

Opportunities for Financing Basic Research in Austria¹

The paper is devoted to the Austrian experience in building up basic research funding system. It is based on the Austrian annual research and technology report and annual reports of major R&D funding institutions. The latest trend shows that R&D expenditures in Austria have been grown faster than GDP, with public sector investing even more in R&D. Public R&D investments are distributed in Austria through the system of R&D funding institutions. There is a special Fund, oriented mainly on basic research, the Austrian Science Fund. Special focus in the paper is given to the process of competitive selection of programs operated by this Fund. The experience of Vienna Science and Technology Fund operating at regional level is also analyzed. It is concluded that Austria has been performing well in implementing the objectives of domestic policy in research, technology and innovation for the benefit of economic growth.

Key words: *research and development, innovation, basic research, financing, program, Austrian Science Fund, Vienna Science and Technology Fund.*

Introduction

As Austria is one of the EU leaders in economic and in research and innovation development, the aim of the paper is to look at the system of basic research financing, which contribute to high level of R&D development of Austria.

Austria is one of the top countries in the EU, with quite sustainable dynamics of economic growth. The projected nominal GDP for 2015 is €335.33 billion, 1.9% increase compared with 2014. The resulting R&D intensity is, therefore, expected to be 3.0% in 2015 (see Fig. 1), which would be a slight increase compared with 2014 (2.99%) and 2013 (2.95%). R&D intensity has an upward trend in Austria at least for the last 15 years: started from less than 2.0% GDP in 2000 [1].

The highest rate of growth in 2015 was in the business enterprise sector, with projected increase of 3.9%. This sector's funds are estimated as €4.76 billion, thereby contributing about 47.2% to financing Austrian R&D, thus representing the highest proportion of the funding. A comparatively steep increase in funding from the business enterprise sector since 2011 (as compared with the crisis years of 2009–2011) could be observed. Yet, in the medium and long-term

period public sector financing of R&D has grown faster than others (Fig.1)

The federal government provides €3.21 billion in funding in 2015, approximately 32% of overall R&D expenditures in Austria (and the total public expenditure is 37%). In absolute figures, this represents rise of some €44.7 million or 1.4% compared to 2014. Overall, the public sector, which includes the regional governments, local governments, professional associations and social insurance institutions, is expected to provide €3.77 billion in 2015, or about 37.3% of the total R&D expenditure, with the federal government responsible for its overwhelming share. Since the crisis the public sector has strongly increased its R&D financing, which is expected to be nearly 42% higher in 2015 than during the recession year of 2009. Foreign sources of funds (primarily foreign-owned firms that co-finance the R&D of their Austrian subsidiaries and, to a lesser extent, funds on line of EU research framework programs) account for €1.53 billion or 15% of the funds for the Austrian R&D, continuing to be a high proportion if compared internationally.

Overall, by the R&D intensity Austria was well above the EU average of 2.01% in 2013 (the last year for which comparative international figures are available), with

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¹ Prepared specially for the GRANT 2015 conference.

2.95% of GDP invested in R&D and thus ahead of Germany (2.85%), though still behind Finland (3.31%), Sweden (3.30%) and Denmark (3.06%).

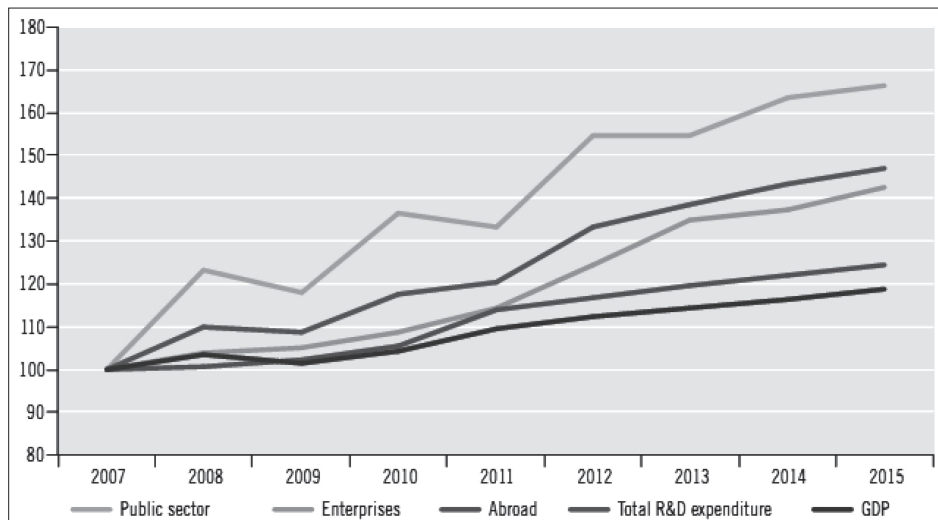


Figure 1. Dynamic of R&D expenditure in Austria by source of funds

Source: constructed by data from [1]

The Research, Technology and Innovation (RTI) strategy adopted by the federal government in 2011 represents the central frame of reference for the formulation of Austrian RTI policy. Its main objective is to include the country into the group of European innovation leaders by 2020. The RTI strategy is implemented at multiple levels with a broad-based and systemic approach to organizing and supporting the innovation system. “RTI Task Force” functions as an important coordinating tool for implementing the strategy, as it supports the strategic and system-oriented coordination efforts of RTI ministries. Led by the Federal Chancellery, it includes representatives of the Federal Ministry of Finance (BMF), the Federal Ministry for Transport, Innovation and Technology (BMVIT), the Federal Ministry of Science, Research and Economy (BMWFV), and the Federal Ministry of Education and Research (BMBWF). Intense and regular contacts and information exchange at a higher administrative level have made a crucial contribution to increasing cooperation between RTI ministries over the last few years.

Detailed plans in this mid- to long-term framework for orientation include the following activities:

- ensuring public funding of research for outstanding basic research, applied research, technology development and knowledge transfer through research funding regulations that allow for long-term planning security;
- introducing measures to trigger more private research investments;
- mobilizing private endowment funds to spread the extra-budgetary basis for RTI;
- developing measures for expanding support for young talent and women;
- promoting research to solve social challenges while taking into consideration the potential of the humanities, social sciences and cultural studies;
- establishing measures to increase the number of innovating enterprises;
- realizing efficiency improvements, needs-oriented development of research infrastructures as well as implementing knowledge transfer centers;
- improving the international scientific network and scientific field offices;
- modernizing the research funding laws and reducing bureaucracy, in order to

facilitate access to funding for small and medium-sized enterprises (SMEs);

- encouraging start-ups, e.g. through venture capital measures;
- developing a national strategy for intellectual property.

Basic Research: a core of federal RTI strategy

There are the three major funding agencies at a federal level for R&D in Austria: the Austrian Science Fund (Fonds zur Förderung der wissenschaftlichen Forschung, FWF), the Austrian Research Promotion Agency (Forschungsförderungsgesellschaft, FFG) and Austria Wirtschaftsservice (AWS). They are the primary institutions responsible for achieving the objectives of the federal government's RTI strategy in Austria. These agencies basically cover all the components of the innovation chain: basic research (Austrian Science Fund, FWF), applied research and experimental development (Austrian Research Promotion Agency, FFG), and the transition of technological developments to corporate growth (AWS).

Basic research is an important focus for the federal government's RTI strategy. It represents a key element with regard to Austria's attractiveness as an international location for RTI and thus has a significant impact on the human potential of the Austrian research area. The main role of basic research in the Austrian innovation system is reflected in the strategic focus of FWF. FWF is dedicated above all to strengthening and developing the science system and the attractiveness of Austria as a location for RTI.

Through targeted projects it supports Austrian research institutes in international competition for top researchers. The strategy for strengthening competitive funding of university research and its international focus is pursued by taking into consideration overhead costs as well as by working closely with foreign partners (in particular, from Germany, the US and the UK).

In addition, by working to selectively shape ERANet initiatives and through involvement in Science Europe, FWF aims to better coordinate the national research

and funding activities of the European Research Area (ERA) and promote an international focus within the Austrian research landscape, which is also an objective of RTI strategy.

Austrian Science Fund²

The main and the largest funding institution for basic research is Austrian Science Fund (FWF). For the past 5 years it increased the funding by almost 45%, which was about €211 million in 2014. Nearly 80% of this amount covered personal costs, while travelling costs accounted for only 2.1% and equipment – only 0.8%. Another interesting point is age distribution of research employees in FWF-funded projects. The total number of postdocs in such projects was 1392 persons in 2014. At about 50% of cases, the age of researchers was 30–36, with only few persons (in 2014) older than 50.

FWF has a number of programs and awards, but their selection procedures have essential similarities (see Fig. 2). All applications received by FWF are subjected to a peer review procedure in which only experts *working outside Austria* are asked to review proposals. These reviews form the basis for all funding decisions, thus ensuring the quality and international relevance of the research funded. The FWF is obliged to treat all scientific disciplines equally and does not have a quota system regulating the distribution of funds among various disciplines. But the normal distribution is following: social sciences and humanities – 20%, natural and technical sciences; biology and medicine – 40% each.

The number of reviews required for taking a decision primarily depends on the amount of funding requested and on the funding program in question. For example, Stand-Alone Projects with the requested amount of funding up to €350.000 will have minimum of two review reports. Above that level, at least one review must be obtained for each additional €100.000 requested. For funding in excess of €550.000, each increment of €150.000 requires a disproportionate number of additional reviews.

² This part is based on annual reports of FWF.

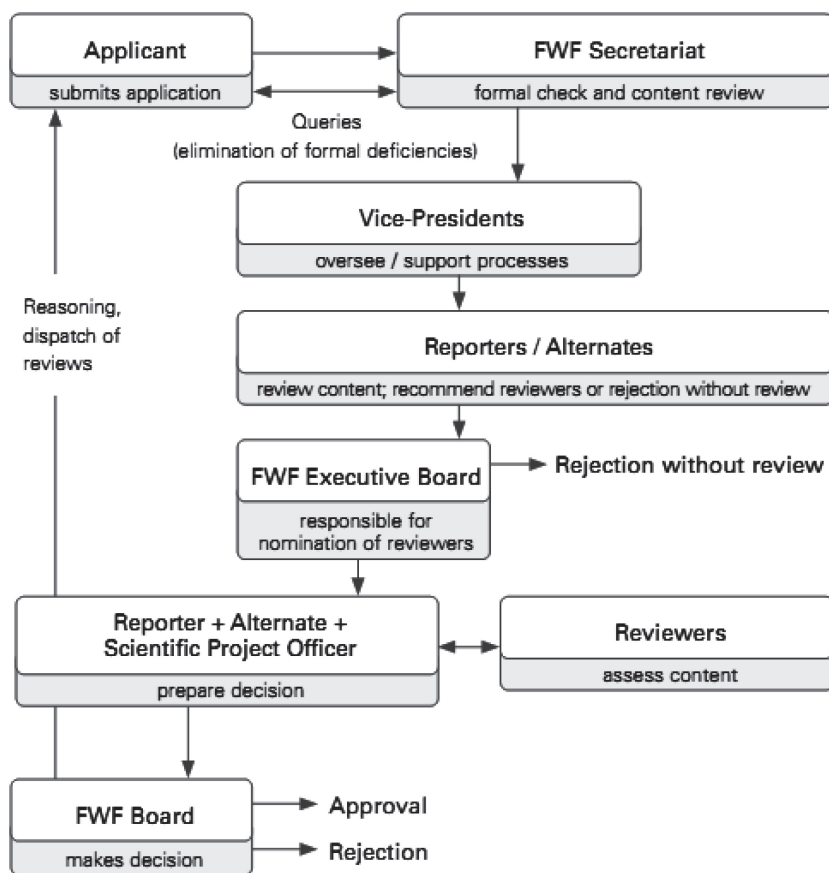


Figure 2. Decision making process in Austrian Science Fund

Source: constructed by data from [2]

In all other programs as well as some commissioned/international programs, the number of reviews required depends on the relevant program-specific agreements; in any case, however, at least two reviews are required. Additional reviews may also be necessary for applications which encompass many disciplines.

So, peer review process lies at the heart of the FWF's decision-making process, in which the organization has consistently relied on experts based outside of Austria for decades. In line with common international practice, the reviewers perform this function for the FWF free of charge. One of the key benefits of the FWF's international peer review process is that it has helped to *bolster*

the international competitiveness of Austrian research on sustained basis. As in the previous years, the FWF's reviews mainly came from three major geographical areas. The US and Canada accounted for the largest share of reviews received (35.4%), just ahead of the EU (except for Germany and Switzerland (33.7%) with top position in 2013). The share of reviews from other German-speaking countries (Germany/Switzerland) reached 16.9% and thus demonstrated another slight decrease in 2014. "Rest of the world", with 12.5%, demonstrated a slight increase in comparison to the previous year. In total, FWF received reviews from 67 nations in 2014, which indicates an especially strong international element in its review

operations. Of the 5.131 reviews received, only one came from Ukraine in 2014. In order to obtain those 5.131 reviews, FWF had to send a total of 15.089 requests, which yields a response rate of 34.0%. Through these considerable efforts, FWF Office has managed to maintain the response rate at roughly the same level over the last few years.

In FWF programs, with applications reviewed on rolling basis, the average time span between submission of an application and a decision taken by FWF Board was 4.5 months in 2014.

Programs and awards of Austrian Science Fund

The core FWF competition is Stand-Alone Projects Program, which amounts about 50% of the grants supported by FWF. Its objective is to support non-profit-oriented individual research projects. The target group is Austrian scientists and researchers from all disciplines. The maximum duration is 36 months, but the follow-up applications are possible. There is no fixed amount of funding per project, which varies depending on project peculiarities. Average volume of funding per project is about €300.000. An advantage of this program is that there is no deadline and everyone could submit proposal when he/she wants.

The next programs for basic research funding are Special Research Programs (SFBs), related to priority research fields. The SFB objectives are:

- to establish research networks on par with international standards through autonomous research concentration at a single university location (or multiple locations, subject to certain conditions);
- to build extremely productive, tightly interconnected research establishments for long-term, generally interdisciplinary/multidisciplinary work on complex research topics.

This competition is opened for research groups in all disciplines working at Austrian universities or non-profit, non-university research institutions. The core group of applicants must be of sufficient size and be qualified to establish and run a research program of high international standing in line

with the profile of the participating research institution(s); minimum of 5, maximum of 15 principal researchers for sub-projects (including spokesperson); and 30% of them should be women. Also at least 50% of principal researchers in sub-projects must be based at one research location. Letters of support are required from all participating research institutions.

The duration of an SFB program is 8 years, but after 4 years an interim evaluation will determine whether or not projects are allowed to continue. The amount of funding is not fixed too, like in the previous case, and depends on specific project and number of sub-projects. Average volume of (new) funding approvals is approximately €4.7 million per SFB for the first four years.

To receive funding for FWF's SFBs, applicants are required to undergo a highly selective two-stage process. In 2013, only 13 research groups took on this challenge, representing a significant decrease compared to the previous year (24 groups). After a review of the outline proposals, four applicants were invited to submit full proposals. Two of those proposals – which comprised a total of 22 sub-projects – were ultimately approved.

Besides quite ambitious programs, FWF runs smaller competitions, called awards and prizes. First of them is START Program. Its objective is to provide researchers with the means to plan their research work on long-term basis and with sufficient financial security. By assuming responsibility for the establishment/expansion and management of a research group, project leaders are able to gain the qualifications necessary for leading positions in science, especially as lecturers at higher education establishments in Austria or abroad. This program is designed to support highly promising young researchers in all disciplines. They should be no less than two years and no more than nine years after conferral of doctoral degree. The applicants should have outstanding international track record, evidence of scientific independence and, desirably, an international experience. It should be noted that till 2014 full professors were not eligible to take part in the START program, but since 2014 they have been eligible as well.

The project duration should not be more than eight years, preferably 6 years, but longer periods are possible in the exceptional cases defined in the application guidelines. Nevertheless, an interim evaluation after 3 years determines whether projects are allowed to continue.

The average volume of funding is approximately €1.2 million per START project and depends on specific project. The award decisions are taken by FWF Board (and the Austrian Federal Ministry of Science, Research and Economy who nominally awards these grants) on the basis of recommendations by the International START/Wittgenstein Jury, which, in turn, are made on the basis of international peer reviews and a hearing to which the most promising START applicants are invited. This call is annual one.

START projects are considered as the best-endowed and most prestigious grants available to junior researchers in Austria. Due to high competition, approval rate in 2013 was below 14%, while in 2012 – 22%.

Wittgenstein Award is another source for basic research funding in Austria. Established by the Austrian Federal Minister of Science and Research, it is operated by FWF. It aimed to provide researchers with maximum of freedom and flexibility in carrying out research. But for this award only outstanding researchers are eligible. It means that they should have internationally recognized track record in the relevant field, be employment at an Austrian research institution and be not older than 56 at the time of nomination.

The award provides funding for 5 years with up to €1.5 million per award. Unlike in other programs, self-nominations are not permitted. This award is running once a year and only 1–2 grants could be awarded. Given those facts, the Wittgenstein Award is the FWF's best-endowed and most prestigious research prize.

Another FWF area for supporting basic research as well as development of human resources is doctoral programs. FWF provides funding for such programs, to enable for establishing internationally oriented centers of education, to support highly qualified junior researchers. These projects are

intended to support concentration in specific areas at Austrian research institutions and promote the continuity and impact of the focus areas.

The FWF doctoral programs are oriented on research groups in all disciplines, working at Austrian universities or non-profit, non-university research institutions. To apply for the funding in the program framework, a DK project should cover at least 5 researchers, but no more than 20 (with the obligatory 30-percent share of women), working as a research unit with outstanding research track records by international standards and cooperating in establishing a formal arrangement to educate and train doctoral candidates in a clearly defined medium-term (and, where possible, also multidisciplinary) research context. DK projects supported by FWF should, above all, be established in close connection with previously funded clusters of excellence (SFBs or NFNs). An important requirement is that the university applying for DK program should provide general resources (space, laboratories, equipment, etc.) for high-quality scientific research.

Also, it is worth mentioning that duration of the program is 12 years, but every 4 years a project should be evaluated to determine its success. The volume of financing varies depending on specific project and number of employment contracts. Average volume of funding approved in 2014 was approximately €2.1 million per DK project for the first four years.

The next group of programs is designed to support international mobility. The first program is Schrödinger Fellowships. Its objectives are to enable Austrian researchers to work at leading research facilities abroad, to acquire international experience in the postdoc phase, and to facilitate access to new areas of science, methods, procedures and techniques so that Schrödinger fellows can contribute to the development of their respective fields upon their return to Austria.

The Schrödinger Fellowships' target group is outstanding young Austrian scientists and researchers in disciplines. To be eligible, they should have finished doctorate studies, international scientific publications and be invited by a research entity from abroad.

Duration of the fellowships is from 10 to 24 months plus possible return phase from 6 to 12 months. So, this program is very similar to Horizon 2020 Marie Curie outcome fellowship.

The size of grant depends on specific project and destination. Average volume of funding approved is about €107.000 per project. The advantage of the program is that there is no deadline and proposals are reviewed on rolling basis.

The Schrödinger Program provides scholars with an opportunity to gain research experience at leading research institutions all over the world. This program has helped lay the foundation for the research careers of many Austrian researchers who are now known as leaders in their fields. Since 2009, it has also been possible to combine a Schrödinger Fellowship abroad with return phase in Austria. This program extension was made possible by the FWF's successful application for EU co-funding within the framework of the Marie Curie Actions (COFUND). The high approval rate (by FWF standards) can also be attributed to EU co-funding. The FWF's fourth COFUND agreement went into effect in mid-2013 and ensured that the FWF would be able to sustain the program improvements implemented after its previous successes with COFUND proposals. In 2013, 60% of all applications included a request for a return phase, and approximately two-thirds of the approved applications involved a return phase.

The second mobility program is Lise Meitner Program. Its aims are to enhance quality and scientific know-how in the Austrian scientific community and provide support for international cooperation. The target group is outstanding scientists and researchers in all disciplines who are capable of making a contribution to the advancement in science at an Austrian research institution. This program looks like Marie Curie incoming fellowship, with the average size of grants about €120.000–130.000. That is comparable with EU funding for such kind of grants.

Meitner researchers came from countries all over the world. Europe was clearly the most common region of origin, accounting for some 70% of Meitner positions. The fact that many researchers came from southern European

countries can be attributed to the crisis and the resulting research budget cuts in those countries. Additional Meitner researchers came from Australia, India, Japan, Canada, Mexico, Russia, Turkey, the U. S. and Vietnam. All in all, these statistics provide impressive evidence for the international orientation of basic research and Austria's worldwide attractiveness as a research location.

Thanks to the attractiveness of this program and of Austria as a research location, the number of applications received in this program has doubled in the last five years. In 2013, the total of 149 applications were received (against 123 in 2012), and 37 Meitner positions were approved (40 in 2012). Based on the projects approved, it appears that the drastic increase in applications received from the countries hit hardest by the economic crisis subsided in 2013.

The next set of programs is specially designed for career development of women in science and research: Hertha Firnberg Program and the Richter Program. Also, one of the FWF's significant contributions to career development for female scientists is the annual two-day Firnberg-Richter Workshop. In addition to providing female scientists and researchers with an opportunity to network, this event also serves the purpose of coaching and human resource development. The workshop has been an integral and essential part of the FWF's career development programs for women in science ever since the two programs were implemented. The feedback on the workshop from Firnberg/Richter veterans and newcomers alike has been entirely positive.

Hertha Firnberg Program is aimed to enhance women's opportunities for academic careers at Austrian research institutions and provide maximum support during the postdoc stage at the beginning of a female scholar's academic career or upon her return from maternity leave. Only outstanding female university graduates in all disciplines with international scientific publications are eligible. The program provides funding for 36 months, of which up to 12 months may be spent at a research institution abroad. The size of grant depends on specific project. And the average volume

of funding is about €216,000 per Firnberg project. Another program for females is Elise Richter Program. It aims to support outstanding female scientists and researchers in their pursuit of university career. By the end of the funding period, a grant recipient should reach a qualification level which allows her to apply for a professorship in Austria or abroad (*venia legendi/docendi* or a similar qualification level). Duration of the project is from 12 to 48 months; average size of grant is €290,000 per Richter project.

For these two programs there are only two calls per year (spring and fall).

In addition to research funding, FWF provides support for publications in distinguished international journals

whenever such publication is a product from FWF projects. One requirement is that a publication should be submitted no later than 3 years after the end of project.

The next set of programs operated by FWF deals with specific areas of research. E. g. Clinical Research (KLIF) Program aims to support clinical research projects that are described precisely in terms of objectives and methods and are subject to limits in terms of duration and budget. The results of the projects must not be linked to direct commercial interests. Projects must involve patients or healthy subjects and aim at generating new scientific insights for the purpose of improving clinical practice or optimizing methods of diagnosis and therapy.

Table 1

Austrian Science Fund: programs applications and approvals

Funding program	Decisions issued		New approvals		Approval rate, %	
	2014	2013	2014	2013	2014	2013
Stand-Alone Projects (including Clinical Research)	1 138	1 295	300	362	26,4	28,0
Women/men	301/837	339/956	85/215	82/280	28,2/25,7	24,2/29,3
International Programs	553	390	125	68	22,6	17,4
Women/men	117/436	79/311	30/95	12/56	25,6/21,8	15,2/18,0
Priority Research Programs (SFBs, NFNs)1)2)	93	47	84	22	90,3	15,4
Women/men	13/80	12/35	11/73	5/17	84,6/91,3	0,0/20,0
START Program and Wittgenstein Award	121	117	9	10	7,4	8,5
Women/men	26/95	29/88	3/6	2/8	11,5/6,3	6,9/9,1
FWF Doctoral Programs (DKs)2)	13	19	11	15	84,6	50,0
Women/men	1/12	5/14	0/111	3/12	0,0/91,7	50,0/50,0
International mobility	309	275	112	94	36,2	34,2
Women/men	130/179	104/171	47/65	32/62	36,2/36,3	30,8/36,3
Career development for women in science and research	136	123	38	34	27,9	27,6
Program for Arts-Based Research (PEEK)	50	73	8	8	16,0	11,0
Women/men	23/27	31/42	3/5	3/5	13,0/18,5	9,7/11,9
Science Communication Program	19	23	4	6	21,1	26,1
Women/men	10/9	9/14	2/2	1/5	20,0/22,2	11,1/35,7
Total	2 432	2 386	691	632	28,43	25,8
Women/men	755/1 677	734/1 633	219/472	177/447	29,0/28,1	24,0/26,8

1) Sub-projects; 2) Extensions only in 2014; 3) The overall approval rate is not comparable to the previous years' figures due to the suspension of calls in FWF Doctoral Programs (DKs and Special Research Programs (SFBs)).

Source: derived from [3]

Another program is Program for Arts-Based Research (PEEK), aiming to support high-quality, innovative arts-based research efforts in which artistic practice plays a key role, to enhance research competence, quality and international reputation of Austria's researchers in art-related fields, and increase awareness of arts-based research and its potential applications among a broader public and in the research and arts communities.

Last but not least, FWF supports international cooperation thorough its international programs that include a variety of funding programs and instruments that are essentially designed to support bilateral and multilateral research projects as well as international networking. For example, FWF can support bilateral and trilateral research projects (possibly with specific thematic focus areas), to support focused multilateral (European) research cooperation arrangements (ERA-Net calls) and joint Seminars to prepare cooperation projects.

Table 1 below provides some latest figures on numbers of applications and approvals on line of FWF programs and awards.

Vienna Science and Technology Fund³

Apart from federal funding body, there exist regional funds for basic and applied research in Austria. One of the largest is operating in Vienna. It is Wiener Wissenschafts-, Forschungs- und Technologiefonds (WWTF) or the Vienna Science and Technology Fund. It was set up in 2001, to encourage top-performing research work in Vienna and make Vienna attractive for international scientists. Its another purpose is to emphasize the importance of basic research to provide an impetus for developing new technologies and insights for the City of Vienna. The Fund is generally open to all fields of science. Through defined thematic programs it develops calls and comparable instruments for research organizations and researchers, to invite them to submit applications for funding.

Within the scope of options available to it, WWTF operates as a fund to promote science

through employing specific instruments for further effect. It views itself as a "niche operator" that strengthens and utilizes the scientific potential in and for Vienna through selectively funding major projects. In choosing thematic programs and in selecting specific project applications, consideration is given to the extent to which such projects help reinforce strengths of and/or significantly contribute to the sphere of interest of the State of Vienna and its regional environment.

WWTF has two key instruments: "project funding" and "endowed chairs". They are offered by way of thematic programs. Endowed chairs are aimed to entice excellent researchers to Vienna. A key element in the scheme is that it is directed not just at recruiting and establishing individuals, but that these will be embedded in an excellent working environment and provided with a working group.

Key factors of selection are the scientific excellence of both the individual to be chosen and the facility for which such individual will work (research group / research field). While the latter is always reviewed in advance by WWTF, there are two options with regard to the selection of individuals:

- where the endowed chair involves the position of the head of a research group, WWTF will choose the individual through external expert;
- where the endowment of a chair involves the direct appointment of a university professor, WWTF identifies abstract criteria to be met by such individual.

WWTF may provide funds for a period from 2 to 5 years. WWTF may assist a selected individual in his/her personal integration by taking suitable action. The point of interest in this program is that an applicant needs not to apply with a detailed research plan. The main selection criteria in person-oriented funding are the scientific excellence of a candidate and the potential and strategy to embed a new team into the existing research environment at a host institution.

WWTF provides funding to major scientific projects in basic research, which offer the prospect of economic or social benefits in the mid-term. Funding is granted to cover the cost of staff, investments, networking and management. To be eligible,

³ This part is based on the information provided by the official web-site of the Vienna Science and Technology Fund at <http://www.wwtf.at/>

projects must have duration between 2 and 4 years. Funding ranges from €200,000 to about €1,000,000⁵. Average size of funding per project was €470,000 in 2008–2012.

For WWTF, excellence is at the centre of its funding schemes, mirrored in the excellence and visibility of researchers and projects, the professionalism of applications and in the organization and management performance achieved by applicants.

All applications need to be measured by the WWTF's criteria, some of them formal, others of a qualitative-evaluating nature. Some of the criteria apply to all tools, others to endowed chairs only or to project funding. WWTF provides detailed guidelines/application forms for each call and each instrument.

Formal criteria reflect the correctness and fullness of application, while qualitative one should be considered in more detail. All applications regardless the call specific should meet the “visibility” criteria. It means that the project submitted will suit for the development of visible dimensions and achievement of medium-term benefits and utilization potentials within the sphere of interest of the State of Vienna.

For the endowed chairs, a potential candidate should have the working career mostly abroad for 5 years (the so called “international recruiting” criterion) and should be shown to be scientifically excellent in the field, and younger (in terms of academic age) top scientists should be preferred.

For the project funding qualitative criteria are the following:

- “applicants’ excellence”: applicant’s track record (in terms of academic age), quality of project and project team management and of the scientific environment;

- “quality and innovativeness”: research activities submitted for funding should meet the highest international quality standards in their field and be covered by the thematic programs run by WWTF; positive points are awarded to collaborative projects, when applicants can show clear role definitions of partners, clear project management and an obvious benefit for Vienna;

- “prospect of benefits and utilization”: a project aims to achieve medium-term economic and/or community benefits; incorporates adequate management and accompanying measures; includes a concept of strategies for publication, protection, exploitation and the prospect of spin-offs.

Thematic distribution of WWTF funds is as follows: Life Sciences, Applied Mathematics, Cognitive Sciences, Information and Communication Technology, and Social Sciences and Humanities. About 40% of the funding for 2003–2013 was allocated to the Life Sciences, and about 20% – to Mathematics and ICT each.

The three institutions in Vienna which have received the greatest share of WWTF funding are: University of Vienna (€25,500,000), Vienna University of Technology (€16,800,000), and Medical University of Vienna (€15,600,000) [5].

Annual budget of WWTF for the last decade varied from €5,000,000 to almost

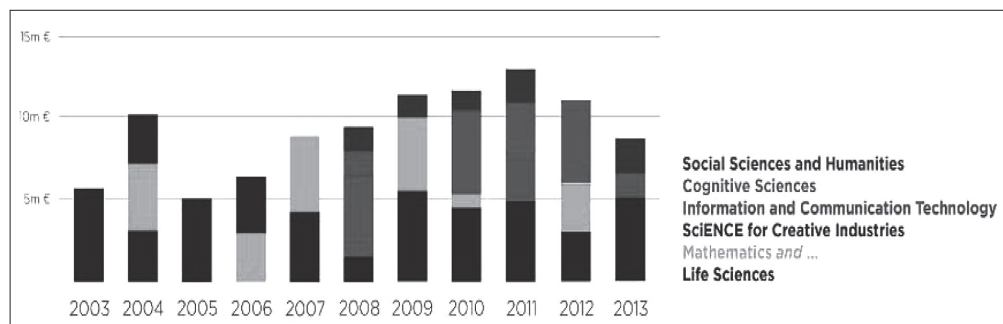


Figure 3. Vienna Science and Technology Fund: funding by priority areas
 Source: constructed by data from¹

⁴ Official web-site of WWTF: http://www.wwtf.at/about/funding_instruments

⁵ WWTF Impact Evaluation 2014 – Self-evaluation Report to International Review Panel [Electronic resource]. – Access mode: http://www.wwtf.at/upload/WWTF_impacteval_SelfevalReport.pdf

€13,000,000. It should be noted that since 2008, WWTF has got the money not only from the city budget but also from the private banking foundation.

WWTF has set up a purely international peer review process that is living up to highest international standards. It is a professionally safe and sound process. The quality assurance matrix involves both the dimension of time (ex ante / interim / ex post) and different organizational levels of WWTF.

Quality assurance typically covers the “life cycle” of projects and person-oriented funding cases. Ex ante evaluations within competitive calls include a rigorous selection process that focuses on the applications’ quality. This process is managed by WWTF office and involves an international jury of renowned scientists and experts in the respective field, which give a funding recommendation after an intensive discussion process based on average 4 international reviews per proposal. This system shall prioritize quality and exclude local interests from decision-making process. The jury consists of 8–12 international scientists and experts.

Note that WWTF has switched recently from one-stage to two-stage application process with an even stronger jury involvement. Interim quality assurance involves annual reporting on the progress of a project, financial monitoring and the reporting of outcomes and outputs such as publications, new cooperation links, career steps, industrial outreach and public outreach. The aim is to maximize the researchers’ flexibility, on the one side, and to get monitoring data to oversee the project success, on the other (and also to get data for mid-term and long-term statistics of WWTF itself). In rare cases of obvious poor performance and non-compliance with basic rules, WWTF can apply “escalation

scenario” to successively get deeper insights in the project performance, to come to a well-informed decision on the continuation or the early termination of a project. Ex post evaluation of WWTF-funded activities, although made on regular basis, is not obligatory for all the calls. It involves mechanisms of peer review, to assess the quality of the project results and provide informed feedback to the projects in a setting that is open to the public. In the non-public part, the invited peers provide more general feedback to WWTF.

Conclusions

Austria is a very dynamic and active country in terms of research and innovation policy improvements that are closely linked to its economic development. The basic research is indispensable for maintaining high innovation performance and competitiveness of domestic industries. Austria has quite developed system for R&D funding, which covers all stages of the innovation process. The share of public financing is about 40%, or 0.75% GDP. For basic research, there are FWF at federal level, and WWTF at regional one. Both funds have developed a wide range of comprehensive programs to support basic research, researchers, and thematic priority fields. Selection process is based on peer-reviews, conducted by only experts working outside Austria. The size of funding project financed by FWF or WWTF is competitive and starts from €100 000 per year, and almost 80% of this amount goes to direct personal expenditures, e. g. wages. Among priority areas are Life Sciences, although each science field is formally treated equally by the above funds, especially by FWF.

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В. Грига

Можливості для фінансування фундаментальних досліджень в Австрії

Стаття присвячена австрійському досвіду функціонування системи фінансування фундаментальних наукових досліджень. Вона ґрунтується на даних щорічної доповіді щодо стану досліджень і технологій в Австрії, а також річних звітів основних інституцій, що фінансують наукові дослідження. Останні тенденції свідчать, що витрати на дослідження і розробки (ДР) в Австрії зрос-

тали швидше, ніж ВВП, а темпи зростання фінансування ДР з боку державного сектору були ще вище. Державне фінансування ДР розподіляється в Австрії через систему відповідних інституцій. Окрему увагу в статті приділено фінансуванню фундаментальних досліджень по лінії Австрійського наукового фонду, зокрема процесу конкурсного відбору програм. Також проаналізовано роботу Віденського фонду науки і технологій, який працює на регіональному рівні. Зроблено висновок, що Австрія успішно реалізовує завдання національної науково-технологічної та інноваційної політики з метою забезпечення економічного зростання.

Ключові слова: дослідження та розробки, інновації, фундаментальні дослідження, фінансування, програма, Австрійський науковий фонд, Віденський фонд науки і технологій.

В. Грига

Возможности для финансирования фундаментальных исследований в Австрии

Статья посвящена австрийскому опыту функционирования системы финансирования фундаментальных научных исследований. Она основана на данных ежегодного доклада о состоянии исследований и технологий в Австрии, а также годовых отчетов основных институтов, финансирующих научные исследования. Последние тенденции свидетельствуют, что расходы на исследования и разработки (ИР) в Австрии росли быстрее, чем ВВП, а темпы роста финансирования ИР со стороны государственного сектора были еще выше. Государственное финансирование ИР распределяется через систему соответствующих институтов. Особое внимание в статье уделено финансированию фундаментальных исследований по линии Австрийского научного фонда, в особенности процессу отбора программ. Также проанализирована работа Венского фонда науки и технологий, который работает на региональном уровне. Сделан вывод, что Австрия успешно реализует задачи научно-технологической и инновационной политики с целью обеспечения экономического роста.

Ключевые слова: исследования и разработки, инновации, фундаментальные исследования, финансирование, программа, Австрийский научный фонд, Венский фонд науки и технологий.