future.

Exhibit 4 zooms in to the project portfolio itself. Projects are mapped along different core criteria. Using "technical challenge" as a reference axis expected learning effects and the financial background of the applicant are mapped. The expectation here was that FFF puts on different quality requirements depending on the current technological level respective to the economic background of the applicant. That is firms that already operate at a high technological level in which the project in question is not likely to trigger a significant build-up up of new "know-

[17] In the observed period (1995 – 2003) the rejection rate for new projects has been increasing from around 25 % percent before 2000 to around 35 % in the last three years of the observed period.

how" are expected to take greater technological risks. Along the same line we'd expect that firms with strong financial performance should face greater requirements in terms of technological risk. Naturally both statements can be challenged. Nevertheless it is worthwhile to examine how FFF has positioned itself in this discussion. The analysis of the project portfolio has come up with some interesting observations.

Exhibit 4: portfolio of funded project, technical challenge versus novelty and augmentation of know-how



Source: FFF, own calculations

The section of the mapping presented here indicates that a relatively big share of funded projects (41.7 %) are neither particularly risky nor do they trigger significant learning effects. At the same time the financial background of the applicant does not seem to have any influence on the requirements, in terms of technical risks, the firm is expected to take. These observations have been important for the evaluation of FFF as they reveal important aspects of the established funding culture.

ASSESSMENT OF THE ASSESSMENT SCHEME

Leaving the discussion on whether the project selection and funding practice of FFF complies with common funding rational, the evaluation acknowledged the high functionality of the assessment scheme. The following positive elements were highlighted:

The assessment scheme is comprehensive. All relevant aspects of public funding of private R&D are covered. The whole range of criteria is needed as all bring in additional relevant information. A certain degree of overlapping is reasonable as it allows crosschecking and helps to identify “unusual” projects.

It is principally able to address specific needs and challenges of firms as it uses a differentiated scoring system putting different weights to different dimensions of assessment.

Moreover it is built as a generic tool. Thus it can be further developed and adapted to new goals. This flexibility is a valuable asset.

The high degree of standardisation helps to keep a relatively high level of objectivity.

It is easy to use. Although it might seem complex and over differentiated the supporting software application is user-friendly.

The assessment scheme is a powerful monitoring tool allowing a wide range of in-depth analysis for evaluation and scientific research.

Besides this positive picture the evaluation has come up with suggestions on how to further develop the scheme. The following two suggestions address the design of the assessment scheme itself:

Targeting specific groups: To enhance funding impact further, project assessment could differentiate between specific groups of firms. As it is used, the assessment scheme covers a big range of settings which indeed should be addressed. For example small newcomer firms are favoured when it comes to “augmentation of knowledge” as they tend to start from lower levels. Innovation champions have an advantage when it comes to “novelty”. Both make sense. However the problem is that in this scheme different criteria tend to leverage each other out. With increasing rejection rates it might become necessary to target specific groups more precisely. Big firms for example could be faced with higher standards when it comes to “novelty” or “technical challenge” of the proposed innovation, whereas small firms should face stronger incentives when it comes to “knowledge augmentation”. The implementation of a customized assessment scheme would require reversing the assessment workflow (economic assessment before technical assessment) and developing an extension of used software in order to allow the scheme to use customized scoring schemes.

Mission oriented criteria: FFF uses a range of criteria that try to link missions to the funding decision. As those criteria have a fairly small score value the practical implication is limited to the KO-threshold. It is important to include such criteria as they at least allow FFF to single out “problematic” projects which contradict values shared by society. The practical use of these criteria suggests that they should either be ranked higher (more scores) or scaled down to mere KO-criteria.

To conclude, the evaluation confirmed the high functionality of the assessment scheme. At the same time it is important to stress that every scheme is only as good as the project officers using it. The example of FFF shows that standardised assessment procedures can help to develop a shared understanding of quality requirements and funding rational. Having said this, the integration of this knowledge pooled together with the established procedures into the broader funding portfolio of FFG seems to be the main challenge ahead. The goal is to develop a generic project assessment strategy that supports portfolio management tasks across

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Impact of R&D subsidies on innovation output and productivity

Output additionality is a necessary condition for the success of the Austrian efforts to catch up with the technology leaders. A recent study conducted on behalf of the European Commission has examined the extent and the effects of government support for innovation in Austria under CIS 3 (see Mohnen and Garcia, 2004). The aim of this study was to investigate whether public R&D subsidies have a positive impact on both innovation output and innovation input. In particular, the Mohnen and Garcia investigate whether public subsidies by the government affect the company's probability to introduce new products and new market products (i.e. output additionality). It is well known that public funding by the FFG is to large extent endogenously determined by firm characteristics. Therefore, the empirical study also control for the possible endogeneity of public support for innovation activities.

Previous studies of the possible impact of publicly funded R&D activities can be divided into two main groups: input additionality analysis and output additionality analysis. Output additionality analysis assesses the impact of publicly funded R&D on both research and innovation output (i.e. patents, introduction of new products) and overall productivity growth. Input additionality analysis investigates whether publicly funded R&D is complementary and thus "additional" to privately funded R&D spending. Rigby (2003) has proposed to require output additionality as a necessary first-order condition for the provision of public money, while high input additionality is to be treated as a kind of second-order condition.

The analysis is based on the micro data of the latest Community Innovation Survey in Austria, CIS 3, covering the years 1998-2000. The CIS data contains firm-level data on inputs and outputs of the innovation process across a wide range of industries. In this survey respondents are faced with the following central question: During the period 1998-2000, has your enterprise introduced onto the market any new or substantially improved products? In the CIS 3 dataset, firms are also asked about four sources of public support for innovation: from the local and regional government, from the central government, from the EU, and in particular from the EU 4th and 5th Framework Programmes for RTD. The central government, including agencies working for the central government is the most often cited source of public support for innovation, followed by the local government, the EU and the Framework Programmes for RTD. Note that the administration of public funds at the central government level is mainly delegated and carried out by the FFG. In Austria, the Industrial Research Promotion Fund (FFF) happens to be the major distributor of R&D subsidies to firms with € 62 million distributed in 2002. The sample size is about 1287, of those only firms with innovation activities (540 firms) are used for the subsequent analysis.

Descriptive statistics already show that the share of firms that introduced new products is higher for publicly supported firms than for non-

supported firms (see Graph 1). For instance, 82 % of the firms receiving R&D funding introduced new products, the corresponding figure for non-recipients is 74 % percent. However, it is well known that it is not enough just to compare the means of the respective variables for supported and non-supported firms. At least we must control for other variables such as firm characteristics. Furthermore, the support variables themselves are endogenous, that is that the funding agency selects from the pool of applications based on certain criteria and firm characteristics such as firm size, sector affiliation, firm age, past success and promise of future success (Mohnen and Garcia 2004).

The main research question is whether firms that receive government support for innovation from its various sources are more innovative than those that receive no governmental support. Government support can affect the input side (i.e. the R&D expenditures) and the output side of innovation (i.e. the share of innovative sales from new market products/products new to the firm). In order to account for the endogeneity of government support for innovation and of R&D and product innovation, the authors have estimated a system of simultaneous equations where government support affects R&D, which itself explains innovative sales. The model thus allows to analyse which type of government support has a significant effect on innovation, and whether is affects innovative sales directly or via R&D. Endogeneity and selectivity are explicitly taken into account in the estimation of the model. Two definitions of innovative sales were distinguished: products new to the firm and products new to the market. The main hypothesis is that firms with publicly funded innovation activities show a higher propensity to introduce both new products and new market products given their level of innovation input activities (Mohnen and Garcia 2004).

The empirical results show that government support has a positive impact on both innovation input and innovation output. Receiving central government support increases by 2.3 percentage points the intensity of R&D (for an average of 19.8 percent). Furthermore, central government support leads to a direct increase of 2.7 percentage points in innovative sales from new market products (for an average of 2.8 percent) in addition to the 0.7 (0.023 x 0.303) percentage point due to the indirect effect through R&D. The total effect of central government support on the share of new to market innovative sales amounts to 3.3 percentage points (see Table 1) (Mohnen and Garcia 2004).

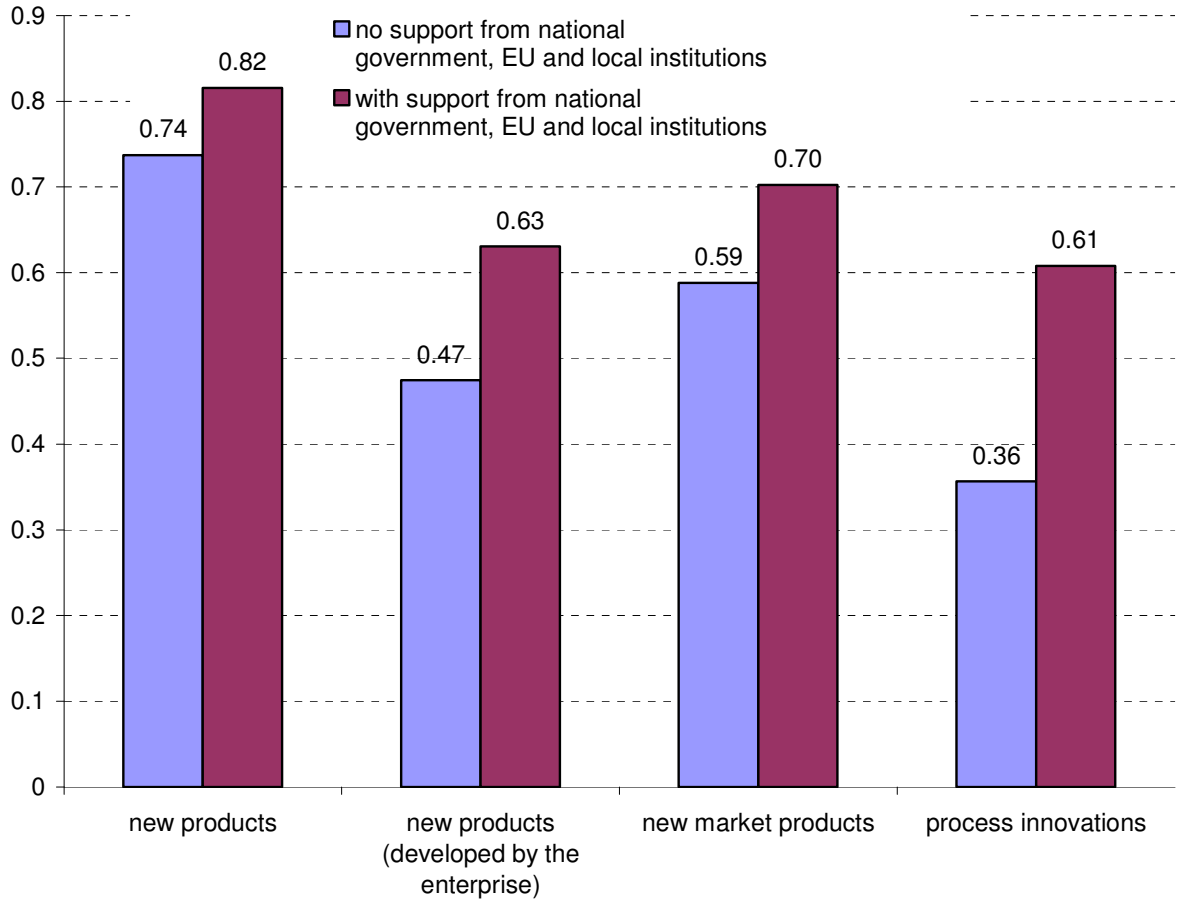
Table 1: Marginal effects of determinants of new to market product innovations, Austria, 1998-2000, CIS 3, ALS estimation

	Specification 1		Specification 2		Specification 3	
	indirect effect of central government support		indirect effect of national government support		direct and indirect effect of central government support	
	R&D	**Innovative sales**	**R&D**	**Innovative sales**	**R&D**	**Innovative sales**
Central government support	0.026***				0.023***	0.027**
EU support	-0.004				-0.001	-0.016
National government support			0.018***			
All EU support			-0.003			
R&D		0.530***		0.506***		0.303*
High-tech industries	0.021*	-0.085***	0.007	-0.084***	0.021*	-0.076**
Low-tech industries	0.015	-0.090***	0.000	-0.090***	0.014	-0.075**
Wholesale trade	0.011	-0.093***	-0.004	-0.093***	0.009	-0.078***
Size	-0.005***	0.008**	-0.003**	0.008**	-0.005***	0.004
Human capital	0.115***		0.097***		0.123***	
Appropriability	0.005		0.004		0.006	
Financial difficulties	-0.005		-0.003		-0.005	
Externalities from science	0.012***		0.010***		0.012***	
Externalities from clients		0.027**		0.027**		0.025**

* Significant at 10%, **significant at 5%, ***significant a 1%

Source: Mohnen and Garcia (2004).

Graph 1: Percentage of firms that introduced new products and new processes for supported and non-supported firms



Source: CIS 3, Statistics Austria.

References

Mohnen P. and A. Garcia (2004), Impact of government funding on R&D and innovation, study prepared for the European Competitiveness Report 2004.

Rigby, J. (2003), ASIF: Evaluating socio-economic impact, Plattform Forschungs- und Technologieevaluierung No. 17 (March 2003), pp. 13-17.

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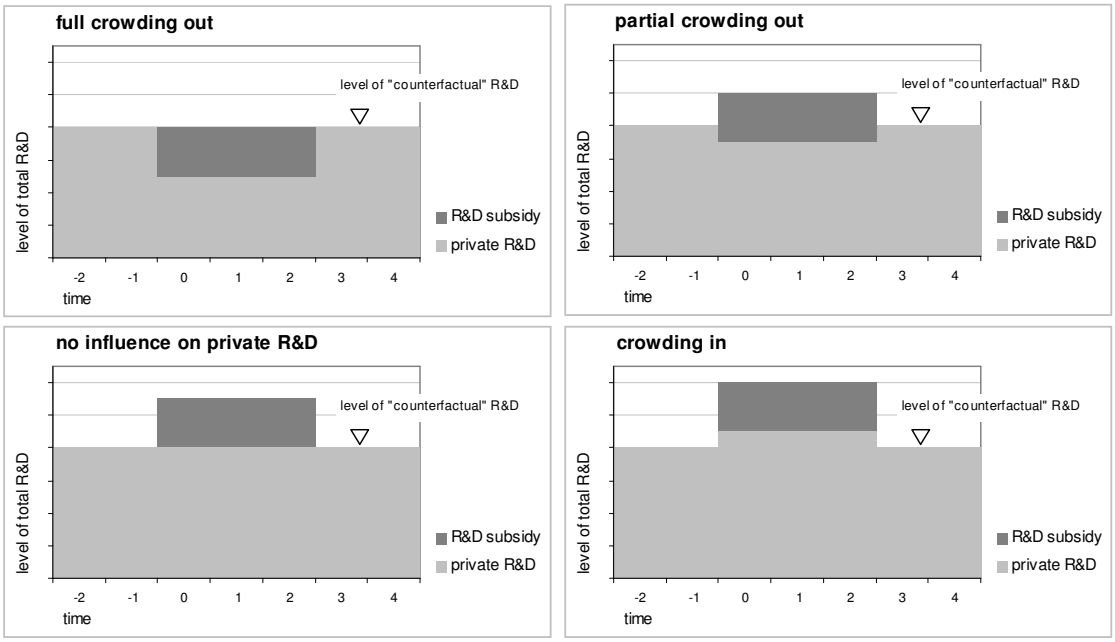
Input Additionality of FFF funding

The main problem which shall be addressed in this paper is the additionality (or, more precisely, the *input additionality*) of R&D subsidies: Do public contributions to private research boost total private R&D expenditures - and if so, do they boost them by an amount which is larger than the amount of taxpayers' money which was used in this way? Moreover, input additionality will be defined primarily in a *contemporaneous* way: What is the immediate effect of a subsidy on R&D expenditures? For reasons to do with data availability, the longer term (how total R&D expenditures are influenced by subsidies in the long run) will not be dealt with.

PRELIMINARY CONSIDERATIONS

It is important to bear in mind that the level of R&D expenditures is the result of an internal decision process within the firm, as are the reactions to R&D subsidies. Therefore, subsidies do not (or only partially) influence R&D directly, but rather indirectly. For the firm as a whole the subsidy implies an outward shift of the budget constraint. The allocation of the additional funds within the firm is then subject to considerations involving "marginal benefit" (for the funded project itself the subsidy lowers marginal costs thus reducing the expected marginal benefit which is necessary to render the project worthwhile). Therefore, the effect of the subsidy on R&D expenditures depends on many (internal and external) circumstances. The following figure presents possible reactions of R&D expenditures to a subsidy.

Graph 1: Effects of R&D Subsidies on Total R&D Expenditures



Full crowding out occurs when firms perceive the subsidy as "windfall gains": in the face of a subsidy, firms do not change their R&D plans, but rather use the subsidy to reduce their own spending[18].

Partial crowding out (or subsitutionality) occurs if firms raise their total R&D expenditures by less than the amount of the subsidy. This is probably the likeliest effect for firms which are not "liquidity constrained", meaning that their R&D plans are not kept down by external budget constraints (e.g., the inability to get bank credit). In the presence of liquidity constraints a possible reaction to a subsidy might be an *unchanged level of own R&D expenditures (*e.g., the firm would like to do more R&D than it is able to afford because of the banks' unwillingness to finance it). In this case, the firm would use the subsidy to extend total research by the full amount of the subsidy. Additionally, if the fact that the firm managed to secure a subsidy somehow results in a loosening of the liquidity constraint (e.g., banks perceive the grant as a positive signal, a "seal of quality", which leads to an extension of the credit line), a result might be a *crowding in*.

[18] In the context of the present analysis "more than full" crowding out can be ruled out as it would imply that firms reduce their own R&D expenditures by more than the amount of the subsidy; total R&D spending (own expenditures + subsidy) would fall. This has been demonstrated in only a few very special cases, notably the SEMATECH program, which was set up in the 1980s to co-ordinate the research efforts of US-american semiconductor firms in order to counter the "Japanese menace". By reducing duplicate research, this programme seems to have had a (significant) negative influence on total R&D expenditures on the part of participating firms (see Irwin and Klenow, 1995).

Some of the reasons for *crowding in* (or complementarity) might also be found in the internal decision-making process. When a firm allocates its total budget to different departments (for e.g., marketing, production, research), the shares each department is awarded is the result of an internal "struggle" between departments. If the R&D grants acts as a stamp of approval this might improve the research department's bargaining power resulting in a larger budget share than would otherwise have been attainable.

As to past attempts at the estimation of input additionality the evidence is quite inconclusive; although most studies point in the direction of at least small positive effects on the level of total R&D expenditures, even if some studies find partial crowding out only (total R&D expenditures rise, but by less than the amount of the subsidy). An interesting difference can be found between American and European studies: whereas most of the American studies report partial crowding out, Europeans tend towards crowding in. Referring to David et al. (2000) this could be partly due to the fact that US studies very often measure the impact of government *contract* R&D on private R&D spending, whereas in Europe firms receive government grants and loans instead of direct R&D contracts (for a sample of papers on this subject, see references). Although extreme values are estimated at -6.5 and +8 respectively (a 1 € increase in subsidies reduces or increases total R&D by 6.5 € to 8 € respectively), most studies put the effect at +0.1 to +2.5 € in total R&D for every 1 € of public subsidy.

ADDITIONALITY OF FFF FUNDING

Estimation of the effect of FFF funding on private research was based on a detailed data base provided by the FFF[19] comprising applications for FFF funding filed in the period from 1995 to September of 2003. At the firm level the data contains information which has to be provided when submitting an application. This includes general firm characteristics:

- Turnover, cashflow, exports, number of employees, year of foundation, legal form, and location

Besides, R&D specific variables are collected:

- R&D expenditures and R&D personnel

On the project level, the data include:

- Classification of the project according to the NACE definition of economic activity, planned duration of the project, planned project costs (disaggregated into personnel, equipment, other), and, if appropriate, a reference to the original project (for applications requesting continued funding for longer projects).

For successful applications, additional data are included:

- The time period for which funding is granted (for longer projects, funding is typically not granted for the whole period), the total amount of funding (nominal and present value), and the "funding mix". After the approved funding period an application for continued funding has to be submitted.

The last point necessitates some explanation. Typically funding is granted to the tune of 50 % of a project's costs[20] (60 % in some cases). Therefore, the *nominal* amount of funding is 50 (or 60) %. Most projects, however, are financed by a mix of non-refundable contributions from the FFF and refundable loans (either a subsidised loan from the FFF or a business loan from a private bank, in which case the FFF's contribution consists in a debt guarantee or in allowances towards the loan's annuities, or both). Together these finance instruments amount to the aforementioned 50 % of project costs. Therefore, the *present value* (PV) of the approved subsidies is smaller than their nominal amount. The share of the non-refundable part depends positively on the FFF's assessment of a project's riskiness and technological "new-ness" and negatively on economic potential. On average the PV of funding represents 22 % of total project costs or about 47 % of nominal subsidies. In all of the analyses it is the reaction of R&D expenditures to this PV which will be of interest, not the reaction to the nominal amount.

To reconcile the different time scales of firm and project data (firm data are annual values of turnover, R&D expenditures, etc, whereas funding for some projects can start and end at any month of the year), project data were annualised in a proportional fashion (total funding for a project which started in, for e.g., April

[19] The author would like to thank Mag. Klaus Schnitzer and DI.Mag. Reinhard Zeilinger from the FFF for their co-operation.

[20] These are "reviewed" costs: it is not necessarily the amount which the applicant asked for in his proposal.

and ended in June of the following year was split 60-40 between the two years in question).

This information has to be provided for the three years prior to the date of application. After the submission of the project application no further data are collected at the firm level. This poses the problem that the effects of FFF subsidies on a firm's level of R&D cannot be studied directly. From the way the firm level data are collected firm level data and project level data cover completely separate periods; the firm level data span the three years *prior* to the project leaving the period when the firm actually receives funding completely uncovered. To solve this problem only firms which have repeatedly applied for funding could be used. For such firms overlapping time series of both R&D and funding data can be constructed in the following way. For example, a firm that had applied for funding in 1999 would have had to report company statistics for the years 1996-1998. If this were the last application this particular firm had made, it would be the end of the story. If, on the other hand, this firm again approached the FFF in, say, the year 2002, the company statistics for the years 1999-2001, which the firm would have to report for the new application, could be used to obtain the information necessary for the evaluation of the project applied for in 1999.

Although firms with repeated applications to the FFF seem common (on average, each firm submitted almost 3 projects), about a third of the firms in FFF's data base have applied only once. Of the remaining firms, only a subset could be used (their applications had to be sufficiently spaced in order to fill in the missing years in a satisfactory way). For these reasons, of the more than 3000 firms in the FFF's data base, only 495 firms could be used in the present analysis.

Altogether 495 firms fulfilled the complete set of criteria, 35 of which did not receive any FFF funding during the observation period (despite their being regular R&D performers).

THE MODEL

Given the type of data described in the previous section (time series data on quite a large number of individual firms), a logical framework for the estimation of the effect of FFF subsidies on firms R&D expenditures is given by panel regressions. Under the assumption that known and unknown characteristics influence a firms R&D behaviour in a firm-specific but time-invariant way, incorporating firm fixed effects (i.e., a different constant for every cross-section unit) allow for the implicit modelling of these characteristics. This is quite convenient because although the data base contains information on some firm characteristics (turnover, export share, employees), most variables which might exert some influence are missing (most notably, firms' sector of activity). In the fixed-effects framework such unobserved but time-invariant variables should be captured by the inclusion of firm-specific fixed effects.

Given the enormous size range of firms in the database (from "owner-only" firms to companies with thousands of employees), adequate correction for any potential (non-time invariant) size-effect must certainly be accounted

Rather, it is the costs which are "negotiated" between the applicant and the FFF.

for. Applying a polynomial in annual turnover (averaged over two years) seems to provide this correction. Using the number of employees instead of annual turnover yielded roughly the same results. However, as turnover is the one variable which is available for every firm (data on employees were missing in about 5 % of firm-years), turnover was used in the final specification. Once size was "sufficiently" corrected for the inclusion of additional variables (employees, export share) seemed not to make much difference to the estimation results.

To allow for the disregard of the calendar year by the typical R&D project lagged R&D expenditures are included. Lastly, year dummies were included to account for the panel's imbalance as data are not available for all firms and all years and each year's data comprise a slightly different sample of firms. A common tendency is that more data-years are available for larger firms than for smaller.

The model can be written as:

$$R\&D_{i,t} = \lambda R\&D_{i,t-1} + \alpha\, subsidies_{i,t} + \sum_{k=1}^{4} \beta_k ((turnover_{i,t} + turnover_{i,t-1})/2)^k + \\ + \sum_{t=1998}^{2002} Dt + \gamma_i + \varepsilon_{i,t}$$

The model was estimated for the years 1997-2002. Although project data were available since 1995, the years 1995 and 1996 were not used in the estimation process. The reason for this is the fact that the typical period for which FFF funding is provided is about 18 months. Therefore it cannot be ruled out (in fact, it is more than likely) that pre-1995 funding persists in the following years. To prevent this unknown source of funding from "contaminating" the estimates, the first two years were dropped.

Using the aforementioned set of 495 firms, the model was estimated using GLS with cross-section weighting, yielding the following results:

Table 1: Results of the fixed-effects panel regression

dependent variable:	R&D expenditure
estimation period:	1997-2002
estimation method:	GLS (cross-section weights)

	coefficient	*s.e.*	*prob-value*
R&D expenditure(-1)	0.701	0.02	0.00
FFF funding (present value)	1.400	0.07	0.00
(turnover+turnovert(-1))	0.008	0.00	0.00
(turnover+turnovert(-1))^2	-2.80E-08	7.40E-09	0.00
(turnover+turnovert(-1))^3	5.40E-14	1.28E-14	0.00
(turnover+turnovert(-1))^4	-1.40E-20	3.98E-21	0.00
Dummy 1998	-18.10	3.53	0.00
Dummy 1999	-13.34	3.83	0.00
Dummy 2000	-27.91	4.19	0.00
Dummy 2001	-85.36	8.38	0.00
Dummy 2002	89.92	15.04	0.00
# cross-section units	495		
# observations	2194		

Source: FFF data base; own calculations

According to the estimation results one additional Euro of funding (or its present value) leads to an increase in total R&D expenditures of 1.40 €. FFF funding and private R&D seem to be complementary, although the "leverage effect", at 40 %, is not particularly large. Moreover, the additive benefits can only be established for the *present value* of FFF funding. For the *nominal* amount of FFF subsidies, a substitution effect has to be admitted (the present value being about half of the nominal subsidy, the coefficient of the nominal funding would be calculated at about 0.7; a re-estimation of the model using nominal funding

instead of the present value confirms this value).

All coefficients are highly significant with an estimated standard error of 0.07. The 95 % range of the funding coefficient is about 1.26-1.54, comfortably above a value of 1.0 which would constitute the boundary between "substitutability" and "complementary". If the coefficient were less than 1.0 it would have to be concluded that firms substitute R&D subsidies for their own expenditures (at least partially).

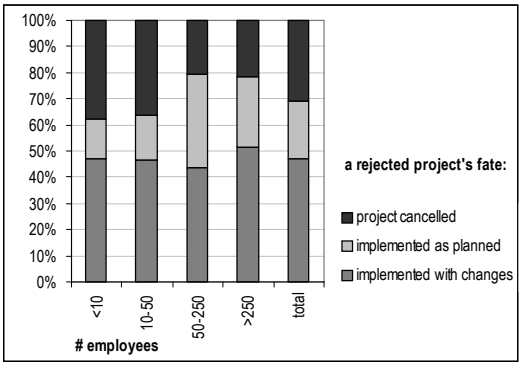
Concluding remarks

What can be said in answering the question as to whether or not FFF funding acts as a compliment to or a substitute of privately financed R&D? The evidence can be interpreted as leaning towards complementary, to the tune of about 40 % as 1 additional euro of funding (or its present value) induces firms to contribute an additional 40 cents of their own money. Total R&D expenditures, therefore, rise by 1.40 € on average. A number of remarks can and must be made with regard to this number:

first of all, it is not overly robust with respect to the sample used in the estimation. A bootstrap exercise (which re-samples the 495 firms on which the analysis was based) produced additive values which were in a range of +0.5 to +2.5 in 95 % of cases. For 8 out of 10 bootstrapped samples, a value larger than 1 (i.e., crowding in) was estimated.

additionality seems to vary with firm size, in a somewhat peculiar way. Both very small and large firms seem to exhibit higher leverage (1.6-1.9), whereas small and medium firms are credited with lower additionalities (around 1.1-1.2). Although not completely explained this outcome is corroborated by the results of a survey of the recipients of FFF funding (see figure below). 20 % of firms of medium size said that they would have abandoned a project had it not been funded by the FFF, a share which is appreciably higher in the case of smaller firms (38 %), and, at 23 %, somewhat higher among larger firms.

Graph 2



As an aside the overall share of projects (32%) which would have been cancelled if unfunded is similar to the estimated additionnality value of 40 %. From the cancellation rate as reported in the survey and a couple of bold assumptions a rough value for funding additionality can be derived. First, assume that 100 projects were submitted. If all had been rejected only 70 of them would have been conducted (either unchanged or modified) and 30 would have been dropped altogether. Suppose further that each project would carry a cost of 100 €. Therefore, considering the 30 dropped projects, 3000 € of R&D expenditures would not have been spent. The funding of all 100 projects, at an average funding rate of 22 %, would have cost the FFF 2200 €. This translates into an "R&D leverage" of 3000/2200 = 1.36, or about 36 cents of additional private R&D for every euro of FFF subsidies. Admittedly, this is only a naive assessment.

Funding from sources other than the FFF are unknown. Although the FFF is by far the most important source of public subsidies to private R&D, it is certainly not the only one. The di-

rection of the bias thus introduced in not completely clear. If, contemporaneously, funding by the FFF and funding by other sources are positively correlated, the analysis is likely to overstate the complementary effect. Conversely, a negative correlation would dampen the estimated effect[21]. Whatever the direction this unknown influence is unlikely to completely alter the results of the analysis (after all the FFF accounts for about 80 % of all public R&D subsidies).

The additionality effect is much higher for firms which do not perform R&D on a regular basis. Although difficult to estimate on the basis of the present data base (especially considering the fact that only pre-project firm-level data are collected means that only a few such firms could be included in the present exercise), such firms seem to exhibit additionalities of 300 % and more (i.e., FFF funding of 1 € is topped up by more than 2 € of a firms own money).

On a methodological level using the lagged endogenous variable introduces the so-called Nickell-Bias resulting in additionality estimates which are probably too conservative. Also, the specification of the model gives rise to dynamic effects. Mathematically the estimated short-run additionality of 1.40, combined with a parameter for lagged R&D expenditures of 0.70, results in a long-run additionality of around 200 %. However, due to the relative shortness of the time series (and the fact that during this period, R&D expenditures show an appreciably rise at the macro-level), this long-term effect probably cannot reliably be separated from an upward trend which is independent from FFF funding.

[21] If funding by other sources coincides with FFF funding the subsidies from the other sources would be part of total R&D expenditures, thus raising the estimated effect of FFF funding on total R&D expenditures. Conversely, if funding by the FFF and other sources took place in different years, the other sources would raise total R&D spending in years without FFF funding, thereby dampening the estimated "jump" in R&D expenditures resulting from FFF funding. As some regional funding agencies top up FFF funding, a certain degree of positive correlation must certainly be allowed for.

References

Busom, Isabel [1999]: 'An Empirical Evaluation of the Effects of R&D Subsidies', Burch Center Working Paper Series B99-05, Berkeley.

Czarnitzky, Dirk and Fier, Andreas (2001): 'Do R&D Subsidies Matter? – Evidence for the German Service Sector', Centre for European Economic Research, Working Paper Series, Mannheim.

David, P. A., Hall, B. H., and Toole, A. A. (2000), Is Public R&D a Complement or Substitute for Private R&D? A Review of Econometric Evidence, Research Policy 29, 497-529.

Irwin, Douglas A., and Klenow, Peter J. (1995): 'High-tech R&D subsidies: Estimating the effects of Sematech' in Journal of International Economics 40, 323-344.

Lach, Saul (2000), Do R&D subsidies stimulate or displace private R&D? Evidence from Israel, NBER Working Paper No. 7943, Cambridge, MA.

Wallsten, Scott J. (2000): 'The effects of government-industry R&D programs on private R&D: the case of the SBIR program' in RAND Journal of Economics Vol. 31, No. 1, Spring 2000, 82-100.

Rudi Novak

The Austrian Science Fund FWF

The FWF (Austrian Science Fund) is Austria's central body for the promotion of basic research. It is equally committed to all branches of science and the humanities and in all its activities is guided solely by the standards of the international scientific community. The aims of the Austrian Science Fund are

- A continued improvement of science in Austria and an increasing of its international competitiveness.
- An enhancement of the qualifications of young scientists and
- Fostering the awareness that science represents a significant aspect of our culture.

The Austrian Science Fund works along certain principles: excellence (FWF concentrates its funds on projects that are of internationally recognized quality), independence: (FWF wants to provide the freedom to protect science from vested interests), transparency and fairness. The FWF ensures that conflicts of interest are avoided. It gives clear information on working procedures and the criteria on which funding decisions are based, and, finally, integration (facilation of cooperations across national borders). The Austrian Science Fund believes that its autonomy is key to live up to these principles. The FWF considers itself to be part of the international scientific community.

Evaluation is not only a central instrument in FWF's business – international peer review is the instrument to ensure independence, transparency and fairness – FWF also uses evaluation as a learning mechanism for its instruments: In 2003, the Austrian Science Fund launched a survey on customer satisfaction. In the same year, FWF started the ex post evaluation (again, international peer review) of its stand alone projects. Finally, in 2004, a team from PREST / University of Manchester and Fraunhofer ISI evaluated FWF's Network Programs (SFB and NFN). The results of all these studies were published (see for example Plattform's Newsletter 24 on the Evaluation of SFBs) or are about to be published: Joanneum Research analysed the first results of the ex post evaluation of stand alone projects. All evaluation reports can be obtained from the FWF´s website at http://www.fwf.ac.at/de/publikationen/publikationen.html.

Evaluation is not only an internal instrument to FWF: Also external evaluations were conducted to control and document the legitimation, effectiveness and efficiency of FWF. The most prominent of these evaluations is object of this newsletter. Beside this international evaluation exercise, also the Court of Auditors (2002-3) scrutinised the fund. Besides that evaluations and audits on the institutional level, the ministry for Education, Science and Culture commissioned an external evaluation of the START/ Wittgenstein Program which is administrated by the FWF.

All these evaluations had a significant impact on how FWF is organized and governed. The

most important milestone of all the changes within the last years is the new Research Promotion Act in 2004. The following lines give an overview on the changes that were made within the last two years:

1) Transparency and Performance

- Ex post Evaluation of FWF Projects (2003)
- Process time for projects was reduced to 4,6 months (2004)
- Modification and streamlining of FWF Guidelines (2005)
- Reorginisation of FWF bodies (2005)
- Broadening the use of "Checks & Balances" in the review and decision making process (2005)
- Electronic online Submission of Proposals (planned for 2006)

2) Support to Researchers

- Establishment of a Mediation center for scientific misbehaviour (2004)
- Waiving of royalties for the FWF from funded projects (2005)
- Initiative to enhance the use of Open Acess (2005)

3) More Flexibility

- Global Budgets plus 5% overall project costs
- No constraints for independent researchers (principal investigator receives her/his salary from project funds)
- Facilitated access of the Non-University Research Sector to FWF funding
- Cancelling of the Project restrictions (until the end of 2003, the number of projects was limited to two projects per scientist)
- Senior-Postdoc salary for experienced Post-doc's (3/2005) who apply as independent scientists
- Extended age limits for applicants in all programs with such a limit: for each child an applicant has been bringing up, the age limit is extended by three years, (2005).
- Reform of Network Programs, based on the Evaluation Report

4) Strategic Orientation

- New internal structure of the Fund, new bodies: Assembly of Delegates, Supervisory Board, Executive Board, Board
- Formulation of a strategic plan with a four year perspective, combined with a defined workplan for each forthcoming year

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The Austrian Research Promotion Agency (FFG)

The Austrian Research Promotion Agency (FFG) was founded on September 1st, 2004 and consists of the following merged organisations; the Austrian Industrial Research Promotion Fund, the Technologie Impulse Gesellschaft, the Austrian Space Agency and the Bureau for International Research and Technology Cooperation.

The new corporate structure, put into place in March 2005, comprises five operational business units; the four General Programmes divisions, Structural Programmes, Thematic Programmes, European and International Programmes and the Aeronautics and Space Agency. In September 2005 the "Programme 2006-2008" was adopted.

The mission of the FFG is to strengthen Austria as a prime location for sustainable industry and research. Operating within the framework of the Austrian innovation system, the FFG supports the competitiveness of the Austrian economy and of Austrian research on a national and international level.

In terms of legal structure, the FFG is a private limited company owned by the federal government and is represented by the Federal Ministry of Transport, Innovation and Labour and the Federal Ministry of Economics and Labour. For 2005 the FFG was allocated a budget of € 371 million. The budget for 2006 will increase to € 420 million.

The General Programmes division supports high quality projects and is not bound by deadlines for the submission of tenders or restricted in terms of fields of research. Due to the fact that criteria are clearly defined, fast and objective decision-making can be achieved. An increase in basic funding is made possible by focusing on special areas such as start-up funding, the Young Researchers Programme, Headquarter Strategy and the bridge building programme BRIDGE.

One of the main aims of the Structural Programmes division is to optimise the structures of the Austrian innovation system by developing new forms of cooperation and by establishing and building on current know-how and creating new fields of strength. The Structural Programmes can be divided into the groups 'Competence' and 'Excellence', dealing primarily with centres of competence, 'Innovation and Cooperation' and 'Human Resources and Gender'.

The Thematic Programmes set national thematic priorities for Research & Development. Here, programmes include FIT-IT (an information technology programme), the strategic programme IV2S (intelligent transport systems and services), KIRAS (security research), the micro-technology initiative, the NANO initiative (nano-sciences und nanotechnologies), the Austrian programme on technologies for sustainable development and the Austrian aeronautics programme TAKE-OFF. The programme GEN-AU, dealing with genome research, is anticipated to be transferred to the FFG in 2006.

The European and International Programmes division is the national competence and service centre for European and international R&D programmes and initiatives. Highly competent National Contact Points provide professional advice and information on all programmes. Here the main goal is to support Austrian researchers in the fields of Industry and Science by promoting and increasing participation in the European Framework Programme for Research and Technical Development.

The Aeronautics and Space Agency is responsible for the implementation of Austrian aeronautics and space policy representing Austria in the EU bodies ESA and EUMETSAT. Within the context of Aeronautics it aims to improve the international positioning and networking of Austrian Industry and Science.

In mid 2006, all of the FFG's units, currently housed in four separate locations, will move to Vienna's purpose-built House of Research. Other organisations pertaining to research, such as the Austrian Science Fund, the Christian Doppler Research Association and ACR - Austrian Cooperative Research will be joining the FFG in this move.

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Recent trends in evaluating public support programs

The German Ministry of Economics and Labour (BMWA) launched a task force in 2003 to collect, systemise and prepare all relevant knowledge on evaluation within the ministry and to compare it with international standards in evaluation practice. The central aim of the task force was to provide an evaluation framework for all areas of interest to the ministry. Because of the re-organisation in 2002, the areas of interest within the ministry range from the traditional, such as sectoral and regional policies, to labour market and employment policies, as well as to innovation policies. It was expected that the task force would develop policy field guidelines allowing policy makers inside the ministry to assess orientation, practicality and scope of evaluation activities. With regard to this fact evaluation activities have been expanded during the last decade from focussing on single support programs to focussing on support institutions as well as on whole support systems. The field guidelines were expected to deliver a set of criteria and checklists applicable to all these types of evaluations.

Coordinated by Hans-Peter Lorenzen, former deputy head of the innovation department, the task force included staff from various departments and invited external consultants to handle specific questions, e.g. recent methodological trends within programme evaluation. The results of the task force were laid down in a final report comprising general guidelines for ex ante evaluation, monitoring, and ex post evaluation, system evaluations of support institutions and subordinated authorities of the BMWA, as well as guidelines and specific recommendations for sectoral policies such as SME initiatives and labour market policies. The guidelines raised issues such as the problem of market failure, e. g. “when are public interventions justified from an economic point of view?” and “which kind of public interventions (measures) are justified with regard to allocation efficiency?” Other problems raised included methodological issues, for instance “which type of indicator is adequate for measuring output, outcome and impact activities?” or topics such as the diffusion of evaluation results for stakeholders.

Within the report it has been argued that a systematic application of central issues at the beginning of a public intervention (within ex ante evaluation) will pave the way for criteria at the end of the policy cycle, i.e. help to carry out ex post evaluation. The task force has also launched terms of reference for specific programs and ongoing evaluation activities. At the end of its report the task force pleads for external evaluation instead of official control activities which are prescribed by public law. While the latter often focus narrowly on target/actual comparisons, evaluation is regarded as a helpful insight and reflection from abroad. Combined with the internal knowledge of the specific department within the ministry it is assumed that evaluation would contribute to a more adequate and precise program planning. From the perspective of the task force policy making within an arena of multilevel governance, such as innovation policy, can be

exceedingly supported by teams of external evaluators.

The task force has placed emphasis on the topic of evaluation because of the growing importance this process for all public activities departments in the near future. It has been mentioned that knowledge about evaluation allows participation in the discussion and implementation of evaluation standards, for example the setting of evaluation standards by the German Association of Evaluation (DeGEval), and therefore the involvement in a process which affects the work of policy makers. Finally, the task force recommends the incorporation of an evaluation budget within program activities and the implementation of an evaluation department within the ministry.

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Klaus Zinöcker

Die österreichische Mathematik – Evaluation

Zusammenfassung und Kommentar

Von einer hochrangig (und ausschließlich international) besetzten Kommission wurde im Zeitraum 2004 bis 2005 Forschung und Lehre an den Fachbereichen für Mathematik der österreichischen Universitäten evaluiert. Einleitend ist anzumerken, dass mit dieser Anstrengung ein beachtenswerter Schritt zur Entwicklung einer Evaluierungskultur in Österreich getan wurde, der eine wichtige Informationsbasis für EntscheidungsträgerInnen der österreichischen Forschungs- und Universitätspolitik darstellen sollte. Für zukünftige Evaluierungsvorhaben sollten jedoch einige methodische Verbesserungen vorgesehen werden.

GEGENSTAND DER EVALUATION: NICHT ALLES WAS ‚ÖSTERREICHISCHE MATHEMATIK' IST.

Gegenstand dieser Evaluation sind freilich nicht sämtliche österreichischen mathematischen Forschungs- und Lehrstätten: Erstens waren nur jene angesprochen, die Mathematik im Hauptfach aufweisen (also beispielsweise nicht jene der Wirtschaftsuniversität Wien), andererseits haben sich ganze Universitäten (die Universität Klagenfurt) und ganze Departmentsteile (etwa an der TU Wien) nicht der Evaluation unterzogen.[22]

DIE ROLLE DES AUFTRAGGEBERS: MIXTUR DER ROLLEN

Bemerkenswert ist die Rolle des Auftraggebers dieser Evaluation: Nämlich die ÖMG, die Österreichische Mathematische Gesellschaft[23]: Das hat mit Sicherheit die prinzipielle Akzeptanz des Evaluationsteams an den Universitäten erhöht, die ja auf freiwilliger Basis an der Evaluation teilnahmen (nicht aber das Antwortverhalten auf die Fragen des Evaluationsteams[24]), gleichzeitig wäre eine strikte Trennung von Auftraggeber und Evaluationsgegenstand die bessere Lösung gewesen. Freilich bleibt zu betonen, dass (i) mit dieser Feststellung nicht der Vorwurf eines Bias im Bericht verbunden, (ii) man mit dieser Vorgehensweise internationalen Beispielen gefolgt ist[25] und schließlich, (iii) dass man auf der Homepage der ÖMG durch Veröffentlichung von Sitzungsprotokollen und der Möglichkeit von Stellungnahmen zum Bericht ein hohes Maß an Transparenz sicherstellt. Noch dazu sind weder die Vorsitzenden der Gruppe noch die GutachterInnen von ÖMG oder bm:bwk direkt gewählt worden, sondern über den Umweg Deutsche Mathematiker-Vereinigung benannt und in weiterer Folge von den Vorsit-

[22] Darüber hinaus fällt (auch dem Nicht-Mathematiker) auf, dass - in Einzelfällen Institutsteile, etwa Arbeitsgruppen der Universität Wien, oder gewisse fachliche Leistungen keine Berücksichtigung fanden.

[23] Finanzier der Studie war das bm:bwk

[24] Die Qualität der Fragebogen-Beantwortung ist als schlecht einzuschätzen: Große Lücken, uneinheitliche Dimensionen, ungenügende Zuordnungen (etwa bei den Drittmitteln) sind feststellbar.

[25] Großbritannien. Siehe auch „Ein Blick über die Grenzen", weiter unten.

zenden selbst gewählt worden. Dennoch: Der Auftraggeber der Evaluation (genauer: die Mitglieder der ÖMG) waren gleichzeitig Gegenstand der Evaluation. Damit ist eine Optik verbunden, die schon allein deswegen verbesserungswürdig ist, weil sie Anlass zu Vermutungen geben könnte – was bleibt ist ein trade off zwischen Optik (Paranoia?) und Akzeptanz.

AUFBAU: STRIKTE TRENNUNG BESTANDSAUFNAHME - EMPFEHLUNGEN

Die Studie ist zweigeteilt: Sie beginnt mit einer deskriptiven Beschreibung, einer Bestandsaufnahme der einzelnen Institute, basierend auf einer detaillierten Fragebogenerhebung und schließt in einem ausführlichen Empfehlungsteil; es liegt also ein klare und lobenswerte Trennung von Beobachtung und Empfehlung vor. Allerdings fehlen im Bericht Elemente wie ‚Executive Summarys' oder Übersichtstabellen gänzlich, also Elemente, die gemeinhin die Nützlichkeit solcher Berichte erhöhen sollen. Auch wird es, zumindest für Sozial- und WirtschaftswissenschafterInnen, immer verwunderlich bleiben, dass Evaluationsberichte wie dieser gänzlich ohne Referenzen und ohne Literatur auskommen.

METHODIK: FRAGEBOGENERHEBUNG

In der Bestandsaufnahme der mathematischen Fachbereiche stützte man sich auf eine Fragebogenerhebung, die an den einzelnen Instituten durchgeführt wurde, und die mit über 11 Seiten und über 100 Fragen durchaus üppig und detailliert ausgefallen ist. Die Angaben dienten – wie bereits erwähnt - einerseits einer deskriptiven Darstellung in der Bestandsaufnahme, andererseits waren sie Grundlage für die Arbeit der GutachterInnen. Einige der hier gesammelten Eindrücke sind hochrelevant. Etwa, wenn die Personalstruktur der Fachbereiche beschrieben (und beklagt) wird, andere Aussagen wiederum schrammen hart an der Beliebigkeit vorbei („Die Anzahl der wissenschaftlichen Publikationen ist ein Indikator für die Aktivität eines Fachbereiches in der Forschung", Seite 9). Leider wurde es darüber hinaus verabsäumt, die hier gesammelten Daten in auch nur irgendeiner Form zu aggregieren: und sei es auch nur einen Überblick zu geben, wie viele Mathematik – Professuren es in Österreich gibt. Auch bleibt der Eindruck, dass eine wahre Fülle von Informationen gesammelt wurde, die jetzt bis zu einem gewissen Grade brach liegt. „Wie viele Drittmittel werben Österreichs MathematikerInnen ein?" ließe sich wahrscheinlich noch mühevoll aus dem Anhang ermitteln, während die ‚Arbeit in EU Netzwerken', ‚externe Kooperationen' oder ‚Patenttätigkeit' höchstens in Nebensätzen der Empfehlungen noch (und an keiner Stelle quantifiziert) Erwähnung findet.

METHODIK: PEER REVIEW, PEER REVIEW, PEER REVIEW

Zehn GutachterInnen aus Deutschland, den USA, Finnland, den Niederlanden und der Schweiz, unter der Leitung von Prof. Hoffmann (angewandte Mathematik, Deutschland) und Prof. Bourguignon (reine Mathematik, Frankreich) arbeiteten diese Empfehlungen aus. Sie sind äußerst knapp, jedoch sehr informativ und konkret und zeugen von einer intimen Kenntnis der österreichischen Universitätslandschaft[26]. Diese Empfehlungen sind zum einen auf die österreichische Gesamtsi-

[26] Was auf Grund der Internationalität der GutachterInnen erfreulich überrascht.

tuation gerichtet, zum anderen auf die untersuchten Institute herunter gebrochen. Sie wurden auf Basis des Studiums der Fragebögen, von side visits und einer gemeinsamen Jurysitzung der GutachterInnen erstellt.

Genau an dieser Stelle wird jedoch der Leser und die Leserin von den AutorInnen alleine gelassen: „*Der Institutsleiter ist eine äußerst aktive Person. Er hat Pionierarbeit in Österreich und Europa geleistet*“, oder ein anderer Institutsleiter sei „*ein führender Vertreter der Finanzmathematik*“, bzw. *„[davon] sind die besten Universitäten des Landes betroffen*“ sind Urteile, die zwar klare Hinweise über Qualität oder Problemlagen geben, *woraus sie geschlossen werden*, ist jedoch nicht nachvollziehbar: Woran misst man eine „äußerst aktive Person“, was sind die „besten Universitäten des Landes“ und was macht sie zu solchen?

Freilich wird man jetzt einwenden können, dass die GutachterInnen eben qua ihrer Kompetenz und qua ihres Wissens evaluiert haben. Aber wozu dann überhaupt eine umfangreiche Bestandsaufnahme im Vorfeld der ExpertInnengutachten? Was also fehlt, ist eine klare Verbindung Bestandsaufnahme – Empfehlungsteil. LeserInnen bleibt nur mehr, den GutachterInnen zu vertrauen und deren Urteilskompetenz nicht in Zweifel zu ziehen. Bleibt Ihnen nicht mehr?

Dies ist nicht als prinzipielle Kritik am Instrument ‚Peer Review’ zu sehen, es ist schließlich das zentrale Instrument zur Beurteilung von Qualität von Forschung (ob auch von Lehre, soll an dieser Stelle dahingestellt bleiben). Es wäre jedoch wünschenswert gewesen, diese hier gewonnenen Kenntnisse und Urteile zu illustrieren und zu erläutern, sie mit anderen Methoden zu ergänzen; mit der Bestandsaufnahme wäre eine Möglichkeit hierzu gegeben gewesen.

ZU DEN ERGEBNISSEN DER BESTANDSAUFNAHME

Die Bestandsaufnahme war, wie schon erwähnt, äußerst umfangreich. Leider wurde sie unvollständig aufgearbeitet und dargestellt, auf Übersicht und Vergleich wurde gänzlich verzichtet; einige Ergebnisse wurden sehr nachlässig abgebildet (etwa wird die Kategorie ‚Investitionen aus Drittmittel’ bei einigen Instituten dargestellt, bei anderen nicht – heißt dies nun, es gab keine Angaben? Oder gab es an einigen der Institute keine dieser Drittmittel? Und wenn es sie nicht gab – was kann man daraus schließen?). Insgesamt ist es schwer, eine sinnvolle Zusammenfassung dieser Bestandsaufnahme zu geben, da die Relevanz der Aussagen für die *Mathematik in Österreich* (oder: *in Wien, in Linz*) zum Teil sehr fraglich ist. Relevant sind die Aussagen nur dann (und das in einem hohen Maße), wenn man sich über ein bestimmtes Institut genauer informieren will.

Die *infrastrukturelle Ausstattung* der Mathematik wird von den befragten Einrichtungen generell als zufrieden stellend beschrieben, mit Abstrichen für Wien und im Bereich der Bibliotheksausstattung.

Als *Hauptproblem* wird die *personelle Ausstattung* angesehen: unzureichende Qualifikationsstellen, Abwanderung hervorragender WissenschafterInnen, „Aderlass der österreichischen Mathematik“. (Seite 8)

‚Deutliche *Unterschiede in den Publikationstätigkeiten*’ ist die einzige relevante Aussage zur Forschung in der Bestandsaufnahme.

Die *Promotionszeit* ist an den Fachbereichen mit mehr als drei Jahren relativ *lang*, das *Alter der Habilitanden* ist im Schnitt zwischen 35 und 40 Jahren und einer Dauer in einem Fall von 10 Jahren *weit über dem Üblichen* (Seite 9).

ERWEITERTE ROLLE DER MATHEMATIK

Im Spannungsfeld zwischen ‚reiner' und ‚angewandter' Mathematik sind die GutachterInnen äußerst neutral geblieben: Positiv ist also zu bemerken, dass man versucht hat, das Gleichgewicht zwischen Grundlagenforschung und anwendungsorientierter Mathematik zu wahren.

Die GutachterInnen konstatieren der mathematischen Forschung jedenfalls, „an Dynamik nie nachgelassen zu haben" (Seite 111); auf eine besonders fruchtbare Wechselwirkung zwischen Mathematik und Physik wird dezidiert hingewiesen, es kämen aber auch in neuerer Zeit lebenswissenschaftliche, selbst geisteswissenschaftliche Fragestellungen hinzu. Mathematik würde einen Beitrag zur Lösung industrieller Probleme leisten (Computerwissenschaften, Fernmelde- oder Sicherheitstechnik, Umweltschutz). Damit verbunden ist jedoch die Notwendigkeit einer permanenten Reorganisation des Faches, um interdisziplinäre Beziehungen (der Begriff wird in der Evaluation vermieden) sicherzustellen. „Das gilt zum Beispiel für die Rolle, die stochastische Prozesse oder diskrete Mathematik spielen" (Seite 111). Zwar bestünde in beiden Gebieten eine lange Tradition, aber die Wechselwirkungen mit anderen Fächern würden in gewaltiger Weise ihre Problemstellungen erweitern und verlangen originelle Zusammenführungen von verschiedenen Kenntnissen, die in unerwarteten Teilgebieten der Mathematik zu finden sind.

HERAUSFORDERUNGEN AN DIE MATHEMATIK IN ÖSTERREICH

Der Bericht streicht folgende Herausforderungen an die Mathematik in Österreich aus:

Permanente Reorganisation des Faches
Sicherstellen interdisziplinärer Beziehungen
Auf gewaltigen Forschungsbedarf in der Statistik reagieren
Verbindung der Statistik mit anderen Fächern der Mathematik verbessern
Aufbau einer adäquaten Personalstruktur
Eine gezielte Institutspolitik gegen die Vereinzelung: Doktoranden seien zu alt, jeder scheint in einer gewissen Isolation vor sich hin zu arbeiten.
Forschungskarrieren für MathematikerInnen attraktiver machen, perspektivische Strukturen für den Mittelbau[27].

Der Stellenmarkt in Österreich für den wissenschaftlichen Nachwuchs sei klein, gleichzeitig streben die österreichischen NachwuchswissenschafterInnen Positionen außerhalb Österreichs nicht in wünschenswerter Weise an: Daraus wird die Forderung der Öffnung der jungen Österreichischen MathematikerInnen nach außen abgeleitet.
Verzerrte Altersstruktur: In den nächsten Jahren ist mit einer hohen Ausscheidequote der habilitierten MitarbeiterInnen zu rechnen.

[27] Wie dies erreicht werden kann, wird zwar an einigen Stellen aufgezeigt (etwa: Vorziehprofessuren, tenure track), diese Herausforderung bleibt jedoch eine große.

Box: Zusammenfassung der GutachterInnen

Im Rahmen einer Endpräsentation haben die EvaluatorInnen folgende Kernpunkte des Empfehlungsteils der Evaluierung vorgestellt. Nachfolgende Bullet Points folgen dem Foliensatz von Professor Hoffmann, der auf der Homepage der ÖMG downloadbar ist:

- Mathematik – eine dynamische Wissenschaft mit Innovationspotential „Hochtechnologie ist mathematische Technologie“
- Österreich verfügt über lange Traditionen auf innovativen mathematischen Gebieten (z.B. J. Radon)
- Es besteht Handlungsbedarf, um den erforderlichen Nachwuchs in Mathematik sicher zu stellen
- Das neue Universitätsgesetz: Flexibilisierung contra Zementierung
- Defizite: Transparenz der Entscheidungswege, Aufbau einer adäquaten Personalstruktur, verlässlicher Rahmen (Stellen, Mittel)
- Wissenschaftlicher Nachwuchs als Quelle eines Erneuerungsprozesses: Zentrenbildung für die Ausbildung des wissenschaftlichen Nachwuchses
- Internationalisierung von Nachwuchskarrieren
- Höchste Priorität dem Aufbau der Personalstruktur (Dauerstellen – Tenure Track Positionen – Mitarbeiter – Doktoranden)
- Erhaltung der Standorte und noch stärkere Profilierung, Zusammenführung der Forschungsaktivitäten in „Schools of Mathematics“, Standorte am Umfeld orientieren
- Erhalt der Studienplätze, Chancen der EU-Erweiterung nutzen
- Ausstellung an Leistungskriterien orientieren
- Kooperation über die Fachbereichsgrenzen stärken
- Prüfungszeit straffer organisieren (Prüfungswiederholung)
- Dem wissenschaftlichen Nachwuchs eine Chance: Programm zur Förderung des wissenschaftlichen Nachwuchses
- Aufbau eines Controllingsystems (internationale Evaluation)
- Mathematikveranstaltungen in anderen Fakultäten von Mathematischen Fachbereichen

VERBESSERUNGSVORSCHLÄGE DER KOMMISSION

Insgesamt möge man danach trachten, „die Mathematik in Österreich *so attraktiv wie möglich* zu gestalten, um für andere Länder auf der Ebene der Studenten aber auch auf der Ebene des Lehrpersonals attraktiv zu sein“ (S. 117).

Der Isolation entgegenwirken: Bildung von (außeruniversitären?) Zentren, in denen intensiver wissenschaftlicher Austausch stattfinden kann. Als orientierende Beispiele wird das RISC (Research Institute for Symbolic Computation, eine Einrichtung der Johannes Kepler Universität Linz) oder das Radon Institut genannt.

Es sei zwar keine Zusammenlegung von mathematischen Forschungsstätten notwendig, allerdings sei eine verstärkte *Abstimmung der Forschungsfelder* und Studienangebote zu einer homogenen Gesamtstruktur mit eindeutiger Prioritätensetzung erforderlich.

Mathematik ist ein Fach: Die Unterscheidung nach grundlagenorientierter und angewandter Forschung sei nicht mehr zeitgemäß, vielmehr käme es darauf an, *Methoden der Problemlösung* zu entwickeln und eine *Gesprächskultur* von MathematikerInnen und NichtmatematikerInnen zu pflegen.

Klare Profilbildung: Eine Konzentration auf Kernkompetenzen bei sinnvoller Weiterentwicklung ausgewählter Spezialgebiete ist ein notwendiger Schritt zu einer klaren Profilbildung der Universitäten.

Studienplätze nicht reduzieren: Eine Reduzierung der Anzahl der mathematischen Studienplätze stünde im Widerspruch zur gesamtgesellschaftlichen Bedeutung des Faches.

Mathematik stärker den Erfordernissen der Wirtschaft öffnen: Diese Empfehlung wird ausschließlich auf das Lehrangebot bezogen.

Hinreichende Anzahl von Qualifikationsstellen: Dem wissenschaftlichen Nachwuchs sind dringend ausreichende Karrierechancen zu geben. An ein eigenes Programm zur Förderung des wissenschaftlichen Nachwuchses (etwa international ausgerichtete Graduiertenkollegs) wird gedacht. Vorrangig soll der Vereinzelung der DoktorandInnen entgegen gewirkt werden. Es wird dringend geraten, die Internationalität der Doktorandenausbildung und der Weiterentwicklung nach erfolgter Promotion nachdrücklich zu fördern.

Möglichkeiten eines tenure-tracks prüfen: Die Kommission hält es für einen gefährlichen Weg, WissenschafterInnen ausschließlich auf temporären Stellen zu beschäftigen.

Qualifikation des Nachwuchses: Es sollte ein *Doktorandenprogramm*, möglicherweise in Form von Graduiertenkollegs, angelegt werden. Im Speziellen wird dies für die Gebiete ‚Scientific Computing’ und ‚Optimization’ empfohlen

Juniorprofessuren: Es wird vorgeschlagen, solche Positionen des selbstständigen Lehrens und Forschens, möglicherweise mit Tenure Tracks versehen, einzurichten.

Blockade und *Perspektivlosigkeit des wissenschaftlichen Mittelbaus entspannen:* Spezielle Sonderprogramme, eventuell vorgezogene Besetzungen, einführen.

Lehrbelastung der ProfessorInnen sehr uneinheitlich: Hier sei für einen *Ausgleich* zu sorgen.

Um *internationale Standards* der österreichischen Mathematik zu *garantieren*, sollen alle

vier bis sechs Jahre *Evaluationen* durchgeführt werden.

Verbünde und Absprachen *mit Universitäten der Nachbarländer*: Vor allem in den neuen Mitgliedsländern, die zum Teil renommierte mathematische Ausbildungsstätten aufweisen, wird einiges Potential gesehen.

Serviceleistungen: Mittelfristiger Abbau isolierter mathematischer Einheiten in fachfernen Bereichen und Reintegration in die Mathematik.

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ZWISCHEN DEN ZEILEN …

Oft scheuen die EvaluatorInnen nicht, in ihrem Bericht klare Worte des Lobs (etwa *„Das hat die Kommission beeindruckt"*), oder aber auch des Tadels (das Forschungsgebiet sei „*verstaubt*") auszusprechen. An mehreren Stellen jedoch zögert man während des Lesens und fragt sich, ob nun zwischen den Zeilen Botschaften verborgen wären. Drei Beispiele:

„*Die Gefahr der Bildung von Schulen […] muss in Zukunft unbedingt vermieden werden*" (Seite 115). Es entsteht hierbei der Verdacht, dass sich Schulen festgesetzt hätten, ob sie das nun wirklich getan haben, und vor allem wo, bleibt unbeantwortet. „*Die Vergangenheit hat gezeigt, dass Österreich ein sehr interessantes Land für die mathematische Community ist, sobald es sich internationalen Entwicklungen öffnet* (Seite 117)" Welche waren dies in der Vergangenheit, und welche könnten diese Entwicklungen in Zukunft sein? „*Die Kommission hat den Eindruck, dass vor allem die jungen Mitarbeiter hoch motiviert […] sind* (Seite 154)". Ist dies als Kritik an den älteren Mitarbeitern zu verstehen?

STARKE BILDER

Insgesamt bleiben dem Leser folgende Bilder, auch auf Grund ihrer Wiederholung durch die Gutachterinnen, haften:

„Hochtechnologie ist mathematische Technologie": Die Bedeutung der Mathematik in *Wechselwirkung* mit anderen Wissenschaftsfeldern.

Es scheint eine starke *Tendenz zur Vereinzelung* der ForscherInnen, aber auch von ganzen Arbeitsgruppen in der Mathematik zu geben – sowohl innerhalb ihres Feldes als auch zu anderen Disziplinen hin. Das ist umso dramatischer, weil die GutachterInnen gleichzeitig den Anspruch zu Interdisziplinarität, die Notwendigkeit von Kooperation und Netzwerken immer wieder betonen.

Höchstes Potential für die Mathematik sehen die GutachterInnen überall dort, wo Mathematik in Wechselwirkung zu anderen Gebieten eingesetzt wird und die Problemlösungskapazität dieser Gebiete durch Mathematik gestärkt wird.

Es besteht *akuter Handlungsbedarf, die Karriereperspektiven* des wissenschaftlichen Nachwuchses und des Mittelbaues zu *verbessern*.

EIN BLICK ÜBER DIE GRENZEN – GROSS BRITANNIEN

In einer kürzlich veröffentlichten, höchst informativen Studie[28] überprüft Technopolis unter der Leitung von Erik Arnold sechs mit dieser Mathematik-Evaluierung vergleichbare Übungen (Reviews) in Großbritannien auf Verbesserungspotential. Vorab kurz zum Aufbau und zu den Ergebnissen des in diesem Rahmen untersuchten Mathematik-Reviews[29]: Begleitet wurde dieser Review von einer Steuerungsgruppe, die den Rahmen für die Studie spannte und den Vorsitzenden der GutachterInnen auswählte. Daneben wurde ein ‚Sekretariat' bestimmt, das unterstützende Funktionen ausübte. Den GutachterInnen wurden Hintergrundinformationen zur Verfügung gestellt, es gab eine Form von kick-off Veranstaltung, während der Rahmenbedingungen (Förderungen, akademischer status quo, rechtliches Umfeld, etc.) den GutachterInnen präsentiert wurden. Danach wurden diese in Sub-Gruppen aufgeteilt, um side – visits an den verschiedenen Universitäten vorzunehmen. Abschließend gab es noch mal eine Zusammenkunft, während der Ergebnisse und mögliche Schlussfolgerungen diskutiert worden sind, es war jedoch am Vorsitzenden, den eigentlichen Bericht zu verfassen (dessen draft dann noch einmal unter den GutachterInnen zirkulierte): „The mathematics review comments at a fairly detailed level on various subfields and especially notes UK strengths in many parts of pure and applied mathematics." Als besondere Schwäche wird die Verbindung zwischen Mathematik und Computer Sciences in Großbritannien angesehen, ebenso die Verbindung von Mathematik mit Material Sciences, insbesondere Nanosciences. Das britische System zeige Schwächen in der Schulausbildung, der zu kurzen Dauer der PhD-Ausbildung und in den Karrieremöglichkeiten für MathematikerInnen in Ihrer „Mid Career". Klare Schwächen gebe es auch in Verbindung mit der Research Assessment Exercise, unter der insbesondere StatistikerInnen zu leiden hätten. „The UK would need to strengthen training, adopting a more continental model, and increase the number of universities with leading mathematics capabilities in order to secure the health of the discipline". (Arnold et al, Seite 10).

EIN BLICK IN DIE (METHODISCHE) ZUKUNFT

Der Einsatz von Peer Review in der Evaluation von Wissenschaft ist zentral, ist unumgänglich, ist absolut notwendig. Anzuregen ist für zukünf-

[28] Erik Arnold et al. Reviews Reviewed: Lessons from the First Six International Panel Reviews, 1999 – 2004, Technopolis 2005. Die Reviews umfassten Engeneering, Physics and Astronomy, Computer Science, Materials, Chemistry und schließlich Mathematics. Chair der letzteren war, ebenso wie in Österreich, Jean-Pierre Bourguignon.

[29] EPSRC and the Council fort he Mathematical Sciences, An International Review of UK Research in Mathematics, 2004

tige Vorhaben vergleichbar zur Mathematik-Evaluierung allerdings ein Methoden- und AuftragnehmerInnenmix, der von FachgutachterInnen nicht als Bedrohung, sondern als Unterstützung angesehen werden sollte. Eine Kombination aus ‚Profi-EvaluatorInnen' und Peers (oder FachgutachterInnen) sollte in Zukunft zum Einsatz kommen, um (i) den Einsatz von Fragebögen zur Informationsgenerierung zu verbessern, (ii) weit reichende Urteile auf Basis verschiedener Informationsquellen und Methoden zu ermöglichen („triangulation" der Eindrücke der GutachterInnen) [30] und schließlich um (iii) die FachgutachterInnen zu entlasten. Man hat im Rahmen dieser Evaluierung, so wurde von den Projektleitern während der Endpräsentation betont, viel Zeit in die Erstellung von Tabellen und die Aufarbeitung von Daten investiert, und das neben der eigentlichen Tätigkeit an der Home Scientific Institution der GutachterInnen. Dies einem/r Profi-EvaluatorIn oder einem/r SozialwissenschafterIn zu überlassen, ist auch eine Erleichterung der Arbeit von FachgutachterInnen.

Einige Anregungen: Die Möglichkeit, Kommentare zur Evaluierung auf der Homepage der ÖMG zu veröffentlichen, sollte als Best Practice angesehen werden. In einem angemessenen Zeitabstand sollte auch ein Feed Back der AdressatInnen (zur Bekämpfung der „Schubladisierungsgefahr") vorgesehen werden.

Will man Evaluierungsergebnisse generell Ernst nehmen, sollte man von vornherein Mechanismen vorsehen, die die Auseinandersetzung mit den Ergebnissen der Evaluierung sicherstellen.[31]

Für zukünftige Evaluierungsvorhaben sollte erwogen werden, eine Feed Back Runde mit den Evaluierten vor Veröffentlichung des Berichtes vorzusehen.

Vergleiche, nationale und internationale: Auch wenn das Feld der Mathematik ein heterogenes ist, bewegt man sich doch in einer verwandten Thematik: Wo, wenn nicht hier (sorgsam interpretierte) Vergleiche wagen?

Methodenmix: Warum Peer Review nicht auch mit Interviews, Focus Groups, Fallstudien oder anderen qualitativen oder quantitativen Mehtoden mixen?

Vorsichtiger Einsatz von Bibliometrie: Zugegeben, die Methode hat Schwächen. Allerdings kann sie, in Kombination mit Peer Review, zu durchaus wertvollen Ergebnissen beitragen.

Den Systemcharakter dieser Evaluierungsübungen stärken: EvaluatorInnen sollten nicht ausschließlich im Saft ihres eigenen Feldes schmoren, sie sollten Rahmenbedingungen (Unternehmenslandschaft, Förderungslandschaft, forschungs- und technologiepolitisches Umfeld, gesetzliches Umfeld, Situation der Studierenden, Akzeptanz des Faches, Situation des Faches gegenüber anderen Fächern, etc.) Auch wenn es Ansätze dazu gibt: Vorliegende Evaluierung ist keine Systemevaluierung.

Abschließend noch ein Verweis auf die hier ausgiebig zitierte Studie von Arnold et al.: Ihre Ergebnisse sollten in die Planung von zukünftigen Evaluierungsvorhaben stark einfließen.

[30] Arnold et al. erheben ebenso diese Forderung. „Outside peer review, the principle of triangulation is fundamental to evaluation. However, as one would expect from the fact that the panellists are good and hard scientists, and not specialist evaluators or social scientists, their use of surveys is not especially advanced."

[31] Vgl. hierzu auch die Standards der Plattform, www.fteval.at/standards

„NICHT IN DIE SCHUBLADE, SONDERN AUF DIE SCHUBLADE!“[32]

Bei aller Kritik: Die vorliegende Mathematik-Evaluierung bietet eine gute Übersicht über die mathematische Forschung und Lehre in Österreich und ist ein klarer Ausgangspunkt für forschungs- oder universitätspolitisches Handeln. Sie ist jedoch (je nachdem, ob der Adressat das Ministerium, Forschungsförderungseinrichtungen, das Rektorat, die Institutsvorstände, die Evaluierten selbst oder die interessierte Öffentlichkeit ist) unterschiedlich nützlich. Man möge dieser Evaluierung aber jedenfalls das Schicksal der Schubladisierung ersparen, man sollte sie nutzen. Das während der Endpräsentation gefallene Bonmot, diese Evaluierung werde nicht in der Schublade verschwinden, sondern auf der Schublade, sollte keine schicksalhafte Bemerkung gewesen sein. Gerade die britischen Erfahrungen, von Erik Arnold zusammengetragen, mögen ein Anstoß sein, mit der Evaluierung zu arbeiten: „Most Interviewees felt that the reviews changed little sor nothing. Panel chairmen were better informed about consequences, but these were often described as ‚the review was used in meetings'“. “From a scientists' perspective, these reviews “disappear into a black hole” and are rarely seen again”. (Arnold et al, Seite 15) Soweit den InitiatorInnen, dem Auftraggeber und dem Finanzier zur Warnung.

„In any evaluation of a complex situation“, schreiben Arnold et al, “the evaluator is unlikely to observe, understand or analyse everything. Such evaluations should therefore be seen not as Truth but as systematic and well-informed contributions to a debate – a debate, to which others also contribute.” (Seite 22) Dies sollte Anregung sein, auf welche Weise die Mathematikevaluierung hinkünftig genutzt werden kann.

[32] Wortmeldung im Rahmen der Präsentation der Evaluierungsergebnisse der Mathematik-Evaluierung im bm:bwk, 4. Juli 2005

References

„Evaluation von Forschung und Lehrprogrammen an den Fachbereichen für Mathematik der österreichischen Universitäten. Endbericht der Evaluationskommission. Im Auftrag der Österreichischen Mathematischen Gesellschaft, finanziert vom Bundesministerium für Bildung, Wissenschaft und Kultur; Wien 2005

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http://www.oemg.ac.at/Mitteilungen/Evaluierung.html

„Reviews Reviewed: Lessons from the First Six International Panel Reviews, 1999 – 2004.” Im Auftrag des EPSRC (Engineering and Physical Sciences Research Council), Großbritannien. Jänner 2005. Erik Arnold, Alessandro Muscio, Rapela Zaman, Technopolis.

http://www.epsrc.ac.uk/Publications/Other/EvaluationOfInternationalReviewMechanism.htm

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Unter Mitarbeit von Beatrix Schönthaler

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New Frontiers in Evaluation

April 24th – 25th 2006, Radisson SAS Palais Hotel, Vienna, Austria

The evaluation of long-term scientific research is about to experience new challenges. Policy makers are increasingly aware that the success of their efforts to finance and promote long-term research is not only dependent on individual programmes, institutions and infrastructure, but also on 'portfolios' of programmes which interact. Therefore it becomes more important to coordinate the existing programmes and to consider new methods for measuring the efforts of individual instruments as well as portfolios of instruments. Evaluation can help policy makers to deal with these challenges. However, to get the most from evaluation, institutions such as the evolving European Research Council (ERC) may need to contribute to the further development, implementation, and application of modified and extended methods of evaluation and selection processes suitable for today's complexities.

The conference "New Frontiers in Evaluation" will bring together policy makers, programme managers, evaluation experts from a variety of disciplines, and managers of science funds from around the world for two days of intensive exploration into current best practices--and beyond--in selection processes and evaluation methods geared towards the complexities of multiple levels of decision making and interdependent science program portfolios.

RESEARCH QUESTIONS

A: Selection Processes & Evaluation Processes

What new selection processes and evaluation methods are being used for long-term scientific research? With what result? Is there a need for further development of methods and sharpening of instruments by new institutions such as the European Research Council? Which role does Peer Review best serve? Can Peer Review be further developed or combined with other methods to increase its effectiveness?

B: Portfolio Evaluation

What is the state-of-the-art of evaluating an institution's research / programme portfolio? Why is it important in long-term research to have a complete overview of an institution's portfolio beyond the individual project? How can such a portfolio be evaluated? What advances are underway?

C: Additionality in Basic Research

The question of additionality has been hotly discussed in recent years resulting out of the growing interest in R&D subsidies and the measurement of their impact on the firm level 'What difference does it make?' – the rationale of additionality still is the main touchstone of design and outcome of public policy. Beside the firm level: How can "additionality" be conceptualized for programmes funding scientific research? Is the promotion of scientific research additional per se?

D: The additional effect of complexity in programmes

What is the "additional" effect of public funding? Do we have any cost-benefit analysis with respect to the cost of funding mechanisms? Actually, the European framework programmes as

much as national policies change their funding strategies in favour of new and complex funding procedures, e.g. competitive research partnerships, creating networks, clusters or carrying out R&D auctions. These new kinds of public funding procedures are much more lavish compared to simple traditional funding schemes. Are they worth the effort – or are they too complex and costly compared to their outcomes? How is evaluation able to take into account variations in funding procedures and shed light on their relative merits?

E: Evaluating Systems
What is the state-of-the-art of evaluating collections of research portfolios extending across multiple instruments and institutions? How can different instruments and institutions be evaluated in context? How can such tasks be tackled and how is this to be done in relation to the level of the individual project or individual institution? How can such questions be discussed in a large European context?

F: Talking about 'Success'
What are the determinants of success in long term scientific research? From a scientific / social / cultural / economic point of view? What are the differences of these determinants across different fields of research (e.g. What makes a project in the humanities successful? And in the social sciences? In natural sciences? What about interdisciplinary activities?)? How to handle such differences in evaluation and decision making processes?

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Registration will start from September 1st 2005. Deadline for submission of abstracts is January 15th 2006. Decision on acceptance will be made by February 15th 2006. Electronic submission of full papers in Post Script, PDF or MSWord format is encouraged. Please use the address given below. The number of participants is limited; participants will be accepted on a first come–first served basis. The conference fee is € 300.—plus VAT covering participation, luncheons and a conference reception. For participants who present a paper the conference fee will be covered by the organisers. Participants who do not intend to present a paper are requested to register not later than February 20th.

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PLATTFORM Forschungs- und Technologieevaluierung fteval

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Die Plattform Forschungs- und Technologieevaluierung GesbR ist eine Initiative der folgenden Organisationen: Österreichisches Bundesministerium für Bildung, Wissenschaft und Kultur (bmbwk), Bundesministerium für Verkehr, Innovation und Technologie (bm:vit), Bundesministerium für Wirtschaft und Arbeit (bmwa), Österreichische Forschungsförderungsgesellschaft mbH (FFG), Fonds zur Förderung der wissenschaftlichen Forschung (FWF), Joanneum Research, KMU Forschung Austria, ARC Systems Research, Technopolis Austria GmbH, Österreichisches Institut für Wirtschaftsforschung (WIFO), Wiener Wissenschafts-, Forschungs- und Technologiefonds (WWTF) und dem Zentrum für Innovation und Technologie GmbH (ZIT), Rat für Forschung und Technologieentwicklung, Christian Doppler Gesellschaft (CDG), Austria Wirtschaftsservice (awsg).
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