

# Organisational Evaluation of the Hungarian Scientific Research Fund (OTKA)

Evaluation Report

## European Science Foundation (ESF)

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# 1.

## Foreword



It has been an honour for the European Science Foundation to undertake this evaluation of the Hungarian Scientific Research Fund, or in Hungarian *Országos Tudományos Kutatási Alapprogramok* (OTKA).

As the first evaluation of OTKA, it seems appropriate to observe upon the rapid changes that the whole of the Hungarian economy and society have achieved since the dismantling of the ‘Iron Curtain’ in 1989 – three years following the establishment of OTKA.

Hungary commenced negotiations to join the European Union in 1998 and was committed to full membership in 2004 following overwhelming support in the referendum on accession. During its first Presidency of the Union in 2011, Hungary facilitated the accession of Croatia as a new member. With focus on human resources, the programme for the Hungarian Presidency was themed ‘Strong Europe with a Human Touch’. It hosted a significant meeting of the European Research Council in June of that year.

As this report observes, Hungary has made very substantial progress as an open and full member of the European Research Area.

This report addresses the effectiveness of OTKA’s support of fundamental research as part of a complex national research support system and must be read in the context of a research environment that is rapidly being aligned to European norms. Since 1994, only universities have the right to award PhD degrees and since 2006 the structures of higher degrees have been adapted to the Bologna Process. These changes in design have been associated with changes in quality assurance systems and formal accreditation systems. With changes in researcher formation have come some

improvements in mobility between enterprise and academia.

OTKA has been active in many international research collaborations and has been a respected member of the ESF for many years as well as participating in other international organisations of benefit to its mission. This international engagement is mirrored in what has been observed as perhaps a surprising level of international researcher mobility. The fundamental potential of Hungarian researchers is reflected in exceptionally strong performance in the ERC competitions.

Challenges remain. As will be seen, the overall expenditure on research – despite recent progress – is much lower than the European average. In a nation in which knowledge intensity and innovation will be crucial aspects of economic development, there would be great benefit from increasing the proportion of qualified researchers in the labour force. Whilst progress has been made in the share of new doctoral graduates in the labour force, it is still about half that of the European average and lags further behind what has been observed in the most competitive countries.

When increases in the number of researchers in formation can be achieved, greater incentives to encourage interchange and mobility with the market-facing sector of the economy would be of great benefit and OTKA experience and systems could play a more significant role if resourced to do so.

The ESF Evaluation Committee observed the commitment and enthusiasm of OTKA staff to developing the country’s research and scientific infrastructure. The Committee was very impressed by the high quality of its programme design and leadership as well as the engagement and support of the research community.

The ESF is indebted to the Evaluation Committee for their commitment, wise insights and full application of their expertise in taking on this important role. We would like to acknowledge the huge contribution of the evaluation participants at all levels of the system, from ministries through to researchers, for their honest observations, measured comments and willingness to engage in a constructive and empowering process.

We trust that the recommendations in this report are seen in the spirit of a constructive peer review process, and that they facilitate procedural development where indicated. We hope that the report will assist the OTKA Board in moving towards a more central role in developing basic research strategy as part of the integrated national strategy. Particular returns could be expected from a renewed resource for beginning and early stage researchers with inter-sectoral mobility.



**Martin Hynes**  
*ESF Chief Executive*

# 2.

## Executive Summary



The main sections of the report are summarised below.

### 2.1 Description of the evaluation process and methodology

The European Science Foundation (ESF) was commissioned by the Hungarian Scientific Research Fund (OTKA) to conduct this evaluation. It is OTKA's first international review and examines its activities over a five-year period: 2009 – 2013. It has the overall goal of identifying strengths and recommendations for further improvement related to OTKA governance and management structures. The scope of the evaluation embraces the following:

1. Assessment of the OTKA governance and management structures
2. Assessment of the OTKA funding portfolio, with regard to
  - a) Its coherence with the OTKA strategic goals
  - b) Its internationalisation
  - c) The efficiency and transparency of the procedures for the OTKA funding schemes.

The evaluation design features a mixed-methods approach including a scoping visit, expert peer review, desk research and an outcomes survey of OTKA's grant applicants (both successful and unsuccessful). The survey measured satisfaction levels of OTKA's applicants with grant administration and procedures, assessed the impact of OTKA research funding and assessed internationalisation of OTKA funded research. A response rate of 68% was achieved from a randomised sample, allowing a high level of confidence in the findings and their generalisability to the full applicant population. The findings of the survey are provided in Section 6.

In parallel, an expert international peer review of OTKA's funding portfolio, governance, strategy and procedures was conducted by an Evaluation Committee. The Committee's report (Section 7) was prepared following its meetings with OTKA governance representatives, staff and clients, as well as other important external stakeholder organisations during their site visit to OTKA in June 2014. The Committee also analysed OTKA's self-evaluation report as well as reference/background documents provided by OTKA and ESF.

### 2.2 Description of the national research and development (R&D) context

An overview of statistics on Hungary's R&D performance as well as a description of the main actors in national science, technology and innovation governance are provided in Section 4. The statistics demonstrate that Hungary is making steady progress in terms of increasing R&D expenditure and intensity. It is also making good progress in terms of improving the quality of its R&D output and implementing the structural changes needed to develop into a knowledge economy. Important vulnerabilities that remain include the need to grow its doctorate holder research base and increasing inward researcher mobility. Other weaknesses include the lack of linkages and knowledge flows between industry and research units. Institutional stabilisation has also been identified as an issue in the wake of wide scale strategic change.

## 2.3 OTKA overview

Established in 1986, OTKA's mission is to provide support to outstanding discovery oriented (basic) research in all fields of science carried out in Hungarian institutes. Funding is allocated on a competitive basis and through a peer review system. OTKA runs a proposal system that aims to offer support at every stage of a researcher's career. The main institutional recipients of OTKA funding include universities and colleges, as well as the research institutes of the Hungarian Academy of Sciences.

The organisational structure of OTKA consists of the OTKA Board, three scientific councils, twenty-nine review panels and the OTKA office. The operation of OTKA depends on the involvement of a large number of researchers, including grant applicants and those researchers involved in its decision making bodies.

## 2.4 Main findings from the survey and analysis of administrative data

OTKA grant applicants are well distributed across all age categories. Male applicants outnumber female applicants by a factor of nearly three to one and correspondingly attract higher numbers of research grants. However, female applicants are as likely as male applicants to be successful across the OTKA scientific groupings.

The majority of respondents were in stable employment at the time of the survey and some 40% identified themselves as 'leading researchers'. The OTKA grant success rate (2009-2013) of leading (R4) researchers (99%) is higher than that of R3 (75%) or R2 (48%). Average success rate for an OTKA grant year is 29%.

OTKA applicant satisfaction with the effectiveness and efficiency of its grant administrative process is very high overall. Feedback also indicates that beneficiaries experience OTKA as responsive and accommodating in terms of necessary changes to their budgets or research plans.

Areas where the results indicate some improvement may be warranted include feedback on negative grant decisions and the perceived independence of the grant selection process. This seems to be linked to the high level of applicant involvement (72%) in the grant decision making process. There also appears to be a need to improve the processes for adjudicating multidisciplinary proposals.

OTKA applicants are almost entirely Hungarian based. External mobility is high, however, as is

international and interdisciplinary collaboration. OTKA grant beneficiaries worked with an average of 7.58 researchers outside Hungary during their OTKA research project. In terms of OTKA applicant geographic mobility, other European countries are the most frequent destination followed by North America and Asia.

An analysis of OTKA grant impact shows that the differences between the academic and other achievements of those who received OTKA grants are not significantly different from those who did not attract OTKA funding, apart from in a small number of areas. OTKA grant beneficiaries were twice as likely as non-beneficiaries to be awarded academic prizes and, somewhat counter-intuitively, non-beneficiaries were more likely than beneficiaries to attract international grant awards.

## 2.5 Report of the Evaluation Committee

The Committee strongly endorsed OTKA as an appropriate body to manage national basic research capacity and its funding. In the Committee's view, OTKA conforms to the highest international standards in terms of its professionalism and procedures.

It noted OTKA's continuing improvements in terms of its approaches and instruments while also raising concerns about the instability of OTKA's operating environment in terms of its weak policy influence, low funding arrangements and weak institutional positioning.

The relatively small size of OTKA's budget as a proportion of national R&D expenditure and as compared to the *per capita* norms in neighbouring countries was noted by the Committee as was its small share of the research community budget. The Committee was also concerned about the small size of OTKA grants. It pointed out that underfunding basic research can have several negative consequences including failure to provide an infrastructure for the development and retention of top-class researchers or the inward attraction of researcher talent from abroad.

In terms of governance and related matters, the Evaluation Committee commended OTKA's high level of institutional independence from inappropriate political influence. This independence comes with drawbacks, however, and the Committee was concerned about OTKA's marginalisation in the policy making arena and its lack of institutional authority in terms of being empowered to negotiate its own budgets and, as a consequence, multi-year strategies.

OTKA's narrow role and responsibilities were of concern to the Committee. It felt that OTKA needed to develop multi-year strategies to address areas of national importance. The Committee believes that OTKA could play a more productive role in strengthening national research capacity, and particularly the nurturing and resourcing of emerging and early stage research talent. It sees OTKA as the obvious agent for investigator led research in Hungary. As such, it is of the view that OTKA's expertise and potential contribution should be proactively utilised by policy makers and more strongly recognised in terms of institutional positioning and role alignment.

In terms of OTKA's funding portfolio, the Committee found that it is well structured and appropriate to the needs to Hungarian researchers. Potential areas that the Committee felt could be developed by OTKA, with the agreement of the appropriate authorities, included the support structure for doctoral students. Internationalisation was also identified as an area where OTKA could play a more important role in terms of promoting the conditions to encourage inward researcher mobility and more generally promoting its importance to the universities and other key stakeholders. On a practical level, the Committee supported the implementation of a new funding scheme to support young Hungarian researchers to do postdoctoral research abroad as long as it did not duplicate existing schemes. The Committee also supported the incorporation of processes that recognise 'round two' level success in European Research Council (ERC) grant applications so that talented researchers are nurtured and supported nationally, increasing their chances of eventual ERC success.

The three-stage evaluation process used by OTKA in grant decision making was endorsed by the Committee. It noted the elaborate but appropriate administrative effort that went into grant selection in terms of panel arrangements and layers of decision making for relatively small grants. Rather than simplifying the grants administration process, the Committee concluded that OTKA's research budget is too small and that it should be increased in the order of 10% per annum. This would allow the size of award be increased to a realistic level. Other grant evaluation improvements encouraged by the Committee included the (continuing) internationalisation of review panels (and probable reduction in their number as a consequence), the development of procedures to deal with interdisciplinary proposals and the consistent use of 'open voting' across review panels.

The Committee was impressed by the level of researcher/scientific community involvement in

OTKA's management and operations. It noted the dilemma that high levels of involvement can increase the chances of conflict of interest claims arising and concluded that OTKA would be well advised to follow procedures of other research councils in minimising opportunities for them to occur. The Committee praised OTKA's administrative expertise in managing grant decision making and endorsed its approach and suitability for external calls/grant selection by other providers. It also endorsed OTKA's monitoring of grant beneficiaries while suggesting the number of annual reports could be reduced. Improvements in the systematic collection of grant outcome/impact data by way of bibliometrics, for example, were also proposed in the context of the Committee's satisfaction with OTKA's progress in already gathering some of the relevant data.

## 2.6 Discussion and conclusions

OTKA is a well managed funding body for basic research and a valuable asset in the Hungarian research system that could be more intensively utilised. Its internal organisational and management structures are clear and fit for purpose.

OTKA has a high degree of political autonomy but is somewhat marginalised by the policy system and has a low public profile. The OTKA Board needs to be empowered to negotiate its own budget, develop multi-year strategies and greater connectedness with relevant R&D agencies required by the Hungarian research system. This would allow it to transition from a high volume small grant body to one with a more ambitious strategy, programmes and capabilities to grow and support the long-term development of Hungarian research.

OTKA's funding portfolio is adequately diverse to cover the major needs of Hungarian researchers. Its focus on research grants is appropriate as there are other parties providing career grants. Its research grants are considered to be very important by institutional stakeholders and are clearly influential in the careers of individual researchers. They are awarded fairly and equitably on the basis of scientific excellence through a rigorous peer review system. Some improvements to the grant decision making process in terms of additional safeguards to prevent conflicts of interest are needed.

Overall, the high standing in which OTKA is held positions it well to manage other/external competitive grant programmes. Potentially, OTKA could also play an important role in supporting doctoral students and early stage researchers as the low

numbers of doctoral students poses a significant problem for developing the Hungarian research system.

OTKA is active internationally and committed to the principle that ‘money follows the researcher’. Its researchers are geographically mobile, working collaboratively with international researchers across disciplines and sectors. Inward researcher mobility is limited because the Hungarian research system is not yet attractive enough for international researchers, something OTKA could well work to influence. It could also do more to support those who had succeeded in getting to the second stage of ERC competitions.

OTKA grant beneficiaries have better career outcomes than non-beneficiaries. They are more likely to have been awarded an academic prize, to have published in peer reviewed journals and to have presented their work to Hungarian research conferences. However, unsuccessful OTKA applicants were more likely than OTKA grant beneficiaries to have won international grant awards, possibly because lack of success motivated grant seeking elsewhere or because they had slipped under the radar of the approvals process.

Applicants – whether successful or not – have a very positive view of OTKA’s administrative procedures. Within this positive context overall, two areas of improvement emerged, both of which are addressed by the recommendations that follow. The first relates to a perception of partiality because so many researchers are active in research panels. The second relates to the quality of OTKA’s feedback to unsuccessful applicants. Other areas requiring fine tuning include improving the procedures for assessing multidisciplinary proposals, implementing open voting consistently across panels and expanding the systems for long-term monitoring of research impact.

The conclusions from the Evaluation Committee review and the survey are overwhelmingly positive in terms of OTKA’s governance, administrative procedures and potential for an expanded role in the Hungarian research system. OTKA is a trusted, effective and valuable resource. In the words of the Evaluation Committee:

*“OTKA conforms to the research council conditions of: competitive on the basis of research excellence, political independence, equal treatment of all scientific disciplines, transparency and fairness and equal chances for all applicants regardless of gender, race or position which makes it the jewel in the crown of the Hungarian research system”.*

The recommendations that follow should be seen in the context of a very positive evaluation and the Committee’s hope that greater utilisation of OTKA’s strengths can be harnessed within the system.

## 2.7 Recommendations

### OTKA mission, governance and management structures

- The OTKA Board should be more centrally involved in developing basic research strategy at national level and have regular structured contact with policy makers and relevant agencies.
- OTKA’s future role in the Hungarian research system should be examined with a view to optimising its research management strengths and potential to better support beginning and early stage researchers. Its functional independence from the Hungarian Academy of Sciences should form part of any such examination so that it can work towards defining its own strategy in keeping with national research priorities.
- The OTKA Board should negotiate a continuous but substantial (in the order of at least 10% per year) increase in its budget to allow it to more effectively fulfil its mandate to support basic research funding at national level.
- OTKA should raise its public profile and ensure that relevant policy makers are aware of its grant management expertise. It should invest in public relations, and consider expanding its PR activities towards research communication.
- OTKA should continue to strongly involve members of the scientific community in its decision making bodies. At the same time OTKA should ensure that robust safeguards against conflicts of interest are in place.

### Funding portfolio

- OTKA should continue to offer a limited number of well defined schemes. Introduction of any new schemes should be subject to a full examination of other schemes operating in the national research and higher education system to ensure complementarities, optimisation of competencies and to minimise potential for duplication.
- OTKA should retain its focus on funding basic research and explore opportunities to develop bridges with the body responsible for applied research.
- OTKA should use any additional funding to increase the size of grants as well as to tackle any gaps in the research system it is well placed to

address. Possible gaps include early stage researchers, schemes for internal/external mobility, and sustainable support for doctoral students.

### **Internationalisation**

- OTKA should raise awareness amongst key stakeholders of its international agenda and its role in supporting inward and outward mobility. Where appropriate, calls for proposals should clearly state that international collaboration is a clear added value to the proposal. The OTKA website should provide extensive information about the upcoming calls in English and Hungarian.
- OTKA should explore ways to support researchers applying for ERC grants, for example by asking applicants to indicate if they had applied for H2020 funding or an ERC grant and, if so, what mark or level they achieved. By doing so, proposals that had made it to the second round of an ERC competition could be given recognition in the OTKA evaluation processes. OTKA should encourage ERC applications in other ways, for example, by providing small grants to ERC applicants.

### **Procedures**

- OTKA should prevent any perception of conflicts of interest by following the example of other councils in ensuring that panel members are not simultaneously applying for funding, e.g., by decreasing the term of the panel members, or by having a special panel consisting only of international reviewers for adjudicating applications from panel members. OTKA should actively communicate to the research community about its safeguard measures to avoid potential conflicts of interest.
- OTKA should continue the process of increasing the involvement of international reviewers in review panels and increasing the proportion of international researchers in its remote reviewer network.
- OTKA should review the quality of its feedback procedures. In particular, feedback for applicants who received a negative funding decision should provide adequate detail on the reason for the decision and pointers as to what would have been needed for the proposal to have been successful.
- OTKA should review and possibly improve its procedures for the selection of interdisciplinary proposals and actively communicate these to potential applicants.
- For reasons of transparency, all OTKA decision making bodies such as the review panels and scientific councils should consistently use 'open voting' procedures.

- OTKA should encourage more women to apply, e.g., by publicising the similar success levels between men and women.
- OTKA should closely monitor and improve the representation of women in its decision making bodies (especially in the scientific councils) and amongst reviewers.
- While the system of monitoring the success of individual grants is appropriate, OTKA should consider doing away with annual reports (or at least limit their number), as they appear to create administrative overhead with little effect.
- OTKA should monitor both academic and socio-economic impact of funded research, e.g., by performing a bibliometric analysis of the outcome of OTKA funded projects and by performing an assessment of wider and longer-term impacts of its activities through periodic surveys of grant beneficiaries.

## 3.

# Description of the Evaluation Process and Methodology



### 3.1 Structure of the report

Following the foreword by the ESF Chief Executive and the Executive Summary, the evaluation process and methodology are described in Section 3. A brief description of the national research and development (R&D) context and OTKA's role are provided in Sections 4 and 5. The survey findings and the analysis of the OTKA administrative data are provided in Section 6. Section 7 provides the report prepared by the ESF Evaluation Committee. Sections 8 and 9 summarise the conclusions of the evaluation and provide recommendations to OTKA, on the basis of the evaluation findings and conclusions.

### 3.2 Background to the evaluation

This evaluation by the European Science Foundation (ESF) was commissioned by the Hungarian Scientific Research Fund (OTKA). A Memorandum of Understanding was signed in late 2013 that set out the terms of reference for ESF to plan and execute an independent evaluation study of OTKA as a national research funding body, within the general context of Hungarian and European public research funding.

OTKA is an organisation with a long history. It was established in 1986 to initiate Hungary's transition into competitive research funding modelled on the approaches of German (Deutsche Forschungsgemeinschaft) and American (National Science Foundation, National Institutes of Health) research funds. While its mission, '*supporting excellent basic research in Hungary*', has remained unchanged over the years, OTKA has continuously developed its processes to adapt to changing

requirements and learning based on international best practice and its own experience.

This evaluation represents OTKA's first international review. Recognising the importance of an international and independent review, OTKA's governance made the evaluation an objective in its strategic plan for 2013-2015. As such, the current evaluation examines the activities of OTKA over a five-year period (2009 – 2013) with the overall goal of identifying strengths and recommendations for further improvement related to OTKA governance and management structures.

### 3.3 Terms of reference

The scope of the evaluation embraces the following:

1. Assessment of the OTKA governance and management structures
2. Assessment of the OTKA funding portfolio, with regard to
  - a) Its coherence with the OTKA strategic goals
  - b) Its internationalisation
  - c) The efficiency and transparency of the procedures for the OTKA funding schemes.

The terms of reference were to:

1. Establish, in consultation with OTKA, the evaluation protocol including the evaluation criteria and methodology as well as the detailed work plan (set out in Appendix I)
2. Constitute the Evaluation Committee
3. Implement an independent evaluation study including the drafting of the evaluation report based on contributions of the Evaluation Committee.

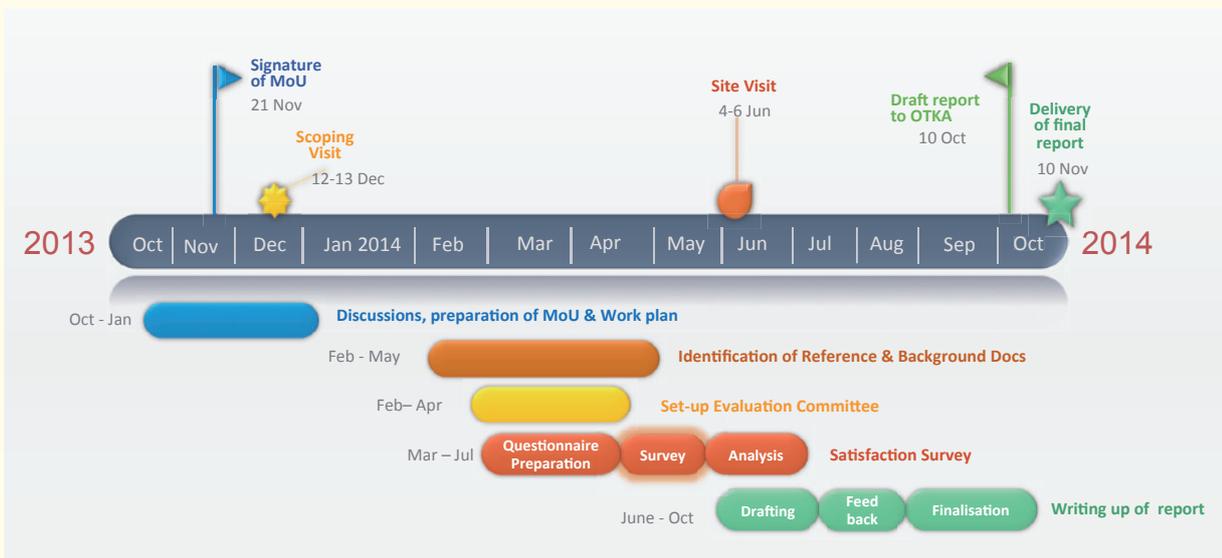


Figure 1. Timeline of the evaluation process

### 3.4 Methodology

The evaluation design features a mixed-methods approach including a scoping visit, desk research and an outcomes survey of OTKA's applicants (both successful and unsuccessful) by the ESF. In addition, an expert international peer review of OTKA's funding portfolio, governance, strategy and procedures was conducted by an Evaluation Committee. The agreed timeline and main steps of the evaluation process are presented in Figure 1 above.

#### 3.4.1 Scoping visit

A scoping visit to OTKA by the ESF Chief Executive and the Evaluation Coordinator took place on 12-13 December 2013. During the visit, the ESF representatives met with OTKA governance and staff, the representatives of selected universities and research institutes, a number of OTKA applicants as well as representatives of the main external stakeholder organisations, e.g., the Hungarian Academy of Sciences, the Ministry of Human Capacities, the Science and Research Committee of the Hungarian Parliament. The purpose of these meetings was to inform the relevant stakeholders about the upcoming evaluation, gain an understanding of the national context and identify and gather relevant documents for the evaluation. In addition, the evaluation protocol and an outline timeline were agreed with the OTKA representatives.

#### 3.4.2 International peer review

The peer review was carried out by an international independent Evaluation Committee of research experts and senior academics set up by the ESF following the scoping visit. The Committee was

chaired by Professor Christoph Kratky and had the following membership:

#### Professor Christoph Kratky (Chair)

- Professor of molecular biology at Karl Franzens University in Graz
- Former president of the Austrian Science Fund (FWF), 2005-2013

#### Professor Jens Christian Djurhuus

- Professor, Institute for Clinical Medicine, Aarhus University
- Former Chairman of the Danish Council for Independent Research

#### Professor Frank Hegarty

- Professor emeritus of Organic Chemistry, University College Dublin
- Deputy Chair, Irish Research Council for Science, Engineering and Technology (2001-2011)
- Member of the Royal Irish Academy

#### Professor Milena Horvat

- Head of Department of Environmental Sciences at Institut Jožef Stefan
- Vice President of the Management Board, Slovenian Funding Agency

#### Professor Anu Realo

- Academy Research Professor at the Institute of Psychology, University of Tartu
- Vice Chair of the Evaluation Board of the Estonian Research Council

#### Dr Barend van der Meulen

- Head of Department of Science System Assessment at Rathenau Instituut, Netherlands

During the site visit to Budapest (4-6 June 2014), the Evaluation Committee and the Evaluation Coordinator met with OTKA governance rep-

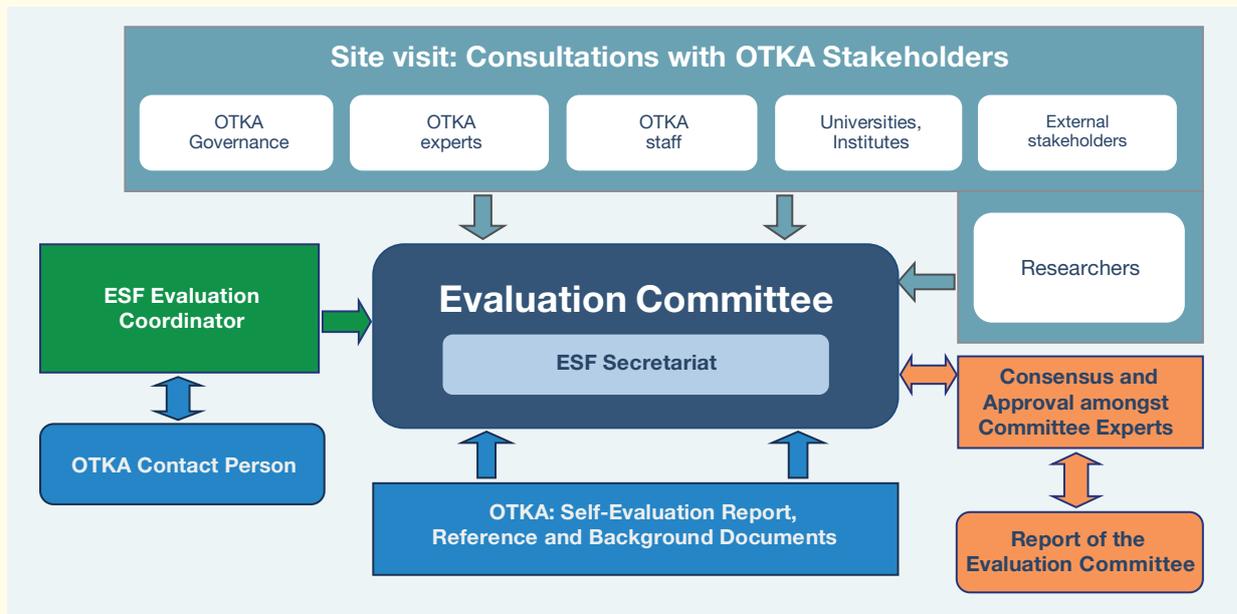


Figure 2. Conceptual framework for the expert peer review process

representatives and staff, as well as other important stakeholders and OTKA clients. The Evaluation Committee invited representatives of various relevant stakeholder organisations to provide their views on different aspects of OTKA strategy and operations. Each group included three to eight representatives, and the interviews were conducted in the form of a guided discussion led by the members of the Evaluation Committee. The full list of all stakeholders consulted is available in Appendix II. ESF made digital recordings of all interviews and discussions. These were made available to the Evaluation Committee.

The groups consulted included:

1. OTKA Governance: OTKA President, presidents of the OTKA scientific councils and the Director of the OTKA Office
2. Chairs of OTKA review panels and OTKA staff members
3. Heads of Hungarian research and higher education organisations: universities and research institutes of the Hungarian Academy of Sciences
4. Research communities: established and early career researchers selected from amongst OTKA applicants during 2009-2013
5. Relevant external stakeholders: the Ministry of Human Capacities, the Hungarian Academy of Sciences and the National Innovation Office.

In addition to the stakeholder consultations, the work of the Evaluation Committee included reviewing various reference documents provided by OTKA. These included OTKA's strategic plan, annual activity reports, as well as documents describing various internal procedures. ESF also

reviewed additional background documents relevant to the Hungarian research policy context. The list of the documents and links that were made available to the Evaluation Committee is provided in Appendix III.

OTKA was also asked to prepare a self-evaluation report using a template provided by ESF. It included a description of OTKA's strategic goals, its portfolio of activities, as well as a SWOT analysis.

After analysing the self-evaluation report, reference/background documents and the interview and focus group material, the Evaluation Committee started their discussions and deliberations. They identified the main themes and issues emerging from the evaluation exercise and reached consensus on the strengths of the OTKA research system and areas needing improvement. These were later elaborated in the form of written findings which have been integrated into this report.

A draft evaluation report was submitted to OTKA management in order to ensure that the report was free of any factual errors and to assure the integrity of the information included. OTKA was neither invited nor sought to question judgments and/or conclusions made by the Evaluation Committee as is consistent with independent good evaluation practice. Figure 2 depicts the overall conceptual framework for the peer review process.

### 3.4.3 Survey of OTKA applicants

A survey of OTKA applicants was carried out by the ESF in order to:

1. Measure the level of satisfaction of OTKA's applicants with grant administration and procedures

2. Assess the impact of OTKA research funding based on a counterfactual comparison of the scientific outcomes of successful and unsuccessful (grant funded) applicants
3. Assess internationalisation of OTKA funded research.

For the purposes of the survey, OTKA provided contact data for all applicants to the various OTKA funding schemes for the period 2009-2013. The total number of applicants was 6,141, from which a random sample of 868 was selected (confidence level: 95%, confidence interval: 4). The survey was launched on 24 April 2014. Several follow-up requests were made to help achieve a high response rate. When an acceptably high rate was achieved the survey was closed (26 May) with a total of 590 respondents, giving a response rate of 68%. This is high enough to allow findings in the sample to be generalised confidently to the full OTKA applicant population. It can also be inferred that there was a genuine and strong interest from the OTKA research community in contributing to the evaluation. The main findings and analysis of the survey are provided in Section 6 and the questionnaire response summary can be found in Appendix IV.

### 3.5 Roles and responsibilities

In the evaluation process, ESF responsibilities included:

- Planning and managing the overall evaluation process
- Selecting and establishing the Evaluation Committee
- Organising the Evaluation Committee site visit, in collaboration with OTKA
- Designing, conducting and analysing the survey of OTKA applicants
- Drafting the evaluation report, based on the contributions of the Evaluation Committee and survey outcomes.

The Evaluation Committee was responsible for:

- Providing an independent and impartial evaluation of OTKA's governance and management structures and funding portfolio
- Making informed judgments on the merit and value of the OTKA research.

The Chair of the Evaluation Committee presided over all committee meetings, as well as the meetings with OTKA representatives and stakeholders during the site visit. He furthermore edited the

Evaluation Committee's report in collaboration with the Evaluation Coordinator, based on the contributions of the Evaluation Committee members.

Finally, OTKA responsibilities included:

- Providing reference and background documents for the evaluation
- Arranging the site visit in collaboration with ESF
- Organising consultations with stakeholders, and facilitating the work of the Evaluation Committee during their visit to Budapest.

## 4. Description of the National R&D Context



### National Research, Development and Innovation (RDI) system: key figures

With a population of 9.89 million in 2013, Hungary is a medium-sized EU member state. It entered the European Union in 2004. Over the last years, Hungary has made steady progress with regard to its R&D expenditure and intensity, as well as improving scientific quality, increasing patent revenues and making structural change towards a more knowledge-intensive economy.<sup>1</sup> In 2011, Hungary had an R&D intensity of 1.2%, up from 0.88% in 2004, demonstrating progress, although remaining well below the 2% average of the EU. In the 2011 National Reform Programme, the Hungarian government set an R&D intensity target for 2020 of 1.8%. The EU's target for the same year is 3%. Between 2004 and 2012 the total R&D expenditure in Hungary increased steadily, largely due to an increasing share of business expenditure, which now exceeds public resources.<sup>2</sup> At the same time, public funding for R&D activities has decreased significantly from 41.9% in 2009 to 36.9% in 2012 (448 M€ in 2009 to 463.5 M€ in 2012).<sup>3</sup>

While still performing below the EU average on most Innovation Union progress indicators, Hungary performs close to the EU average with regard to the share of employment in knowledge intensive activities, and the growing share of busi-

ness enterprise researchers per thousand of the labour force. Hungary exceeds the EU average with regard to the rate of business enterprise expenditure on R&D (BERD) financed from abroad and the EU FP7 funding per thousand GERD (gross domestic expenditure on R&D).

Vulnerable areas include research outputs and human resources, as well as innovation and technology production. Hungary had a lower number of researchers (5 researchers FTE per thousand labour force) than the EU average (6.6) in 2010,<sup>4</sup> and also a lower share of new doctoral graduates (0.8% per thousand of the population aged 25-34 in 2010, compared to an EU average of 1.6%).<sup>5</sup> It has progressed moderately with regard to the number of new doctorate graduates with an average annual increase of 5.1% over 2000-2010. Only 5% of Hungarian scientific publications are in the top 10% of most cited publications, compared to an EU average of 11.6%. However, the number of international scientific publications (387 per million population in 2011) is above the EU average (300) and has been growing with an average annual rate of 5.7% over 2000-2012.<sup>6</sup>

Inward researcher mobility is declining with an average annual drop of 8.9% in the share of foreign doctoral students over 2000-2012.<sup>7</sup> In 2010, the percentage of foreign doctoral students amongst all doctoral students was only 2.6%, compared to an EU average of 20%.<sup>8</sup> Strikingly, only 2% of researcher positions were advertised through EURAXESS in 2012, compared to the EU average of 40.8%.

1. *European Commission (2013) Research and Innovation performance in EU Member States and Associated countries. Innovation Union progress at country level 2013.*

2. *National Innovation Office (2013) The National Research and Development and Innovation Strategy (2013-2020) 'Investment in the future'.*

3. *ERAWATCH country pages: Hungary* [http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/country\\_pages/hu](http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/country_pages/hu)

4. *Researchers' Report 2013. Country Profile: Hungary.* Deloitte.

5. *European Commission (2013) Research and Innovation performance in EU Member States and Associated countries. Innovation Union progress at country level 2013.*

6. *Ibid.*

7. *Ibid.*

8. *Researchers' Report 2013. Country Profile: Hungary.* Deloitte.

Hungary performs slightly better than the EU average with regard to outward mobility, with 34% of post-PhD researchers having been internationally mobile in the last ten years.<sup>9</sup>

The European Innovation Scoreboard 2014<sup>10</sup> classifies Hungary as a moderate innovator, together with Croatia, Czech Republic, Greece, Hungary, Italy, Lithuania, Malta, Poland, Portugal, Slovakia and Spain. Hungary's innovation index performance between the years 2006 and 2013 has been improving steadily, with an average annual growth rate (2.4%) above the EU average of 1.7%. Its performance relative to the EU increased to 63% in 2013 from around 60% in 2006. According to the Innovation Union Progress Report,<sup>11</sup> when it comes to innovation and technology production, Hungary has a low level of Patent Cooperation Treaty (PCT) patent applications with a decreasing trend. Hungary does better in terms of licence and patent revenue from abroad. This is probably due to the increased role of large foreign-owned companies in business R&D investment. With regard to scientific production, the pharmaceutical industry, the IT sector and the automotive industry are strongest in Hungary.

The Hungarian National Research and Development and Innovation Strategy (2013-2020) 'Investment in the future' prepared by the Ministry for National Economy and published by the National Innovation Office (NIH) highlights the urgent need to tackle the challenges related to the development of the Hungarian knowledge base. Some of the major challenges listed in the strategy include poor supply of new researchers and outdated scientific education, the lack of internationally competitive research centres and eroded research infrastructures, and lack of stability of the institutional system and public R&D funding. With regard to knowledge flow and utilisation, the weaknesses of the system include weak linkages between industry and research units, the small number of innovative small and medium-size businesses, and poor coordination of various RDI policies and subsidies.

In this context, the national strategy highlights the importance of the EU's Horizon 2020 programmes, and calls for more efficient use of the EU (co-)funding resources in the future. Hungarian researchers have already shown good success in FP7: among the new EU member states, Hungary

submitted the second highest number of successful applications, after Poland, and also received the second highest amount of funding. However, when taking the whole European Union as the benchmark, Hungary's combined performance in terms of both success rate and funding *per capita* has been lower than the EU average.<sup>12</sup> Hungary has had a participant success rate of 20.4% in FP7, close to the EU average of 21.5%, and received more than 114 M€ for 681 Hungarian participations from 2007 up to mid-2011.<sup>13</sup> The Hungarian business sector has also responded well to the appearance of the EU co-funded resources.<sup>14</sup>

## Key players at the national level

The latest ERAWATCH country report for Hungary and ERAWATCH country pages<sup>15</sup> mention the following as key players in the Hungarian science, technology and innovation (STI) policy system: the Parliament, the National Development Cabinet, the Ministry of National Development, the Ministry for National Economy, the Ministry of Human Capacities, the National Innovation Office (NIH), and the Hungarian Academy of Sciences. Figure 3 depicts the current structure of the RDI system in Hungary, distinguishing between its political, strategic and operational levels.

The Parliament is the highest-level political body in the field of Science, Technology and Innovation (STI) policy. In addition to its two supporting committees on Education, Science and Research, and Economic and Informatics, in 2011 the Parliament established the Innovation and Development Ad-hoc Committee which provides support to the Parliament in reviewing the relevant laws, acts and government decrees, the management practice of the government and assessing the effectiveness of the STI policies.

At strategic level, there have been several changes during the past years. The high-level STI policy coordination body, the National Research, Innovation and Science Policy Council (NKITT), which was set up in December 2010, was dissolved in July

9. *Ibid.*

10. [http://ec.europa.eu/enterprise/policies/innovation/files/ius/ius-2014\\_en.pdf](http://ec.europa.eu/enterprise/policies/innovation/files/ius/ius-2014_en.pdf)

11. *European Commission (2013)* Research and Innovation performance in EU Member States and Associated countries. Innovation Union progress at country level 2013.

12. *National Innovation Office (2013)* The National Research and Development and Innovation Strategy (2013-2020) 'Investment in the future'.

13. *European Commission (2013)* Research and Innovation performance in EU Member States and Associated countries. Innovation Union progress at country level 2013.

14. *National Innovation Office (2013)* The National Research and Development and Innovation Strategy (2013-2020) 'Investment in the future'.

15. *ERAWATCH Country Report 2012: Hungary. ERAWATCH country pages: Hungary* [http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/country\\_pages/hu](http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/country_pages/hu)

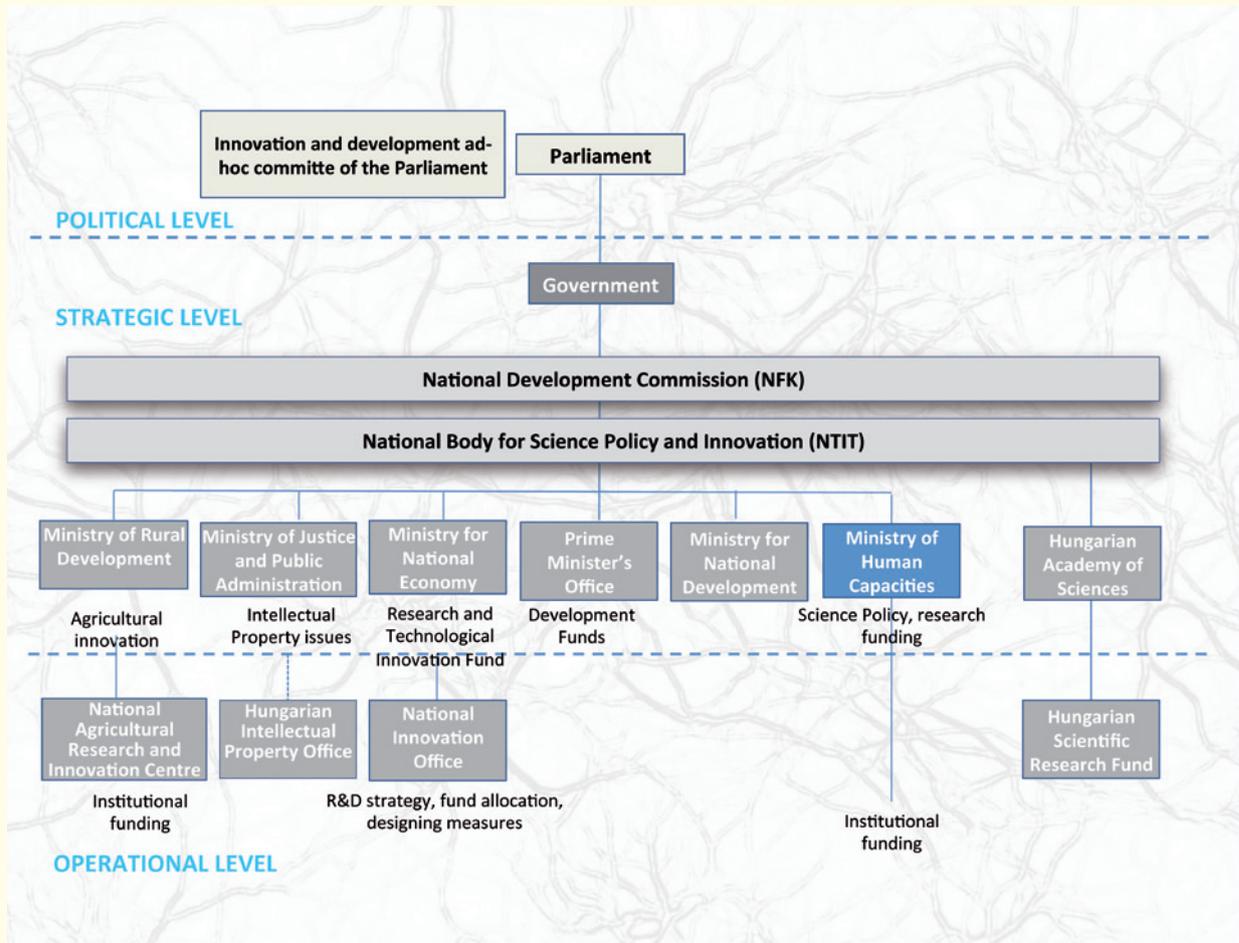


Figure 3. Structure of the RDI governance in Hungary (source: The Ministry of Human Capacities)

2012 when a new body, the National Development Cabinet (NFK) was set up by the Prime Minister. The members include the Secretary of State and the ministers responsible for the national economy and national development. NFK discusses and approves all major development policies, including RDI support programmes, and has the right to initiate legislation concerning development policy issues. The Government can only make decisions on any development policy issue once it has been discussed and approved by NFK.

The National Science Policy and Innovation Board (NTIT) is an advisory body established in 2013. It is chaired by the Prime Minister, and co-chaired by the President of the Hungarian Academy of Sciences. NTIT's mandate is to provide advice, evaluate and make recommendations on strategic issues of scientific, research and development and innovation programmes, the sustainable finance of these programmes and the evaluation methodology to be used at scientific institutions.

The Hungarian Academy of Sciences, established in 1825, plays a double role: it has responsibilities for contributing to science policy making, as well as implementing the largest network of non-university

research institutes in Hungary. Its tasks involve supporting and conducting research at its own research institutes and research units affiliated with universities, promoting science and disseminating scientific results, forming expert opinion on the major issues of science and society in Hungary, and fostering international relations in research. The network of the Academy's research institutes was reorganised in 2012: its former 38 research institutes and two research centres were merged into 10 research centres and five research institutes.

At operational level, the National Innovation Office (NIH) is a major player. The NIH is the governmental body responsible for research, development and technological innovation, providing support to STI policy development (e.g., performing statistical research), implementing innovation support schemes (e.g., promoting start-ups and innovation activities of SMEs) as well as international RDI collaboration (e.g., coordinating Hungary's participation in the EU's funding schemes – Horizon 2020, Joint Programmes, ERA-NETs as well as bilateral agreements with other countries).

## Public R&D funders

In 2012, the share of government funding was 39% for the higher education sector, 32% for public research organisations (PROs) and 29% for business enterprise.<sup>16</sup>

In addition to institutional funding for higher education institutions (HEIs) and PROs, there are three main sources of RDI funding that are allocated on a competitive basis.

One important source is the Research and Technological Innovation Fund (RTIF). The Fund used to allocate funds from two sources – the innovation levy paid by medium-sized and large firms and the matching contribution from the central budget. However, since 2012, the central budget contribution to the fund was discontinued, its only source now being the innovation levy.

Another important source of funding is the various Operational Programmes (OPs) co-financed by the EU Structural Funds. In the new programming period 2014-2020, it is planned that, out of nine OPs, three will specifically address STI. Five ministries (i.e., the ministries for National Economy, National Development, Human Capacities, Public Administration and Justice as well as Rural Development) will be responsible for implementing the Operational Programmes.

OTKA provides competitive funding for basic research in all the major scientific disciplines.

In addition, the Hungarian Academy of Sciences runs several competitive funding programmes such as the ‘Momentum Programme’ or the ‘Bolyai Janos Research Scholarship’ supporting outstanding young researchers.

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16. Source: Eurostat

## 5. OTKA Overview

Established in 1986, OTKA's mission is to provide support to outstanding discovery oriented (basic) research in all fields of science carried out in Hungarian institutions. The funding is allocated on a competitive basis and appraised through a peer review system. Its aims are:<sup>17</sup>

- Supporting discovery research in every field of science
- Supporting the highest-level research projects of international standing
- Giving preference to economic and social implications of research results
- Supporting research projects carried out in Hungarian institutions
- Supporting research according to the 'blue sky research' approach
- Running a proposal system that covers every stage of a researcher's career
- Cooperating with international organisations
- Maintaining a peer review system of international standard, involving the scientific community
- Ensuring transparent, modern, effective operation
- Responsible handling of public funding.

The budget for OTKA's programmes, currently at about 25 M€, was increased by 41% in 2012 compared to 2011 and has not been increased since (Figure 4).

Among the institutional recipients of OTKA funding, in 2013, universities and colleges competed for and won 54.4% of the awarded funding, followed by the research institutes of the Hungarian Academy of Sciences (39%). OTKA funds applications from all fields of science, with around 45% of its funding going to life sciences, 32% to physical sciences and engineering and 23% to humanities and social sciences in 2013.

17. OTKA Annual Report 2013

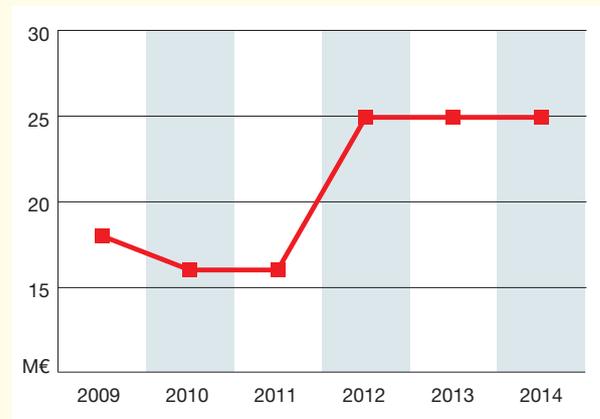


Figure 4. The state budget of OTKA Programmes by the Act on the Budget of Hungary (M€) from 2009-2014

OTKA provides support to both 'senior' researchers via calls for research projects (about 73% of total OTKA grants), and 'early career' researchers, for instance, via postdoctoral proposals scheme (about 15% of total OTKA grants), as well as large scale junior research projects (about 3% of OTKA grants). Other smaller schemes provide support for publications and international cooperation.

The organisational structure of OTKA depicted in Figure 5, consists of the OTKA Board, three scientific councils, 29 review panels and the OTKA office.<sup>18</sup>

**Review Panels** evaluate proposals and prepare a preliminary ranking based on independent reviews. Panel members are selected to proportionately represent the different institution types, different geographic regions, and various scientific disciplines.

18. OTKA Self-Evaluation Report. May 2014.

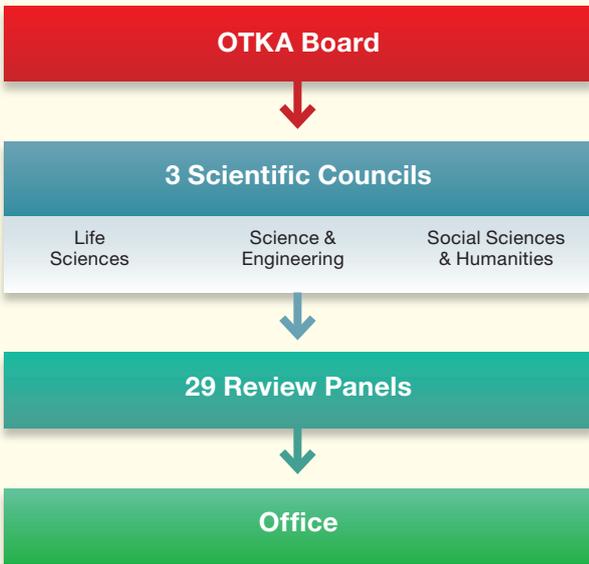


Figure 5. OTKA organisational structure

**Scientific Councils** supervise the work of the review panels, discuss and approve the ranking lists by secret ballot with the right to take science policy aspects into consideration. Another of the councils' tasks is to make suggestions to the OTKA Board on the modification of the proposal system, rules of procedure, panel system and evaluation criteria.

The **OTKA Board** makes final funding decisions with regard to the supported proposals and determines OTKA's strategy, proposal structure, funding policy and administrative regulations. It is composed of 18 members who include representatives of the Academy, certain ministries, the Hungarian Rectors' Conference, public collections, and the National Innovation Office, as well as the presidents of the three scientific councils. The members, with the exception of the presidents of the scientific councils, are appointed by the Prime Minister for a three-year period.

The operation of OTKA depends on the involvement of a large number of researchers, including grant applicants and those researchers involved in its decision making bodies. In 2013, researcher involvement in OTKA embraced:

- Three scientific councils (each involving about 20 researchers)
- 29 review panels (each involving about 15-20 researchers)
- Overall 450 members of different decision making bodies
- 8,000 – 10,000 applicants
- 5,000 persons per year connected with the proposal system (applicants, reviewers, members of different bodies).

The technical, financial, organisational and administrative tasks associated with the operation of OTKA are performed by the OTKA office. The office supports the review process, and contracts and monitors the funded projects. The office is composed of 43 public servants, and five senior science administrators assisting the work of OTKA committees in the framework of other assignments.

OTKA requires all proposals to be submitted in English (with the exception of 'Hungaricum' type proposals) which are evaluated by at least three external experts, including both Hungarian and foreign reviewers. On the basis of these reviews, the respective review panel or a dedicated committee evaluates and ranks the proposals. The scientific councils discuss and finalise the ranked lists of proposals, and the OTKA Board makes final funding decisions.

## 6.

# Main findings of the Survey of OTKA Applicants and Analysis of OTKA Administrative Data



ESF carried out a survey of OTKA's applicants over the period 2009-2013 to measure their satisfaction with OTKA's procedures, and examine the outcomes of researchers' activities including grant success, internationalisation and impact on research careers. This was based on a counterfactual comparison of scientific outcomes of successful and unsuccessful funding applicants.

The main findings of the survey are presented below and the survey response summary is presented in Appendix IV. In addition to the survey, a complementary statistical analysis of the available administrative data for the full population (6,141) of OTKA applicants was conducted and the relevant results are also presented in this section.

### 6.1 Demographic profile of OTKA applicants

#### Age distribution of applicants across all years

As can be seen from Figure 6 below, OTKA applicants are spread across all age categories, with a higher proportion of older than younger applicants across all years (2009-2013).

#### Relationship between age and grant success across all years

As Table 1 illustrates, taking all years into account, nearly 19% of grant awardees at the time of the survey were under 40 years old, of whom less than 1% was under 30. Some 81% were over 40 years of age, of whom 21% were between 40 and 50 years old. About 50% of the grant awardees were over 50 years old, of whom some 13% were over 65.

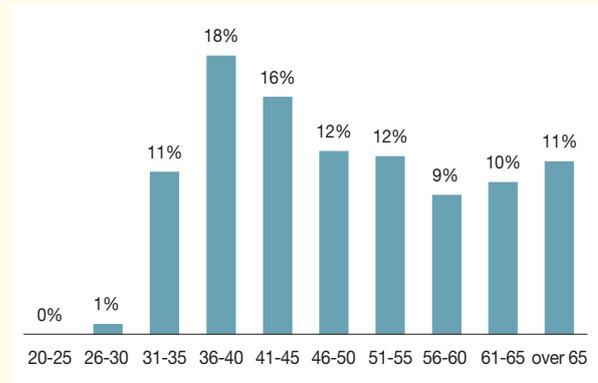


Figure 6. Age distribution of OTKA applicants across all years (2009 – 2013)

#### Relationship between age and grant success in the most recent year (2013)

The applicant profile over the full period (2009-2013) appears to be skewed towards older respondents as does grant success. Age distribution patterns across all years can be misleading, however, as the actual 'live' age trends in any one year are obscured. The year 2013 being the most recent year for which grant figures are available is the most appropriate reference to examine the actual age and grant success trends. This is because historical award patterns are inherently skewed by age (older beneficiaries would have higher numbers of grants going back over time). Taking the most recent grant year controls for that tendency, allowing us to see how different age groups performed at any one point in time.

In Figure 7 below, with 2013 as the most recent reference year, it can be seen that a healthy 30% of OTKA grant awardees were under 40 years of age. Some 41% were aged between 40 and 50, and 17% were between 50 and 60. Those aged over 60 accounted for 11% of the sample.

**Table 1.** Relationship between age and grant success across all years

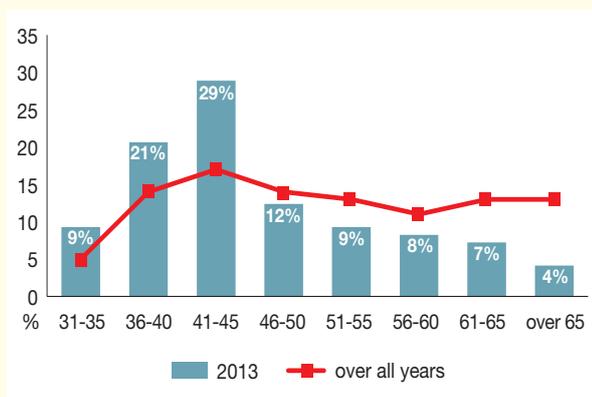
	Period Grant Awarded													
	pre-2009		2009		2010		2011		2012		2013		Total	
Age	N°	%	N°	%	N°	%	N°	%	N°	%	N°	%	N°	%
31-35	0	0%	3	3%	7	9%	5	6%	12	10%	9	9%	36	5%
36-40	36	11%	11	13%	9	12%	17	21%	18	16%	20	21%	111	14%
41-45	59	18%	11	13%	10	14%	12	15%	14	12%	28	29%	134	17%
46-50	45	14%	18	21%	12	16%	6	7%	18	16%	12	12%	111	14%
51-55	47	15%	10	12%	7	9%	14	17%	16	14%	9	9%	103	13%
56-60	40	13%	8	9%	6	8%	9	11%	13	11%	8	8%	84	11%
61-65	42	13%	15	17%	11	15%	5	6%	17	15%	7	7%	97	13%
Over 65	51	16%	10	12%	12	16%	14	17%	7	6%	4	4%	98	13%
<b>Total</b>	<b>320</b>	<b>100%</b>	<b>86</b>	<b>100%</b>	<b>74</b>	<b>100%</b>	<b>82</b>	<b>100%</b>	<b>115</b>	<b>100%</b>	<b>97</b>	<b>100%</b>	<b>774</b>	<b>100%</b>

**Table 2.** Application overview by gender and research programme activity, 2009-2013

	N° Applicants	Awarded	Success rate	Not awarded
<b>Women</b>	<b>1,773</b>	<b>491</b>	<b>28%</b>	<b>1,282</b>
Life Sciences	738	176	24%	562
Physical Sciences & Engineering	332	91	27%	241
Social Sciences & Humanities	601	170	28%	431
International	22	0	0%	22
Publication Grants	80	54	68%	26
<b>Men</b>	<b>4,368</b>	<b>1,275</b>	<b>29%</b>	<b>3,093</b>
Life Sciences	1,656	434	26%	1,222
Physical Sciences & Engineering	1,471	421	29%	1,050
Social Sciences & Humanities	1,061	329	31%	732
International	48	0	0%	48
Publication Grants	132	91	69%	41
<b>Grand Total</b>	<b>6,141</b>	<b>1,766</b>	<b>29%</b>	<b>4,375</b>

## Gender

OTKA grant applicants were much more likely to be men than women. The administrative data indicate (as do the survey data) that there were almost two and a half times more male (4,368, or 71% of the population) than female applicants (1,773, or 29%



**Figure 7.** Grant success per age group (2013)

of the population) during 2009-2013. However, the success rates for men and women were similar – 29% and 28%, respectively.

The success rates of men and women are also very similar across the three domains of science groupings used by OTKA: life sciences, physical sciences and engineering and social sciences and humanities (see Table 2 above).

According to the data provided by the OTKA office for 2013, women represented 24% of all reviewers, 22% of review panel members, 11% of the scientific council members and 17% of the OTKA Board members.

## Education level

As would be expected, most OTKA applicants had a doctoral degree (87%) and 25% also had a postdoctoral qualification.

## Employment status

The majority of the respondents (76%) were in secure employment, i.e., employed on permanent full-time contracts. A further 10% were full-time employees on temporary contracts. Some 2% were employed part-time and about 2% described themselves as ‘interns’. Almost 5% of respondents described themselves as ‘retired’ and nearly 3% as in ‘full-time study’.

Over 86% of the respondents said they worked as researchers. Of these, over 40% identified themselves as ‘leading researchers’, or researchers leading their research area or field (R4 according to the European Commission’s communication *Towards a European Framework for Research Careers*<sup>19</sup>). Over 30% identified themselves as established researchers (R3) who have developed a level of independence, and over 20% as recognised researchers (R2), i.e., PhD holders or equivalent who are not yet fully independent. Fewer than 2% identified themselves as first stage researchers (R1) up to the point of PhD. This is not surprising given that OTKA funding is not aimed at the R1 group.

Success rates were much higher for more senior researchers, as might be expected. Of the 402 successful R2-R4 researchers, more than half (52%) described themselves as being at the R4 level. Some 33% of successful applicants described themselves as being at R3, and 12% were at the early (R2) stage.

**Table 3.** Researcher seniority and success rates, 2009-2013

	N° applicants	N° successful	Success rate
R2	103	50	48%
R3	178	134	75%
R4	216	213	99%

As can be seen from Table 3 above, success rates of early stage researchers over a five-year time period are at a reasonably high level compared to more senior peers. There are almost no first stage researchers among the respondents (as they are not eligible to apply for OTKA grants). Those at the senior R4 level have very high grant application success levels.

## OTKA funding success rate for all applicants

According to the OTKA administrative data, the average success rate of OTKA applicants (all instru-

ments, 2009-2013) was 29% (see Table 4 below). The success rate dropped from 32% in 2011 to 24% in 2012 but then went up to 27% in 2013.

## Non-OTKA vs OTKA funding success rates

Returning to the survey data, the sample was asked about their success rates for OTKA and non-OTKA funding applications. Some 77% of OTKA applicants applied for other research funding. Respondents claimed a much higher success rate for non-OTKA funding compared to OTKA funding success. For example, of those respondents who applied for OTKA funding in 2009, over 40% were successful, compared to 80% of those who applied for non-OTKA funding. Similar tendencies can be seen for the years 2010-2013. There is a much higher proportion of very small grants (under 5,000 HUF) awarded by non-OTKA sources (some 53% of first grants) compared to OTKA grants (34% of first grants).

## 6.2 OTKA grant administration processes

Respondents were asked a series of questions about their perceptions of OTKA’s grant administration process. Please see the questions and the analysis of responses in the Table 5.

As can be seen from this table, in overall terms the ratings are very positive with some aspects achieving higher levels of satisfaction than others. There is only one area of notable weakness.

In terms of respondents’ perceptions, the highest rating (level of agreement) was achieved for the importance of OTKA support for respondents’ research careers.

OTKA’s administration system was perceived to be both effective and highly efficient with over 75% of respondents agreeing or strongly agreeing with the following statements (listed in order of rating strength):

- “Queries were dealt with quickly and efficiently”
- “The electronic application system was easy to use/navigate”
- “The procedures for applying for funding are easy to understand”
- “The OTKA funding programmes were well advertised/publicly communicated”
- “Overall the OTKA funding, application and award process was well managed”.

Only a very small number of open-ended comments were made about the applications/submission procedure. The only issues raised were that it could be simplified and that applications should be in one

19. [http://ec.europa.eu/euraxess/pdf/research\\_policies/Towards\\_a\\_European\\_Framework\\_for\\_Research\\_Careers\\_final.pdf](http://ec.europa.eu/euraxess/pdf/research_policies/Towards_a_European_Framework_for_Research_Careers_final.pdf). The four career stages are: **R1: First Stage Researcher** (up to the point of PhD) / **R2: Recognised Researcher** (PhD holders or equivalent who are not yet fully independent) / **R3: Established Researcher** (researchers who have developed a level of independence) and / **R4: Leading Researcher** (researchers leading their research area or field).

**Table 4.** Breakdown of grants awarded 2009-2013, by year of grant\*

\*For the purpose of this evaluation, the grant figures were converted from Hungarian Forints (HUF) to Euros (€), using the rate of 1 May 2014 (0.0033). The average annual rates actually fluctuated between 0.0033 and 0.0036.

Year	Sum of grants (€)	Total N° of applications	Total N° of grants	Success rate	Average grant amount (€)
2009	24,203,556	1,374	436	32%	55,513
2010	14,670,003	751	234	31%	62,692
2011	24,680,499	1,132	364	32%	67,804
2012	27,592,921	1,644	396	24%	69,679
2013	24,539,810	1,240	336	27%	73,035
<b>Grand Total</b>	<b>115,686,788</b>	<b>6,141</b>	<b>1,766</b>	<b>29%</b>	<b>65,508</b>

**Table 5.** Perception of grant administration process by applicants\*

\*Please note that the lower the mean (rating average), the higher the level of agreement, i.e. lower means indicate higher levels of satisfaction.

Please indicate how strongly you agree/disagree with each of the following statements in respect of OTKA	Strongly agree	Agree	Disagree	Strongly disagree	N/A or don't know	Total	Average rating
OTKA support was essential to my research career	44.27% 255	29.51% 170	11.46% 66	6.42% 37	8.33% 48	576	<b>1.78</b>
Queries by applicants are dealt with efficiently/quickly	29.23% 171	48.38% 283	10.77% 63	4.44% 26	7.18% 42	585	<b>1.90</b>
The electronic application system was easy to use/navigate	27.13% 159	55.46% 325	13.99% 82	2.39% 14	1.02% 6	586	<b>1.92</b>
The procedures for applying for funding are easy to understand	26.32% 154	56.07% 328	14.19% 83	3.42% 20	0.00% 0	585	<b>1.95</b>
The OTKA funding programmes are very well advertised/publicly communicated	22.92% 135	56.03% 330	14.77% 87	3.23% 19	3.06% 18	589	<b>1.98</b>
Overall the OTKA funding application and award process was well managed	21.03% 123	55.21% 323	14.53% 85	4.79% 28	4.44% 26	585	<b>2.03</b>
Helpful/practical feedback on the funding decision making process was provided	15.41% 90	42.98% 251	24.32% 142	11.13% 65	6.16% 36	584	<b>2.33</b>
The selection procedures are fair and impartial	12.29% 72	37.37% 219	26.11% 153	14.16% 83	10.07% 59	586	<b>2.47</b>

language only. The absence of any serious criticisms or any volume of minor ones is consistent with the very strong ratings achieved for OTKA administration generally.

Two areas were rated less positively. Respondents were inclined to rate OTKA's provision of helpful feedback and selection procedures less highly than other dimensions.

### **Selection procedure and perceived independence**

The weakest dimension in terms of respondent ratings was the selection procedure, with just under half of the sample agreeing that it is fair and impartial. This is mirrored by the findings from the open-ended questions: the majority (just over 55%) of the open-ended comments made by

respondents were critical about the review process, referring especially to the need for a transparent and fair review. Reported perceptions included: biased reviewers, favouritism, biased selection of panel members, conflicts of interest, etc. In a number of cases, respondents noted that there seemed to be "little relation between reviewers' comments/scores and the final panel decision". A number of open-ended comments addressed a need for more international reviewers on decision making panels.

### **Involvement in OTKA evaluations and funding**

The level of respondent involvement in OTKA's grant decision making process appears to be very high. Over 72% of respondents, besides having applied to OTKA for funding, have also been

involved in the OTKA evaluation and decision making processes in the last five years. Of these, almost 97% acted as reviewers, 26.5% as review panel members, 5% as scientific council members and a similar proportion as review panel chairs.

### Comparison of ratings of successful and unsuccessful applicants

We analysed whether there were statistically significant differences between the ratings of those who were successful at any stage in being awarded an OTKA grant and those who have not been successful to date.

The t-test results indicate highly significant differences (all significant at  $p < .0001$ ) between the ratings of unsuccessful and successful applicants, with the latter being much more likely to rate OTKA favourably on the following dimensions:

- “The OTKA funding programmes were well advertised/publicly communicated”
- “The procedures for applying for funding are easy to understand”
- “The selection procedures are fair and impartial”
- “Overall the OTKA funding, application and award process was well managed”.

Any bias is more likely to be in a positive than negative direction, however, as disproportionately more successful than unsuccessful applicants responded to the survey.

### Responsiveness and flexibility

OTKA appears to very adaptable and good at dealing with the change it frequently encounters with its funded projects.

Of those respondents who received an OTKA grant, over 53% had to make changes to their budget, over 37% made changes to their research team and over 25% to their research plan. Almost all (98%) of these respondents evaluated OTKA’s response and handling of the changes to the grant as “helpful” (about 70% rated OTKA as “very helpful” and 28% as “reasonably helpful”). These are strikingly positive results.

A very small number of critical open-ended comments were made about grant management. Some respondents saw certain administrative procedures as time consuming or diverting monies from their research project.

A number of open-ended comments were made about the lack of an interdisciplinary funding category. An interdisciplinary proposal was perceived as being less likely to succeed in getting OTKA funding because it does not fit well with the current funding model.

## 6.3 Mobility and international cooperation

### Research collaboration

There is a good level of interdisciplinary collaboration with researchers in the OTKA research population. Some 62% of respondents worked on a joint publication, 48% on a joint research project and 29% collaborated on a joint project, mainly through virtual communication.

Europe appears to be the most popular region for collaboration with 78% of the respondents working with Europe-based partners on a joint publication and 64% on a joint research project with occasional/frequent physical presence. About 37% of the respondents collaborate with their European partners mainly through virtual communication.

North America appears to be the second most important region with about 25% of the sample working with North American colleagues on a joint publication and 16% on a joint project. 19% of the respondents work with partners from North America mainly through communication.

Outside Europe and North America, Asia is the third most popular region with about 3% of the sample working on a joint publication or a joint project.

### Mobility

Europe is the most important non-home country destination for OTKA applicants, with over 50% of respondents having lived in more than one European country for three months or more. North America appears to be a relatively important destination also, with some 31% of the sample having lived there for at least three months and more than 7% of the sample having lived there more than once. Outside of Europe and North America, Asia is the next most popular destination attracting 8% of the sample for one or more periods of stay.

Some 12% of the respondents intend to live or work in another country within the next year (for a period of at least one year), of whom 81% intend to go to Europe, 24% to North America and 6% to Asia. The main reasons cited for moving country included academic/career development opportunities (56%) and economic/financial opportunities (18%). Other less frequently cited factors included family or personal reasons (8%), end of job contract (7%) and political reasons (7%).

## 6.4 Impact of OTKA funded research

Respondents were asked to indicate their achievements over the previous 12 months against a range of outcome indicators associated with successful research careers. Table 6 below compares the outcomes or impacts of those who received OTKA funding and those who applied but were not successful. It is interesting to note that the differences in achievement across three groups (1. unsuccessful applicants, 2. those who were awarded one grant to date and 3. those who were awarded more than one grant) are for the most part not large. Only notable differences are highlighted in the description below and in the analysis that follows.

### Conference activity

In the 12 months prior to the survey, a high proportion (75%) of successful and unsuccessful applicants made presentations at national and international conferences and were lead and other author for peer reviewed articles (c.70%).

### Awards, international and Hungarian research grant success

Some 9% of respondents were awarded academic prizes. It is notable that twice as many one-time

successful OTKA grant awardees (8%) as unsuccessful OTKA applicants (4%) were awarded prizes and not far off twice as many multiple OTKA grant awardees (13%) as one-time awardees, lending strong support to respondent views that OTKA grants are very important for their research careers.

Some 10% of respondents were awarded international research grants in the twelve months prior to the survey. Interestingly, unsuccessful OTKA applicants were more successful (13%) in attracting international grant funding than either one-time (9%) or multiple OTKA grant awardees (10%).

### Patents and licences

In terms of research application outcomes, some 4.7% of respondents filed a patent and 1.2% registered a licence. One-time OTKA grant awardees were as successful as multiple OTKA grant awardees (just over 5%) and also, but to a lesser extent than unsuccessful OTKA applicants (3%). However, the numbers applying for patents are very small.

**Table 6.** Impact of OTKA grant funding success

Impact	Yes	%	Unsuccessful applicants		Successful applicants (1 grant)		Successful applicants (>1 grant)	
Presented work at a national conference	443	75%	88	69%	172	75%	183	78%
Presented work at an international conference	447	76%	86	68%	172	75%	189	80%
Lead author peer reviewed article	417	71%	76	60%	160	70%	181	77%
Other author peer reviewed article	416	71%	82	65%	156	68%	178	76%
Awarded academic prize	53	9%	5	4%	18	8%	30	13%
Awarded international research grant	60	10%	17	13%	20	9%	23	10%
Awarded Hungarian research grant	176	30%	28	22%	53	23%	95	40%
Produced new research resources or software	82	14%	19	15%	33	14%	30	13%
Filed a patent	28	5%	4	3%	12	5%	12	5%
Registered a new product licence	7	1%	1	1%	5	2%	1	0%
Had a significant impact on policy/practice	42	7%	6	5%	15	7%	21	9%
Received media coverage	102	17%	15	12%	39	17%	48	20%
<b>Total</b>	<b>590</b>	<b>100%</b>	<b>127</b>	<b>21%</b>	<b>228</b>	<b>39%</b>	<b>235</b>	<b>40%</b>

## 6.5 Discussion

### Demographic issues

Gender balance is good in terms of similar rates of grant success. However, many more male researchers apply for OTKA funding and men are thus more likely to succeed. OTKA may wish to encourage more women to apply and may also wish to publicise the similar success levels. Women are also underrepresented in OTKA's decision making bodies, especially the scientific councils and the OTKA Board.

The majority of those applying for OTKA funding were independent, established researchers, many of whom were at the most senior level (principal investigators). Their success rates are correspondingly high.

There are virtually no respondents under 30, which is not particularly surprising as OTKA only supports researchers who have already obtained a doctoral degree.

Early stage R2 researchers (postdoctoral level) account for 20% of respondents, which is quite high. Their OTKA grant success rates are higher than might be expected for those in the earlier stages of their careers. Clearly OTKA is supportive of early career researchers and those R1 researchers coming through the system should feel encouraged by these trends.

The OTKA average success rate (29%) appears to be well in line with success rates in other research councils across Europe. By international standards, this success rate is reasonably high. However, it appears that OTKA grants are more competitive than other types of grants available in Hungary.

Total grant success is relatively evenly distributed across all age categories with a higher level of over 60 year olds (26%) than might be expected in terms of normal distribution curves. That 13% were over 65 was somewhat surprising at first glance, but is explained by the fact that the survey covered a relatively long time period.

If 2013 is taken as a recent reference year for analysis of grant distribution patterns, a different trend emerges – i.e., a normal age distribution. A higher proportion of younger applicants were successful in 2013 and a significantly lower proportion of those approaching or at retirement age were successful. Assuming the 2013 distribution is typical, it can be stated that success in achieving OTKA grant funding is reasonably well balanced across age groups.

### Administrative effectiveness and efficiency

Overall, respondents evaluated OTKA grant administration processes (including communication, electronic system, application procedures, etc.) very positively. In addition, OTKA staff appear to be flexible and helpful with regard to handling the changes in the funded research projects during the post-award phase.

There is overall agreement amongst all respondents that OTKA grants are essential to research careers. The impact evidence discussed below suggests this is indeed the case.

Two areas of improvement, which may indeed be linked, can be identified for OTKA's attention.

Firstly, OTKA could review its selection procedures with regard to fairness and impartiality. The system has been relatively closed until recently with the same researchers applying for funding and acting as reviewers or review panel or scientific council members in the past five years. This situation is not uncommon for a country of Hungary's size – especially since OTKA funding attracts top scholars in the country.

This practice has undoubtedly influenced how OTKA is perceived by the research community in terms of impartiality and independence. It appears that the recent change to a more international and transparent decision making process was needed and there is scope for increasing the independence of the system further.

Secondly, OTKA could review the quality of its feedback procedures. In particular, an assessment of its clarity and helpfulness to applicants who received a negative funding decision would be very worthwhile to help them understand what they need to do to be successful on subsequent occasions and to improve the transparency of the process overall.

Finally, OTKA might also consider reviewing its treatment for interdisciplinary proposals. A high proportion of the respondents appear to be engaged in interdisciplinary research. At the same time, open-ended comments seem to indicate that there are difficulties in getting an OTKA grant with an interdisciplinary proposal. OTKA may wish to revisit its evaluation procedures specifically with regard to such proposals.

### OTKA research funding impacts

The level of research impacts of OTKA funded research (as inferred from the number of patents and licences registered) achieved in the year prior to the survey is not particularly strong. However, this is not surprising given that OTKA's main mission is to fund basic rather than applied research. While research applications are difficult to moni-

tor as they may take decades to emerge, OTKA would be well advised to monitor both academic and socioeconomic impact of the funded research on a long-term basis.

OTKA grant awardees appear to have better career outcomes than unsuccessful applicants. They are more likely to have been awarded an academic prize, to have published in peer reviewed journals and to have presented their work at Hungarian research conferences.

The results for successful OTKA grant applicants at the arguably more prestigious international level indicate impact. They are more likely than unsuccessful OTKA applicants to have presented work at this level. However, unsuccessful OTKA applicants have a higher level of international grant success than successful OTKA applicants. It is difficult to be precise as to the reason, but it is possible that lack of success in OTKA calls motivates international grant seeking (and hence greater levels of success). It is also possible that some very talented researchers are slipping under the radar in the award decision making process. This outcome is worthy of further study and ongoing follow-up by OTKA.

Overall, the level of internationalisation is quite high. OTKA researchers are both geographically and virtually mobile. They appear to be prepared to travel internationally to further their research careers and many have in fact done so. On average, respondents worked with about seven researchers outside Hungary during their OTKA research project or during the period they have applied for OTKA funding. They are also active in terms of embracing interdisciplinary research and teamwork challenges.

Having an international profile and being part of international research networks is good for Hungarian research. It makes it more likely that the already solid achievement of 10% international grant success can be built on in future.

## 7.

# Report from the Evaluation Committee



As Hungary aspires to compete with other knowledge-based economies within and outside Europe, it has to prioritise the development of its Higher Education (HE) and its Research and Development (R&D) system. HE and R&D are intimately associated and mutually dependent upon one another. In every well developed national system, these consist of several components, among them a publicly funded research council for basic research, whose role is to organise competitions to distribute funds for investigator initiated research, thus providing a funding stream independent of the research institutions' core budgets. A sufficiently funded and well functioning research council for basic research is an important element for the attractiveness of a country's research infrastructure. The role of such a research council, however, far exceeds merely distributing funding, since the competition is (or should be) based on scientific excellence. The funding provided by research councils also confers reputational capital to successful applicants, which in turn impacts on the applicant's research career. The inverse may be true for unsuccessful applicants, thus putting a heavy responsibility upon the shoulders of the council. In view of its intimate knowledge of the country's scientific community, research councils often play a crucial role acting as agents for basic research in the country.

In order to fulfil their complex task, research councils for basic research should conform to several conditions including:

- Competition on the basis of scientific excellence
- Political independence
- Equal treatment of all scientific disciplines
- Transparency and fairness, including checks and balances for all steps of decision making and strict rules for conflicts of interest for all individuals involved in decisions
- Equal chances for all applicants irrespective of gender, race or position within an institution as well as adherence to ethical standards.

In the Evaluation Committee's view, OTKA conforms to the above requirements, which makes it the crown jewel of Hungary's R&D system; it is a professionally managed research council, whose procedures conform to the highest international standards. For several years, it has been in a constant process of improving its approaches and instruments, and it is obvious that OTKA will continue to do so in the future.

However, OTKA has to operate in a rather unstable environment, which compromises some of its activities. Elements of this instability include short-term budgeting at an insufficient level, serious underfunding of universities and the existence of several other institutions funding basic research in Hungary, while there is no comparable organisation for the funding of applied research. The relationship of OTKA with the Hungarian Academy of Sciences is remarkable, since the Academy has a strong position in nominating five of the OTKA Board members (including the president) and OTKA's budget is negotiated by the president of the Academy on behalf of OTKA. At the same time, the Academy is the largest research performing organisation in Hungary, and it also runs a number of funding programmes.

In almost all European countries, basic research has a low public profile. It might be desirable if OTKA were to improve its role as an agent for basic research in Hungary by enhancing its public visibility.

## 7.1 OTKA mission, governance and management structures

### OTKA within the Hungarian R&D structure

Although this evaluation is focused on OTKA and detailed consideration of the broader R&D structure in Hungary is not within the scope of this evaluation, it is important first to consider OTKA's role in the system and its relationships with other actors. The Evaluation Committee was struck by the complex and frequently changing nature of the various national mechanisms for funding of higher education and research in Hungary. It does not make any recommendations on the broader national level, but notes it as a topic that might merit separate review.

Within the national R&D system, OTKA is the body that has the mission to fund basic research in every field of science and to support every stage of a researcher's career. OTKA funds projects exclusively on the basis of scientific excellence and scientific impact. Its selection processes are held in high esteem by institutional stakeholders. OTKA grants are considered to be very significant for research careers and are clearly seen as a sign of academic recognition in the country. Furthermore, OTKA grants offer a certain degree of independence to grant holders. OTKA is seen by many stakeholders as the only organisation that provides help to a young researcher's career or helps to initiate research in a new area.

OTKA's applicants include researchers in universities and research institutes of the Hungarian Academy of Sciences. Hungarian universities are (by volume) the largest research performers for basic research; together they receive about 55% of OTKA's budget (2013 figures). Universities are currently going through very hard times, having suffered large cuts in their core funding during the last three years. OTKA grants and other research grants are much appreciated by both researchers and university administrations as these help to stabilise research and academic activity. The Academy has traditionally been a strong player in the national R&D context, and is a very substantial research performer, which runs a number of scientifically excellent research institutes. The Academy's research institutes received about 39% of OTKA funding in 2013.

### OTKA in the Hungarian research funding landscape

In the research funding landscape, there are a number of schemes and programmes scattered throughout various ministries and institutions. The Evaluation Committee found it surprising that more

use is not being made of OTKA's growing competences in research funding and evaluation. For example, as mentioned previously, the Academy, in addition to being a research performer, has recently developed a number of important funding schemes providing support to research groups based both in the Academy institutes and at the universities. One example is the Momentum Programme that aims to attract young researchers back to Hungary with a budget of 9 M€ over 2009-2013. The Academy has also started a new infrastructure programme of about 20 M€.

Other schemes, such as the National Excellence Programme aimed at supporting young researchers and currently managed by the Ministry of Public Administration, fit well with OTKA's remit and could, with the agreement of the Academy and the Ministry, be managed by OTKA. This would avoid overlap and ensure a high quality selection process.

The Evaluation Committee is of the opinion that, because of OTKA's high standing and grant management expertise, it would be well placed to manage the selection processes in various external research funding programmes in Hungary.

While OTKA's mission is limited to funding basic research, it is important to understand its position in relation to national funding mechanisms for applied research. The Hungarian National Office for Research and Technology (NKTH) was the only body that used to support applied research in the country (with a budget four times that of OTKA's). It has been closed, and a new agency, the National Innovation Office (NIH), with a much more modest budget has been set up. NIH reports to the Ministry of National Economy and is responsible for science, technology and innovation policy development. Its role includes monitoring, innovation services, support for start-ups and support for technology incubator programmes.

NIH does not have strong relations with OTKA, while its predecessor NKTH and OTKA used to have joint funding schemes for projects involving both basic and applied research phases. It is clear that Hungary needs one system for funding basic research and one for funding applied research, as well as formal and regular communication and interaction between the two. While the relative budgets of the two can be debated, the need for both and good communication and transitional support pathways between them is indisputable.

While Hungary has very limited institutional support for applied research, it has a number of institutions supporting basic research via various programmes, which is unfortunate in the Evaluation Committee's view. While beyond the remit of the

present evaluation, the fragmentation of funding activities for basic research and the development of human capital need to be addressed and roles clarified including responsibility for developing important and strategic linkages between basic and applied research.

### Budgetary issues

In relative terms, OTKA's yearly budget (25 M€) represents only a very small share of the total R&D expenditure in Hungary (about 2%). Although OTKA received a budget increase of 41% in 2012, the budget has effectively decreased (when adjusted for inflation) during the last ten years, and so has the share of OTKA funding in Hungary's GDP. The percentage of OTKA's grant funding is also relatively small in Hungarian research organisations' budgets – the representatives of Hungarian universities and research institutes mentioned that, typically, less than 10% of their budgets come from OTKA grants. The small size of OTKA grants is a significant problem and is discussed later in the report. Although numerous stakeholders stressed the importance of OTKA grants, it appears that the enhanced professional reputation which comes with a successful OTKA grant application is equally if not more important.

In the interviews with stakeholders, the question of increasing OTKA's budget was frequently raised. While the vast majority of the stakeholders view OTKA's role in funding basic research very positively, in the context of the overall scarcity of resources in the national research system, not all players appear to support a *substantial* increase of OTKA's budget. While some believed an increase of 30% – or even 50% – is needed, others felt that such an increase would dilute competition and decrease the overall excellence of the funded projects. Most of the participants agreed that a continuous, 'cautious' increase would be a good strategy. In the open-ended comments of the survey there were many respondents calling for an increase in OTKA's funding.

In fact, the budget of OTKA is also small when compared to the budgets of research councils of neighbouring countries. Based on each country's population, OTKA currently receives 2.7 € per inhabitant, compared to 3 € for NCN (Poland), 12.6 € for GACR (Czech Republic) and 18.2 € for FWF (Austria). A well funded research council for basic research is an important component of every healthy research system since it provides incentives to excel in research, rewards good researchers and provides opportunities to follow up on new research ideas. The availability of sufficient funds for bottom-up research is particularly relevant for top-

class researchers, for whom it is thus an important element for the attractiveness of Hungary as a country to do research in. In view of OTKA's funding policy, an increase in OTKA's budget would target Hungary's research elite and improve Hungary's attractiveness to researchers from abroad.

The Evaluation Committee is of the opinion that OTKA's budget is – in absolute and in relative terms – far too small for OTKA to achieve the impact that it is capable of as a national funding body of basic research. A continuous but substantial (in the order of at least 10% p.a. until international norms have been achieved) increase of OTKA's budget would be advisable, and allow OTKA to take on additional activities.

### Institutional independence

Institutional independence is a serious issue for research councils like OTKA. On the one hand, the council has to protect itself from influences on funding decisions from outside, be they politically motivated or otherwise; on the other, the institution is accountable to the public. All publicly funded research councils face the dilemma of striving for (and needing for its proper operation) institutional independence, yet without being politically marginalised. It is in the interest of the research council to be well connected to political decision makers, who should show a commitment to it, in terms of participating in its strategic development and its programmes and providing sufficient funding, yet without interfering in the day-to-day operation of the research council. Independence from political influences on funding decisions is also crucial for the trust of the scientific community (both nationally and internationally) in the research council. This is the basis for the reputation ('quality stamp') coming with a successful grant application.

Indeed, OTKA is a fully independent institution in so far as the only way that political stakeholders can exert influence is through the appointment of members of the OTKA Board. There is an elaborate system to identify members of the Board. With the exception of the three presidents of the scientific councils, all Board members are appointed by the Prime Minister of Hungary for a period of three years with optional renewal for another three years. Following nomination by various stakeholders, one vice president is *nominated* by the president of the Academy and the other by the Rector's Conference. The president and vice presidents are subsequently *appointed* by the Prime Minister on the joint proposition of the President of the Academy and the minister responsible for education. Five of the twelve Board members are proposed by various

ministries, two are nominated by the President of the Academy, one by the directors of public collections, three by the Conference of Higher Education and one by the President of the National Innovation Office. According to the OTKA governance, the Board members act on behalf of science and not their respective institutions once they have been appointed (although according to OTKA rules, if they change their institutional affiliation, they can no longer continue as members of the Board).

Further down OTKA's hierarchy, there is no institutionalised way that politics could directly influence appointments: the three presidents of the scientific councils as well as the other council members are selected (by a secret ballot) by the OTKA Board. The basis of these Board decisions are recommendations by members of the scientific community collected through OTKA's electronic system. Recommendations can come from the scientific departments of the Academy of Sciences, from researchers who submitted a proposal to OTKA during the last five years as well as from "scientific organisations, communities engaged in scientific research and persons with a scientific degree". Panel chairs are appointed by the presidents of the respective scientific councils based on the proposal of the council. Panel members are appointed by the presidents of the respective scientific council based on the proposal of the panel chair and on the proposal of the council.

The Evaluation Committee commends OTKA's high degree of political autonomy and the fact that the identification of OTKA's decision makers – with the exception of Board members – is largely controlled by Hungary's scientific community.

While OTKA is quite well protected from direct political influence, it also seems quite marginalised. For example, The Hungarian National Research and Development and Innovation Strategy (2013-2020) "Investment in the future" mentions OTKA only briefly. Moreover, OTKA is not represented in the National Body for Science and Innovation (NTIT), led by the Prime Minister. It used to be an observer in its predecessor institution, the National Research, Innovation and Science Policy Council. Therefore, OTKA is not in a good position to provide advice to policy makers or create important bridges between basic and applied research. While OTKA's President takes part in various fora, there is no direct formal contact with the ministries in this regard. This results in OTKA's low public profile and political sidelining.

Here, OTKA's relationship with the Academy deserves mention. To the surprise of the Evaluation Committee, OTKA's budget is a line in the budget

of the Academy. Budget negotiations with the Government are performed by the Academy on OTKA's behalf each year. The Academy also has the role of representing science in NTIT and is much more visible and influential in the political arena. There was agreement among the interviewed stakeholders that the roles of the two institutions are rather unclear and need to be made more distinct. Researchers often believe OTKA is a subsidiary of the Academy, rather than an independent institution. In the eyes of the Evaluation Committee, this political subsuming of OTKA by the Academy unnecessarily complicates the relationship between the two organisations. To add to the complexity, the institutions of the Academy are competitors for OTKA funds. Moreover, the Academy recently started running a number of similar competitive funding programmes as OTKA. In the end such conflicting and non-aligned interests will not be good for either organisation or Hungarian research.

OTKA's governance sees both advantages and disadvantages in being so linked to the Academy. The Academy's strong and influential position in the system offers OTKA stability and protection in a politically unstable climate, thus helping OTKA to preserve its independent, albeit marginal, position. When asked about the rather low-key role of OTKA in the national R&D system, some of the stakeholders that were consulted felt that it might be better for OTKA to remain apart from the political system and its volatility, under the protective custody of the Academy. At the same time, several respondents to the survey carried out by the ESF suggested in their open-ended comments that OTKA should be fully independent of the Hungarian Academy of Sciences, as the current situation is conducive to bias. The number and nature of the comments suggest that, whatever the actual bias, there are strong perceptions of bias.

### **OTKA strategy and public profile**

The Evaluation Committee is of the view that OTKA would benefit from defining its broader role and mission as playing a key role in shaping higher education and research in Hungary by contributing to the improvement of research careers and creating the next generation of researchers. Given its mission, it is inevitable that OTKA should certainly work towards obtaining a more visible public profile, and establish itself as a guardian for excellence in basic research in Hungary. Like many research councils in other countries, OTKA should substantially increase its public relations activities and try to reach not only the country's research community, but also a broader general public. Public relation activities

might also include elements of science communication, particularly relating to the outcomes arising from OTKA funded research. OTKA should act as an important and productive agent for investigator driven basic research in Hungary.

This should be reflected in a multi-year longer-term strategy. Currently, the organisation has the practice of setting up its strategic objectives for the rather short period of two years. While the objectives that are set are appropriate for the period of two years, OTKA would benefit from a more ambitious longer-term vision and a more strategic use of its governance structures, i.e., the OTKA Board.

The Evaluation Committee is of the opinion that the current relationship between OTKA and the Academy inhibits the ability of OTKA to develop an independent role and to define its own strategy in keeping with national research priorities. In the view of the Committee, OTKA could usefully act as the principal agent for bottom-up investigator led research in Hungary. The OTKA Board, as the key body in its governance structure, needs to be used much more for strategic purposes, as a place of contact and networking with the policy makers, with the aim of better positioning OTKA in the national system and developing a more ambitious longer-term strategy.

### **OTKA's governance and management structures**

OTKA is similar to most other research councils in that it has two separate levels within the organisation – an ‘academic’ level and an ‘administrative’ level. The academic level is represented by the OTKA Board, the highest governing body, which defines OTKA’s strategy and makes funding decisions. The administrative level is represented by the OTKA office which supports the decision making process, handles applications and manages projects. In addition to researchers, the OTKA Board also includes a number of research policy makers from the main relevant stakeholder institutions.

The academic level is complemented by the three scientific councils (Life Sciences, Physical Sciences and Engineering, and Social Sciences and Humanities) which oversee a total of 29 review panels in charge of their respective disciplines. Review panels, scientific councils and the Board are each responsible for a specific phase of a typical proposal selection process. The review panels evaluate and rank the proposals of their respective discipline. The scientific councils approve and merge the ranked lists they receive from their respective review panels and the OTKA Board makes the final funding decisions. The OTKA Board also decides on the

allocation of resources to the three scientific councils.

Rotation of members is ensured at all three organisational levels. Each member is appointed for a period of three years, and at each rotation approximately one third of the memberships are renewed. OTKA asks for suggestions for new members from the scientific community. In 2013, OTKA contacted 11,587 researchers to recommend new members.

The large number of review panels could be seen as complicating and adding to the work of OTKA. The recruitment of new members to review panels is a major task. However, the involvement of a large body of engaged researchers ensures strong scientific awareness and active participation from a large proportion of Hungarian researchers.

The management of the three-stage evaluation process by the OTKA office results in an administrative overhead of about 5%. Considering that the office oversees about 2,000 contracts and it receives and manages about 1,000-1,500 applications each year, the overhead appears to be justified. However, since the awarded grants are of a modest size, the Evaluation Committee wondered whether the complex management structures and the elaborate three-stage evaluation process are cost-effective. Most of the stakeholders that were interviewed agreed that the three-stage process is appropriate as it safeguards from conflicts of interest, which is an important challenge for a country of Hungary’s size. They also commended the professionalism of the OTKA office in the management of research calls’ evaluation process. The Evaluation Committee is therefore of the view that, rather than scaling down the existing procedures, the size of the awarded grants and the overall budget of the organisation should be increased.

The communication between OTKA’s various organisational levels is ensured by regular bi-weekly meetings of the presidents of the scientific councils, the president of the OTKA Board and the director of the OTKA office. An operative board, consisting of the president and vice presidents of the OTKA Board, the presidents of the scientific councils and the director of the OTKA office, is held prior to each OTKA Board meeting. In addition, scientific councils collect the views of the review panel members on the experiences of the evaluation process via annual reports, and then formulate recommendations to the Board as regards the operation of OTKA and its proposal system, rules of procedures or evaluation criteria. Scientific councils also provide suggestions to the OTKA Board regarding such strategic issues as the future priority research areas and the calls for proposals to be announced.

The Evaluation Committee finds that OTKA’s internal organisational and management structures are clear and fit for purpose. There is an appropriate division of tasks and good communication between its academic and administrative levels. While the three-stage evaluation process appears to be rather complex considering the small size of the awarded grants, it is managed in a professional way. The continuous involvement of a large number of members of the scientific community (in review panels, scientific councils and the OTKA Board) appears to work well in Hungary, assuming the right safeguards against conflicts of interest are in place. It roots OTKA within Hungary’s national academic system. OTKA’s grant management procedures ensure an allocation of resources with the highest degree of integrity.

## 7.2 Funding portfolio

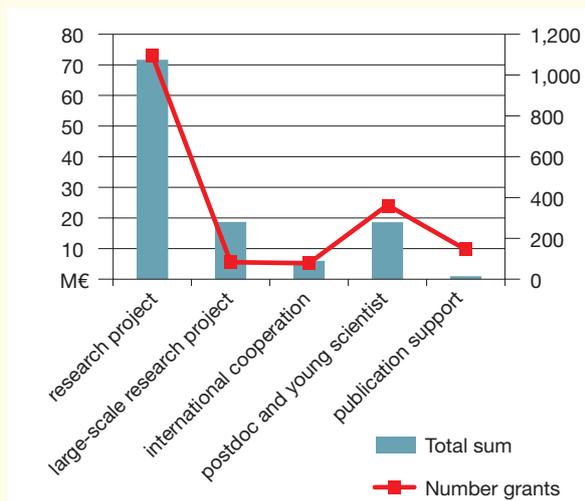
### OTKA’s funding schemes

Scientific research flourishes best in environments that allow research organisations and researchers to invest in research programmes and projects for longer periods of time. Within such research systems, the traditional role of research councils is to fund excellent research, thus creating a competitive element in the funding of research. This role is both in the interest of the researchers who can be rewarded for excellent research and in the interest of the government, which gets certainty that public money is well spent.

The portfolio of programmes of a basic research council (i.e., the number and types of various funding schemes) should adequately address the specific needs of different disciplines and researchers in their different career stages, yet stay as simple and transparent for the research community, also avoiding budget fragmentation on the side of the council. While one can find similarities in the funding portfolio of councils in different countries, the appropriateness of a portfolio is dependent on the overall funding and organisational landscape.

Relevant criteria for the assessment of OTKA’s funding portfolio concern the following questions: (1) whether OTKA funds target the best research in Hungary; (2) whether OTKA’s funding portfolio is appropriate to the size of its budget; and (3) whether OTKA’s portfolio is appropriate to address the challenges of a modern research system.

OTKA has a relatively small budget for its programmes (see Figure 4: The state budget of OTKA Programmes by the Act on the Budget of Hungary (M€) from 2009-2014). This restricts its capacity to



**Figure 8.** Total number and sum of OTKA research grants per grant type, 2009-2013, in €\*

\*For the purpose of this evaluation, the grant figures were converted from Hungarian Forints (HUF) to Euros (€), using the rate of 1 May 2014 (0.0033). The average annual rates actually fluctuated between 0.0033 and 0.0036.

develop a broad funding portfolio. In the period 2009-2013 OTKA has made use of five grant types: (1) research project grants; (2) large scale research project grants; (3) grants for international cooperation, via Lead Agency agreements with Austria and Finland, for example; (4) career grants for postdocs and young scientists; and (5) publication support grants. Table 7 provides an overview of the types of the various grants grouped under these five broader categories.

Figure 8 shows the number of grants and the total sum spent on the grant type. Both in terms of number and total sum, the (normal) research projects grants are in the majority, accounting for 62% of the total number of grants and of the total sum. The other two major grant types are for large scale research projects (5% of grants and 16% of total funds) and career grants (21% of grants and 16% of total funds). While 8% of the grants are for publication support, these take only 1% of the total sum of OTKA’s budget.

The Evaluation Committee finds OTKA’s funding portfolio is clearly structured and adequately diverse to cover the major needs of researchers in Hungary. The strongest focus is on funding research projects while career grants and international cooperation grants receive significantly less funding. In the Committee’s view this focus is appropriate to the extent that at the moment there are other institutions in Hungary funding career grants. Further developments of the funding portfolio would have to be subject to substantial budget increases.<sup>20</sup>

20. A fair number (c. 13%) of open-ended comments by survey respondents on suggested improvements recommended broadening

**Table 7.** Breakdown of grants awarded 2009-2013, by type of grant<sup>1</sup>

1. For the purpose of this evaluation, the grant figures were converted from Hungarian Forints (HUF) to Euros (€), using the rate of 1 May 2014 (0.0033). The average annual rates actually fluctuated between 0.0033 and 0.0036.

Grant	Type	N° grants	Sum of grants (€)	Average grant (€)	Min. grant (€)	Max. grant (€)
<b>K</b>	Research Project	1,097	71,673,639	65,336	3,769	256,014
62% of grants & 62% of total funds						
<b>NK</b>	Large Scale Research Project	83	18,679,013	225,048	69,983	407,025**
5% of grants & 16% of total funds						
<b>ANN</b>	Lead Agency Call (AT-HU Cooperation)	3	290,169	96,723	77,524	108,108
<b>FNN</b>	FI-HU Cooperation Project	3	413,787	137,929	132,700	141,755
<b>IN</b>	International cooperation, additional support	10	79,596	7,960	4,508	11,880
<b>NN</b>	International Cooperation Project	62	5,217,851	84,159	20,632	190,704
	International Cooperation TOTAL	78	6,001,403	76,941	4,508	190,704
4% of grants & 5% of total funds						
<b>PD</b>	Postdoctoral Project	337	15,411,556	45,732	5,742	100,188
<b>NF</b>	Starting Grant for young scientists	17	2,987,813	175,754	109,256	269,564
<b>NNF2</b>		9	226,713	25,190	13,345	36,854
	Postdoc and Young Scientists TOTAL	363	18,626,082	51,312	5,742	269,564
21% of grants & 16% of total funds						
<b>PUB-C</b>	Publication of Results of Research Supported	22	29,970	1,362	231*	3,399
<b>PUB-F</b>		28	170,905	6,104	1,980	32,069
<b>PUB-I</b>		24	112,880	4,703	1,980	12,807
<b>PUB-K</b>		71	392,895	5,534	581	23,100
	Publication TOTAL	145	706,650	4,873	231	32,069
8% of grants & 1% of total funds						
<b>Grand Total</b>		<b>1,766</b>	<b>115,686,788</b>	<b>65,508</b>		

\* smallest grant / \*\* largest grant

With regard to the costs of scientific publications, these are often considered as basic research costs. In a well funded system there would be no need for a separate grant scheme for covering publication costs, since such small grants require administration costs both on the side of the funder and the grantees, which are hardly justified given the added value. OTKA's publications scheme involves three different types of publication projects: PUB-K (monographs), PUB-I (popular science), and PUB-F (edition of primary sources). The PUB-I scheme fosters publication of articles promoting science as a result of OTKA projects. While grants for monographs are intended for those researchers who have received an OTKA grant, the other two types of grants do not have such eligibility restrictions. If there is a need

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*the range of funding schemes (e.g. more/better start-up grants and increasing support for international collaboration). However, a third of the open-ended comments made by respondents (34%) appeared to support OTKA's funding increase principally to allow for more projects being funded, rather than adding new funding schemes to the portfolio.*

for such funds for university researchers because of scarcity of university resources, the Evaluation Committee can acknowledge that this scheme can have an added value. However, it would be advisable to keep the overhead costs of the scheme at a reasonable level.

### Possible development of OTKA's funding portfolio

OTKA's aims include supporting researchers in every stage of their research careers. OTKA has two programmes for research career grants, one aimed at postdocs and one aimed at internationally recognised young scientists. The latter programme has been suspended, mainly because the Hungarian Academy of Science launched the Momentum Programme (mentioned above) with similar aims. While the Evaluation Committee agrees with OTKA that, given the size of its budget, it should not repeat initiatives of other bodies, the Evaluation Committee believes that within the Hungarian

research system OTKA would be a highly appropriate body to execute a funding programme aimed at internationally recognised scientists.

As outlined in Section 3, the low number of new PhD students (about 1,300 state-funded doctoral students per year) poses a serious problem for the Hungarian research and industrial system and Hungary's future. Doctoral programmes are not attractive for students as stipends are too low and for a limited duration of three years only. In this context, the relevant ministry might consider whether doctoral funding could be provided for a period of four or five years. Given the small numbers involved it might also consider expanding OTKA's portfolio to PhD grant funding.

In view of low numbers of new doctoral students in Hungary, the Evaluation Committee is of the view that the Hungarian authorities could examine different ways to incentivise and support doctoral students in an administratively efficient manner. A longer grant funding period is obviously important but there are other measures that could be developed in order to encourage entry into doctoral education and minimise attrition. While the Evaluation Committee is conscious that it may be straying outside its remit here, the issue is sufficiently important to merit further examination. One option worth exploring in this regard might be to expand OTKA's portfolio to PhD grant funding. This would be in keeping with its mission of supporting researchers at every stage of their career. It would have the advantage of a specialised agency's focus on a critical resource and could greatly encourage the growth and sustainable development of a new generation of researchers in the country.

The Evaluation Committee is aware that at present OTKA is not in a position to utilise European Union funds because other institutions in Hungary (e.g., the National Innovation Office) are responsible for coordinating EU funding schemes (see Section 6.3). However, similar funding bodies in Central and Eastern Europe have in recent years developed funding mechanisms that use European funding to strengthen their national research capacity in terms of infrastructure and human capital and/or to support researchers to compete and succeed at European research funding level.

The Evaluation Committee is of the opinion that it would be beneficial for OTKA and the Hungarian R&D system to be able to connect OTKA grant schemes to European funding and co-funding possibilities (EU Structural Funds) to increase OTKA's leverage. However, the Evaluation Committee is aware that this would require a political decision outside OTKA's remit.

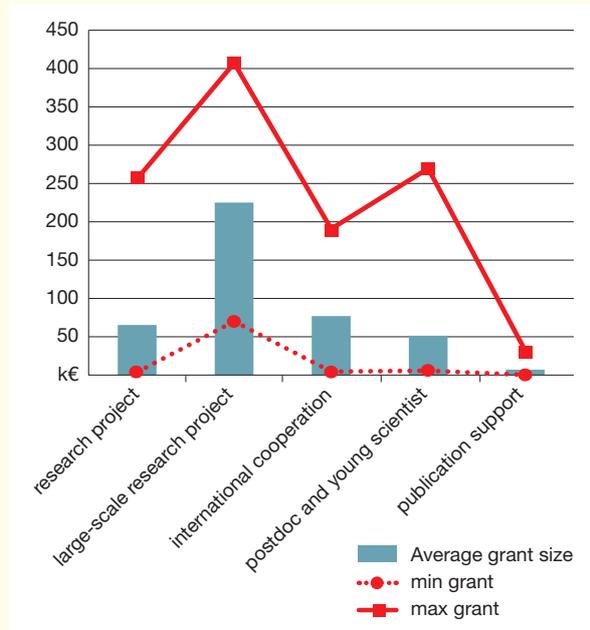


Figure 9. Size of OTKA research grants per grant type, 2009-2013, in €\*

\*For the purpose of this evaluation, the grant figures were converted from Hungarian Forints (HUF) to Euros (€), using the rate of 1 May 2014 (0.0033). The average annual rates actually fluctuated between 0.0033 and 0.0036.

### Size of grants

Figure 9 above shows the minimum, average and maximum size for each of the five grant types. Remarkably, the largest 'normal' research project grant is larger than the average 'large scale research project' grant, while the smallest 'large scale research project' grant equals the average 'research project' grant. Also, the size of the smallest grants for a research project, an international cooperation project and a postdoc project are at a level where they cannot possibly reflect the true costs of a substantial research project. The self-evaluation report of OTKA reveals that the average requested budget for large scale research projects has decreased from 238.5 k€ in 2009 to 151.3 k€ in 2014.

That the line between the research project grant and the large scale research project grant is blurred is also clear from the consultations the Evaluation Committee had with both OTKA staff and Hungarian researchers. There appears to be a tendency amongst researchers to move away from the large research projects in favour of the normal research projects. From the interviews with researchers, the Evaluation Committee learned that they are reluctant to ask for large grants, presumably because they anticipate that competition and peer review for large research grants is more severe than for normal grants. Also, within a given grant type, several researchers interviewed noted that they reduced the requested amount of money

in the hope that this would enhance the chance for success. At the same time, researchers indicated that the research grant is often not sufficient to cover the research costs that are usual for their respective disciplines.<sup>21</sup>

The Evaluation Committee feels that spreading funding too thinly is neither in the interest of the researchers, nor the Hungarian research system. The basic point is that the essence of OTKA's claim to excellence is that proposals go through a stringent peer review process, and that the grant allows excellent research to be funded.

There is, of course, the general issue of success rates, which is an area of great torment for almost every research council in the world. With an average success rate of 29% during 2009-2014, OTKA is close to such research councils as the Academy of Finland, which had a success rate of 31% in 2011 and the Austrian Science Fund (FWF), which had a success rate of 30% in 2012<sup>22</sup> and is probably close to the European average. There are institutions lucky enough to have higher rates (e.g., Germany, with success rates over 30% during 2010-2013<sup>23</sup>), but there are many more who suffer from substantially lower success rates (e.g., the Netherlands Organisation for Scientific Research – NWO with 24% average success rate in 2012<sup>24</sup>). Stakeholders expressed the concern that increasing the OTKA budget would compromise competition. The Committee agrees that this indeed might be the case if budget increases were used exclusively to increase the number of grants instead of increasing the size of the awarded grants.

OTKA's management strongly emphasised that it is an unfounded myth that smaller grants are more easily funded than larger ones. It thus appears that at the heart of the tendency towards small grants there might be a communication problem, which needs to be tackled. In addition to actively communicating to its applicants that the chances for success do not depend on the requested amount of money, OTKA should ensure

that proposals with clearly insufficient budgets are not granted. There is a strong need to counter the tendency towards insufficiently funded small research project grants, in order to keep the main grant scheme effective in funding excellent science.

### 7.3 Internationalisation

#### OTKA's involvement in international organisations and funding schemes

OTKA represents Hungarian science in several international organisations and through different activities. Since 1996, OTKA, together with the Academy, has been a member of the ESF. Both OTKA and the Academy also joined Science Europe (an association of European research funding organisations and research performing organisations) when it was established in October 2011 as a successor of EUROHORCs (European Heads of Research Councils). OTKA actively participates in several Science Europe working groups such as *Open Access to Scientific Publications*, *Open Access to Data*, *European Grant Union*, *Research Integrity* and *Cross-border Collaboration*. OTKA (once again, together with the Academy) also participates and contributes financially to different financing programmes launched by the European research funding agencies, so-called ERA-NET programmes.

It is commendable that Hungary is represented in international organisations such as Science Europe jointly by OTKA and the Academy, i.e., by the country's most important funding council and by the largest (non-university) research performing organisation. The joint representation and sharing of responsibilities by OTKA and the Academy in ERA-NET programmes – which are primarily cross-border funding instruments – appears to be less justified.

The Evaluation Committee noted that national committees for Horizon 2020 programmes are located at the Hungarian National Innovation Office, which is also in charge of international cooperation, Marie Skłodowska-Curie actions, and bilateral relationships with other countries. Hungary is also a relatively large recipient of European Economic Area (EEA) and Norway Grants which are centrally managed by the National Development Agency and a number of programme operators (e.g., the National Innovation Officer acts as the programme operator for the bilateral research cooperation, and the Tempus Public Foundation is the programme operator for scholarships).

21. A third of the open-ended comments of the survey (34%) carried out by the ESF drew attention to the small amount of funding allocated, advocating an increase in funding, in the context of what they perceive to be a low success rate and modest funding in comparison with Western Europe. These respondents felt that a higher budget envelope would allow for more projects being funded, including smaller projects, but would also allow for the funding of high quality projects just below the cut-off point. The latter projects were said to be submitted repeatedly, increasing review work and lowering the overall success rate, according to these commentators.

22. Erik Arnold et al. (2013) Evaluation of the Academy of Finland, *Technopolis: report to the Ministry of Education and Culture*. FWF (2013) Annual report 2012.

23. DFG: [http://www.dfg.de/en/dfg\\_profile/evaluation\\_statistics/statistics/success\\_rates/index.html](http://www.dfg.de/en/dfg_profile/evaluation_statistics/statistics/success_rates/index.html)

24. NWO (2013) Annual report 2012.

The Evaluation Committee is of the opinion that considering OTKA's competences in peer review and evaluation as well as its efficient administrative practices, its role in coordinating and evaluating different international programmes disbursing funds for research (grants, scholarships, etc.) – currently managed by various governmental agencies – could be expanded. The Committee is aware, however, that this is not within the decision power of the OTKA's governance and would require a restructuring of the current system.

### **OTKA's activities and schemes supporting international cooperation**

OTKA aims to encourage Hungarian researchers to carry out high-level and internationally competitive research within the framework of the Lead Agency agreements with the Austrian Science Fund (FWF), the Academy of Finland (only in specific fields), and with the Slovenian Research Agency (ARSS). Since 2012, the FWF and OTKA jointly offer the possibility to apply for bilateral Austrian-Hungarian joint research projects. Also in 2012, the Academy of Finland and OTKA launched a joint call in the field of linguistics with the theme '*The changing linguistic scenery in Finno-Ugric speech communities and its impact on society and culture*' and the first three Finnish-Hungarian joint projects were funded in 2013. Further negotiations are currently underway with the National Research Foundation of Korea (NRF) in order to reach a Lead Agency agreement also between OTKA and NRF. The Evaluation Committee commends OTKA's recent activities in establishing Lead Agency agreements with three European research funding agencies and encourages continuing and expanding this process.

OTKA has a separate proposal type (known as the NN-type), which aims to support high-level basic research based on international cooperation. According to the conditions of the NN-type proposal, the proposal can be funded only if the Hungarian proposal is supported by OTKA and the foreign proposal is funded by the national research fund organisation in the respective country. The funding decisions about NN-type proposals are generally taken twice a year. This type of grant might be particularly interesting for foreign researchers who want to collaborate with researchers in Hungary.

OTKA also supports international collaboration when evaluating all other types of proposals – it is considered to be an added value if the research is conducted in the framework of international cooperation, which the applicants declare in the proposal form. This, however, should be more

explicitly mentioned in the OTKA calls for proposals.<sup>25</sup>

One important way to promote international collaboration is to strengthen research at national level, since it establishes the attractiveness of Hungarian research groups for international partners. In this respect, OTKA is one of the key players in promoting and facilitating collaborations between Hungarian and international researchers. In addition, OTKA research grants support international collaboration simply by providing funds for international travel, including participation in conferences and visiting colleagues in other countries. OTKA is encouraged to intensify its efforts towards promoting international collaboration as this is crucial for the development of research in the country.

### **OTKA's support to researcher mobility**

The Evaluation Committee learned during its site visit that international mobility into Hungary is relatively low, mostly because of the Hungarian language (which is difficult to learn and not spoken anywhere else in the world) but also because of low salaries, poor research infrastructures and complicated bureaucratic procedures. When it comes to OTKA's schemes, foreign researchers (i.e., non-Hungarian nationals) can submit proposals to OTKA as principal investigators if they are affiliated with a Hungarian research institution. All OTKA proposals have to be submitted in English which supports inward mobility by making it possible, as well as easier, for foreign researchers to apply for OTKA funding. According to the OTKA office, however, most of OTKA's grant recipients are still of Hungarian nationality.

Despite OTKA's efforts to make it easier for foreign researchers to apply for OTKA grants, there are still very few non-Hungarian grantees. While OTKA is encouraged to increase its efforts in this respect, this is a wider problem of the Hungarian research system, which in general does not appear very 'welcoming' to foreign researchers. The salary level and lack of advanced research infrastructures were named among the main obstacles to inward mobility.

What is also worrying is that Hungarian universities and research institutes do not seem to see internationalisation and promotion of researcher mobility as an important objective or mission of

<sup>25</sup> As the results of the survey of OTKA applicants indicate, about 75% of respondents had presented work at an international research conference or meeting during the past year and, on average, a respondent worked together with more than seven researchers outside Hungary during their OTKA research project or during the period they applied for OTKA funding.

OTKA, assuming the views of those stakeholders we consulted are an indication of those in the sector more generally. The Evaluation Committee is of the opinion that OTKA needs to raise awareness of its international agenda and role in supporting inward mobility amongst the public and other key stakeholder audiences.

OTKA's mission, over the years, has been to keep talented Hungarian researchers at home and fight the 'brain drain', by funding excellent basic research. Special attention has been paid to proposal calls targeting young researchers. The PD-type proposals are meant for postdoctoral researchers who are about to start their first independent research projects whereas the larger, NF-type proposals are aimed at more experienced and internationally recognised young researchers who wish to establish their own independent research groups. However, the NF-type was suspended in 2013 to avoid overlap with the Momentum Programme launched by the Academy in 2009 referred to previously.

The 'Money Follows Researcher' scheme was established with the aim of allowing research projects funded by national research funding organisations started and funded in one country to be finished in another country if the principal investigator moves abroad. In 2004, 27 EUROHORCs member organisations in 18 countries signed a memorandum and in 2014 all Science Europe member organisations were invited to sign a new draft letter of intent as an expression of their intention to implement the scheme. The President of OTKA was among the first eight heads of European national research funding organisations to sign the letter in order to support the international mobility of Hungarian researchers by enabling the continuity of OTKA funding when researchers move abroad. In order to support outward mobility of young researchers, OTKA is also considering having a 'postdoc abroad' scheme should their budget be increased.

The Evaluation Committee commends the OTKA's commitment to the 'Money Follows Researcher' scheme, thus supporting the international mobility of Hungarian researchers. In a similar vein, the Committee supports the idea of establishing a new funding scheme that would allow young talented Hungarian researchers to do postdoctoral research abroad. The implementation of such a funding scheme, however, must be coordinated and negotiated with the Hungarian National Innovation Office (which is currently in charge of Hungarian researcher mobility programmes, including Marie Skłodowska-Curie fellowships) in order to avoid parallel funding.

### Hungarian participation in ERC calls

When it comes to the participation of Hungarian researchers in European Research Council (ERC) calls, Hungary has been relatively successful. In total, researchers at Hungarian research institutions have received 19 Starting Grants and 14 Advanced Grants, as well as two 'Proof of Concept' grants during the years 2007-2013. For such a small nation, this is a truly remarkable achievement. While ERC is not explicitly mentioned in OTKA's strategy, the 2012 annual report states that "with its proposal and corporate system complying with international standards, techniques and attitudes, OTKA prepares Hungarian researchers for international competition" (p. 17).

The role of OTKA in supporting researchers to apply for ERC grants could also be stronger, for instance by giving recognition in OTKA's evaluation process to researchers who have made it to the second round of an ERC competition or by providing small grants to researchers preparing an ERC application. However, the Evaluation Committee also came to realise that supporting researchers to apply for ERC grants stands high on the agenda of the Academy as the recipients of its Momentum grants are expected to apply for an ERC grant before completing their research project.

## 7.4 Procedures

One of OTKA's strategic goals concerns continuous improvement of its processes and procedures. The current international review of the organisation was initiated by OTKA in order to critically assess its progress to date and focus on areas that need further improvement. The researchers and the employers of researchers who met with the Evaluation Committee during the site visit all concurred that the OTKA schemes are well managed, transparent and operate generally to standards which compare favourably with international best practice.<sup>26</sup>

26. According to the survey results (see Section 6), OTKA achieved very strong ratings for administration of grants, communication and application procedures. However, it appeared that over 50% of the respondents disagreed with the statement that OTKA selection procedures were fair and impartial. The vast majority of the open-ended comments of the survey also concerned the lack of transparency in funding decisions, perceived bias and the corresponding need for international reviewers, objective criteria to guide decision making and consideration of 'blind' reviews. The possible reasons for the discrepancy between this survey outcome and the opinion of the Evaluation Committee are explored in Section 8: Discussion and Conclusions.

## Safeguards against potential conflicts of interest

A serious issue in all countries (and even more so in small countries) is the danger of conflicts of interest since a relatively small scientific community is in charge of decisions to fund projects submitted by other members from the very same community. The Evaluation Committee noted that OTKA is fully aware of this dilemma, and has organised its work in appropriate ways to handle it.

The actual structure of the three-stage decision making process – review panels, scientific councils, and the OTKA Board – was designed to minimise the potential influence of individuals on the outcome of the selection process. Submitted proposals are evaluated by national and foreign experts invited by the review panels. According to the OTKA office, the standard requirement is three reviews by external experts per proposal; the minimum number of reviews per proposal is two, without which the review panels will not consider the proposal. Based on the reviews, the panels rank the proposals and make a recommendation on their support. Subsequently, the scientific councils give funding recommendations to the OTKA Board, with due consideration of the review panel comments, and taking into account the targeted calls with regard to specific disciplines announced by the OTKA Board. The final funding decisions are made by the OTKA Board. There is a general agreement that neither the scientific councils nor the OTKA Board change the original rankings by the review panels.

In addition, OTKA is continuously working towards the involvement of greater numbers of foreign experts in remote peer review, which has been facilitated by the fact that all proposals (with the exception of ‘Hungaricum’ proposals) have been submitted in English since 2009. According to the OTKA self-evaluation report the percentage of foreign reviewers has continuously grown since, i.e., from 9.51% in 2009 to 28.9% in 2014 (Figure 10).



Figure 10. Percentage of foreign experts among external reviewers, 2009-2014

While the existing 29 review panels are currently composed principally or solely of Hungarian researchers, OTKA is starting to conduct pilots with mixed review panels, known as International Committees or International Panels, that are convened for the evaluation of large scale research programmes. In these panels, researchers from outside Hungary are in the majority; meetings are held in English, and the members themselves do much of the reviewing instead of relying on remote assessments by external experts. This evaluation process mirrors the one used by the ERC.

Rotation of membership of review panels is in line with best practice internationally. While members (including the review panel chair) can, in theory, submit proposals while on a panel, procedures are in place to deal with this in order to avoid possible conflicts of interest. For instance, if the chair or a member of the review panel submits a proposal that is evaluated by the same panel on which they serve, their membership on the review panel is suspended for the specific call for proposals. They can retain their membership, however, if their proposal is evaluated by a different panel. If a member of one of the OTKA scientific councils submits a proposal, they are not allowed to be present at the review panel meeting and must leave the room during the council meeting when their proposal is being discussed.

The Evaluation Committee is aware of the dilemma associated with review panel or council members being able to submit OTKA proposals. On the one hand, it raises obvious conflict of interest issues. On the other, OTKA wishes to have active top-class scientists in its decision making bodies, many of whom would not serve if that prevented them from applying for funding (one has to keep in mind that at any given time, there are about 500 Hungarian researchers active in OTKA's decision making bodies, which is a significant fraction of the Hungarian research community). OTKA could minimise any possibility of conflicts of interest by following the example of other councils, e.g., the ERC where panel members only serve every second year, or the Czech Science Foundation, which has a special panel – consisting only of foreign members – for applications from panel members. It can be anticipated that the problem will diminish with decreasing numbers of Hungarian review panel members as a result of the gradual introduction of foreign panel members.

In fact, the Evaluation Committee was very impressed with OTKA's systems to involve the research community in its review panels and the steps it has taken to improve the independence of the review process by increasing the involvement of

international reviewers. It needs to prevent any perception of possible conflicts of interest by following the example of other councils. OTKA should make every effort to communicate to the Hungarian research community all the measures it employs for prevention of possible conflicts of interest.

### Operation of review panels

The number of review panels (currently 29 and even more a few years ago) may seem rather high considering the spectrum of scientific disciplines. This number is determined not just by the needs of science, but also by the numbers of proposals that each review panel can handle. The number of panels is decided by the OTKA Board, and will most likely be reviewed in the context of the move to international panels.<sup>27</sup>

It is important that the treatment of projects (and the success rates) does not vary significantly within each panel. OTKA distributes funds in proportion to the grant requests in each category, similar to the way the European Research Council distributes its funds across panels. The method ensures that the success rates across the review panels are broadly similar. The problem of funding via a spectrum of panels is encountered by many research councils throughout Europe, and few have come up with a suitable alternative. The Austrian Science Fund (FWF) is one example, with one single Board taking decisions on all applications on the basis of external reviews.

In all cases scientific excellence is the main criterion for selection of projects or people, with sub-criteria such as novelty of the scientific idea, track record of the Principal Investigator, expected outcomes and their scientific and social application. Financial feasibility, work plan and the appropriateness of the research infrastructure at the host institution are also taken into account. In some cases it is recommended that the budget should be decreased.

The Evaluation Committee understands that at present some review panels use open voting procedures that are not part of OTKA rules, while others do not. In the interests of transparency and consistency, it would be advisable that a move to open voting in all cases is encouraged.

Generally, research councils try to implement procedures to deal with interdisciplinary projects.

27. Some of the respondents of the survey, in their open-ended comments, suggested that the scientific coverage be more balanced (e.g., agricultural sciences have more review panels than other disciplines) and take into account newer and emerging disciplines. This may imply the creation of more review panels, but with a better focus of experts in a particular field.

This also seems to be of concern for researchers.<sup>28</sup> From the stakeholder consultations our understanding is that OTKA uses an Interdisciplinary Panel to examine interdisciplinary proposals. In addition, such proposals need to be evaluated by at least three external reviewers. It was indicated that each of the parts of an interdisciplinary project would have to be judged as ‘excellent’ for it to be funded. The European Research Council for instance no longer uses an interdisciplinary panel, but instead uses a wider array of referees to help the most closely related panel(s) to make recommendations for such projects. Following this line for OTKA might be challenging, if there is only one meeting of the review panel, but it should be considered, perhaps with the more direct involvement of the appropriate review panel chairs and/or vice chairs. It is also noted that ‘preliminary panel meetings’ can be held and indeed that review panels can decide to hold additional meetings. Given the trend towards international panels, videoconferencing might be particularly useful for the additional panel meeting(s).

With regard to the operation of the review panels, the Evaluation Committee finds that, in general, appropriate procedures and selection criteria are in place. Some areas of fine-tuning are needed, including reducing the number of review panels, improving the procedures for assessing interdisciplinary projects and increasing transparency of the decision making process, e.g., by using open voting procedures.

### Electronic proposal review system

The Evaluation Committee was impressed by OTKA’s electronic proposal review system for managing proposals. It is now well established and is viewed as one of the best internationally. The quality of the system is important in terms of attracting good international referees. A cumbersome system tends to discourage the involvement of busy externs. It is also particularly useful when OTKA acts as the lead agency in international cooperation schemes.<sup>29</sup>

### Grant monitoring procedures

As regards monitoring the success of OTKA grants, there is a system of brief annual reports and a more substantial final report, which are evaluated by the review panels. In the final report, the scientific work,

28. In some of the open-ended comments of the survey of the OTKA applicants, interdisciplinary and transdisciplinary proposals were perceived as being less likely to succeed because they do not fit well with the more traditional research domains/ areas.

29. Survey respondents rated OTKA’s electronic application system very highly (over 80% of respondents agreed it was easy to use).

the results achieved and their significance is outlined and publications or patents are listed. The Evaluation Committee learnt that annual reports do not usually have any particular consequences for the continuation of the grants, while the final report may impact the success of subsequent applications. If final scientific reports and annual reports are evaluated as inadequate by the review panel, then the respective scientific council would make a decision about the further steps. The president of the OTKA Board would make decisions about more serious sanctions (e.g., temporary exclusion from proposal submission, partial or complete return of funds, etc.) taking the scientific council's opinion into consideration.

The justification of costs arising during the project are monitored simultaneously with the assessment of reports by review panel chairs (with the involvement of external experts) or in certain cases by the scientific council. The respective council's president adjudicates on the reasonableness of modifications to the original scientific research budget or plan.

Financial reports are examined by the Finance Department of OTKA on the basis of research fund regulations. In 2013, the Finance Department examined 2,253 financial reports, and made 71 on-site examinations.

The Evaluation Committee finds the system of monitoring the success of individual grants appropriate. OTKA might even consider doing away with annual reports (or at least limit their number), as they appear to create administrative overhead with little effect.

### **Impact assessment**

When it comes to assessing the impact of funded research and of its funding schemes, OTKA's main focus is on the collection of data and analysis of outputs by the funded projects. In the interim and final reports, researchers are asked to list publications, patents or doctoral dissertations obtained through OTKA support. These are then recorded in the OTKA electronic proposal review system. Furthermore, the electronic system provides information on the project participants and young researchers, postdocs and PhD students employed as well as on costs and investments. OTKA analyses the success of funded research based on the number of publications, patents and doctoral dissertations, taking into account the impact factor and citation count.

In addition to these, OTKA governance is aware that other potential impacts of OTKA funding include establishment of new research groups, the involvement of young researchers in research, participation of Hungarian researchers in international

projects, the transfer of research results into education, the promotion of doctoral training, to name but a few. However, no systematic collection or analysis of these kinds of data has been carried out. OTKA is encouraged to develop a broader understanding of research impact, as is currently the tendency across research councils internationally, and systematise data collection to assess broader impacts of its research.

The success and impact of OTKA's funding schemes need to be monitored in a more systematic way, e.g., by performing a bibliometric analysis of the outcome of OTKA funded projects and by performing an assessment of wider and longer-term impacts of its activities via feedback from grant beneficiaries, for example. While this represents a substantial effort, the results would constitute a valuable element of OTKA's accountability towards political stakeholders. It is very encouraging that some of the relevant data (e.g., publications, patents and doctoral dissertations) are already being systematically collected by OTKA and standardised in its electronic proposal review system.

## 8.

# Discussion and Conclusions



Based on the report from the Evaluation Committee and the findings of the applicant survey, OTKA is a professionally managed funding body for basic research in Hungary. It delivers competitive funding on the basis of scientific excellence, with equal treatment of all scientific disciplines and equal chances for all applicants.

The Evaluation Committee was very impressed by OTKA's achievements during recent years in improving its selection processes and by its determination to continue doing so in the future. The survey clearly demonstrated that OTKA grants play an essential role for research careers in Hungary. The respondents have also evaluated OTKA grant administration processes very positively.

The conclusions and recommendations outlined below refer to several possible areas of improvement, and should be viewed in the context of a very positive evaluation of OTKA overall by both the Evaluation Committee and the survey respondents. OTKA is a valuable asset in the Hungarian research system, and the following conclusions and recommendations are intended to strengthen its important role.

## 8.1 OTKA mission, governance and management structures

Within the Hungarian R&D system, OTKA is the main body for funding basic research in every field of science and supporting every stage of a researcher's career. OTKA funds research projects exclusively on the basis of scientific excellence, and employs well defined selection processes involving large numbers of researchers from Hungary and abroad. OTKA grants are considered by researchers and institutional stakeholders to be very significant

for research careers and are clearly seen as a sign of academic recognition in the country.

In Hungary, in addition to OTKA and the Academy of Sciences, there are a number of other programmes that provide funding for researchers at various stages of their careers managed by various ministries and governmental bodies. The Evaluation Committee is of the opinion that because of OTKA's high standing and grant management expertise it would be well placed to manage the selection processes in various external research funding programmes, in addition to its current portfolio.

OTKA enjoys a high degree of political autonomy. The identification of researchers involved in OTKA's decision making bodies, with the exception of Board members who are appointed by the Prime Minister, is largely controlled by Hungary's research community.

While being well protected from direct political influence, OTKA may also come across as quite marginalised in the national R&D system, where OTKA's role is confined to the operational level. There are no channels for OTKA to provide advice to policy makers since it is not represented in the country's strategic bodies for STI policy. This results in OTKA's low public profile and political sidelining. The OTKA Board, as the key body in its governance structure, needs to be used much more for strategic purposes, as a place of contact and networking with the policy makers, with the aim to better position OTKA in the national system and develop a more ambitious longer-term strategy.

Furthermore, the Evaluation Committee considered that the current relationship between OTKA and the Hungarian Academy of Sciences inhibits the ability of OTKA to develop an independent role and strategy in keeping with national research priorities.

Budget negotiations with the Government are performed by the Academy on OTKA's behalf each year and OTKA's budget is a line item in the Academy's.

In the eyes of the Evaluation Committee, the political subsuming of OTKA by the Academy complicates the relationship between the two organisations unnecessarily. To add to the complexity, the institutions of the Academy are competitors for OTKA funds, alongside universities. Moreover, the Academy recently started running similar competitive funding programmes to OTKA. These conflicting and non-aligned interests will not be good for either organisation or Hungarian research. The roles of the two institutions are rather unclear to researchers and others and need to be made more distinct.

The Evaluation Committee found that OTKA's internal organisational and management structures are clear and fit for purpose. There is an appropriate division of tasks and good communication between the 'academic' level, represented by the OTKA Board, scientific councils and the review panels, and the 'administrative' level represented by the OTKA office.

Overall, the Evaluation Committee found that OTKA's grant management procedures ensured an allocation of resources with the highest degree of integrity. While the three-stage evaluation process, involving review panels, scientific councils and the OTKA Board, appears to be rather complex, especially considering the small size of the awarded grants, it is managed in a professional way, with administrative overheads kept at a reasonable level. There may be scope for simplifying the process for small grants.

The continuous involvement of a large number of members of the scientific community in OTKA's decision making bodies appears to work well in Hungary, although stronger safeguards against conflicts of interest are needed to ensure the full independence of the grant decision making process. The large number of researchers involved means that it is difficult to avoid the risk that those who are applicants for and/or beneficiaries of funding may also be involved in the evaluation process. This is discussed further below.

## 8.2 Funding portfolio

OTKA aims to support excellent research and to provide support to all stages of a researcher's career. The survey demonstrated that there is a balanced level of grant distribution across all age categories. The majority of those applying for OTKA fund-

ing (pre-2009-2013) were independent, established researchers, many of whom were at the most senior level. Early stage researchers (postdoctoral level) account for 20% of respondents, which is quite high. Their OTKA grant success rates are higher than might have been expected for those in the earlier stages of their careers. Younger applicants can feel very encouraged by this finding.

The Evaluation Committee found OTKA's funding portfolio to be clearly structured and diverse enough to cover the needs of researchers in Hungary, with the possible exception of systems for interdisciplinary research. The strongest focus is on funding research projects while career grants and international cooperation grants receive significantly less funding, as would be expected. In the Evaluation Committee's view this focus is appropriate to an extent that at the moment there are other institutions in Hungary funding career grants. Further developments of the funding portfolio would be reliant on budget increases.

OTKA's budget is far too small for a national funding body of basic research. A continuous but substantial (in the order of at least 10% per year) increase of OTKA's budget would be advisable.

The OTKA average success rate (29%) appears to be well in line with success rates in other research councils across Europe. However, according to OTKA's governance, many OTKA proposals evaluated as excellent could not be funded because of the lack of funds. The survey respondents' view appears to be that OTKA grants are more competitive than other types of grants available in Hungary. While this may be the case, by international standards OTKA's success rate is reasonably high.

The Evaluation Committee agrees with some of the institutional stakeholders consulted that increasing OTKA's grant budget might compromise competition, if used exclusively to increase grant numbers instead of the size of the awarded grants. There is a strong need to counter the tendency of unrealistically small research grants, if OTKA grant schemes are to be fully effective in funding excellent science.

In terms of broadening the portfolio, the Evaluation Committee is of the view that OTKA is well positioned to manage the selection process for various external funding schemes offering career grants. In addition, it would be worth exploring whether OTKA could play a role in supporting doctoral students, e.g., provide PhD grant support with the responsible Ministry of Human Capacities. Low numbers of entrants to doctoral study pose a serious problem for the Hungarian research system. Incorporation of this role would be in keeping with

OTKA's mission of supporting researchers at every stage of their career. It would also have the advantage of a specialised agency's focus on a critical resource and could greatly encourage the growth and sustainable development of a new generation of researchers in Hungary.

Finally, the Evaluation Committee is of the opinion that it would be beneficial for OTKA and the Hungarian R&D system to be able to connect OTKA grant schemes to European funding and co-funding possibilities (EU Structural Funds) to increase OTKA's leverage. However, the Evaluation Committee is aware that this would require a political decision outside OTKA's remit as these schemes are currently managed by other governmental agencies.

### 8.3 Internationalisation

OTKA is fairly active internationally: it represents Hungary, together with the Academy of Sciences, in international organisations such as Science Europe as well as the EU's ERA-NET programmes. It has also established Lead Agency agreements with three European research funding agencies. Among the European research councils, OTKA is one of the forerunners in implementing open access strategies, and is fully committed to the 'Money Follows Researcher' scheme supporting the international mobility of Hungarian researchers. The Evaluation Committee commends OTKA on these achievements, and encourages continuing and expanding this process.

One important way to promote international collaboration is to strengthen research at national level, since it establishes the attractiveness of Hungarian research groups for international partners. In this respect, OTKA is one of the key players in promoting and facilitating collaborations between Hungarian and international researchers. In addition, OTKA research grants support international collaboration simply by providing funds for international travel, including participation in conferences and visiting colleagues in other countries.

According to the survey results, the level of internationalisation of OTKA applicants is quite high: they are both geographically and virtually mobile. They appear to be prepared to travel internationally to further their research careers and many have in fact done so. On average, respondents worked with about seven researchers outside Hungary during their OTKA research project or during the period they have applied for OTKA funding.

OTKA grant awardees appear to have better career outcomes than unsuccessful applicants. For example, they are more likely to have been awarded an academic prize, to have published in peer reviewed journals and to have presented their work at Hungarian research conferences. However, the results for unsuccessful OTKA grant applicants at the arguably more prestigious international level are intriguing. They are somewhat more likely than one-time OTKA awardees to have presented work internationally. Moreover, they have a notably higher level of international grant success than successful OTKA applicants. It is difficult to be precise as to the reason, but it is possible that lack of success in OTKA calls motivates international grant seeking (and hence greater levels of success). It is also possible that some very talented researchers are slipping under the radar in the award decision making process. This outcome is worthy of further study and ongoing follow-up by OTKA.

With regard to internal mobility, despite OTKA's efforts to make it easier for foreign researchers to apply for OTKA grants, there are still very few non-Hungarian grantees. While OTKA is encouraged to increase its efforts in this respect, this is a wider problem of the Hungarian research system, which in general does not appear very 'welcoming' to foreign researchers. The salary level and lack of advanced research infrastructures were named among the main obstacles to inward mobility.

The Evaluation Committee is of the opinion that OTKA needs to raise awareness of its international agenda and its role in supporting inward and outward mobility amongst the public and other key stakeholders.

The role of OTKA in supporting researchers to apply for ERC grants could also be stronger, for instance by giving recognition in OTKA's evaluation process to researchers who have made it to the second round of an ERC competition or by providing small grants to researchers preparing an ERC application.

### 8.4 Procedures

Overall, the survey respondents evaluated OTKA grant administration processes (including communications, electronic system, application procedures, etc.) very positively. In addition, OTKA staff appear to be flexible and helpful with regard to handling the changes in the funded research projects during the post-award phase.

There is overall agreement amongst the respondents that OTKA grants are essential to research

careers. The impact evidence suggests this is indeed the case.

Two areas of improvement, which may be linked, can be identified for OTKA's attention:

Firstly, OTKA needs to review its selection procedures with regard to fairness and impartiality. The system has been relatively closed until recently with the same researchers applying for funding and acting as reviewers, being a panel or council member/chair in the past five years. This situation is not uncommon for a country of Hungary's size – especially since OTKA funding attracts top scholars in the country.

This practice has undoubtedly influenced how OTKA is perceived by the research community in terms of impartiality and independence. It appears that the recent change to a more international and transparent decision making process was needed and there is scope for increasing the independence of the system further. There appears to be a need for better communication to the research community as to how conflict of interest issues are dealt with.

Secondly, OTKA is encouraged to review the quality of its feedback procedures. In particular, an assessment of its clarity and helpfulness to applicants who received a negative funding decision would be very worthwhile to help them understand what they need to do to be successful on subsequent occasions and to improve the transparency of the process overall.

The Evaluation Committee was very impressed with OTKA's systems to involve the research community in its decision making bodies and the steps it has taken to improve the independence of the review process by increasing the involvement of international reviewers over the last few years. It is recommended that OTKA prevent any perception of conflicts of interest by following the example of other councils, e.g., the ERC, where panel members only serve every second year, or the Czech Science Foundation, which has a special panel – consisting only of foreign members – for applications from panel members.

With regard to the operation of the review panels, the Evaluation Committee found that in general appropriate procedures and selection criteria were in place. Some areas of fine-tuning are needed, including reducing the number of review panels, improving the procedures for assessing interdisciplinary projects and increasing the transparency of the decision making process, e.g., by using open voting procedures.

OTKA carefully monitors gender balance in its decision making bodies, yet women are still under-represented in review panels, scientific councils and

among reviewers. While gender balance is good in terms of similar rates of grant success, many more male than female researchers apply for OTKA funding and men are thus more likely to succeed. OTKA may wish to encourage more women to apply and could also publicise the similar success levels.

The Evaluation Committee found the system of monitoring the success of individual grants to be appropriate. OTKA might even consider doing away with annual reports (or at least limiting their number), as they appear to create administrative overhead with little effect.

The success and impact of OTKA's funding schemes need to be monitored in a more systematic way, e.g., by performing bibliometrics and by performing an assessment of wider and longer-term impacts of its activities. While these activities require a significant input, they would improve OTKA's accountability to the public and to the political system. It is very encouraging that some of the relevant data (e.g., publications, patents and doctoral dissertations) are already being systematically collected by OTKA and standardised in its Electronic Proposal Review System.

The survey supports the widespread belief that OTKA is essential for research careers in Hungary. OTKA grant awardees appear to have better career outcomes than unsuccessful applicants. They are more likely to have been awarded an academic prize, to have published in peer reviewed journals and to have presented their work at Hungarian research conferences. The level of research impacts from OTKA funded research (as inferred from the number of patents and licences registered) achieved in the year prior to the survey is not particularly strong. However, this is not surprising given that OTKA's main mission is to fund basic rather than applied research. While research applications are difficult to monitor as they may take decades to emerge, OTKA would be well advised to monitor both academic and socioeconomic impact of the funded research on a long-term basis.

# 9. Recommendations



## OTKA mission, governance and management structures

- The OTKA Board should be more centrally involved in developing basic research strategy at national level and have regular structured contact with policy makers and relevant agencies.
- OTKA's future role in the Hungarian research system should be examined with a view to optimising its research management strengths and potential to better support beginning and early stage researchers. Its functional independence from the Hungarian Academy of Sciences should form part of any such examination so that it can work towards defining its own strategy in keeping with national research priorities.
- The OTKA Board should negotiate a continuous but substantial (in the order of at least 10% per year) increase in its budget to allow it to more effectively fulfil its mandate to support basic research funding at national level.
- OTKA should raise its public profile and ensure that relevant policy makers are aware of its grant management expertise. It should invest in public relations, and consider expanding its PR activities towards research communication.
- OTKA should continue to strongly involve members of the scientific community in its decision making bodies. At the same time OTKA should ensure that robust safeguards against conflicts of interest are in place.

## Funding portfolio

- OTKA should continue to offer a limited number of well defined schemes. Introduction of any new schemes should be subject to a full examination of other schemes operating in the national research and higher education system to ensure complementarities, optimisation of competencies and to minimise potential for duplication.
- OTKA should retain its focus on funding basic research and explore opportunities to develop bridges with the body responsible for applied research.
- OTKA should use any additional funding to increase the size of grants as well as to tackle any gaps in the research system it is well placed to address. Possible gaps include early stage researchers, schemes for internal/external mobility, and sustainable support for doctoral students.

## Internationalisation

- OTKA should raise awareness amongst key stakeholders of its international agenda and its role in supporting inward and outward mobility. Where appropriate, calls for proposals should clearly state that international collaboration is a clear added value to the proposal. The OTKA website should provide extensive information about the upcoming calls in English and Hungarian.
- OTKA should explore ways to support researchers applying for ERC grants, for example, by asking applicants to indicate if they had applied for Horizon 2020 funding or an ERC grant and, if so, what mark or level they achieved. By doing so, proposals that had made it to the second round of an

ERC competition could be given recognition in the OTKA evaluation processes. OTKA should encourage ERC applications in other ways, for example, by providing small grants to ERC applicants.

## Procedures

- OTKA should prevent any perception of conflicts of interest by following the example of other councils in ensuring that panel members are not simultaneously applying for funding, e.g., by decreasing the term of the panel members, or by having a special panel consisting only of international reviewers for adjudicating applications from panel members. OTKA should actively communicate to the research community about its safeguard measures to avoid potential conflicts of interest.
- OTKA should continue the process of increasing the involvement of international reviewers in review panels and increasing the proportion of international researchers in its remote reviewer network.
- OTKA should review the quality of its feedback procedures. In particular, feedback for applicants who received a negative funding decision should provide adequate detail on the reason for the decision and pointers as to what would have been needed for the proposal to have been successful.
- OTKA should review and possibly improve its procedures for the selection of interdisciplinary proposals and actively communicate these to potential applicants.
- For reasons of transparency, all OTKA decision making bodies such as the review panels and scientific councils should consistently use 'open voting' procedures.
- OTKA should encourage more women to apply, e.g., by publicising the similar success levels between men and women.
- OTKA should closely monitor and improve the representation of women in its decision making bodies (especially in the scientific councils) and amongst reviewers.
- While the system of monitoring the success of individual grants is appropriate, OTKA should consider doing away with annual reports (or at least limit their number), as they appear to create administrative overhead with little effect.
- OTKA should monitor both academic and socio-economic impact of funded research, e.g., by performing a bibliometric analysis of the outcome of OTKA funded projects and by performing an assessment of wider and longer-term impacts of its activities through periodic surveys of grant beneficiaries.



# 10. Appendices

## Appendix I: Evaluation Work Plan

### Work package 1:

#### Setting up the legal and procedural framework

Starts: October 2013

Ends: January 2014

#### Tasks:

- Preparation and signing of the Memorandum of Understanding (November 2014)
- Scoping visit (December 2013) – CEO, Science Officer
- Preparation of the detailed evaluation protocol (January 2014)

#### Milestones:

Date	Milestone(s)
12-13 December 2013	First scoping visit of the ESF staff to OTKA
November-December 2013	The signature of the MoU

#### Deliverables:

Date	Deliverable(s)
15 November 2013	Draft MoU
31 January 2014	Evaluation Protocol and Work Plan

### Work package 2:

#### Setting up the Evaluation Committee

Starts: January 2013

Ends: February 2014

#### Tasks:

- 2.1 Drafting a list of potential members of the Evaluation Committee
- 2.2 Feedback and additional recommendations from OTKA
- 2.3 Contacting potential members of the Evaluation Committee

#### Milestones:

Date	Milestone(s)
February 2014	1 <sup>st</sup> virtual meeting of the Evaluation Committee

#### Deliverables:

Date	Deliverable(s)
28 February 2014	Evaluation Committee Membership List

### Work package 3:

#### Data gathering and analysis

Starts: January 2014

Ends: March 2014

#### Tasks:

- 3.1 Desk research: background information on OTKA, R&D context in Hungary
- 3.2 Identification of the reference documents for the evaluation (in collaboration with OTKA)
- 3.3 Preparation of the structure for the self-evaluation report by OTKA
- 3.4 Two virtual meetings with the Evaluation Committee to discuss available documentation and methodological issues

#### Milestones:

Date	Milestone(s)
April 2014	2 <sup>nd</sup> virtual meeting of the Evaluation Committee

#### Deliverables:

Date	Deliverable(s)
31 March 2014	List of reference and background documents (determined in consultation with OTKA)
1 April 2014	Data analysis report

## Appendix I: **Evaluation Work Plan**

### **Work package 4:**

#### **The site visit of the Evaluation Committee**

Starts: March 2014

Ends: May 2014

##### **Tasks:**

- 4.1 Preparation of the site visit of the Evaluation Committee
- 4.2 Site visit: consultations with OTKA staff, researchers and other stakeholders
- 4.3 Meeting of the Evaluation Committee following the site visit

##### **Milestones:**

Date	Milestone(s)
May 2014	Site visit of the Evaluation Committee to OTKA
May 2014	Meeting of the Evaluation Committee

### **Work package 5:**

#### **Preparing the Evaluation Report**

Starts: May 2014

Ends: November 2014

##### **Tasks:**

- 5.1 Draft Evaluation Report following the Evaluation Committee's meeting
- 5.2 Feedback from OTKA on the draft Evaluation Report
- 5.3 Finalising the Evaluation Report
- 5.4 Publication of the final Evaluation Report

##### **Deliverables:**

Date	Deliverable(s)
10 October 2014	Draft Evaluation report
10 November 2014	Final Evaluation report (publication)

### **Work package 6:**

#### **Project Management**

Starts: October 2013

Ends: November 2014

##### **Tasks:**

- 6.1 Coordination of the Evaluation Committee and liaison with OTKA
- 6.2 Financial and human resources management

## Appendix II: **OTKA Clients and Stakeholders Consulted**

### **OTKA Governance**

- **Professor László Kollár**, President of OTKA Board
- **Professor László Acsády**, President of the Council of Life Sciences
- **Professor Dezső Beke**, President of the Council of Science and Engineering
- **Dr Andrea Balla**, Director, OTKA Office
- **Dr Anikó Csákány**, Acting Director, OTKA Office

### **Policy Makers and relevant Bodies**

- **Dr Csaba Deák**, Vice President for Strategy, National Innovation Office
- **Dr Béla Kardon**, Head of the Department for Science Policy, Ministry of Human Capacities, Hungarian Government
- **Professor Domokos Szász**, Vice President for Natural Sciences, Hungarian Academy of Sciences

### **OTKA Panel Chairs and Staff**

- **Professor András Cser**, Chair, Linguistics Panel
- **Professor Miklós Menyhárd**, Chair, Physics Panel
- **Professor János Szöllősi**, Chair, Molecular Biology, Molecular Interactions Panel
- **Dr Andrea Balla**, Director, OTKA Office
- **Dr Anikó Csákány**, Acting Director, OTKA Office
- **Dr Előd Nemerkenyi**, Assistant of international affairs, OTKA Office
- **Dr Árvácska Sárpátki**, Head of Department of Social Sciences and Humanities, OTKA Office
- **Dr Gábor Tóth**, Head of Department of Life Sciences, OTKA Office

### **Representatives of Research Organisations**

- **Professor László Csernoch**, Vice Rector for Scientific Affairs, University of Debrecen
- **Professor Ákos Jobbágy**, Vice Rector for Education, Budapest University of Technology and Economics
- **Professor Attila Z. Papp**, Deputy Director General of the Centre for Social Sciences & Director of Institute for Minority Studies, Hungarian Academy of Sciences
- **Professor Gábor Szabó**, Rector, University of Szeged
- **Professor János Szépvölgyi**, Deputy Director-General of the Research Centre for Natural Sciences, Hungarian Academy of Sciences

### **Researchers (OTKA Applicants)**

- **Dr Gergely Csiky**, Research Centre for the Humanities, Hungarian Academy of Sciences
- **Dr Balázs Dóra**, Institute of Physics, Budapest University of Technology and Economics
- **Dr Katalin Felvinczi**, Deputy Director of the Institute of Psychology, Eötvös Loránd University
- **Dr Franco Magurno**, Plant Protection Institute, Szent Istvan University
- **Dr Károly Vékey**, Head of Department, Institute of Chemistry, Chemical Research Center, Hungarian Academy of Sciences

## Appendix III: List of Reference and Background Documents

The documents listed below were provided to the Evaluation Committee to make available information on OTKA and the general context. Certain documents were provided by OTKA; others were sourced by the ESF. Web links are provided where available for easy consultation.

The reference and background documents are divided into two main sections: those pertaining to OTKA directly; and those more generally related to the R&D context.

### 1. Hungarian Scientific Research Fund

*Act CXXXVI of 1997 on the Hungarian Scientific Research Fund.* <<http://www.otka.en/rules>>.

*Organisational and Operational Rules of the Hungarian Scientific Research Fund (OTKA SzMSz).* Budapest, 2013 (translated 2014). [Accessed online: 2014]. <<http://www.otka.en/rules>>.

*Rules of Procedure of the OTKA Board.* Budapest, 2013 (translated 2014). [Accessed online: 2014]. <<http://www.otka.en/rules>>.

*Rules of Procedure of OTKA Scientific Councils.* Budapest, 2014 (translated 2014). [Accessed online: 2014]. <<http://www.otka.en/rules>>.

*Rules of Procedure of the OTKA Procedure and Ethics Board.* Budapest, 2012 (translated 2014). [Accessed online: 2014]. <<http://www.otka.en/rules>>.

*Rules of Procedure of OTKA Panel and ad hoc Committee Meetings.* Budapest, 2014 (translated 2014). [Accessed online: 2014]. <<http://www.otka.en/rules>>.

*Rules of Procedure of Managing OTKA's Interdisciplinary Proposals.* Budapest, 2013 (translated 2014). [Accessed online: 2014]. <<http://www.otka.en/rules>>.

*Code of scientific ethics of the Hungarian Academy of Sciences (MTA) and the corresponding Memorandum,* adopted by Resolution No. 25/2010 (V. 4.) of the General Assembly of the MTA.

*Code of Ethics of the Hungarian Scientific Research Fund.* Budapest, 2011 (translated 2014). [Accessed online: 2014]. <<http://www.otka.en/rules>>.

*Rules on Conflict of Interest of OTKA.* Budapest, 2013 (translated 2014) <<http://www.otka.en/rules>>.

*Rules of Procedure of Managing OTKA's Risky Proposals.* Budapest, 2013 (translated 2014). <<http://www.otka.en/rules>>.

*Complaint Management Related to OTKA Proposals/Projects.* Budapest, 2011 (translated 2014). <<http://www.otka.en/rules>>.

*Regulations on the Performance of OTKA Support Contracts* Budapest, 2014. (translated 2014). <<http://www.otka.en/rules>>.

*Hungarian Scientific Research Fund. 2013-2015 Strategy.* Budapest, 2012. [Accessed online: 2014]. <<http://www.otka.hu/en/about-otka/strategy>>.

*Hungarian Scientific Research Fund. Annual Report 2013.* Budapest, 2014. [Accessed online: 2014]. <<http://www.otka.hu/en/about-otka/otka-publications>>.

*Hungarian Scientific Research Fund. Annual Report 2012.* Budapest, 2013. [Accessed online: 2014]. <<http://www.otka.hu/en/about-otka/otka-publications>>.

*Hungarian Scientific Research Fund. Annual Report 2011.* Budapest, 2012. [Accessed online: 2014]. <<http://www.otka.hu/en/about-otka/otka-publications>>.

### 2. Research and Development (R&D) Context

Döry, Tibor and Havas, Attila (2013) *ERAWATCH Country Reports 2012: Hungary.* European Commission. [Accessed online: 2014]. <[http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/reports/countries/hu/report\\_0007](http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/reports/countries/hu/report_0007)>.

Deloitte (2013) *The Researchers' Report 2013, Country Profile: Hungary.* [Accessed online: 2014]. <[http://ec.europa.eu/euraxess/pdf/research\\_policies/country\\_files/Hungary\\_Country\\_Profile\\_RR2013\\_FINAL.pdf](http://ec.europa.eu/euraxess/pdf/research_policies/country_files/Hungary_Country_Profile_RR2013_FINAL.pdf)>.

European Commission (2014) *ERAWATCH Country Pages: Hungary.* [Accessed online: 2014]. <[http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/country\\_pages/hu/country](http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/country_pages/hu/country)>.

European Commission (2013) *Innovation Union Scoreboard 2013.* [Accessed online: 2014]. <<http://ec.europa.eu/enterprise/policies/innovation/facts-figures-analysis/innovation-scoreboard/>>.

European Commission (2013) *She Figures 2012 – Gender in Research and Innovation.* Luxembourg: Publications Office of the

## Appendix III: List of Reference and Background Documents

European Union. [Accessed online: 2014]. <[http://ec.europa.eu/research/science-society/document\\_library/pdf\\_06/she-figures-2012\\_en.pdf](http://ec.europa.eu/research/science-society/document_library/pdf_06/she-figures-2012_en.pdf)>.

European Commission (2013) *Research and Innovation performance in EU Member States and Associated countries. Innovation Union progress at country level*. Luxembourg: Publications Office of the European Union. [Accessed online: 2014]. <[http://ec.europa.eu/research/innovation-union/pdf/state-of-the-union/2012/innovation\\_union\\_progress\\_at\\_country\\_level\\_2013.pdf](http://ec.europa.eu/research/innovation-union/pdf/state-of-the-union/2012/innovation_union_progress_at_country_level_2013.pdf)>.

European Commission (2012) *ERAWATCH Country Pages: Hungary- Support measure: Hungarian Scientific Research Fund (OTKA)*. [Accessed online: 2014]. <[http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/country\\_pages/hu/supportmeasure/support\\_mig\\_0004](http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/country_pages/hu/supportmeasure/support_mig_0004)>.

European Commission (2013) *Researchers' Report 2013*. [Accessed online: 2014]. <<http://ec.europa.eu/euraxess/index.cfm/services/researchPolicies>>.

National Innovation Office (2013) *Investment in the Future: National Research and Development and Innovation Strategy (2013-2020)*. Budapest. [Accessed online: 2014]. [www.nih.gov.hu/download.php?docID=25559](http://www.nih.gov.hu/download.php?docID=25559).

## Appendix IV: Questionnaire Response Summary

ESF carried out a survey of OTKA applicants over the period 2009-2013. The response rate was 68% and 590 applicants responded to the survey. The response counts per question are provided below. Open-ended comments are not included for reasons of confidentiality. For certain questions,

multiple answers were possible (the response percent or count may therefore not be equal to the number of respondents for that question). The survey methodology is described in Section 3.4.3 of the report and an analysis of the data in Section 6.

### Questionnaire to OTKA applicants

**Total Started Survey: 590**

**Total Finished Survey: 568 (96.3%)**

#### 1. In which country do you currently live, work or engage in research?

##### **Africa – 3 responses**

1 - Ivory Coast

2 – Egypt

##### **Asia – 1 response**

1 – China

##### **Europe – 578 responses**

2 – Austria

1 – Belgium

3 – Germany

564 – Hungary

1 – Ireland

1 – Norway

1 – Romania

1 – Switzerland

4 – United Kingdom

##### **Oceania – 0 responses**

##### **North America – 4 responses**

4 – United States

##### **South America – 0 response**

##### **Other – 4 responses**

**Answered question: 582**

**Skipped question: 8**

## Appendix IV: Questionnaire Response Summary

### 2. Please tick your age category:

		Response Percent	Response Count
20-25		0.0%	0
26-30		0.7%	4
31-35		10.7%	63
<b>36-40</b>		<b>18.4%</b>	<b>108</b>
41-45		15.7%	92
46-50		12.1%	71
51-55		11.8%	69
56-60		9.2%	54
61-65		10.1%	59
Over 65		11.4%	67
		<b>answered question</b>	<b>587</b>
		<b>skipped question</b>	<b>3</b>

## Appendix IV: Questionnaire Response Summary

### 3. Are you Male or Female?

		Response Percent	Response Count
Male		73.5%	433
Female		26.5%	156
answered question			589
skipped question			1

### 4. Please indicate which of the following educational awards you have achieved:

		Response Percent	Response Count
Primary Degree		8.5%	50
Masters Degree		12.4%	73
<b>Doctoral Level Degree (including PhD, DsC: Doctor of Academy)</b>		86.9%	512
Post Doctoral Qualification		24.8%	146
		Other	23
answered question			589
skipped question			1

## Appendix IV: Questionnaire Response Summary

**5. Please indicate the Field of Science and Technology (Frascati Manual Classification) that best corresponds with your educational studies:**

### Natural Sciences (Response count: 286)

18	6.3 %	Mathematics
4	1.4 %	Computer and information sciences
54	18.9 %	Physical sciences
56	19.6 %	Chemical sciences
25	8.7 %	Earth and related environmental sciences
<b>126</b>	<b>44.1 %</b>	Biological sciences
3	1.0 %	Other natural sciences

### Engineering and Technology (Response count: 57)

9	15.8 %	Civil engineering
9	15.8 %	Electrical/electronic/information engineering, electronic
<b>10</b>	<b>17.5 %</b>	Mechanical engineering
9	15.8 %	Chemical engineering
<b>10</b>	<b>17.5 %</b>	Materials engineering
0	0 %	Medical engineering
0	0 %	Environmental engineering
1	1.8 %	Environmental biotechnology
1	1.8 %	Industrial Biotechnology
5	8.8 %	Nano-technology
3	5.3 %	Other engineering and technologies

### Medical and Health Sciences (Response count: 83)

<b>39</b>	<b>47.0%</b>	Basic medicine
20	24.1%	Clinical medicine
16	19.3%	Health sciences
2	2.4%	Health biotechnology
6	7.2%	Other medical sciences

### Agricultural Sciences (Response count: 44)

10	22.7 %	Agriculture, forestry, and fisheries
6	13.6 %	Animal and dairy science
6	13.6 %	Veterinary science
<b>15</b>	<b>34.1 %</b>	Agricultural biotechnology
7	15.9 %	Other agricultural sciences

### Social Sciences (Response count: 88)

10	11.4%	Psychology
<b>23</b>	<b>26.1%</b>	Economics and business
5	5.7%	Educational sciences
22	25.0%	Sociology
6	6.8%	Law
6	6.8%	Political Science
5	5.7%	Social and economic geography
2	2.3%	Media and communications
9	10.2%	Other social sciences

### Humanities (Response count: 73)

27	37.0%	History and archaeology
<b>34</b>	<b>46.6%</b>	Languages and literature
7	9.6%	Philosophy, ethics and religion
1	1.4%	Art
4	5.5%	Other humanities

Other (e.g. multidisciplinary field) – Response count: 51

Answered question: 573 - Skipped question: 17

## Appendix IV: Questionnaire Response Summary

### 6. Please tick your main employment status currently- please note that the term 'employed' includes funded post doc positions.

		Response Percent	Response Count
Intern		1.7%	10
Permanent Part-time Employed (less than 30 hours per week)		1.7%	10
<b>Permanent Full-time Employed (more than 30 hours per week)</b>		<b>75.7%</b>	<b>446</b>
Temporary Part-time Employed (less than 30 hours per week)		0.5%	3
Temporary Full-time Employed (more than 30 hours per week)		9.8%	58
Self Employed		0.2%	1
Full time study		2.7%	16
Career break/sabbatical		0.2%	1
Retired		4.9%	29
Unemployed		0.3%	2
Other (please specify)		2.2%	13
<b>answered question</b>			<b>589</b>
<b>skipped question</b>			<b>1</b>

### 7. Do you work as a researcher (either part-time or full-time)?

		Response Percent	Response Count
Yes		86.2%	500
No		13.8%	80
<b>answered question</b>			<b>580</b>
<b>skipped question</b>			<b>10</b>

## Appendix IV: Questionnaire Response Summary

### 8. If you replied 'yes' in Q7, at which stage or the European Framework for Research Careers are you: (if you ticked 'no' in Q7, skip to Q9)

		Response Percent	Response Count
R1 First Stage Researcher (up to the point of PhD)		1.4%	7
R2 Recognised Researcher (PhD holders or equivalent who are not yet fully independent)		20.4%	103
R3 Established Researcher (researchers who have developed a level of independence)		35.3%	178
<b>R4 Leading Researcher (researchers leading their research area or field)</b>		<b>42.9%</b>	<b>216</b>
		<b>answered question</b>	<b>504</b>
		<b>skipped question</b>	<b>86</b>

### 9. Please tick the years in which you applied for OTKA funding and whether or not you were successful:

	Successful	Unsuccessful	Rating Count
Pre 2009	<b>83.6% (322)</b>	30.4% (117)	385
2009	40.1% (87)	<b>64.1% (139)</b>	217
2010	33.2% (74)	<b>69.5% (155)</b>	223
2011	29.9% (83)	<b>72.7% (202)</b>	278
2012	34.6% (115)	<b>68.1% (226)</b>	332
2013	40.4% (97)	<b>61.7% (148)</b>	240
		<b>answered question</b>	<b>586</b>
		<b>skipped question</b>	<b>4</b>

## Appendix IV: Questionnaire Response Summary

### 10. For any OTKA grant(s) you were awarded, please indicate the size below in HUF:

	Under 1 000 000	1 000 001 – 5 000	5 000 001 – 10 000 000	10 000 001 – 20 000 000	20 000 001 – 30 000 000	30 000 001 – 50 000 000	Over 50 000 000	Rating Count
Grant 1	8.0% (37)	<b>26.0%</b> <b>(121)</b>	23.9% (111)	24.1% (112)	12.0% (56)	4.3% (20)	1.7% (8)	465
Grant 2	3.6% (10)	16.1% (45)	25.4% (71)	<b>30.5%</b> <b>(85)</b>	14.3% (40)	8.2% (23)	1.8% (5)	279
Grant 3	1.4% (2)	13.5% (20)	24.3% (36)	<b>29.7%</b> <b>(44)</b>	12.2% (18)	15.5% (23)	3.4% (5)	148
Grant 4	2.6% (2)	11.8% (9)	14.5% (11)	<b>28.9%</b> <b>(22)</b>	21.1% (16)	17.1% (13)	3.9% (3)	76
<b>answered question</b>								<b>467</b>
<b>skipped question</b>								<b>123</b>

### 11. Please tick the years in which you applied for non-OTKA funding and whether or not you were successful:

	Successful	Unsuccessful	Rating Count
Pre 2009	<b>92.4% (281)</b>	19.1% (58)	304
2009	<b>81.6% (115)</b>	24.8% (35)	141
2010	<b>76.9% (110)</b>	31.5% (45)	143
2011	<b>70.8% (109)</b>	35.7% (55)	154
2012	<b>74.3% (130)</b>	36.0% (63)	175
2013	<b>73.8% (118)</b>	31.9% (51)	160
<b>answered question</b>			<b>454</b>
<b>skipped question</b>			<b>136</b>

## Appendix IV: Questionnaire Response Summary

### 12. For any non-OTKA grant(s) you were awarded, please indicate the size below in HUF:

	Under 1 000 000	1 000 001 – 5 000	5 000 001 – 10 000 000	10 000 001 – 20 000 000	20 000 001 – 30 000 000	30 000 001 – 50 000 000	Over 50 000 000	Rating Count
Grant 1	17.9% (71)	<b>34.8%</b> <b>(138)</b>	10.6% (42)	8.6% (34)	5.3% (21)	6.1% (24)	16.7% (66)	396
Grant 2	12.7% (33)	<b>35.1%</b> <b>(91)</b>	11.6% (30)	10.4% (27)	4.6% (12)	10.4% (27)	15.1% (39)	259
Grant 3	18.1% (25)	<b>33.3%</b> <b>(46)</b>	11.6% (16)	8.0% (11)	5.8% (8)	8.0% (11)	15.2% (21)	138
Grant 4	16.5% (14)	<b>22.4%</b> <b>(19)</b>	16.5% (14)	10.6% (9)	5.9% (5)	11.8% (10)	16.5% (14)	85
<b>answered question</b>								<b>402</b>
<b>skipped question</b>								<b>188</b>

### 13. How did you find out about OTKA funding?

	Response Percent	Response Count
via OTKA	45.6%	265
<b>via your institution</b>	<b>60.4%</b>	<b>351</b>
via a colleague	25.6%	149
read in newspaper/journal	0.5%	3
on the Internet	12.2%	71
Other (please specify)		12
<b>answered question</b>		<b>581</b>
<b>skipped question</b>		<b>9</b>

## Appendix IV: Questionnaire Response Summary

### 14. Please indicate how strongly you agree/disagree with each of the following statements in respect of OTKA:

	Strongly Agree	Agree	Disagree	Strongly Disagree	N/A or don't know	Rating Average	Rating Count
The OTKA funding programmes are very well advertised/publicly communicated	22.9% (135)	<b>56.0%</b> (330)	14.8% (87)	3.2% (19)	3.1% (18)	1.98	589
Any Comments							23
The procedures for applying for funding are easy to understand	26.3% (154)	<b>56.1%</b> (328)	14.2% (83)	3.4% (20)	0.0% (0)	1.95	585
Any Comments							17
The electronic application system was easy to use/navigate	27.1% (159)	<b>55.5%</b> (325)	14.0% (82)	2.4% (14)	1.0% (6)	1.92	586
Any Comments							18
The selection procedures are fair and impartial	12.3% (72)	<b>37.4%</b> (219)	26.1% (153)	14.2% (83)	10.1% (59)	2.47	586
Any Comments							63
Queries by applicants are dealt with efficiently/quickly	29.2% (171)	<b>48.4%</b> (283)	10.8% (63)	4.4% (26)	7.2% (42)	1.90	585
Any Comments							7
Helpful/practical feedback on the funding decision-making process was provided	15.4% (90)	<b>43.0%</b> (251)	24.3% (142)	11.1% (65)	6.2% (36)	2.33	584
Any Comments							26
Overall the OTKA funding application and award process was well managed	21.0% (123)	<b>55.2%</b> (323)	14.5% (85)	4.8% (28)	4.4% (26)	2.03	585
Any Comments							16
OTKA support was essential to my research career	<b>44.3%</b> (255)	29.5% (170)	11.5% (66)	6.4% (37)	8.3% (48)	1.78	576
Any Comments							34
						<b>answered question</b>	<b>589</b>
						<b>skipped question</b>	<b>1</b>

## Appendix IV: Questionnaire Response Summary

**15. If you received an OTKA grant, did you encounter any of the following issues during the grant application post-grant application process:**

	Yes	No	Rating Count
Change of research plan	25.7% (113)	<b>74.3% (326)</b>	439
Change of research team	37.5% (164)	<b>62.5% (273)</b>	437
Change to budget	<b>53.2% (240)</b>	46.8% (211)	451
Change of institution	6.0% (25)	<b>94.0% (393)</b>	418
Any other notifiable change to the grant	9.9% (39)	<b>90.1% (354)</b>	393
		Please describe	60
		<b>answered question</b>	<b>467</b>
		<b>skipped question</b>	<b>123</b>

**16. If you ticked 'yes' for any of the replies in Q15, please rate OTKA in terms of its helpfulness in communicating/negotiating an appropriate resolution: (if you ticked 'no' in Q15, skip to Q17)**

		Response Percent	Response Count
Very helpful		69.1%	237
Reasonably helpful		28.0%	96
Not very helpful		0.6%	2
Very unhelpful		2.3%	8
		Any comments	9
		<b>answered question</b>	<b>343</b>
		<b>skipped question</b>	<b>247</b>

## Appendix IV: Questionnaire Response Summary

### 17. Besides having applied to OTKA for funding, have you been involved in any OTKA evaluation or decision-making processes in the last five years?

		Response Percent	Response Count
Yes		72.6%	422
No		27.4%	159
answered question			581
skipped question			9

### 18. If you ticked 'yes' in Q17, in which role? (if you ticked 'no' in Q17, skip to Q19)

		Response Percent	Response Count
Reviewer		96.9%	409
Panel member		26.5%	112
Panel chair		4.5%	19
Council member		5.2%	22
Other (please specify)			9
answered question			422
skipped question			168

## Appendix IV: Questionnaire Response Summary

**19. For each region, in how many countries have you physically worked, studied or carried out/contributed to research for more than three months?(please tick only one response per column (i.e. per region); if you have not worked in a region, leave it blank)**

	Europe	North America	South America	Oceania	Africa	Asia	Rating Count
1	<b>66.5%</b> <b>(236)</b>	38.6% (137)	1.4% (5)	2.8% (10)	3.1% (11)	10.1% (36)	355
2-3	<b>93.4%</b> <b>(227)</b>	7.8% (19)	0.4% (1)	0.8% (2)	0.0% (0)	3.3% (8)	243
4-6	<b>85.2%</b> <b>(46)</b>	14.8% (8)	0.0% (0)	0.0% (0)	1.9% (1)	0.0% (0)	54
7-10	<b>84.6%</b> <b>(11)</b>	23.1% (3)	0.0% (0)	0.0% (0)	0.0% (0)	7.7% (1)	13
More than 10	<b>75.6%</b> <b>(31)</b>	29.3% (12)	2.4% (1)	0.0% (0)	0.0% (0)	12.2% (5)	41
<b>answered question</b>							<b>571</b>
<b>skipped question</b>							<b>19</b>

**20. For each region, in how many countries have you virtually (i.e via telecommunications/ICT) worked, studied or carried out/contributed to research for more than three months? (please tick only one response per column (i.e. per region); if you have not worked in a region, leave it blank)**

	Europe	North America	South America	Oceania	Africa	Asia	Rating Count
1	<b>57.3%</b> <b>(168)</b>	40.3% (118)	4.1% (12)	3.4% (10)	3.8% (11)	15.0% (44)	293
2-3	<b>83.3%</b> <b>(155)</b>	11.8% (22)	2.2% (4)	1.6% (3)	1.1% (2)	9.7% (18)	186
4-6	<b>95.5%</b> <b>(64)</b>	3.0% (2)	0.0% (0)	0.0% (0)	1.5% (1)	3.0% (2)	67
7-10	<b>88.9%</b> <b>(16)</b>	5.6% (1)	0.0% (0)	0.0% (0)	0.0% (0)	11.1% (2)	18
More than 10	<b>88.6%</b> <b>(31)</b>	25.7% (9)	0.0% (0)	2.9% (1)	0.0% (0)	11.4% (4)	35
<b>answered question</b>							<b>448</b>
<b>skipped question</b>							<b>142</b>

## Appendix IV: Questionnaire Response Summary

**21. In how many enterprises/commercial firms have you worked, studied or carried out/contributed to research in the last year? (please tick only one response per column (i.e.per region); if you have not worked in a region, please tick 'none')**

	Home Country	Other European Country	North America	South America	Oceania	Africa	Asia	Rating Count
None	<b>87.1%</b> <b>(343)</b>	69.0% (272)	67.3% (265)	68.3% (269)	67.5% (266)	68.3% (269)	68.0% (268)	394
1	<b>72.5%</b> <b>(108)</b>	22.8% (34)	13.4% (20)	1.3% (2)	1.3% (2)	0.7% (1)	4.7% (7)	149
2-3	<b>82.7%</b> <b>(86)</b>	31.7% (33)	1.9% (2)	0.0% (0)	0.0% (0)	0.0% (0)	1.0% (1)	104
4-6	<b>81.0%</b> <b>(17)</b>	14.3% (3)	4.8% (1)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	
More than 6	<b>87.5%</b> <b>(14)</b>	6.3% (1)	6.3% (1)	0.0% (0)	0.0% (0)	0.0% (0)	6.3% (1)	
Any comment								
<b>answered question</b>								<b>571</b>
<b>skipped question</b>								

## Appendix IV: Questionnaire Response Summary

**22. Outside of the country you are living in, are you currently collaborating on research with researchers in another region in any of the following ways? (e.g. if you are based in Hungary, but collaborate with someone from Spain, tick the 'Europe' column. Please tick as many responses as applicable. Leave a region blank if it does not apply.)**

	Europe	North America	South America	Oceania	Africa	Asia	Rating Count
Working on a joint publication	<b>92.6%</b> <b>(388)</b>	30.1% (126)	3.3% (14)	2.9% (12)	3.1% (13)	17.9% (75)	419
Collaborating at a distance on a joint research project with occasional/frequent physical presence	<b>94.3%</b> <b>(317)</b>	23.8% (80)	1.8% (6)	0.9% (3)	2.4% (8)	15.8% (53)	336
Using web based or virtual technology only (i.e no physical presence) to collaborate on a research project	<b>81.5%</b> <b>(185)</b>	40.5% (92)	4.0% (9)	2.2% (5)	2.6% (6)	18.5% (42)	227
Other	<b>85.7%</b> <b>(6)</b>	71.4% (5)	0.0% (0)	0.0% (0)	0.0% (0)	14.3% (1)	7
						Please specify)	10
						<b>answered question</b>	<b>493</b>
						<b>skipped question</b>	<b>97</b>

**23. With how many researchers outside Hungary (if any) did you work (e.g. project partners, co-publications, co-applicants etc) during your OTKA research project OR during the period you applied for OTKA funding?**

	Response Average	Response Total	Response Count
If none please place a 0	7.58	3,886	513
	<b>answered question</b>		<b>513</b>
	<b>skipped question</b>		<b>77</b>

## Appendix IV: Questionnaire Response Summary

### 24. Please indicate whether you are currently working with researchers from another discipline(s) to yours in any of the following ways:

	Yes	No	Rating Count
Working on a joint publication	<b>64.6% (327)</b>	35.4% (179)	506
Collaborating at a distance on a joint research project with occasional/frequent physical presence	<b>55.8% (252)</b>	44.2% (200)	452
Using web based or virtual technology only (i.e no physical presence) to collaborate on a research project	38.3% (155)	<b>61.7% (250)</b>	405
Other	1.9% (5)	<b>98.1% (258)</b>	263
		Please specify)	5
		<b>answered question</b>	<b>527</b>
		<b>skipped question</b>	<b>63</b>

## Appendix IV: Questionnaire Response Summary

### 25. Please indicate whether you are currently working with industry/commercial ventures in any of the following ways:

	Yes	No	Rating Count
Working on a joint publication	19.2% (87)	80.8% (367)	454
Collaborating at a distance on a joint research project with occasional/frequent physical presence	26.0% (118)	74.0% (336)	454
Using web based or virtual technology only (i.e no physical presence) to collaborate on a research project	13.3% (55)	86.7% (360)	415
Other	2.5% (8)	97.5% (315)	323
		Please specify)	6
		<b>answered question</b>	<b>491</b>
		<b>skipped question</b>	<b>99</b>

### 26. Within the next year, do you plan to live or work (for a period of at least one year) in another country?

		Response Percent	Response Count
Yes		12.1%	69
No		68.7%	392
Don't know		19.3%	110
		<b>answered question</b>	<b>571</b>
		<b>skipped question</b>	<b>19</b>

## Appendix IV: Questionnaire Response Summary

### 27. If you replied 'yes' to Q26, which country do you plan to move to? (if you replied 'no' to Q26, skip to Q29)

**Africa – 0 responses**

**Asia – 5 responses**

1 – China

1 – Israel

2 – Kazakhstan

1 – Other territories and dependencies

**Europe – 62 responses**

7 – Austria

2 – Belgium

2 – Czech Republic

2 – Denmark

1 – Finland

6 – France

12 – Germany

3 – Greece

6 – Hungary

2 – Italy

1 – Netherlands

1 – Norway

1 – Russia

4 – Spain

2 – Switzerland

10 – United Kingdom

**Oceania – 1 response**

1 – Fiji

**North America – 18 responses**

2 – Canada

16 – United States

**South America – 0 responses**

**Other – 5 responses**

**Answered question: 76**

**Skipped question: 514**

### 28. If you plan to move to another country, please indicate the MAIN reason for moving below:

		Response Percent	Response Count
End of postdoc or job contract		7.4%	11
Economic/financial opportunities		18.1%	27
<b>Academic/career development opportunities</b>		<b>56.4%</b>	<b>84</b>
Family or personal reasons		8.1%	12
Political reasons		7.4%	11
Other		2.7%	4
		Please specify	11
		<b>answered question</b>	<b>149</b>
		<b>skipped question</b>	<b>441</b>

## Appendix IV: Questionnaire Response Summary

### 29. Do you use your research skills in your current post?

		Response Percent	Response Count
Regularly		92.0%	517
Sometimes		6.9%	39
Never		1.1%	6
answered question			562
skipped question			28

### 30. Within the last twelve months, which of the following activities have you been responsible for:

	Yes	No	Rating Count
Formally supervising PhD students	79.8% (419)	20.2% (106)	525
Formally supervising undergraduate/master's students	86.0% (444)	14.0% (72)	516
Supervising a work colleague's research	74.7% (377)	25.3% (128)	505
Managing own research team	78.5% (402)	21.5% (110)	512
Technology Transfer to industry	21.7% (91)	78.3% (329)	420
Setting up laboratory	35.1% (150)	64.9% (277)	427
Lead authoring peer review article	82.0% (410)	18.0% (90)	500
Joint authoring peer review article	84.6% (418)	15.4% (76)	494
Performing peer reviews	86.7% (442)	13.3% (68)	510
Other	23.0% (37)	77.0% (124)	161
		Please describe	39
answered question			567
skipped question			23

## Appendix IV: Questionnaire Response Summary

31. What is your annual gross income in HUF (before deductions)?		Response Percent	Response Count
under 2 500 000		10.2%	57
<b>2 500 001 - 5 000 000</b>		<b>39.4%</b>	<b>220</b>
5 000 001 - 7 500 000		23.1%	129
7 500 001 - 10 000 000		12.4%	69
10 000 001 - 15 000 000		5.6%	31
15 000 001 - 20 000 000		1.4%	8
Over 20 000 000		0.5%	3
Prefer not to say		7.3%	41
Other (please specify)			11
		<b>answered question</b>	<b>558</b>
		<b>skipped question</b>	<b>32</b>

## Appendix IV: Questionnaire Response Summary

### 32. Within the last twelve months, which (if any) of the following outputs did you achieve:

		Response Percent	Response Count
Presented work at a national research conference or meeting		78.0%	443
<b>Presented work at an international research conference or meeting</b>		<b>78.7%</b>	<b>447</b>
Lead author on peer reviewed article		73.4%	417
Other author on peer reviewed article		73.2%	416
Awarded an academic prize		9.3%	53
Awarded an international research grant		10.6%	60
Awarded a Hungarian research grant		31.0%	176
Produced new research resources or software		14.4%	82
Filed a patent		4.9%	28
Registered a new product license		1.2%	7
Had a significant impact on policy and/or changes in practice		7.4%	42
Received media coverage		18.0%	102
Undertaken public engagement activities		15.1%	86
Contributed book chapter		44.5%	253
Published book		13.7%	78
Please name any academic awards and/or patent or licence details			19
<b>answered question</b>			<b>568</b>
<b>skipped question</b>			<b>22</b>

## Appendix IV: Questionnaire Response Summary

**33. Please indicate any important area in which improvements could be made to OTKA funding programmes:**

	Response Count
	229
answered question	229
skipped question	361

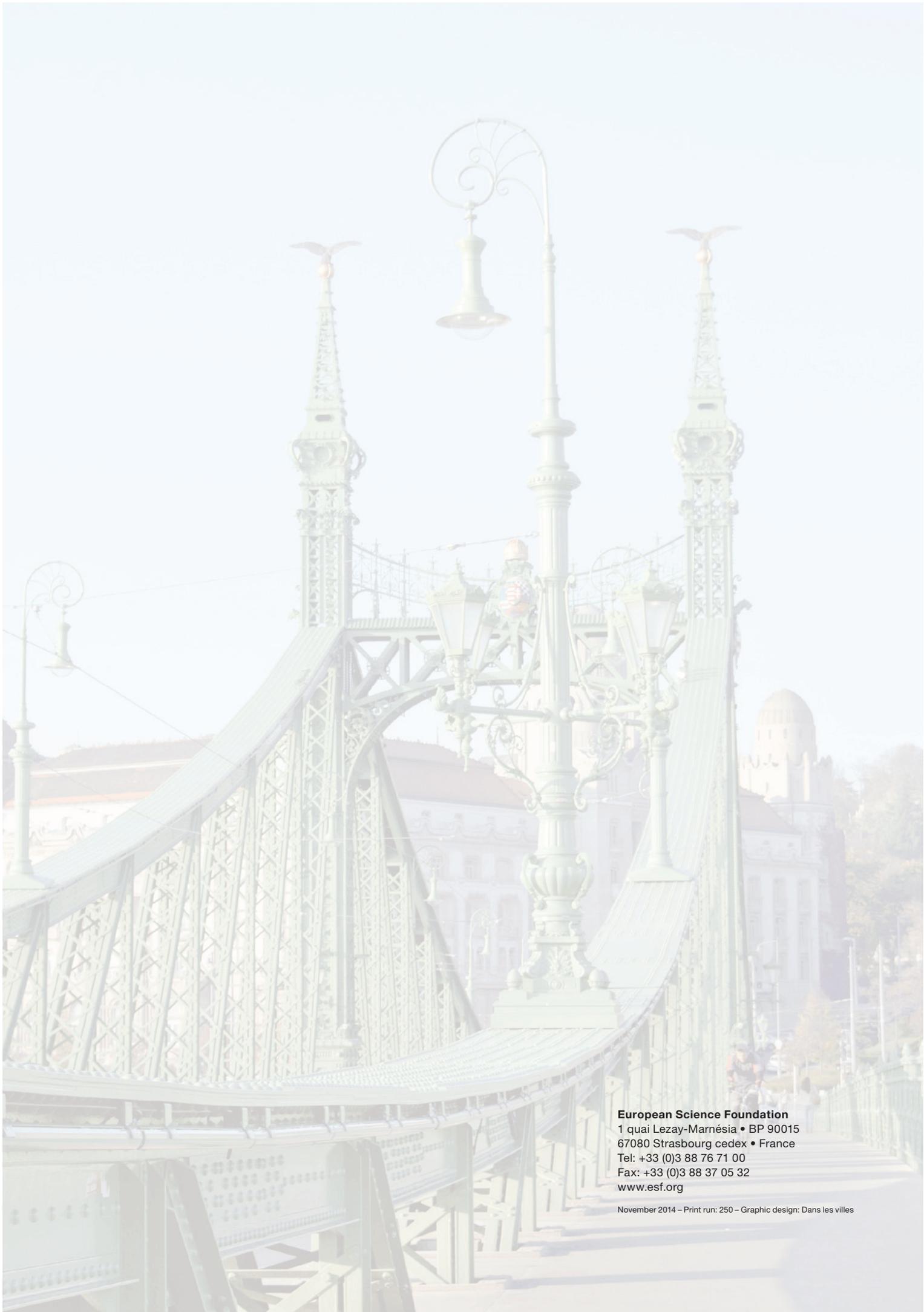
**34. Please rate the questionnaire you have just completed in terms of the following aspects:**

	Good	Fair	Poor	Rating Count
Clarity/understandability of questions	81.6% (460)	17.6% (99)	0.9% (5)	564
Relevance of questions to your OTKA funding experience	47.5% (264)	46.0% (256)	6.5% (36)	556
Design in terms of time taken/effort to complete	69.9% (384)	28.8% (158)	1.3% (7)	549
			Any comments	40
			answered question	566
			skipped question	24

## Appendix V: **Acronyms**

<b>ARSS</b>	Slovenian Research Agency ( <i>Javna agencija za raziskovalno dejavnost Republike Slovenije</i> )
<b>BERD</b>	Business Enterprise Expenditure on R&D
<b>EEA</b>	European Economic Area
<b>ERC</b>	European Research Council
<b>ESF</b>	European Science Foundation
<b>EU</b>	European Union
<b>EUROHORCs</b>	European Heads of Research Councils
<b>FP7</b>	Framework Programme Seven
<b>FWF</b>	Austrian Science Fund ( <i>Fonds zur Förderung der wissenschaftlichen Forschung in Österreich</i> )
<b>GAČR</b>	Czech Science Foundation ( <i>Grantová agentura České republiky</i> )
<b>GDP</b>	Gross Domestic Product
<b>GERD</b>	Gross Domestic Expenditure on R&D
<b>HE</b>	Higher Education
<b>HEI</b>	Higher Education Institutions
<b>IT</b>	Information Technology
<b>MTA</b>	Hungarian Academy of Sciences ( <i>Magyar Tudományos Akadémia</i> )
<b>NCN</b>	National Science Centre, Poland ( <i>Narodowego Centrum Nauki</i> )
<b>NFK</b>	National Development Cabinet ( <i>Nemzeti Fejlesztési Kormánybitottság</i> )
<b>NIH</b>	National Innovation Office ( <i>Nemzeti Innovációs Hivatal</i> )
<b>NKITT</b>	National Research, Innovation and Science Policy Council ( <i>Nemzeti Kutatási, Innovációs és Tudománypolitikai Tanács</i> )
<b>NKTH</b>	National Office for Research and Technology ( <i>Nemzeti Kutatási és Technológiai Hivatal</i> )
<b>NTIT</b>	National Science Policy and Innovation Board ( <i>Nemzeti Tudománypolitikai és Innovációs Testület</i> )
<b>NWO</b>	Netherlands Organisation for Scientific Research ( <i>Nederlandse Organisatie voor Wetenschappelijk Onderzoek</i> )
<b>OP</b>	Operational Programmes
<b>OTKA</b>	Hungarian Scientific Research Fund ( <i>Országos Tudományos Kutatási Alapprogramok</i> )
<b>PCT</b>	Patent Cooperation Treaty
<b>PhD</b>	Doctor of Philosophy
<b>PRO</b>	Public Research Organisations
<b>R&amp;D</b>	Research and Development
<b>RDI</b>	Research, Development and Innovation
<b>SME</b>	Small and Medium Enterprises
<b>STI</b>	Science Technology and Innovation
<b>SWOT</b>	Strengths, Weaknesses, Opportunities and Threats





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