



Vetenskapsrådet

RESEARCH QUALITY EVALUATION IN SWEDEN – FOKUS

Report of a government commission regarding a model
for resource allocation to universities and university colleges
involving peer review of the quality and relevance of research

RESEARCH QUALITY EVALUATION IN SWEDEN – FOKUS

SWEDISH RESEARCH COUNCIL

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RESEARCH QUALITY EVALUATION IN SWEDEN – FOKUS

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1 FOREWORD

On 14 March 2013, the Swedish Government commissioned the Swedish Research Council, in consultation with the Swedish Research Council for Health, Working Life and Social Research (Forte), the Swedish Research Council Formas, and Vinnova, Sweden's innovation agency, to develop and propose a model for allocating resources to universities and university colleges involving peer review of the quality and relevance of research. In accordance with the Government's instructions, this report presents the principal features of the Swedish Research Council's proposed model.

The Swedish Research Council regards the new model for quality-based resource allocation as a better method of rewarding and driving forward quality in research, as well as promoting its impact beyond academia, compared with the current indicator-based resource allocation model. We would like to emphasise that, in view of the proposal's complexity, some parts need to be further developed and tested prior to any implementation. The Swedish Research Council therefore recommends that the proposal be circulated for consideration and that pilot exercises be carried out. Pilot exercises will allow for practical testing of various aspects of the proposed methodology, but may also provide input regarding possible changes to the model as such. On the basis of these experiences, a more well-informed decision can be taken about the introduction of a quality-based model for resource allocation involving peer review in Sweden.

The Swedish Research Council would like to express its heartfelt gratitude to all who took part in the project to develop the model, employees at the Swedish Research Council and the Council's Board, colleagues at Forte, Formas and Vinnova, members of national and international advisory boards, and other stakeholders. They have all made valuable contributions to the proposed model that we have named FOKUS (after Forskningskvalitetsutvärdering i Sverige, or Research Quality Evaluation in Sweden).

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2 SUMMARY

The Swedish Government has given the Swedish Research Council, in consultation with the Swedish Research Council for Health, Working Life and Welfare (Forte), the Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (Formas), and the Swedish Governmental Agency for Innovation Systems (Vinnova), the task of developing and proposing a model for allocating resources to universities and university colleges involving peer review of research quality and relevance, that enables resource allocation such that quality and performance are rewarded. The study should be presented by December 31st, 2014.

The model proposed by the Swedish Research Council is called FOKUS (Forskningskvalitetsutvärdering i Sverige – Research Quality Evaluation in Sweden). The proposal comprises two parts; the first consisting of the evaluation model itself and the second part consisting of a calculation model that suggests how the evaluation results can be translated into resource allocation. The Swedish Research Council would like to underline that the model itself is designed to be a driver of quality and to facilitate better informed research policy decisions, even if not used for resource allocation as outlined here. Reallocation of funding is thus not the objective of FOKUS, but the evaluation model and the possibility to allocate certain funds based on the results both aim towards higher quality in Swedish research.

The Swedish Research Council's proposed new evaluation model has therefore had as its ultimate objective to be a driver of quality i.e. to promote improved quality of research carried out at Swedish universities and university colleges and also to promote the contribution of high quality research to societal development. The implementation of FOKUS is also expected to lead to positive effects regarding improved data for national and subject-based overviews and comparisons, as well as improved reporting of statistics and publications. This will facilitate research policy decisions and priorities at various levels. The Swedish Research Council believes that the implementation of a new model should also benefit long-term planning at higher education institutions (HEIs), serve as a support to HEI management in strategic decisions, as well as create a greater incentive for universities and university colleges to prioritise their activities where there is potential for improvement.

The Swedish Research Council has in this proposal strived to achieve balance between two principles. On the one hand the model should be resource efficient, on the other hand the outcome should be informative enough to be of value to the higher education institutions themselves. Since the model, in so far as possible, uses existing statistics and entails a development of the national publication database, SwePub, the Swedish Research Council considers this balance to have been achieved.

Within the remit of this study a dialogue has been held with various stakeholders both within and outside of the higher education sector. National evaluation systems in other countries have been studied with an emphasis on the United Kingdom, Australia and the Netherlands. In the final part of this report an overview and analysis of systems in other countries and the current international trends concerning performance-based research funding is presented. An overview of research evaluations carried out at Swedish higher education institutions is also presented.

The Swedish Research Council proposes that all research carried out at Swedish universities and university colleges should in the long term be evaluated every sixth year, but initially at somewhat more frequent intervals. The evaluations should enable comparison between HEIs within research areas and fields of research concerning the three components: *scientific/artistic quality*, *quality enhancing factors* and *impact beyond academia*. Panellists should also have access to *background information* that highlights certain conditions for the research that is evaluated. Background information will not in itself be appraised and graded but rather is to be used to provide context and understanding to the other evaluation material.

The Swedish Research Council's proposed model provides a common framework where the evaluation material is in part adapted to each research area. The responsibility for the evaluation of all research areas and fields of research lies with the evaluation panels. No data or indicators will directly control resource allocation, but rather all evaluation material will be assessed by panels that set grades and submit explanatory statements for their grading.

All research is to be divided into 24 *research areas*, which in turn consist of reporting units, one for each research area at each HEI concerned. The division is proposed to be disciplinary and is based on the Swedish

National Standard for Research Subject Classification 2011 and how the HEIs classify their research according to that standard. The number of units per research area varies and is in total estimated to be just over 400 units at the research area level. The reporting units do not necessarily correspond to a particular organisational unit at a given HEI, but consists of the HEI’s body of research in those research subjects that are included in each research area. What is included in each research area is determined by how the HEI classifies its research when reporting to the various government agencies involved.

Furthermore it is proposed that there be 24 panels at the research area level to evaluate scientific/artistic quality, set a grade profile and submit explanatory statements for their grading per HEI and research area. The research area panels will consist of international scientific/artistic experts with subject expertise. The 24 research areas are in turn aggregated to *five fields of research*: Natural sciences and Agricultural sciences (NL), Engineering sciences (T), Medicine (M), Social sciences (S), Humanities and Artistic research (HK).

The evaluation of quality enhancing factors and research impact beyond academia is made for each field of research at each HEI. There will be a reporting unit per relevant field of research at each HEI, giving a total of around 130 units. The five main panels corresponding to the five fields of research are responsible for evaluating and setting separate grades for each of these two components. The main panels will be comprised of approximately 50 percent expertise representing societal and/or industry and business interests within the relevant field of research (“impact expertise”) and roughly 50 percent experts with experience of and expertise in leadership and management of academic bodies. It is proposed that the experts in the main panels have experience of the Swedish or Nordic context.

Below, the evaluation components are summarised in a single figure together with the proposed weighting for each component when translating the evaluation results into resource allocation.

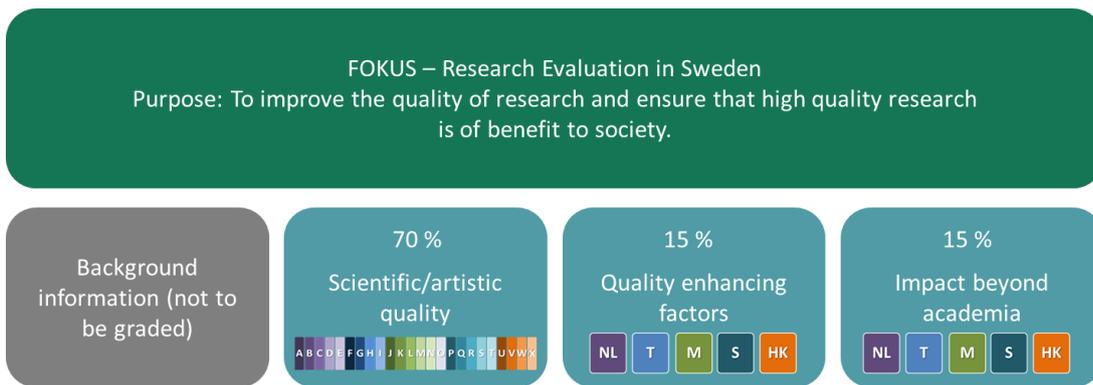


Figure 2. *Summary of evaluation components and proposed weighting*

Each HEI will submit a *short description* of its research profile, vision and strategies, and management issues (leadership, recruitment and career systems). The description forms part of the **background information**. Also included is a description of how the HEI ensures access to infrastructure. *Quantitative data* also form part of the background information including external funding, teaching and research staff, doctoral education, publication profiles and publication volume.

Research quality (in terms of scientific/artistic quality) is given the greatest weighting in the evaluation – 70 percent in the final algorithm. The following criteria are used to make a balanced assessment of the research quality of the unit of assessment (i.e. a research area at an HEI): *novelty and originality, significance of the research in its field and rigour*. The research area panels base their assessment on the following evaluation material:

- the unit’s own description of its research (research statement)
- a nominated sample of the unit’s top research outputs
- in order to capture the unit’s overall research quality: citation analysis (where appropriate) *or* external peer review of a sample of outputs

Apart from the evaluation material described above, the research area panels will also have access to background information regarding the unit's productivity (i.e. its publication volume in relation to the volume of staff and funding) when they make their assessment of scientific/artistic quality. The overall evaluation of scientific/artistic quality will result in a grade profile for each unit. This means that the unit's overall research quality as assessed by the panel is expressed as percentages of the unit's research production at each point on the grading scale.

Quality enhancing factors is proposed to have a weighting of 15 percent and is evaluated at the level of field of research against the following criteria: *potential for renewal* and *sustainability*. The Swedish Research Council proposes that the following quality enhancing factors are included:

- doctoral education and early career researchers
- collaboration and mobility within academia (nationally and internationally)
- collaboration, partnerships and mobility beyond academia (nationally and internationally)
- integration of research and education
- gender equality

The evaluation material mainly consists of quantitative data and, where necessary, other facts, together with a short description with comments related to the HEI's overarching strategies for quality development.

Impact beyond academia is also proposed to have a weighting of 15 percent and is evaluated at the level of field of research in relation to the criteria *reach* and *significance*. The evaluation is made based on the following evaluation material:

- *Case studies*. Here, specific evaluation mechanisms for ensuring the quality of the underpinning research for the societal impact documented in each case study are included.
- *The unit's own description* of strategies and resources for working with dissemination of results, collaboration and promotion of the use of research beyond of academia.

The main panels make separate assessments of the two components quality enhancing factors and impact beyond academia. The main panels set a single overall grade for each of the components at each field of research at the HEI.

For all panels a five point grading scale, which is internationally common, is proposed for single overall grades as well as grade profiles. The panels also submit explanatory statements for their gradings.

In order to reduce the workload for individual researchers as well as the costs (economic and in terms of human resources), we propose that the data used are collected mainly from existing sources. The prospects of realising such an approach in Sweden are deemed good. Data will be collected from the following government agencies: Statistics Sweden, the Swedish Higher Education Authority, the National Library of Sweden (publications in the publication database SwePub) and from the Swedish Research Council. Apart from these data, the evaluation material that is FOKUS-specific – i.e. case studies, research statements and certain narratives – will be reported by the HEI directly to the organisation responsible for administering FOKUS.

The Swedish Research Council has, in this study, assumed that the performance-based portion of the block grant for research and doctoral education will remain at 20 percent. It should be noted that if any subsequent changes in this proportion were to occur, it would have consequences for the effects of the calculation model. In order to translate the evaluation results to resource allocation, the Swedish Research Council proposes that a weighting of 70:15:15 is used in the calculation model (see Figure 2) together with a so-called *combined volume measure*, taking into account the HEI's share of the total block grant and each research area's share of the given HEI's research staff. The calculations for the three components scientific/artistic quality, quality enhancing factors and impact beyond academia will be combined to give the total sum of the performance-based funding allocated to each respective HEI. The HEI is then free to allocate the funds internally as it sees fit.

In the calculation model, the Swedish Research Council proposes a non-linear weighting of the grades according to the scheme 6,4,3,2,0; where grade 5 corresponds to a weighting of 6 and grade 1 to 0. The purpose

is to give the HEIs incentives to promote the best research and at the same time reward HEIs that maintain a consistent high research quality across the board.

The costs of running a full FOKUS evaluation – calculated for a six year period – are preliminarily estimated to be 170 million SEK, of which 75 million SEK are costs to the organisation responsible for FOKUS and 95 million SEK are costs incurred by the HEIs. Implementation of the model entails a start-up cost that is estimated to be 65 million SEK in total. The estimated costs of 170 million kronor for one full evaluation correspond to 0.2 percent of the total block grant (at current levels) over a six year period (or approximately one percent of the funds allocated through the performance-based part of the block grant). This means that the running costs for FOKUS should be seen as reasonable in comparison with systems in other countries, and in relation to the expected added-value in terms of increased research quality and the improved overview of and information on Swedish research and its results – both between research areas and over time.

FOKUS is in the first instance, designed to be a driver of quality and also to promote the contribution of high-quality research to societal development. The results of the evaluation should, in a transparent manner, inform resource allocation of a certain portion of the block grant for research and doctoral education. Furthermore FOKUS is expected to improve the basis for national and discipline-based overviews and comparisons, as well as improved reporting of statistics and publications. In that sense an improved basis for research policy decisions and priorities at various levels can be attained.

Several mechanisms have been included into the proposal in order to counteract potential negative effects. These mechanisms concern, amongst other things, how interdisciplinary research is handled, avoiding conservative effects that could disincentivise originality and risk-taking, ensuring that doctoral education are not disincentivised in the model as well as ensuring that research is not rewarded at the expense of education but instead promoting synergies between research and education. The Swedish Research Council maintains that an evaluation system based on peer-review has a greater potential to avoid and counteract such negative effects than the current indicator based resource allocation system. The Swedish Research Council believes, however, that specific incentives for rewarding doctoral education may be necessary, possibly in the form of separate parallel mechanisms in the resource allocation system.

The Swedish Research Council proposes that the evaluations are initially carried out more frequently. This provides the possibility to develop and refine the methods and to achieve a sufficient consensus among the stakeholders concerning the preconditions for and implementation of the model. Consultation on this proposal should be carried out during the first half of 2015. During the autumn of 2015 preparations for pilot exercises can be initiated once a commission has been given to the Swedish Research Council. It is proposed that pilot exercises are carried out during 2016/2017, in which both international expertise and the HEIs are included, and for which funding thus is required. The pilot exercises allow the opportunity to practically test various aspects of the proposed model, and also to identify possible changes to the model itself. After necessary revisions of the evaluation model based on the pilot exercises, it is proposed that the model is implemented in full-scale for the first time 2017/2018 with results available by the beginning of 2018 at the earliest, and with subsequent resource allocation in 2019. A second evaluation could then take place four years later, i.e. 2021/2022. Thereafter evaluations can be carried out at six year intervals. In this report we present different scenarios for implementation and an account of how the pilot exercises should be carried out.

The Swedish Research Council's proposal has been designed to be organisationally neutral and various organisational solutions are possible. Internationally, the most common organisational form is for a specific agency or organisation – not a research council – to have the responsibility for comparable systems. However, since the Swedish Research Council has the necessary competence and also significant experience of engaging and working with international scientific expertise, the Swedish Research Council is prepared to undertake the administration of FOKUS.

3 INTRODUCTION

This chapter will present the government commission, specify the basic assumptions of the Swedish Research Council, provide a brief background to the commission and describe how the work was carried out. In closing it will present conclusions from earlier studies and look at the commission's connection with other commissions.

It should be mentioned at the outset that the term “performance-based research funding” can be used in a variety of contexts. In this report, the term refers to systems that in one way or another assess and evaluate research results and link these to the allocation of resources. The Swedish Research Council in fact recommends the designation *quality-based* research funding, since the allocation is made on the basis of a quality assessment. However, the term “performance-based research funding” is relatively well established, in international contexts as well, and therefore this report uses both terms, depending on the context.

3.1 The government commission

In the parliamentary bill entitled *Research and Innovation* (Bill 2012/13:30), the Government announced that the Swedish Research Council would be commissioned to propose a system of resource allocation involving peer review of research quality and performance at Swedish universities and university colleges, including scientific evaluations as well as assessments of the relevance and societal benefit of the research. The Bill also stated that allocation of resources based on a model using peer review of research quality would not be ready for implementation until 2018 at the earliest.¹

The Swedish Research Council received the commission to develop a model for resource allocation on 14 March 2013. The commission, which is carried out in consultation with the Swedish Research Council for Health, Working Life and Social Research (Forte), the Swedish Research Council Formas, and Vinnova, Sweden's innovation agency, includes “*developing and proposing a model for resource allocation to universities and university colleges involving peer review of the quality and relevance of research*”², see also Annex 1.

The model for resource allocation shall, according to the government commission,³

- be a driver of quality
- make it possible to allocate resources in such a manner as to reward quality and performance in research
- provide a more coherent assessment in which a research area's current potential can also be considered, instead of basing the allocation of resources on historical data only
- allow for a more finely-balanced assessment of research at a higher education institution (HEI) and the evaluation of different subject areas on the basis of their distinctive character
- reward quality in a broader manner than the current allocation model
- provide a platform for long-term planning at the HEIs
- include assessments of various forms of beneficial use of research-based knowledge

¹ The Government Bill entitled *Forskning och innovation 2012/13:30*, p. 61, 62.

² Government of Sweden, the Ministry of Education and Research, *Uppdrag att utreda och lämna förslag till en modell för resursfördelning till universitet och högskolor som innefattar kollegial bedömning av forskningens kvalitet och relevans*, U2013/1700/F.

³ *Ibid.*

3.2 Objectives, expected outcomes and underlying assumptions

The Swedish Research Council has formulated the following objectives and expected outcomes for the proposal:

- The ultimate objective of introducing the new model of resource allocation is that it should be a driver of quality, i.e. serve to raise the quality of the research carried out at Sweden's HEIs.
- The model should also promote the impact of research beyond academia.
- The introduction of a national model should further support the HEIs' own quality improvement efforts: it should promote renewal and long-term planning at the HEIs, serve as support to HEI management on strategic issues, and increase incentives for HEIs to prioritise their activities where there is potential for improvement.
- The model should be capable of identifying strengths and weaknesses, and allow for comparisons within different research areas and fields of research.
- The evaluation results should serve as a basis for allocating part of the block grant with the aim of rewarding high levels of research quality.

The Swedish Research Council has also formulated the following underlying assumptions for the model's further development and design:

- The main premise is that the model *be based on expert assessment*, comprising scientific as well as other expertise. Experts with the right qualifications and profile make a balanced assessment of different documentary material for each research area and field of research.
- The model must set out from a *common framework* but must at the same time *value each area of research according to its own premises*.
- The model must be *objective, comprehensible and transparent* throughout all stages of the process, and must provide for *comparable assessments*.
- It must furthermore be *resource efficient* relative to the estimated increase in quality.

3.3 Background

3.3.1 The current model for resource allocation and an international outlook

A performance-based model for resource allocation was introduced in Sweden in 2009. The model allocates a part of the block grants to HEIs for research and doctoral education⁴ on the basis of two quality indicators: publications/citations and external funding. The external funding indicator counts revenue from grants and commissioned research. Both indicators are assigned the same weight – 50 per cent each. The current model comprises 29 HEIs, with arts university colleges among those who are not included, see also Section 4.2. As of 2014, the share of the block grant subject to competition was increased from 10 to 20 per cent.⁵

⁴ HEIs' revenue for research and doctoral education is approx. SEK 36 billion annually (2013). Of this amount, about 40 per cent is in the form of direct grants, also referred to as base financing (previously known as faculty funding), or about SEK 14.5 million for 2013, including the "strategic research funding" (strategiska forskningsområden). The "ALF funds" (funds paid to county councils as compensation for their participation in medical training and clinical medical research) are not included. In an audit carried out by the Swedish National Audit Office it emerged that between just under a third and half of the block grant goes to doctoral education. The share would appear to be considerably higher at university colleges and new universities than at older universities (Swedish National Audit Office, 2011, *Användningen av basanslaget för forskning och forskarutbildning*, RiR 2011:21, p 11).

⁵ Actual redistribution has been relatively modest. The HEI which lost most funding did so to the tune of SEK 14 million for the period 2011–2014. The HEI which has received the most funding received SEK 31 million. In total, about SEK 70 million was redistributed between HEIs in 2014 (Budget bill for 2015, Bill 2014/15:1, Expenditure area 16, p 133).

The Government has not specified how large a share of the block grant will go to the model now being proposed, however the Swedish Research Council has assumed that the performance-based portion of the block grant will remain at 20 per cent. It should be pointed out that any change to this share would consequently impact the outcome of the new model, and would thus most likely mean that adjustments were required.

A performance-based system of resource allocation aims to determine the distribution of research resources on the basis of quality evaluations. The first performance-based research funding system for block grants was introduced in Britain in 1986, and today (2014) around fifteen countries have such systems. Some are entirely based on indicators and some entirely on peer review, see also Chapter 13. Opinion is divided as to the effects of such national evaluation systems on the quality of research. Examples from other countries with evaluation systems for research indicate that they lead to improvements in quality and that these are most marked initially, when an evaluation system is first implemented. Both in Britain and the Netherlands, which have run regular national evaluations of research quality involving peer review for a couple of decades, evaluations are regarded as having led to improved quality – even if it is difficult to prove this unequivocally. In the Netherlands evaluations are carried out without a subsequent allocation of resources.⁶ In Australia national evaluations are also reported to have been drivers of quality.⁷ How much a system of performance-based research funding can be expected to increase the quality of the country's research depends, according to a study, in part on how large a share of resources is involved, and in part on how long the performance-based system has been running.⁸ According to another study, performance-based research funding systems are effective even if they only include a small part of the total block funding, however the transparency of the systems and their ability to involve institutions as participants are at least as important for an effective, efficient research system as is funding itself.⁹

In summary, a considerable amount of experience now exists concerning national research evaluation systems and their use, to varying degrees, as a basis for allocating resources to research. These experiences suggest that quality-driving effects may be strongest at the initial stage, but also that the systems promote efficiency, transparency and a broad overview of national research systems.

3.3.2 Previous proposals for models of resource allocation

Two previous reviews have looked at models of resource allocation. In the commission *Resurser för kvalitet [Resources for quality]* (SOU 2007:81), Dan Brändström proposed a model of resource allocation to undergraduate and masters education as well as doctoral education, and to research. The proposals in the review were intended to constitute a coherent approach, with a resource allocation model for both education and research. In brief, the proposal for research was that 50 per cent of existing grants be subject to competition and be distributed according to quality and activity-based criteria. The share of each university's research grant

⁶ Swedish Research Council (2013). *Kartläggning av olika nationella system för utvärdering av forskningens kvalitet – förstudie inför regeringsuppdraget U2013/1700/F*; Swedish Research Council (2013). *Kvalitetsutvärdering av forskning i Nederländerna – rapport från studiebesök i oktober 2013 för projektet FOKUS*; van Drooge L., de Jong S., Faber M. and Westerheijden D. (2013). *Twenty years of research evaluation. Fact & Figures*, Rathenau Instituut; Swedish Research Council (2012). *Swedish production of highly cited papers*. Vetenskapsrådets lilla rapportserie 5:2012; Öquist, G. & Benner, M. (2012) *Fostering breakthrough research: A comparative study*. Academy report. Royal Swedish Academy of Sciences.

⁷ Swedish Research Council (2014). *ERA – Excellence in Research for Australia. Rapport inom ramen för Vetenskapsrådets uppdrag Forskningskvalitetsutvärdering i Sverige – FOKUS*.

⁸ Geuna, A. & Piolatto, M. (2014). The development of research assessment in the UK and Italy: costly and difficult, but probably worth (for a while). Department of Economics, University of Turin, *Working Paper series 16/2014*.

⁹ Sivertsen, G. (2014). Performance-based funding. Presentation at the workshop *The effectiveness of national research funding systems*, Brussels, 6 May 2014. The study *Swedish production of highly cited papers* (2012), p 11, shows that countries with performance-based research funding systems, e.g. Britain, Australia and the region of Flanders, had an upward trend in terms of the most-cited 10 per cent of publications in the period from 1990 to 2011. However, so did countries without such systems, e.g. Switzerland and most notably Singapore (albeit from a low starting point). For the Netherlands, too, a considerable increase can be noted – the country has a national evaluation system of all research which is not linked to resource allocation. Sweden also showed an upward trend, but it was less marked than in the other countries mentioned.

exposed to competition would be assessed and distributed following quality evaluations of research, measurements of mean normalised citation scores for international scientific production, external funding, the number of PhD-holding teachers and the number of female professors.¹⁰

In its Bill *Ett lyft för forskning och innovation 2008/08:50 (A boost for research and innovation)* (Bill 2008/09:50), the Government chose to introduce two of the proposed indicators – citations and publications, and external funding – as well as commissioning a study of whether peer review and the assessment criterion ‘collaboration’ should be included in a future model of resource allocation.¹¹

Anders Flodström was commissioned to develop and submit a proposal for how evaluations of research quality might complement the two indicators introduced in 2009. The commission also included making a proposal for how HEI quality in terms of collaboration with the outside world and utilisation of research results become part of the system for resource allocation. The 2011 review, entitled *Prestationsbaserad resurstilldelning för universitet och högskolor [Performance-based research funding for universities and university colleges]*, led to a number of proposals. Among the most important of these were that peer review of research quality should *not* be introduced, that only grant revenue gained in “scientific competition” should be counted as external funding, that the SwePub database should be expanded to include the humanities, social sciences and artistic research, that artistic research should not be included in the model, and that a pilot project should be carried out to measure collaboration. The main arguments cited against introducing national expert review of research quality centred on excessive costs, that their precision would be insufficient to serve as a basis for resource allocation, and the extended time intervals between different assessments.¹²

A number of consultation bodies supported Flodström’s proposal that a national system of expert review should not be introduced. Several of them did not share the proposal’s conclusions, however, including the Swedish Research Council. Its consultation statement specified the primary reasons for this:

*The reasons for rejecting the bibliometric indicator are that there are different publication traditions in different areas, that publication statistics are retrospective and too mechanical, and that more innovative and high-risk research is disfavoured. It is the Swedish Research Council’s view that the assessment should involve a process of peer review. Such a system would be better at assessing the quality of current research and future research potential, and would also create a greater incentive for continued high-quality research.*¹³

At the request of the Ministry of Education and Research, in May 2012 the Swedish Research Council submitted an outline of how a commission to develop a proposal might be formulated, based on the opinions presented in earlier consultation statements on Flodström’s proposal.¹⁴ The joint statement by the six research-financing agencies regarding the Research Bill was also clear about the need for a new model of resource allocation, and that a new model be seen as a tool for creating better and more sustainable conditions for researchers, in combination with being a driver of quality. In their report *För svensk framgång inom forskning och innovation 2013–2016 [For Swedish success in research and innovation 2013-2016]*, the six agencies suggested that the Government

devise a new national system for distributing and redistributing block grants that rewards and steers towards quality, not quantity, and at the same time gives HEIs the opportunity for long-term planning, thereby creating incentives for the HEIs to offer the best researchers good conditions by means of prioritisation and redistribution. (...) Current exposure

¹⁰ SOU 2007:81. *Resurser för kvalitet. Slutbetänkande av Resursutredningen*, p 19–20.

¹¹ The government bill *Ett lyft för forskning och innovation 2008/08:50*, p 51–60.

¹² Flodström, A. (2011). *Prestationsbaserad resurstilldelning för universitet och högskolor*, p 11, 47.

¹³ Swedish Research Council (2012). The Swedish Research Council’s consultation statement regarding the review *Prestationsbaserad resurstilldelning för universitet och högskolor* (U2011/7356/UH), p 1.

¹⁴ Swedish Research Council (2012). *Utformning av ett system för peer review utvärdering som underlag för prestationsbaserad resurstilldelning för universitet och högskolor*.

*to competition, and the system for distribution of block grants, are in our view insufficiently directed towards quality, either in terms of the practice and results of research or of making beneficial use of it.*¹⁵

3.4 How the commission was carried out

In accordance with the government commission, the Swedish Research Council has been in continuous contact and consultation with Forte, Formas and Vinnova. Briefings have been held at special consultation meetings at different levels and through joint participation in external meetings. Consultations have also been held regarding Vinnova's commission to produce proposals for indicators and criteria for evaluation of collaboration, see also Section 3.6. The Government Offices (the Ministry of Education and Research) have been kept continuously informed about progress on the commission.

In order to gain insight, experience and opinions from various types of systems and evaluation models, the Swedish Research Council set up two advisory boards. One consisted of eight vice-chancellors appointed by the Association of Swedish Higher Education (SUHF). The other group was an international advisory board comprising nine experts on research quality assessment, with experience from a number of different countries. See Annex 2 for a listing of the members of both advisory boards.

Two study visits were carried out – to Britain (February 2013), as part of the preliminary study, and to the Netherlands (October 2013) – in order to study different models of national research evaluation in greater detail. Additionally, a special study of the Australian system was undertaken in the spring of 2014, including interviews with key actors in Australia and in conjunction with a visit by the *Australian Research Council* in June 2014. Special reports have been compiled of these study visits and interviews.¹⁶

The Swedish Research Council worked to inform the research community about the process of the commission and to receive comments. These efforts included a continuous dialogue with the Swedish Research Council Board, scientific councils, councils and committees. Eight meetings and hearings were held at four locations in May 2014, for HEI management as well as researchers, to which all HEIs were invited. A total of about 600 people participated in these meetings. A special dialogue was held with representatives of the artistic research area. The Swedish Research Council also invited stakeholders such as businesses, the public sector, civil society, foundations and academies, as well as relevant or interested government agencies, to take part in a dialogue about the commission, primarily through the so-called Stakeholder Group. Information about work on the commission was disseminated on a continuous basis via the Swedish Research Council's digital journal, *Curie*, and the website *vr.se*.

The project's working group took active part in a series of meetings in 2013 and 2014, some initiated by the working group itself and others organised by academia and industry/business. Examples of these include the Swedish Association of University Teachers (SULF), the Swedish National Union of Students (SFS), the Young Academy of Sweden, Faculties of Technology, the Confederation of Swedish Enterprise, Teknikföretagen (the Association of Swedish Engineering Industries), and the Swedish Association of Graduate Engineers. Please refer to Annex 3 for a complete list of external meetings, study visits and hearings. Continuous dialogues were also held with Statistics Sweden (SCB), the Swedish Higher Education Authority (UKÄ) and the National Library of Sweden (KB).

Work on the commission was carried out at the Swedish Research Council between May 2013 and December 2014 by a project group consisting of Sara Monaco (Project Manager), Sten Söderberg (Assistant Project Manager), Tomas Andersson (until September 2013), Andreas Augustsson (from July 2014), Malin

¹⁵ Swedish Research Council, Vinnova, Formas, FAS, the Swedish Energy Agency and the Swedish National Space Board (2012). *För svensk framgång inom forskning och innovation 2013–2016. Underlag till forsknings- och innovationspropositionen.*

¹⁶ Swedish Research Council (2013). *Kartläggning av olika nationella system för utvärdering av forskningens kvalitet – förstudie inför regeringsuppdraget U2013/1700/F*; Swedish Research Council (2013). *Kvalitetsutvärdering av forskning i Nederländerna – rapport från studiebesök i oktober 2013 för projektet FOKUS*; Swedish Research Council (2014). *ERA – Excellence in Research for Australia. Rapport inom ramen för Vetenskapsrådets uppdrag Forskningskvalitetsutvärdering i Sverige – FOKUS.*

Eklund (from June 2014), Daniel Faria (until October 2013), Staffan Karlsson (from June 2014), Maud Quist, Bo Sandberg (from October 2013 until May 2014), Gwendolyn Schaeken (from April 2014), Elisabeth Sjöstedt (from October 2013 until May 2014), John Tumpane and Marianne Wikgren (from June 2014). Marlene Truedsson served as the Swedish Research Council's internal communicator throughout the project period. Director-General Sven Stafström (Mille Millnert until 1 December 2013) bore overall responsibility. A Steering Committee comprising the Director-General, Secretaries General Kerstin Sahlin and Mats Ulfendahl, Head of Department Jonas Björck (from April 2014) and Senior Advisor Carl Jacobsson oversaw the project throughout.

3.5 Lessons from earlier work

In preparation for the commission, a preliminary study was carried out between November 2012 and March 2013, in consultation with Forte, Formas and Vinnova. The preliminary study included a detailed survey of the British evaluation system, briefer surveys of eight other countries' systems, and a review of evaluations at the Swedish HEIs that have undertaken their own research quality assessments. The results and conclusions of the preliminary study were presented in the report *Kartläggning av olika nationella system för utvärdering av forskningens kvalitet – förstudie inför regeringsuppdraget U2013/1700/F [Survey of different national systems for evaluation of research quality – preliminary study for the government commission U2013/1700/F]*.

Important conclusions drawn from the preliminary study included the importance of clarifying, at the outset, what the introduction of a new model of resource allocation was intended to achieve, and also of striving to create as resource-efficient a system as possible.

Compared with the other countries in the study, Sweden is readily able to collect data from existing registers and databases, and can therefore be more structured in its data collection. Another important aspect is that each system has to be adapted to the conditions that apply in the country in question. All countries have their own specific conditions, meaning that the aims of performance-based research funding systems differ from country to country, see also Chapter 13. Practical circumstances also differ – in Sweden, for example, we are more dependent on international peer reviewers than the larger research countries are. And in terms of the proposal itself, particular constraints apply in proposing a model that does not place an unreasonable workload on those involved. A national resource allocation model must thus be adapted to the specific conditions that apply in Sweden.

In Britain it is evident that the national evaluation system has not replaced the need for the HEIs' own follow-ups and evaluations. One of the Swedish Research Council's premises is that a national model for resource allocation should be helpful to Swedish universities and university colleges and that, if possible, it should be able to replace the major HEI evaluations carried out in recent years. However, the need for HEI-specific follow-ups and evaluations will most certainly remain, as a national evaluation will not, and should not, be designed to meet that need. This notwithstanding, the results from FOKUS should also be applicable to in-depth evaluations at the local level.

3.6 Relationship to other government commissions

The proposal for evaluation of ALF-financed clinical research presented by the Swedish Research Council to the Government on 3 September 2013¹⁷ has several points in common with the current commission (ALF is a Swedish acronym for an agreement between the state and county councils on the financing of medical training and clinical research). A new ALF agreement between the state and the county councils concerned was signed

¹⁷ Swedish Research Council (2013). *En utvecklad modell för kvalitetsutvärdering av klinisk forskning finansierad av ALF-medel. Redovisning av ett regeringsuppdrag* Report 2:2013.

in September 2014. Under this agreement a new model of resource allocation, based on an evaluation of the quality of clinical research, is to be introduced in 2019.¹⁸ The Swedish Research Council's recommendation is that the FOKUS and ALF evaluations be coordinated to the greatest possible extent in order to avoid duplication of work or parallel evaluations of clinical research in Sweden, see also Section 12.1.2.

The commission also relates to Vinnova's government commission to design methods and criteria for assessing performance and quality in HEIs' collaboration with society at large, in terms of relevance and beneficial use of research-based knowledge.¹⁹ Vinnova intends to present the final report on its commission in 2016. The Swedish Research Council has held special consultations with Vinnova regarding the parts of the Swedish Research Council's commission that concern assessment of the impact of research beyond academia as well as factors for quality development, which include activities involving collaboration with society at large. The agencies' respective commissions have not included the coordination of the evaluation models themselves. The question of coordination between the commissions is discussed in Section 12.1.2.

The Swedish Research Council has a commission to draw up national guidelines for open access publishing.²⁰ FOKUS could potentially counteract the open access policy in respect of publishing channels, and the open access policy could complicate FOKUS' primary objective of evaluating the quality of *all* research. FOKUS evaluates quality as such; it would be difficult to justify assessing quality only if the results are published as open access publications.²¹ There is thus a potential conflict in the objectives of a national policy for open access and FOKUS, and it is unfortunate if these two policy instruments offer contradictory incentives to researchers. HEFCE, in preparation for the next *Research Excellence Framework* (REF) planned for 2020, has specified that as 1 January 2016, publications must be open access in order to be considered in REF. Exceptions are made for monographs, book chapters and non-text based works.²² In summary, Sweden needs clearer policy guidelines to address the interrelation between quality assessments of research and guidelines for open access.

3.7 Limitations

A guiding principle for the commission has been to strive to present as simple and resource-efficient a model as possible, but one which nonetheless is capable of providing valuable feedback to HEIs. During the course of the work various suggestions were made concerning which aspects to include, such as a clearer promotion of doctoral education, in order to ensure that HEIs do not prioritise hiring post-docs at the expense of doctoral students. It should be pointed out that negative effects for doctoral education are not in any way connected specifically to the current proposal, but that they risk arising in the current performance-based research funding system as well, as long as research and doctoral education are covered by the same grant. In fact, opportunities for using the evaluation to highlight the circumstances and needs of doctoral education should be greater in a system based on peer review, where relevant considerations can be made, than in a purely indicator-based system.

In FOKUS, the Swedish Research Council has attempted, to the greatest possible extent, to balance the various assessment aspects in order to promote both scientific/artistic quality and quality enhancing factors, which include doctoral education and early career researchers. Given the fact that the block grant finances both doctoral education *and* research, however, the Swedish Research Council shares the view of many other

¹⁸ Government of Sweden, Ministry of Education and Research. *Hårdare kvalitetskrav på klinisk forskning – nytt ALF-avtal klart*. Press release, 11 September 2014. <http://www.regeringen.se/sb/d/18270/a/246494>

¹⁹ Vinnova's commission, *Ändring av regleringsbrev för budgetåret 2013 avseende Verket för innovationssystem inom utgiftsområde 24 Näringsliv*, item 14 under New Commissions, 28 Feb 2013.

²⁰ *Vetenskapsrådets regleringsbrev för budgetåret 2013*, 24 Oct 2013.

²¹ Open access is concerned with access to research results, and touches on issues of dissemination both within and beyond academic circles. It is not in itself a measure of quality.

²² HEFCE (2014). *Policy for Open Access in the post-2014 Research Excellence Framework*.

stakeholders that it may be necessary to create special incentives that specifically promote doctoral education in the form of parallel mechanisms within the resource allocation system.

4 EVALUATION UNITS: WHAT IS TO BE EVALUATED?

4.1 Subject classification

In FOKUS, the Swedish Research Council proposes that all Swedish research be divided into 24 research areas and five fields of research. On the basis of the principles laid out below, the model should as far as possible

- avoid creating classifications that conflict with the HEIs' own organisational systems
- be based on a classification that individual researchers can easily recognise and navigate
- collect data which are easily obtained using existing and established classification systems
- minimise the duplication of reporting in different data systems

The model must further achieve a balance between

- the requirement for scientific 'proximity' in order that the peer review maintain a high quality and precision (which can partly be regarded as increasing with a more detailed classification), and
- practical, logistical and cost-related requirements for minimising the number of panels and the volume of material to be produced

For these reasons, the Swedish Research Council has chosen to classify research by discipline, on the basis of *Standard för svensk indelning av forskningsämnen (National Standard for Research Subject Classification)* at the base level of research subjects (referred to as the 5-digit level), and has strived to avoid, as far as possible, splitting up the standard's research subject groups (at the 3-digit level), which is the most common level for presenting official higher education and research statistics.²³ Some adjustments have been made, and we have produced a classification proposal with a total of 24 research areas for evaluation of the scientific/artistic quality component. The classification is not intended to be fixed – adjustments can be made following suggestions from the HEIs. However, any changes must use the national standard at the research subject group level (i.e. the 3-digit level). Using a standardised classification based on an existing system for classifying research will allow for national comparisons.²⁴

The 24 research areas are aggregated into five fields of research. We propose that these fields of research constitute the classification that underlies the assessment of quality enhancing factors and of the impact of research beyond academia. The five fields of research are Natural and Agricultural Sciences (NL), Engineering Sciences (T), Medicine (M), Social Sciences (S), and Humanities and Artistic Research (HK).

The proposed research areas and fields of research are presented below. The estimated number of HEIs affected in each research area is shown in Annex 4. The number of reporting units is estimated at 414 for scientific/artistic quality, and a total of 131 for quality enhancing factors and impact beyond academia, see also Annex 4. A detailed description of which research subjects are included in each research area is available on the Swedish Research Council website.²⁵ The proposal was referred to the Swedish Research Council's scientific councils and panels in 2014, but needs further consultation prior to the implementation of FOKUS. For example, more detailed discussions are needed with the relevant HEIs on how to treat biology and

²³ Statistics Sweden & the Swedish Higher Education Authority. *Standard för svensk indelning av forskningsämnen 2011* (revised 2012).

²⁴ Experiences from the local, national HEI evaluations undertaken in recent years indicate that one of the biggest challenges was defining the reporting units. Since the reporting units in most cases differed from one another in terms of size and circumstances, comparisons within each HEI were made more difficult, see also Chapter 14.

²⁵ Swedish Research Council (2014). Förslag till indelning i forskningsområden för ett nytt nationellt kvalitetsutvärderingssystem – FOKUS. 29 May 2014. <http://www.vr.se/download/18.439efd48145f49ad5fb137/1399991198241/FOKUS+indelningsf%C3%B6rslag+140529.pdf>

agricultural sciences.²⁶ A somewhat altered classification for engineering subjects is also possible. There are alternatives to dividing medical research into the traditional *basic medical sciences* and *clinical medicine*, such as the *Health Research Classification System (HRCS)*.²⁷ However, we have chosen to use the agreed discipline-subject classification *Standard för svensk indelning av forskningsämnen 2011 (National Standard for Research Subject Classification)*, which also governs how other relevant statistics on Swedish research are reported.²⁸

Field of Research		Research Area	
NL	Natural Sciences and Agricultural Sciences	A	Mathematics
		B	Physics
		C	Chemistry
		D	Geosciences and environmental sciences incl. climate research
		E	Biology
		O	Agricultural sciences
T	Technical and Engineering Sciences	F	Chemical engineering, material engineering, nanotechnology and mechanical engineering
		G	Civil and environmental engineering
		H	Computer science, signals and systems and electrical and electronic engineering
		I	Biotechnology and medical technology
M	Medicine	J	Basic medical sciences I
		K	Basic medical sciences II
		L	Clinical medicine I
		M	Clinical medicine II
		N	Health sciences
S	Social Sciences	P	Psychology
		Q	Economics (incl. social and economic geography, business and industrial economy)
		R	Educational science
		S	Sociology, anthropology, technology, cultural studies and gender studies
		T	Political science and law
HK	Humanities and Artistic Research	U	History and archaeology
		V	Language, literature and aesthetics
		W	Philosophy, ethics and religious studies
		X	Artistic research

Table 1. *Division into five fields of research and 24 research areas*

The risk of classifying by discipline is that interdisciplinary sciences (multidisciplinary research) become hidden from view. However, the problem remains even if other possible classifications are used. Irrespective of the classification used, there will always be research and fields of research that span several areas, or that

²⁶ For example, it might be problematic to dedicate a separate research area to agricultural sciences when only one or two HEIs have activities in that area, when one of the aims of FOKUS is national comparison. An alternative classification worth discussing is to evaluate “white biology” (biochemistry, molecular and cell biology etc.) in one group and “green biology” (organism biology, ecology, agriculture etc.) in another.

²⁷ In HRCS, medical research is divided into two dimensions, one concerned with the health category to which it belongs and the other with what type of research activity is being carried out.

²⁸ It should be underlined that the two main categories basic medical sciences and clinical medicine are very broad categories which can be perceived as rather meaningless, but which include more specific and detailed sub-categories. For example, the Swedish Research Council’s proposal for an evaluation model for ALF-financed clinical research (Swedish Research Council 2:2013) suggests dividing clinical research into eleven categories (which in the ALF proposal are divided between four assessment panels): Cardiovascular and respiratory disease; neurological, eye and ENT disease including head trauma; mental illness and addiction; infection, inflammation and immunological disease; cancer and haematological disease; metabolic and endocrine disease; disease and trauma of the motor organs; urogenital disease, obstetrics and neonatology; odontological disease; medical technology, processes and organisation; and public health and healthcare research. Such a detailed classification is not feasible within the framework of FOKUS, for purely logistical reasons – FOKUS is intended to evaluate all research at Swedish HEIs and not, as in the ALF proposal, only clinical research carried out in the seven regions that have university hospitals. However, the underlying classification may very well be the same in FOKUS as in the proposed ALF model.

occupy the borderland between two areas. For this reason it is particularly important that this is taken into account when appointing panels and in formulating instructions to the reviewers. We have built a number of mechanisms into FOKUS to deal with interdisciplinary sciences e.g. by allowing HEIs to highlight interdisciplinary research in their material and by means of a referral procedure between panels, see also sections 5.3.2.1 and 6.2.

The Swedish Research Council is aware that the classification may be regarded as rather crude, and that each field of research encompasses a great breadth of research disciplines and traditions. It is our view, however, that the proposed classification provides a reasonable level of detail for a national evaluation – a higher resolution of disciplines is simply not feasible at the national level.²⁹ We further believe that a more detailed classification would exacerbate the possible drawbacks of classification by discipline, and would risk concealing broad and/or inter and multidisciplinary environments in adjacent disciplines. The fact that disciplines are included in the same research area means that they can be assessed together and the HEIs at the national level can be compared within these research areas. It does not mean, however, that all research within the research area is fully comparable – instead it is important to ensure that there is sufficient variety of expertise among the reviewers to guarantee a reliable assessment of the material.

4.2 What the evaluation encompasses

The question of which HEIs should be included in the evaluation, and of whether the result should determine resource allocation to all those evaluated or to some of them, are ultimately policy issues. However, the Swedish Research Council has designed FOKUS on the premise that *all* Swedish universities and university colleges should be able to participate and that all research areas can be included.³⁰

The research areas in which the HEI will be evaluated are determined by how the HEI has classified its activities in terms of research output i.e. publications and other research outputs (or equivalent) and staff. Whether an HEI is going to participate with a research area for assessment of scientific/artistic quality is determined by two parameters:

- a) the HEI's total volume of published works in the research area is at least 50 articles in scientific journals, or the equivalent, over the six-year evaluation period
- b) the number of research and teaching staff³¹, including doctoral students, in the research area at the HEI is at least five full-time equivalent (FTE) employees during the final year of the evaluation period

The Swedish Research Council's view is that it is reasonable to make these demands in order to ensure that the research environments that become subject to evaluation are viable. The first threshold ensures that the volume of research output is sufficient to apply the proposed evaluation methods. The second threshold ensures that it is an area in which active research is underway at the university in question. The value of these two parameters,

²⁹ For the sake of comparison, Britain's REF has four *main panels* and 34 *sub panels*, Australia's ERA eight *Research Evaluation Committees* and Italy 14 expert panels in its VQR.

³⁰ Of the 33 HEIs that currently receive grants for research and doctoral education, or grants for artistic research, 29 are included in today's performance-based research funding system. State-run HEIs which are *not* included today are the Swedish National Defence College (Försvarshögskolan) and the four arts colleges: the University College of Arts, Crafts and Design (Konstfack), the Stockholm University of the Arts (Stockholms konstnärliga högskola), the Royal College of Music in Stockholm (Kungliga Musikhögskolan i Stockholm) and the Royal Institute of Art (Kungliga Konsthögskolan). One privately-run university, the Stockholm School of Economics (Handelshögskolan i Stockholm), is not included in the current redistribution system either.

³¹ Refers to the following employment categories: professor, senior lecturer, career development posts (includes junior researchers, associate senior lecturers, postdoctoral positions), other research and teaching staff as defined by the Swedish Higher Education Authority. Lecturers are not included.

and the volume that types of publication other than journal articles should represent, needs to be examined and specified more closely in a pilot exercise.³²

By applying parameter (b) above, we estimate that approximately one per cent of research at Swedish universities and university colleges (measured as the share of full-time equivalent research and teaching staff) will *not* be considered for evaluation within the framework of FOKUS.

An HEI's participation with a *field of research* for assessment of impact beyond academia and quality enhancing factors is determined by the following parameter:

- a) the number of research and teaching staff within the *field of research* at the HEI is not less than 10 FTE employees during the final year of the evaluation period

With regard to the assessment of scientific/artistic quality, the emphasis will be on research output. It may be difficult in this regard to distinguish between what has been produced at the HEI and what has, for example, been produced at associated but independent institutes. The basic principle, however, is that the HEI must be one of the institutions named on the published work in order for it to be included in the evaluation. Published works that specify a Swedish university hospital may also be attributed to the associated HEI.³³ Another principle is that *all* research output be included, irrespective of the author's position or whether he/she has obtained a PhD.

Provided that the evaluations are carried out every six years, we estimate that an evaluation will include approximately 210 000 publications (about 35 000 are produced every year), produced by around 28 000 researchers and 19 000 doctoral students at 34 HEIs.³⁴ These will be evaluated as a part of just over 400 reporting units within the 24 research areas (see also Annex 4). The reporting unit does not necessarily correspond to any organisational unit at the HEI; it represents the sum of the HEI's research in the subjects included in the research area. What is included in each reporting unit is determined by how the HEI classifies its research when it reports to the various agencies responsible for statistics, and to SwePub (see also Chapter 8).

4.3 Artistic research

The current resource allocation system includes certain HEIs where artistic research is carried out³⁵, but not the four arts colleges in Stockholm.³⁶ The Swedish Research Council believes it is important for artistic research at these four HEIs to be placed on an equal footing with the research carried out at other HEIs with broader remits, and that a division does not occur where artistic research is not afforded the same opportunities to demonstrate its quality and compete for research resources. Artistic research should therefore be included in a future evaluation model; however, whether evaluation results for the arts colleges should be tied to resources remains a policy issue. As this is a relatively new area, with a small but growing body of researchers, there are special circumstances involved in evaluating artistic research, meaning that existing systems and procedures need to be developed further.

Research may be conducted on either a scientific or an artistic basis, and some research is based on both approaches. The quality of the research should therefore be evaluated on the basis of its own premises, and be assessed on its artistic or scientific merit – or both when that is pertinent – by experts who are qualified in the

³² For example, a monograph could be equivalent to five articles in scientific journals. How books, chapters and other types of publishing, e.g. of artistic works, should be counted needs to be determined in consultation with the sector.

³³ We estimate that 1000 publications a year will be added if publications that specify university hospitals as organisations are included.

³⁴ This estimate is based on statistics from the Swedish Higher Education Authority and SwePub.

³⁵ The University of Gothenburg, Umeå University and the University of Borås, among others.

³⁶ The University College of Arts, Crafts and Design (Konstfack), the Royal Institute of Art (Kungliga Konsthögskolan), the Royal College of Music in Stockholm (Kungliga Musikhögskolan i Stockholm) and the Stockholm University of the Arts (Stockholms konstnärliga högskola).

relevant area and methodology. Furthermore, a researcher using an artistic methodology may study the same breadth of objects, social issues, phenomena etc. as the scientific researcher. Artistic research can thus not be regarded as a special branch of, or a delimited subject within, the sciences; instead it is a broad and diversified domain in its own right.

Due to the special circumstances governing artistic research, and the currently limited volume of research, we recommend that artistic research constitute a separate research area within the proposed classification (Research Area X). This will place considerable demands on FOKUS for guaranteeing the variety of cutting-edge expertise among panel members and external reviewers, capable of evaluating a very heterogeneous area in terms of methods and research traditions. For assessing quality enhancing factors and impact beyond academia, we recommend that artistic research and humanities be included in a field of research entitled *Humanities and Artistic research*.

Documenting and archiving artistic research is an underdeveloped area, and an important prerequisite for evaluating artistic research is therefore the development of the SwePub publications database. The Swedish Research Council and the National Library (KB) have begun this process within the framework of the ongoing SwePub commission³⁷ and we propose that these two organisations be charged with the continued task of drawing up, in dialogue with the sector, a national standard for the classification and categorisation of artistic research outputs.

The Swedish Research Council recommends that

- the arts colleges be included in FOKUS
- Statistics Sweden and the Swedish Higher Education Authority be charged with revising, in consultation with the Swedish Research Council and the Association of Swedish Higher Education, the *National Standard for Research Subject Classification 2011* with the aim of introducing artistic research as a separate research subject area or separate research subject group
- the National Library (KB) be commissioned to develop, in consultation with the Swedish Research Council and the Association of Swedish Higher Education, a national standard for categorising non-text based research outputs in SwePub. KB should further be commissioned to formulate, in consultation with the Association of Swedish Higher Education, a national standard for how artistic research outputs are to be documented digitally and archived at HEIs

³⁷ See the National Library (2014). *SwePub blir ett kugghjul i forskningens infrastruktur*. <http://www.kb.se/aktuellt/nyheter/2014/SwePub-blir-ett-kugghjul-i-forskningens-infrastruktur/>

5 FRAMEWORK FOR EVALUATION – COMPONENTS, CRITERIA AND ASSESSMENT MATERIAL

Three assessment components are evaluated in expert assessments that include scientific and other expertise: scientific/artistic quality, quality enhancing factors, and impact beyond academia. The three components will be given separate grade profiles and grades. As a basis for assessment, review panels will examine each unit's *research production* in terms of scientific/artistic quality (in the form of peer review, citation analysis or external peer opinions), received *case studies* describing impact beyond academia, and *quantitative data* regarding quality enhancing factors. To this material will be added the HEIs' *own brief descriptions*. *Background information* is furthermore considered in the assessment, but is not graded.

As with the Swedish Research Council's proposal for an evaluation of ALF funding, site visits are not deemed justified on grounds of the logistical challenge and cost they imply.³⁸

Below is a diagram summary of the evaluation components and the proposed weight of each component in the evaluation.

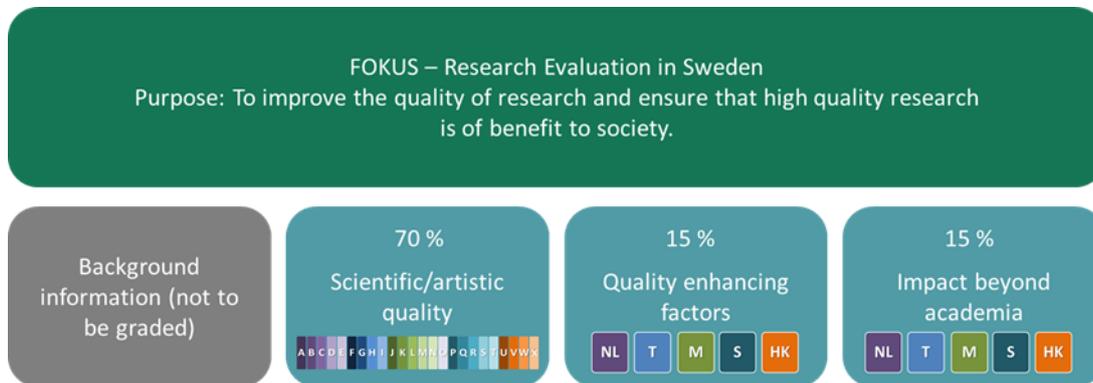


Figure 3. *Summary of evaluation components and proposed weightings*

5.1 Evaluation periods

The Swedish Research Council's proposed model involves carrying out national evaluations as an integrated activity with a specific periodicity – every six years is recommended, though somewhat more often would be preferable initially, if possible. One expressed aim of FOKUS is for the model to contribute to strengthening HEIs' strategic development towards becoming better drivers of quality, which would indicate that all HEI-based research should be evaluated together, at the same time. That would allow for long-term planning and longer periods of uninterrupted work between evaluations.

The results of a national evaluation carried out on one and the same occasion will provide valuable mapping of the state of research in the nation and identify areas of strength, both at national level and HEI level. The evaluation may thus serve as a benchmark and as a basis for strategic decisions by actors at various levels. The Swedish Research Council's proposal cannot completely obviate the need for HEI-specific evaluations, but because it implies that the model is implemented simultaneously for all HEIs – thus providing a full national picture and scope for comparisons – the need for ambitious individual evaluations should be significantly reduced.

³⁸ Swedish Research Council (2013). *En utvecklad modell för kvalitetsutvärdering av klinisk forskning finansierad av ALF-medel*. Redovisning av ett regeringsuppdrag Report 2:2013. Site visits do not feature in other national evaluation models either, e.g. Britain's REF and Australia's ERA.

There are also economies of scale in carrying out the evaluation all at the same time. A further argument for carrying out the entire evaluation of Swedish research at the same time and with a specific periodicity is that it allows for the gradual development and improvement of the model between evaluations. The quality evaluations carried out by Swedish HEIs of their own research in recent years have also been organised as an integrated activity at a specific point in time, rather than as a continuous activity. All other countries that allocate resources on the basis of national evaluations also carry out their evaluations in an integrated manner.

The alternative to an integrated national evaluation with a specific periodicity would most likely be a system of continuous evaluation, with the Swedish Higher Education Authority's evaluation system for higher education as a possible model. Such a continuous system might then be based on the five fields of research described in Chapter 4, and be coordinated with the Swedish Higher Education Authority's evaluations of doctoral education, which is planned to begin and be tested in the spring of 2015. One circumstance which argues against such a continuous system is the fact that allocations to HEIs for research and doctoral education are now granted to HEIs as block grants, and not divided by field of research or research area. A continuous system would thus mean that some fields of research would be evaluated in some years but not in others, which over time would lead to an unclear or insufficient connection with the resource allocation system in respect of an overall block grant. An integrated evaluation of all research would also allow interdisciplinary research, quality enhancing factors and impact beyond academia to be better served by the evaluation model. These three aspects of the evaluation are often not limited to individual fields of research.

Yet another argument against a continuous system is that it runs the risk of causing too many changes to the methodology in the course of the evaluation work: minor adjustments are often made after an evaluation is complete, and an evaluation which is carried out on one and the same occasion will thus be fairer and more equivalent for all.

Finally, experience from Australia shows that continuous evaluations are also more costly than integrated. In Australia a continuous evaluation system was initially tested for ERA, but was abandoned for reasons which included the ones described above. Against this background, our proposal is for an integrated national evaluation.

The Swedish Research Council further proposes a periodicity to the effect that the evaluations would be carried out in aggregate *every six years*. In several countries with national evaluation systems the interval is precisely six years. If it should be deemed appropriate to link the periodicity of evaluations to research policy bills, four-year intervals could also be considered. Our view, however, is that four years may be too short as an interval, at least in the longer term. Regular four-year evaluation periods risk placing too much pressure on the research system and associated costs, while longer intervals – adapted e.g. to every second research policy bill, i.e. every eight years – may come to be seen as based on material which is too old, thus reducing the legitimacy of the evaluation. This is ultimately a question of weighing up policy advantages and disadvantages. A long-term research policy, with e.g. ten-year planning horizons, could possibly reduce the need for linking the evaluations specifically to research policy bills.

Regardless of the periodicity chosen for the longer term, it may be appropriate initially to apply somewhat shorter intervals in order to allow for necessary adjustments to the model; these could then be expanded to the proposed six-year periodicity. Section 12.1.3 contains a more detailed description of the proposed implementation. Implementing the model in the proposed manner, with shorter intervals between evaluation results initially, allows for comparisons over time and for the identification of development trends. If evaluations were spaced six years apart from the outset, it would be 12 years before a comparison over time could be made and any progression noted.³⁹

³⁹ The proposed implementation process is in line with experience and recommendations from the *Australian Research Council* in terms of the introduction of the ERA system. An initial trial run of ERA was carried out in Australia in 2009, without a subsequent allocation of resources. A first full-scale run of ERA was then implemented in 2010, a second one in 2012, and a third run is planned for 2015. The periodicity after that has not been decided, but longer intervals have been requested.

5.2 Background information

Before moving on to a more detailed description of the three evaluation components proposed by the Swedish Research Council, this section provides an overview of the model's proposed background information package that assessment panels would receive when assessing and grading the three components.

To allow for an assessment of the quality of research at an HEI and its impact beyond academia, certain background information about circumstances at the HEI in question must be obtained. In the Swedish Research Council's proposed model, this background information is to be used to give the panels a comprehensive picture of the HEI's character and to give reviewers an increased understanding of, as well as a context for, the other material – but the background information itself is not to be graded. The Swedish Research Council has chosen to make this background information separate in order to refine the assessment of each of the evaluation components scientific/artistic quality, quality enhancing factors, and the impact of research beyond academia. The background information is also intended to be used to relate the three evaluation components to the HEI's profile, vision, strategies and organisation, how it deals with management, governance, recruitment and career systems, resources available (revenue, staff and infrastructure), the extent of doctoral education, and the profile and volume of publications, divided by field of research and research area.

However, as the model is not based on an assessment of individuals or existing organisational units at the HEIs, there will not always be a direct correspondence between financing, staff and publications, since financing and staff are reported by organisation, while publications (articles, monographs or similar) are classified by research area.⁴⁰ For example, a researcher at a mathematics department may produce publications in physics or chemistry as well as in mathematics. The delimitation of reporting units and the reasons for the proposed delimitation are described in greater detail in Chapter 4.

5.2.1 Material to illustrate research circumstances

The background information consists of each HEI's own text-based description as well as a number of quantitative data that HEIs report to the Swedish Higher Education Authority, Statistics Sweden and SwePub. HEIs are to be given the opportunity to fact-check the background information before it is passed on to the panels. The procedure for collecting the assessment material is described in Chapter 8. Annex 5 contains a compilation in table format of the documentation we propose be obtained for each entry under background information.

5.2.1.1 Short descriptions

Each HEI submits a short general description, about five A4 pages in length, of itself, with the possibility of further specifications for each field of research in which it carries out research to an extent that means it is included in the evaluation, see also Section 4.2. The document must contain a description of the HEI's profile (in particular regarding research), vision and strategy, as well as how it deals with organisation, management, governance, staff recruitment and career systems. If the HEI operates a large share of interdisciplinary research, for example, this may be described here.

Additionally, the HEI must describe how it ensures its access to research infrastructure. We have considered whether the panels should make an assessment of infrastructure, as a part of the quality enhancing factor component. There is no doubt that infrastructure can be a factor for quality development, but we have chosen in our proposal to view access to infrastructure as a prerequisite and resource for research, on a par with the access to revenue and staff. More extensive infrastructure financed with funds from the research councils must also be nationally (or internationally) accessible to researchers, regardless of their host department, which means it

⁴⁰ The Australian ERA system does not have an exact correspondence between evaluation units and the universities' organisational units either. Different reporting periods are also applied for different indicators (staff, revenue etc.). See Swedish Research Council (2014). *ERA – Excellence in Research for Australia. Rapport inom ramen för Vetenskapsrådets uppdrag Forskningskvalitetsutvärdering i Sverige – FOKUS*.

makes little sense to ascribe them to individual HEIs. In the worst instance, it could also counteract rather than favour collaboration if an HEI's infrastructure was included as part of the assessment basis for grading. However, *the result* of a good infrastructure can be part of the assessment of research achievements in evaluating the scientific/artistic quality component.

5.2.1.2 Quantitative data

The Swedish Research Council proposes that quantitative data on *revenue, staff, doctoral education and publication profiles* be included in the background information for the panels. This data must cover, with rare exceptions, the research area level and the field of research level as well as being aggregated at the HEI level. Thus both research area panels and main panels will have access to information at all three levels, but the instructions to each panel should clarify which information comprises its main material (e.g. the research area level for the research area panels). Data is to be presented for every year of the evaluation period in question, e.g. 2012-2017 for the first evaluation. It should be emphasised in this connection that SwePub accepts publications from 2012 and beyond. Staff statistics for universities and university colleges are also reported in a new structure, as of 2012, in the NU database held by the Swedish Higher Education Authority and Statistics Sweden. This also matches the timeline for implementation of the model outlined in Section 12.1.

Detailed instructions must be written on how each item of information is to be reported (in respect of e.g. time periods and dates, which type of revenue, which staff and which publications are eligible for inclusion), see also Chapter 8 on the collection of assessment material, and Annexes 5 and 9. Data collection must also be tried out in pilot exercises, see Chapter 12 on implementation issues. Below are recommendations for quantitative data which, together with the HEIs' own descriptive texts, will form the background information given to the panels. It should be permissible for reporting units to supplement, as necessary, the purely quantitative data with other factual information.

Revenue for research and doctoral education

The Swedish Research Council proposes that data on revenue for research and doctoral education be used to illustrate access to resources for the production of research and as background information for the panels' consolidated assessment of quality. In the current, indicator-based resource allocation model, data on external funding plays a direct role as an indicator when allocating the performance-based part of the block grant. It is the Swedish Research Council's view, however, that revenue (total as well as external funding) should be treated as background information, i.e. as an input variable instead of an output variable since it is a resource – a prerequisite – for pursuing research and producing research results.

Staff statistics

Staff supply is also a resource that panels need information about for their consolidated assessment. The Swedish Research Council recommends that statistics regarding research and teaching staff be reported both in terms of individuals and of FTE employees. The distribution in terms of employee categories, gender and age should be described.

Doctoral education

A significant part of the research environment and of research itself can often be attributed to doctoral students. What is more, a large part of the block grant generally goes to doctoral education – between a third and half.⁴¹ This justifies the inclusion of data about the extent of doctoral education in the background information provided for the panels. The Swedish Research Council suggests that data on the number of active doctoral students and PhDs awarded be reported.

⁴¹ Swedish National Audit Office (2011). *Användningen av basanslaget för forskning och forskarutbildning*, RiR 2011:21, p 11.

Doctoral education is of considerable significance for early career researchers, and thus for the HEI's potential for renewal and sustainability. Doctoral education and early career researchers are therefore included as an element of the quality enhancing factor component (see Section 5.4). However, evaluating the quality of doctoral education *per se* is not part of the FOKUS remit – that task falls to the Swedish Higher Education Authority.

The Swedish Higher Education Authority is responsible for quality assurance of all higher education in Sweden. This involves quality evaluations of first-cycle, second-cycle and doctoral education, as well as considering applications for degree-awarding powers from HEIs.⁴² The Swedish Higher Education Authority is currently developing a new model for evaluating doctoral education. The result of future evaluations will not be linked to the allocation of resources, but if the education programme is deemed to have quality deficiencies, the Authority may decide to revoke degree-awarding powers at the doctoral level. A trial run of these evaluations is expected to begin in the spring of 2015.

Publication profiles

In order to give the panels an overview of the evaluated unit's publication pattern, they will receive documentation material with tables showing *volume of publication* (quantity and percentage), *types of publication* and *channels of publication*. Data on publication patterns will be provided at the research area level as well as aggregated at the field of research level and possibly also at the HEI level, but as in the case of other quantitative data in the background information, panels will be instructed to look primarily at the data regarding the level at which they are making their assessment.

The distribution of publication types will be presented in publication lists with frequencies for e.g. journals, books, conference papers, artistic performances etc. Each type of publication is in turn made up of aggregated publication lists giving panels a more detailed picture of what publication channels the unit uses (journal A, journal B, publisher C etc.). The data will cover a six-year period.

The intention is to obtain data for the tables from the SwePub publication database. For a more detailed description, see Chapter 8 on the collection of assessment material and examples in Annex 5 (Tables 13 and 14, and Figure 12).

The material presented is intended, together with the unit's own description and quantitative data on staff and revenue, to give the panels contextual information about the unit's productivity and types of publication activities. Productivity is weighed into the assessment of scientific/artistic quality, and includes volumes of publication and staff as well as financing, see also Section 5.3.1.

5.3 Scientific/artistic quality

The Swedish Research Council recommends that scientific/artistic quality be assessed per research area by the 24 research area panels, based on the quality of research production. Each HEI will receive feedback in the form of a grade profile per research area, reflecting how the panels assess the quality of total production, as well as a brief written explanatory statement (grounds for the grade profile) from the panel. The grade profiles in one research area can then be compared between HEIs across the country. We recommend that the scientific/artistic quality component be given a weight of 70 per cent in the model.

⁴² Ordinance (2012:810) containing instructions for the Swedish Higher Education Authority.

5.3.1 Assessment criteria

We propose that the assessment of the quality of research production be based on the following criteria⁴³

- novelty and originality
- significance to the field of research in general
- scientific reliability and rigour (or the equivalent for the artistic research area)

All criteria are to be assessed by the panel from an international research perspective.

One of the main aims of the model is to raise the overall quality of research at Sweden's HEIs. The research area panels must assess the evaluated unit's top results as well as the quality and potential of its overall research production. A more precise specification of the assessment criteria will be necessary. Panel members as well as external peer reviewers will receive detailed instructions regarding the assessment criteria and the aim of the model.

A research area will be evaluated if its research and teaching staff correspond to at least five FTE employees in the final year of the evaluation period, and it has a volume of research production of at least 50 works or equivalent over a six-year period, see also Chapter 4.⁴⁴

The quality assessment of research production must be made in relation to the nature and circumstances of the research area, and be regarded against the background of the reporting unit's resources, i.e. the number of full-time equivalent research and teaching employees and total revenue for research, and its total production volume. This information will be part of the background information, see also Section 5.2.

It is important to emphasise that the model does not assume any direct link between quantity and quality. The panels are to assess the quality of research production, and a small unit with high-quality research production must be able to attain the same grade as a large unit with high quality. As mentioned previously, however, productivity must be considered in the assessment of scientific/artistic quality, meaning that production volume is viewed in relation to both staff volume and funding volume. A unit producing high-quality research in a resource-efficient manner must be rated more highly than a unit producing high-quality research with less resource efficiency. In the Swedish Research Council's opinion, this consideration of productivity in relation to quality is best made by each individual panel at the time of the final assessment for each research area and HEI.

The Swedish Research Council's proposal further means that it is the overall research quality of the individual work that is to be assessed, not the journal or publisher that accepted it for publication.⁴⁵ It follows that Open Access publications must be regarded as equal to publications in more traditional publishing channels.

The existence and extent of interdisciplinary research will be highlighted in the material by allowing each work to be classified as belonging to three different research subjects⁴⁶ in SwePub, and by presenting the research focus of a unit in the description of the unit's research (see Section 5.3.2 below).

5.3.2 Basis for assessment

The review is carried out using the same criteria and guidelines for all research areas, however the basis of assessment is partly adapted to each research area. The panels' task is to make a balanced assessment of the quality of research production at the reporting unit (i.e. the research area at an HEI).

⁴³ The same criteria (originality, significance and rigour) are used in REF, and they are also in line with two of the Swedish Research Council's basic criteria for assessing applications: "novelty and originality" and "scientific quality".

⁴⁴ Australia's ERA has a threshold of 50 outputs, where a book counts as 5 outputs. A unit whose output does not attain the threshold is classified as *Not Assessed*.

⁴⁵ See also the San Francisco declaration: *San Francisco Declaration on Research Assessment* (DORA), 2012/2013. <http://am.ascb.org/dora/>

⁴⁶ According to Statistics Sweden's 2011 standard for classifying Swedish research subjects.

For the assessment of scientific/artistic quality at each unit, panels will be provided with the following material:

- the unit's description of its focus within the research area
- a nominated sample of the top research
- material that illustrates the overall quality of the research area, *either* in the form of citation analysis, where possible, *or* in the form of external peer opinions regarding a selection of the unit's other research production (not including the nominated top research)

As explained above (Section 5.2), the panels will also have access to background information comprising the HEI's description of its research profile, vision, strategy, financial and staff resources available for the research area, infrastructure and publication profiles for each research area with data on the total volume of publication, what types of publications the unit's research is published in, and the publishing channels used.

The Swedish Research Council recommends that peer review (actual reading or equivalent) of the top research be carried out by the research area panels themselves in *all* research areas. For assessment of remaining production, which is intended to give an idea of overall quality, external peer review is recommended only in the research areas that are not described by means of citation analysis. The primary advantage of this approach, which is used in the Australian ERA model, is that it is more resource efficient.

It should be emphasised that research areas with different assessment bases (bibliometric data as opposed to opinions from external reviewers on publications, or "non-traditional" material) may feature within the same field of research. For example, in the psychology research area – which is classified as belonging to the field of research of social sciences – citation analysis might be substituted for external peer review of research production. If that were the case, this would be carried out for all (preliminarily) 15 units to be evaluated within psychology. In other words, the same combination of assessment material must apply nationally for each research area. The final determination of what constitutes an appropriate basis for assessment within a research area, i.e. citation analysis or external review, should be made in close consultation with representatives of that area.

5.3.2.1 Units' descriptions

For each reporting unit (up to 24 research areas per HEI), a description of the unit's research is provided. In this description the HEI is able to describe the strengths of its research production within the area, point to examples of novelty and originality, highlight any interdisciplinary focus, and provide other information to contextualise its research. The description is *not* intended to highlight the merits of individual researchers, *neither* may it include descriptions not corroborated by the research production under review. The description should run to about two pages, and the following structure is proposed.

Research focus and strengths

A brief descriptive text highlighting the focus of research production: is it interdisciplinary in nature for example? Has the focus shifted – if so, why? How does the unit's research contribute to the field as a whole? What are the strengths of the unit's research production?

Potential and novelty

To what extent is the unit working at the forefront of the research area? Has the unit contributed any conceptual or methodological development of the area? Is the unit's research moving in a new direction? Are emerging fields of research being explored? How great is the potential for successful research?

Miscellaneous

Use this section to highlight and explain special circumstances, e.g. a special context or historical connection.

5.3.2.2 Selection of research outputs for assessment of scientific/artistic quality

The sample should reflect the whole, i.e. overall quality as well as the works deemed to represent the best research, i.e. what is termed the top research.

The selection of a reporting unit's research production for peer review may be carried out in many ways. The suggestion advocated by the Swedish Research Council involves the HEIs themselves selecting and nominating the works which will represent the top research and overall quality, respectively (the latter applies to areas without citation analysis). To represent the *top research*, each HEI may nominate five per cent of the works in a given research area. This proposal implies that five per cent of total research production in all areas over a six-year period will in fact be read and assessed by the panels.

To represent *overall quality*, the research areas suited to bibliometrics should undertake a bibliometric analysis of the *entire* research area's scientific production.

For research areas where citation analysis is not appropriate for an assessment of overall quality, HEIs nominate a further approximately 50 per cent from remaining research production, i.e. excluding the five per cent nominated as the top research. This means that just over half of total production will be nominated for review in areas without citation analysis, which the Swedish Research Council deems to be a sufficiently large sample to capture overall quality, including the research area's strengths and weaknesses. There is also the possibility of adjusting the number of works to be nominated once the system has been tested in a pilot exercise. Of the 50 per cent nominated, research area panel members select a proportion – 40 per cent would seem adequate – for review. The selection process allows the panel members to analyse a larger volume of the unit's research production, while the selection process at the same time provides them with knowledge they can use in their balanced assessment of scientific production. This proposal implies that about a quarter of research production in subjects without bibliometrics will, in fact, be reviewed.

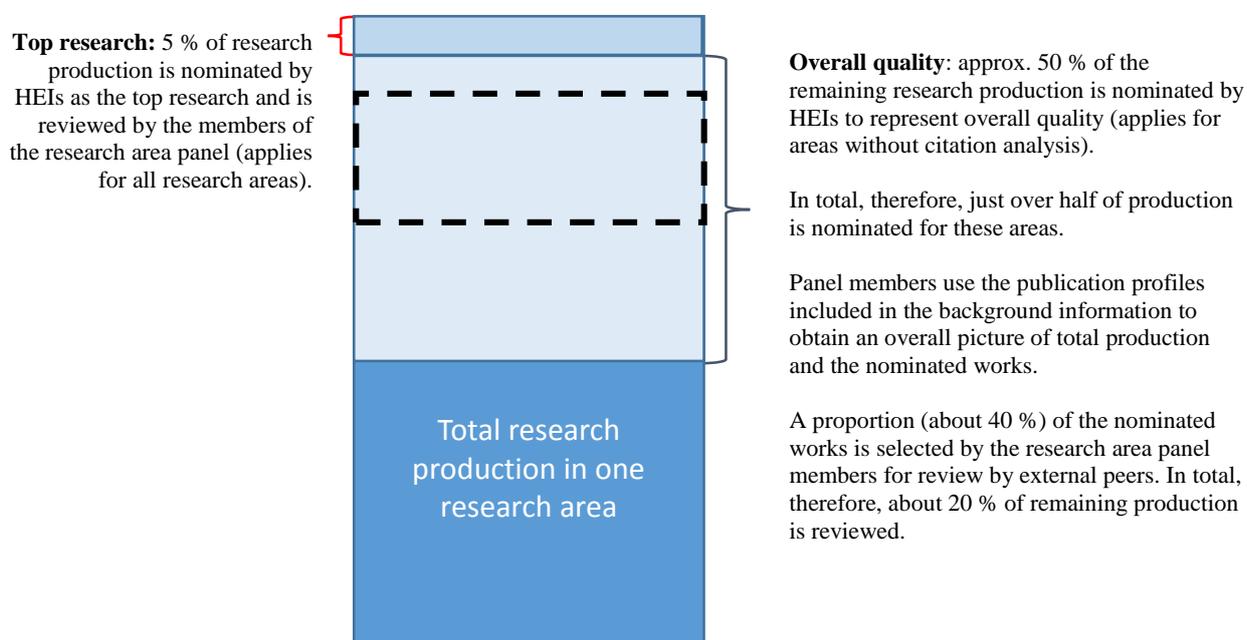


Figure 4. *The Swedish Research Council's proposal for the selection of research production, combining nominations and the sample of top research for review in all research areas, and selection for review of overall quality in research areas where citation analysis is not considered appropriate.*

The Swedish Research Council has considered an *alternative* selection method by which each HEI nominates its top research as a percentage of the works in a research area, after which a *random selection* of the remaining publications are reviewed to reflect the whole. One risk of random selection of works to review from of a non-homogenous body of production, in this case a research area which might encompass philosophy, ethics and religious studies (area W), is that it will give a distorted picture of the quality of research produced in that area. It also makes it difficult to compare results over time between two evaluations and analyse any changes. For these reasons we have rejected a selection method based on random selection.

Yet another way of capturing both overall quality and the top research would be to have *every researcher* within a given area *submit a number of selected works* for review, or that a certain number of research outputs per FTE employee were nominated.⁴⁷ This method has the advantage of including works from all researchers, but that also means it risks letting some of the top research slip through the net – unless the top research happens to be very evenly spread among the participating researchers. Another problem is that it is based on individual researchers, which is something the Swedish Research Council wish to avoid since it implies a heavier work load on the individual researcher, who will need to participate actively in the nomination process.

The nomination and selection procedure proposed here means that HEIs themselves, as well as the peer reviewers on the panels, will have a real opportunity to influence the research outputs that form the basis of the assessment. The Swedish Research Council's view is that this procedure enjoys clear advantages over the alternative methods described above.

5.3.3 Types of assessment process, dependant on the basis of assessment

Below are more detailed descriptions of nomination, selection and review procedures for each of the three review processes: peer review of the top research in all research areas, peer review of overall quality in research areas where citation analysis is the basis for assessment, and peer review of overall quality in research areas where citation analysis is not possible. The Swedish Research Council estimates that just over half of the 24 research areas will use citation analysis as a basis for assessment of overall quality. This procedure makes FOKUS, just like ERA, more resource efficient than e.g. REF.

5.3.3.1 Peer review of the top research in all research areas

Each HEI may nominate five per cent of research production to represent the top research in each research area under review. A research area must nominate at least three works as the top research, to be reviewed by the research area panel.

In order to ensure the quality of assessments, one guideline is that each panel member should, under normal circumstances, review works from the same research area at three HEIs, at least (e.g. physics at HEI A, B and C). Correspondingly, works from a given research area at one university should, under normal circumstances, be reviewed by at least three panel members. In reviewing the works, the reviewers on the panel must make their assessment based on the three evaluation criteria: novelty and originality, significance for the research area, and scientific/artistic reliability and rigour. The assessment of the top research is then combined with the other assessments of the research area's production to arrive at an overall grade profile, see also sections 5.3.3.2 and 5.3.3.3, and 7.2.

5.3.3.2 Peer review of overall quality in research areas where citation analysis is the basis for assessment

For research areas where citation analysis constitutes part of the panel's basis for assessment of overall quality, publications are measured against an international citation database. The Swedish Research Council uses a database built on the contents of the *Web of Science* (WoS).⁴⁸ The assumption is thus that FOKUS will be

⁴⁷ The latter method is applied by HEFCE in Britain's REF.

⁴⁸ The Swedish Research Council is aware that other suppliers are also present in the market.

based on the use of publications present in WoS⁴⁹, which limits the analysis to two types of publication: *articles* and *reviews*.

Panels' assessments are made on the basis of information about *citation impact*. We propose that citation impact be captured using three bibliometric indicators: (1) mean normalised citation scores, (2) share of highly cited publications in relation to the field, according to several different definitions of "highly cited", and (3) mean normalised citation scores for publications fractionalised into different types of collaboration. See Annex 6 for a more detailed description. Information about different types of collaboration (e.g. divided into the four categories *sole author*, *internal HEI authors only*, *authors with Swedish addresses only*⁵⁰, and *international co-authorship*) may thus constitute a further quality indicator in addition to citation analysis. This can be carried out in the form of a description of how much various types of collaboration are cited, and of whether – and if so to what degree – the research area has the strength and capacity to produce good research on its own, which indicates how successful collaboration is.

We propose that the reporting unit's citation impact be described in two different ways: (a) on the basis of the total number of works and (b) on the basis of the total number of works minus the top research – this in order to clarify the difference between the overall quality of research production and the quality of the production nominated as the top research by the HEIs.

The panels' assessments on the basis of citation data must take background information about the reporting unit's total volume of publication into consideration, as well as the share of that volume identified in the citation database.

Panels then combine data from the citation analyses with other information about the research area's production, including the panel's own review of the top research, to form an overall grade profile, see also Chapter 7. This grade profile, together with a written explanatory statement for the profile, is to describe research quality as a whole for the research area and HEI under review. Annex 6 contains a more detailed presentation of the bibliometric material panels are provided with for their assessment of scientific quality in the relevant research areas.

5.3.3.3 Peer review of overall quality in research areas not using citation analysis

For the areas that are not evaluated using citation analysis, HEIs nominate – as mentioned earlier – about 50 per cent of the total research production in order to illustrate the overall quality within the research area. The members of the research area panel then select about 40 per cent of the nominated works for review, which means that altogether *about 20 per cent of the research area's total production* is, in fact, reviewed to assess overall quality. The review is carried out by external peer reviewers (i.e. not panel members) on the basis of stated evaluation criteria.

In order to make the best possible selection from the nominated works in order to reflect the research area's overall quality, panel members may refer to the background information – primarily the publication profiles. Panel members can thus obtain an overview of the entire production within the research area and the units they are evaluating.

As a guideline for reviewers, every external reviewer should, under normal circumstances, review works from at least three reporting units and works from one unit should be reviewed by at least three external peer reviewers. External reviewers do not grade individual works, instead each reviewer reports a grade profile per research area and HEI, based on the entire selection reviewed, and states how, taking the three evaluation criteria into account, the works reviewed are distributed between the five grade categories (see also Section 7.1). External reviewers should also present a rating of their own competence in the reviewed unit's research profile.

⁴⁹ Open Access journals are not as well indexed in WoS, which could present a problem, at least in the short term.

⁵⁰ "Authors with Swedish addresses only" means that all the authors have addresses at HEIs, institutes or similar in Sweden, and that no other countries are mentioned in the addresses.

As for the research areas in which bibliometric analysis forms the basis of the panels' assessments, it would be preferable if information about the publications' authorship (e.g. divided into the four categories *sole author*, *internal HEI authors only*, *authors with Swedish addresses only*, and *international co-authorship*) could constitute an additional quality indicator for the panels' assessment of scientific/artistic quality. However, access to information on collaboration where bibliometric data are not available would require that information about e.g. the number of authors and the presence of foreign authors was included in SwePub.

The panels then combine the external reviewers' grade profiles and other information about research area production, including the panel's own review of the top research, into an overall grade profile. This overall grade profile, together with a written explanatory statement for the profile, is to describe research quality as a whole for the research area and HEI under review.

5.3.4 Estimation of the need for reviewers

How large the need for reviewers is will depend, as will the design of the model as a whole, on a trade-off between how informative and how resource-efficient the model should be. The top research and overall quality selections must be representative of a reporting unit's research production, but at the same time the number of works to be reviewed should be kept within reasonable limits. An estimated 210 000 research outputs are produced at Swedish universities and university colleges over a six-year period, which means that the top research comprises about 10 500 works. Between 40 and 50 works is estimated to be a manageable number for each panel member to review.⁵¹ FOKUS assumes that each individual work will be read by one panel member.

In order to be able to review the top research this means that the 24 research area panels will have to consist of between 10 and 20 members each, depending on the size of its research area.

If we apply a somewhat simplified picture which assumes that citation analysis is not used for research areas in the humanities and social sciences, we can estimate that the volume of the material for assessing the overall scientific/artistic quality of these areas will be about 80 000 works over a six-year period, of which about 20 per cent are to be assessed by external reviewers. Each external peer reviewer assesses up to 50 works and then submits his/her assessments to the panels. If each work receives one review, that comes to about 320 external peer reviewers.

In order to keep the work load and cost implications of the review at a reasonable level, there is the possibility instead of setting an upper limit for the number of works to be reviewed. However, setting a specific upper limit based on current information on the volume of production is difficult. As mentioned earlier, the Swedish Research Council proposes that all research areas be allowed to nominate 5 per cent or 50 per cent (the latter share in those areas where citation analysis is not appropriate) of its research production. In respect of the top research, we propose that the entire nominated production be read by the research area panel – whose member count will have to be increased as necessary to manage this. If and when a research area reaches any maximum volume set for overall quality, we suggest that the members of the research area panels make this selection from the body of nominated production, i.e. a selection that remains within the stipulated limit.

5.4 Quality enhancing factors

With FOKUS, the Swedish Research Council wishes to put a premium on a number of factors regarded as drivers of quality development in research. The quality enhancing factor component is assessed on the basis of the criteria *potential for renewal* and *sustainability*, with a combined grade on a five-point scale at the field of research level. Quality enhancing factors are assigned a weight of 15 per cent in the model.⁵²

⁵¹ In Australia's ERA, each reviewer reads a maximum of 50 outputs, and every output is read by at least one reviewer. A monograph is counted as five outputs.

⁵² In Britain's REF14, *environment* is one of three assessment criteria graded for *vitality* and *sustainability*, and is assigned a weight of 15 per cent in the combined assessment. In the Netherlands' evaluation system too, under the *Standard Evaluation Protocol* (SEP), *vitality* and *feasibility* are graded, as one of four assessment

5.4.1 Definition of the quality enhancing factor component

The Swedish Research Council recommends that a combined assessment of the following factors be included in the quality enhancing factor component:

- doctoral education and early career researchers
- collaboration and mobility within academia, internationally and nationally
- collaboration, partnerships and mobility beyond academia, internationally and nationally
- integration of research and education
- gender equality

It is the Swedish Research Council's view that a balance between well-established senior researchers, researchers at the beginning of their career and doctoral students promotes the quality of research. *Doctoral education and early career researchers* are thus prerequisites for a vigorous and sustainable research environment.

The Swedish Research Council and other research actors⁵³ believe that the quality of Swedish research can be strengthened through both international and national *collaboration and mobility within academia*. In international evaluation systems it is also common to try, in one way or another, to capture and promote some dimension of internationalisation, collaboration and mobility.⁵⁴

Collaboration, partnerships and mobility beyond academia can lead to improved research quality by contributing to socially-relevant research and increasing opportunities for research to exert an impact beyond academia. This refers primarily to ongoing and planned activities which may be assumed to promote the quality of research.⁵⁵ Vinnova has been tasked to devise methods and criteria for the assessment of achievement and quality in HEIs' collaboration with society at large, report to be submitted in 2016.⁵⁶ The Swedish Research Council and Vinnova are consulting with each other regarding their commissions, but further coordination measures may be required before implementation of the Swedish Research Council's and/or Vinnova's proposals, see also Section 12.1.2.

The Swedish Research Council is also concerned that the model does not push the university and university college system towards an undesired separation between research and teaching staff. One way of counteracting any such tendency is to reward the *integration of research and education* in the evaluation model. A close link between research and education (at the first and second-cycle levels), both in terms of the content of education and through encounters between researchers and students, may provide research with new impulses and promote interest among students for going on to doctoral studies and possibly pursuing an academic career, which will contribute to renewal and a sustainability. Arguments for synergies are presented, for example, in a report about what Swedish HEIs can learn from the successful universities of Stanford and Berkeley.⁵⁷ The quantitative data on staff included in FOKUS covers research *and* teaching staff.

criteria, without a combined assessment. Swedish HEIs' own quality evaluations of research often include some aspect of vitality, see the Swedish Research Council's report *Kartläggning av olika nationella system för utvärdering av forskningens kvalitet* (2013).

⁵³ Swedish Research Council (2013). *Forskarmobilitet idag och imorgon. Rapport från Vetenskapsrådets och SUHF:s workshop 6 februari 2013*.

⁵⁴ Swedish Research Council (2013). *Kartläggning av olika nationella system för utvärdering av forskningskvalitet – förstudie inför regeringsuppdraget U2013/1700/F; Tillväxtanalys* (2014). *Indikatorer och strategier för internationalisering av forskning och innovation – en översikt med exempel från flera länder* Svar Direkt 2014:09.

⁵⁵ Collaboration is also discussed under the *impact beyond academia* component, but mainly with reference to collaboration which has led to an impact, i.e. collaboration that has already occurred and has led to documented effects.

⁵⁶ Government of Sweden, Ministry of Enterprise and Innovation, *Ändring av regleringsbrev för budgetåret 2013 avseende Verket för innovationssystem inom utgiftsområde 24 Näringsliv*.

⁵⁷ Bienenstock, A., Schwag Serger, S., Benner, M. & Lidgard, A. 2014. *Utbildning, forskning, samverkan. Vad kan svenska universitet lära av Stanford och Berkeley?* SNS Utbildningskommission.

In line with the government commission that the Swedish Research Council and several other authorities have which deals with gender equality integration, the Swedish Research Council would like to emphasise *gender equality* as a quality enhancing factor, both as a means to achieving higher quality and as a quality in itself, i.e. an objective.⁵⁸ As Dan Brändström argues in the proposal *Resurser för kvalitet (Resources for quality)*, the Swedish Research Council's view is that "diversity is a quality. For that reason, the most powerful incentive academia, like most other activities, possesses – the resource allocation system – should include an indicator which clearly promotes the quality factor of gender equality".⁵⁹ A recently-published study shows that several HEIs regard themselves as having limited opportunities to consider gender equality in the distribution of research grants, and the management signals coming from the current indicator-based model do not facilitate this either. FOKUS could thus contribute to an improvement in this context by including gender equality as a quality enhancing factor.⁶⁰

In summary, quality enhancing factors can be seen as a means for achieving high levels of quality, but to some extent also as goals in themselves. With FOKUS, the Swedish Research Council wishes to encourage and highlight quality enhancing factors, as well as providing incentives for further work on these factors at the HEIs. Another aim of including these factors is to avoid a model that leads to undesired consequences, e.g. disadvantaging early career researchers and mobility. By singling out these factors for special assessment, the scientific/artistic quality component becomes more focused and transparent. The inclusion of quality enhancing factors in the model also highlights the fact that HEIs have several important tasks in addition to research, i.e. education and collaboration with society at large. Thus the importance of integrating research with the HEIs' other activities is also emphasised in these quality enhancing factors. The list of quality enhancing factors could be extended, but as the model needs to be simple and resource-efficient, we have chosen to limit it to these five specific factors.

5.4.2 Assessment criteria

The Swedish Research Council recommends that the quality enhancing factor component be assessed on the basis of the criteria *potential for renewal* and *sustainability* and be graded using a five-point scale with five as the highest grade. Potential for renewal and sustainability mean that a vigorous and dynamic research environment, with an influx of new impulses, as well as a certain degree of balance and stability, helps create favourable conditions for producing high-quality research. Panels are to award *one* overall grade for this component; we suggest that more detailed criteria and instructions for how this is to be done in practice be developed in pilot exercises before FOKUS is implemented. One fundamental point to bear in mind is that, in order to achieve a high grade, the HEI should demonstrate high quality and achievement evenly across all five quality enhancing factors. A weak showing with regard to one factor cannot be compensated for by an excellent achievement with regard to another.

5.4.3 Basis for assessment

Quantitative data, supplemented by a description formulated by the HEI, will be used as the basis for assessment of quality enhancing factors. The panel will also have access to background information on revenue, staff, volume of publication, research profile etc. (see Section 5.2). A comprehensive assessment will then be agreed by the panels' experts through discussion. Regular evaluations will allow for an assessment of

⁵⁸ Government of Sweden, Ministry of Enterprise and Innovation *Regleringsbrev för budgetåret 2014 avseende Vetenskapsrådet*. See also *Vetenskapsrådets jämställhetsstrategi* (2013).

⁵⁹ SOU 2007:81 *Resurser för kvalitet. Slutbetänkande av Resursutredningen*.

⁶⁰ Swedish Agency for Public Management (2014). *Forskningsanslagen ur ett jämställhetsperspektiv*. 2014:27, p 89.
<http://www.statskontoret.se/upload/Publikationer/2014/201427.pdf>

progression, i.e. whether the HEIs' work on these factors has contributed to an improvement of research quality.

5.4.3.1 Quantitative data

Statistical and publication data will be presented to the panels in the form of tables and graphs. Data will primarily be obtained directly from the relevant authorities, such as Statistics Sweden and the Swedish Higher Education Authority. The assessment material can be of the same kind, irrespective of field of research, except for data on publication collaboration, where data in some fields of research can be obtained directly from publication databases and in other cases must be provided by the HEI, or eventually from SwePub. Data from the fields of research should only be evaluated in relation to what can be expected within each field. All data should furthermore be presented and made available to the HEI. Clear specifications must be developed in order to include comparable data, e.g. what point or period in time is referred to, which members of staff are authorised to be included in the presentation, and what minimum extent of e.g. time spent or employment at another HEI or in business is required for inclusion. Data collection must also be tried out in pilot exercises, see Chapter 12 on implementation issues. Below are suggestions for quantitative data to present, alongside a descriptive text and background information, for the panels' assessment of quality enhancing factors. Reporting units should be allowed, as necessary, to supplement purely quantitative data with other factual information.

Table 2. *The Swedish Research Council proposes that the following quantitative data be presented for the quality enhancing factor component. Data should be presented on a per-year basis for the relevant evaluation period, at the field of research level, and should be obtained directly from Statistics Sweden and the Swedish Higher Education Authority whenever possible.*

Doctoral education and early career researchers
Share (per cent) of doctoral students ⁶¹ in relation to total research and teaching staff (based on the number of individuals).
Age distribution and distribution of career ages for different employment categories of research and teaching staff, and doctoral students.
Collaboration and mobility within academia, internationally and nationally⁶²
Share (per cent) of research and teaching staff in each employment category recruited internationally, as well as doctoral students.
Numbers of outbound and inbound research and teaching staff.
Share (per cent) of publications co-authored with researchers abroad. Where possible, presented also in the form of network maps (see examples in Annex 7).
Share (per cent) of research and teaching staff in each employment category, as well as doctoral students, who were recruited from another Swedish institution, outside the HEI.
Share of publications co-authored with researchers at another Swedish institution, outside the HEI. Where possible, presented also in the form of network maps (see examples in Annex 7).

⁶¹ Not all HEIs have the power to award research qualifications. We suggest that doctoral students admitted to one HEI but active at an associated HEI be attributed to the associated HEI. We estimate that just under two per cent of all doctoral students are active at associated HEIs. (The Swedish Higher Education Authority, *Årsrapport 2014*, p 55. <http://www.uka.se/download/18.32335cb414589905b28acd/1411636334777/arsrapport-2014.pdf>)

⁶² Where possible, information about collaboration within academia can be illustrated using bibliometric information, see also Annex 7.

Collaboration, partnerships and mobility beyond academia⁶³
Person mobility (employment) between the HEI and society at large (in both directions).
Extent of research carried out together with non-academic active party.
Share (per cent) of publications co-authored with external party (beyond academia). ⁶⁴

Integration of research and education
Distribution of working hours on research and teaching respectively, within each employment category including doctoral students, on first and second-cycle programmes.
Number of full-year students on first and second-cycle programmes.

Gender equality
Share (per cent) of women and men among research and teaching staff (based on the number of individuals and divided by employment category).
Share (per cent) of women and men among doctoral students.
Share (per cent) of doctoral theses presented by women and men, respectively.

5.4.3.2 Units' own descriptions

To complement the quantitative data and any other factual information, we propose that each reporting unit (a maximum of five fields of research per HEI) submits a brief description, no more than five pages long, of what has been achieved so far and what strategies the HEI has for dealing with quality enhancing factors. This documentation of processes in support of quality development constitutes an important additional basis for the panel's assessment. However, the panel's instructions will be that its assessment should be based primarily on the material presented in the form of quantitative data and other factual information. In other words, if an HEI presents a good description of its strategies etc. this cannot compensate for any shortcomings reflected in data on quality enhancing factors.

5.4.4 The issue of an appropriate analysis level

One assumption is that the strategies that HEIs have for working on quality enhancing factors are fairly similar overall, and that they do not differ in any significant ways between research areas. This justifies making the assessment at the field of research level. The level of ambition for evaluating quality enhancing factors must also be related to the weight assigned to this component in the comprehensive assessment of the HEIs. The Swedish Research Council's view is that the suggested weight of 15 per cent means that analyses at the field of research level constitutes a reasonable level of ambition in order to keep costs and work input down, for HEIs as well as panels.

5.4.5 Expertise for assessing quality enhancing factors

The assessment of quality enhancing factors will be carried out by main panels, one for each field of research, which will also be responsible for making the assessment of the impact beyond academia component. The assessment of quality enhancing factors will be carried out separately from the assessment of scientific/artistic

⁶³ A prerequisite is that Vinnova decides to use these data in its model for evaluating collaboration; at present, these are some of several proposed indicators.

⁶⁴ Where possible, information about co-authorship with an external party (beyond academia) can be illustrated using bibliometric information, see also Annex 7.

quality. A comprehensive and more detailed presentation of our proposal regarding the structure, composition and tasks of the evaluation panels can be found in Chapter 6.

5.5 The impact of research beyond academia

The Swedish Research Council's commission specifies that the model to be developed should include, in addition to an assessment of the quality of research, an assessment of its relevance and benefits to society.

The Swedish Research Council's premise is that research *does* benefit society from a perspective of knowledge economy.⁶⁵ Assessing the relevance and societal benefit of research can then be done by means of an assessment of how it contributes to knowledge and skills development in society. We can assume that those who have been able to learn about research results and the working methods of research, not least via higher education, will spread their knowledge further in society, thus contributing to its development. The assessment panels are to make a balanced assessment of the impact of research with respect to its reach and significance. A grade is to be awarded on a five-point scale, at the field of research level, and with a proposed weight in the model of 15 per cent.

5.5.1 Defining "impact beyond academia"

Below we propose that the term *impact of research* be used to describe the effects of research beyond academia. Impact means, in a broad sense, effects of research beyond academia which in some contexts and over time could amount to concrete influence on society by the application of research results to achieve social, economic, environmental or cultural effects. Impact beyond academia thus refers to the dissemination, further refinement, commercialisation, patenting, licensing or other practical use of research results.

The Swedish Research Council would underline that the term impact (*genomslag* in Swedish) refers to the impact that occurs *beyond* academia's confines, and not to intra-scientific effects such as research contributing to new scientific methods, new theories, increased intra-scientific knowledge, or to the circumstance that reporting units have a high citation score. The latter examples are aspects of intra-scientific impact, rather, and as such are encompassed by the scientific/artistic quality component. It goes without saying that knowledge transfer and the dissemination of research results also occur within academia, via teaching and various links to research in higher education, in first and second-cycle as well as in doctoral education. However, these should primarily be regarded as effects of research within the university and university college system, which in turn naturally promote both research quality and impact in society beyond academia. We have therefore chosen to include integration of research and education and doctoral education as quality enhancing factors rather than examples of impact (see also Section 5.4).

The *relevance* of research is sometimes used as a concept when assessing or evaluating research. Relevance is not necessarily the same thing as an actual impact, but the relevance of research for activities beyond academia, e.g. in industry or public authorities, remains an underlying assumption of the ability of research to have an impact beyond the academic sphere.

A critical issue when assessing the impact of research beyond academia is the time factor. There are examples of research which has taken 50 or 100 years to produce an actual impact. Still, this circumstance should not be allowed to stand in the way of attempts to clarify the societal effects of research. Even basic research of a more long-term nature can produce societal effects in the short term. Such attempts to demonstrate impact will eventually contribute to upholding and strengthening the legitimacy of research – irrespective of research area and degree of application – and to the continued development of individual researchers' and HEIs' systematic efforts regarding collaboration with society at large and promotion of the use of research

⁶⁵ See e.g. Wolfe, D. A. & Salter, A. (1997). *The Socio-Economic Importance of Scientific Research to Canada*. Discussion Paper Prepared for The Partnership Group for Science and Engineering, Canada.

results. The Swedish Research Council therefore proposes a pragmatic definition, specifying that the research on which the assessment of impact beyond academia is based can be up to 20 years old. The impact is attributed to the HEI, i.e. the results produced at a given HEI will be attributed to it even if the researcher moves. However, the examples of impact quoted by the HEIs which are to be assessed must have occurred over the current evaluation period, i.e. during the past six years.⁶⁶

5.5.2 Assessment criteria

The impact of research beyond academia is assessed using the criteria *reach* and *significance*.⁶⁷ *Reach* refers to the range of businesses, public authorities, other organisations and/or individuals who have learned of or been affected by the impact of the research. It is important here that reach is related to the use or application of research beyond academia and to the target group. There should be no hierarchical difference in the assessment between local, regional, national or international dissemination – instead the assessment should set out from the specific research and its target group.

Significance refers to the extent to which the impact of research has enriched, influenced, marked or been put to use in products, services, changed policies, working methods, conditions discovered, problems and solutions in businesses, public authorities, other organisations and/or individuals. A significant impact can thus be achieved with a wide reach as well as within a limited research area which affects only a small number of organisations, public authorities or individuals, or within a limited geographical area.

5.5.3 Basis for assessment

Two types of material are proposed as the basis for assessment: *case studies* and *a brief and structured description of the reporting unit's strategies* for communicating results beyond academia and for promoting the use of research results beyond academia, and to exert an impact.

5.5.3.1 Case studies

Case studies have, in several contexts, been deemed the most productive way of approaching the issue of the impact of research beyond academia.⁶⁸ The case study methodology has been applied in several connections: in pilot exercises preceding Britain's REF 2014 as well as in the final implementation, and in pilot exercises carried out in Australia by the *Group of Eight* (Go8) and *Australian Technology Network* (ATN) university organisations, which together involve 15 Australian HEIs.⁶⁹ The RAE12 evaluation at Sweden's KTH (Royal Institute of Technology) also used case studies to assess "*impact and involvement in society*".⁷⁰

The Swedish Research Council's assessment is that a purely indicator-based (metric) system is difficult to apply in a national evaluation system, in which the possibilities and access to material for measuring the impact of research vary greatly between different research disciplines. It is unlikely that there are any indicators that

⁶⁶ This limitation is the same as that stipulated in the Swedish Research Council's proposal *En utvecklad modell för kvalitetsutvärdering av klinisk forskning finansierad av ALF-medel*. [A developed model for quality evaluations of clinical research financed with ALF funds. Report of a government commission Report 2:2013.] Britain's REF2014 also uses a 20-year horizon. In the pilot exercise that preceded REF2014, the time horizon was 15 years, but this was then extended to 20 years in the final implementation.

⁶⁷ REF2014 also uses these criteria.

⁶⁸ See e.g. Bornmann, L. (2012). Measuring the societal impact of research. *EMBO Reports* Vol 13, No.8, 2012, s 673–676; Group of eight (2012). *Excellence in Innovation. Research Impacting our Nation's Future*. Group of Eight, Australia; HEFCE (2010). *Research Excellence Framework impact pilot exercise: Findings of the expert panel*; Swedish Research Council (2012). *Att utvärdera effekter av ett grundforskningsprogram – en pilotstudie*. Vetenskapsrådets lilla Rapportserie 2012:7; Technopolis (2010). *REF Research Impact Pilot Exercise Lessons-Learned Project: Feedback on the Pilot Submissions*.

⁶⁹ Swedish Research Council (2014). *ERA – Excellence in Research for Australia. Rapport inom ramen för Vetenskapsrådets uppdrag Forskningskvalitetsutvärdering i Sverige – FOKUS*.

⁷⁰ RAE12 KTH Research Assessment Exercise 2012.

can be used across all research disciplines and institutions.⁷¹ We have further considered the circumstance that many of the types of impact that may be referred to are not only difficult to quantify, but also difficult to identify.⁷² An evaluation system based on quantitative data has been deemed to run the risk of reducing the impact of research to the information that is readily available, precisely in the form of such data. As indicated below, however, the case study methodology does not preclude the reporting of impact using indicator-based information, such as production volumes, patent information or intellectual property rights.

Case studies refer to describing selected research results with respect to their impact beyond academia. Case studies allow the reporting unit – in this case at the field of research level – itself to select and describe different types of impact beyond academia. Within the framework of a case study, various types of data can be used to present impact. These may be straightforward indicators that identify and quantify effects generated by research activities,⁷³ and/or more qualitative descriptions of e.g. processes, activities, methods or products which have influenced societal functions, industry or other actors in society. This makes it possible to capture effects that have not been pre-defined by the evaluator, and for the reporting unit to describe how result dissemination and collaboration with society at large, as well as the actual impact, have occurred. Case studies also offer the opportunity to capture the complexity of the relationship between research results and the wider effects of research over the short and the long term.

The case studies will be presented by the reporting units according to a specific template, in order to make reporting uniform and to limit the length of case studies (about four pages). In a first step, the quality of the research that each individual case study is based on will be assured by scientific expertise, or the equivalent for the artistic field. This can be done in the first instance by members of the research area panels, and in the second by external peer reviewers. The case study will then be passed on to the main panel for assessment of the impact beyond academia component. A threshold value should be established for scientific/artistic quality as a condition for the further assessment of the case study, see also Section 6.3.⁷⁴

Case studies contain a description of a specific and delimited research effort (a research project, publication or other form), the result of the effort, its impact beyond academia, and material (references or other information) to corroborate the impact. Within the framework of the presentation of the impact, scope is provided for presenting how the research results were communicated to society at large, and what collaboration with society at large occurred in this connection. The communication of research and the collaboration efforts should, in other words, refer primarily to the case studies presented and be connected to the actual impact.

As shown above, case studies are a relatively tried and tested method for presenting impact, irrespective of research area and subject. However, they have been less well tested as a method in larger national contexts, and when results are to form the basis for resource distribution. For this reason it may be appropriate to test the methodology systematically in a pilot exercise – this is discussed in greater detail in Chapter 12, on implementation. In 2014 the case study methodology was applied on a larger scale in Britain's REF, which resulted in close to 7 000 submitted and assessed case studies. Preliminary reports of this experience, presented by HEFCE and to the Swedish Research Council's *International Advisory Board* for the FOKUS commission, are positive. HEFCE plans to present a more systematic evaluation of the impact component of REF2014 in 2015. This evaluation will be in two steps: first of the process at British HEIs and in the groups of researchers who produced the case studies, and then of how the assessments worked. HEFCE further plans to make the case studies available to the public in the form of a web-based, searchable database. This database will, according to

⁷¹ See e.g. Academy of Finland (2007). *Civilisation cannot be imported*. Academy of Finland, Helsinki; Bornmann, L. (2012). Measuring the societal impact of research. *EMBO Reports* Vol 13, No.8, 2012, 673–676.

⁷² See e.g. Group of Eight (2011). *Measuring the impact of research – the context for metric development*. Group of Eight, Australia; RAND (2006). *Measuring the benefits from research*. Policy Resource. RAND Europe, Cambridge.

⁷³ See e.g. Group of Eight (2011). *Measuring the impact of research – the context for metric development*. Group of Eight, Australia.

⁷⁴ In Britain's REF, the corresponding threshold is 2* on the five-point grading scale for scientific quality which goes from 0 ("unclassified") to 4* ("world-leading"). In REF, the grade 2* indicates "internationally recognised" research. See also the Swedish Research Council's *Kartläggning av olika nationella system för utvärdering av forskningens kvalitet* (2013).

HEFCE, constitute a unique and valuable source of information about the impact of British research, and they encourage continued analysis of, and research into, the material nationally as well as internationally.⁷⁵ In this connection we can also mention that the Formas research council is currently running a project as part of its documentation in preparation for the 2016 Research Policy Bill, and that this includes trials of assessing research impact in Formas' research areas by means of case studies.⁷⁶ A total of 89 case studies from 11 HEIs, produced according to instructions that correspond to those for impact in Britain's REF, will be collected and assessed by panels during the spring of 2015.

The Swedish Research Council would also like to point out that the work on case studies should in itself be of potentially considerable value in developing the systematic efforts of HEIs, institutions, groups of researchers and individual researchers regarding collaboration with society at large and the promotion of the use of research results beyond academia.

Table 3. *Examples of different activities that may illustrate various aspects of the impact of research beyond academia*

Dialogue and results dissemination	Collaboration⁷⁷	New products and processes	Use	Documented effects (Benefits)
<i>Examples:</i> - Seminars, conferences, exhibitions - External education - Participation in debates, consultations	<i>Examples:</i> - Collaboration with businesses and other actors - Consortia with non-academic organisations - Funding from the business sector and others, incl. in-kind - Joint publications with the business sector and other actors	<i>Examples:</i> - Patents ⁷⁸ - Intellectual property rights - New policies and guidelines (in e.g. social services, health care, conservation etc.) - New services - New infrastructures	<i>Examples:</i> - Products, services or processes used by organisations or businesses - Policies or guidelines lead to changed procedures and working methods in businesses and organisations (e.g. social services, health care, conservation etc.)	<i>Examples:</i> - Economic benefits from commercialisation - Improved public health or reduced ill health - Social and cultural benefits - Increased knowledge/education

Table 3 above gives examples of activities that could illustrate impact. This classification is intended to serve as support both for HEIs in their reporting and for the expert panel in its assessment of the impact of research. In this way, the transparency of the evaluation process and the quality of the assessment can be facilitated. It is important to point out that a classification such as the one above must naturally be adapted more closely to the type of research and to the field of research in question. Case studies must always focus on the documented impact rather than on the processes (communication measures, collaboration etc.) that have contributed to the impact. The table above aims to illustrate that the *emphasis* of the presentation can vary, depending on the type of research, special conditions of the HEI and the field of research, how far the process has progressed, etc.

It should further be noted that the various activities outlined in the table are not necessarily part of a linear process. For example, new products and processes can naturally emerge as a result of research while that research is still ongoing i.e. before its results have been actively disseminated.

⁷⁵ See also HEFCE (2014). *Analysis of the REF impact case studies*. <http://www.hefce.ac.uk/whatwedo/rsrch/researchassessment/analysis/>

⁷⁶ Government of Sweden, Ministry of the Environment and Energy. *Uppdrag att göra en analys av finansieringen av forskningen inom Formas ansvarsområden*.

⁷⁷ Collaboration here refers primarily to collaboration activities that have already taken place and have led to an impact, in contrast to the type of collaboration referred to under the quality enhancing factor component, see Section 5.4.

⁷⁸ Information on patents can e.g. be obtained by the HEIs from the Swedish Patent and Registration Office (PRV) database, from which data about collaboration beyond academia can also be obtained.

5.5.3.2 Units' descriptions

The case studies also include a brief description by the reporting unit – in this case at the field of research level – with information about strategies and resources for communicating results beyond academia and for promoting the use of research results beyond academia (known as an impact statement).⁷⁹ This may also include other concrete information about existing support functions for researchers in respect of results dissemination beyond academia, about forums and contact points for researchers and societal and business interests etc. This documentation of the processes that support the enabling of research impacts beyond academia is an important additional basis for the panel's assessment. However, the panel will be instructed to base its assessment primarily on the documented impact reported in the case studies; a good description can thus not compensate for any shortfall in documented impact.

5.5.4 The issue of an appropriate level of analysis

Experience of the work on impact in REF2014 at HEFCE and at British HEIs show the importance of considering the work effort and costs of assessing the impact of research – which in turn must of course be seen in relation to the potential value of a good case study for the reporting unit.⁸⁰ The level of ambition should be that the impact beyond academia component of FOKUS does not impose too extensive a cost and work burden on HEIs when producing material for the evaluation.

The Swedish Research Council's assessment is that the level of ambition should also consider the circumstance that for several research areas it remains a relative novelty to look at and describe your own research in terms of its impact beyond academia. Furthermore, the data collection method itself (case studies) will be a novel and potentially work-intensive process for many.

It is also reasonable to assume that it will be easier for some research areas to document impact beyond academia than for others, which is something the British experience indicates. The level of ambition for evaluating the impact of research beyond academia must also be regarded in relation to the weight assigned to the impact of research in the comprehensive assessment of the HEIs. A greater weight than proposed here (i.e. >15%) would reasonably lead to the need for a larger selection of case studies from HEIs, since assigning a greater weight to the impact of research beyond academia would reasonably require case studies to be more broadly representative of the research carried out.

All these considerations, taken together, lead the Swedish Research Council to recommend that the assessment of impact beyond academia be carried out at the *field of research level* rather than at the research area level, at least initially. The proposed pilot exercises (see also Chapter 12) will provide feedback as to whether it might be possible, appropriate and resource-efficient to carry out the impact assessment at some other level.

With case studies being submitted from the five fields of research, HEIs will have the ability to highlight selected cases which provide examples of high-quality research that have also exerted impact beyond academia. It is important to note that this classification organises data collection, but naturally does not limit the fields of research or research areas within which a case study may describe an impact.

We have also considered, in this connection, an alternative thematic classification into 5-6 themes that e.g. set out from societal problems and challenges which have been deemed particularly urgent or a priority (e.g. life sciences, energy and climate, environment or social development). Such a thematic classification is not unproblematic, however, as a given research project may relate to several different themes, leading to difficulties in placing the research in the right context. Additionally, the advantages of beginning from existing disciplinary research statistics are lost, and there is a risk that the classification will become less stable over time, since priorities in terms of which societal problems are regarded as particularly urgent will most likely

⁷⁹ Cf REF2014: Research Excellence Framework (2012), *Panel criteria and working methods*, Annex B, Impact template (REF 3a).

⁸⁰ See Technopolis (2010). *REF Research Impact Pilot Exercise: Lessons-Learned Project. Feedback on the Pilot Submissions*. Technopolis Group, U.K.

change. For these reasons, we have chosen not to recommend a thematic structure for the assessment of impact beyond academia.

In order to make the number of case studies manageable, we propose:

- that submissions be made from the five fields of research (natural and agricultural sciences, engineering sciences, medicine, social sciences, and humanities and artistic research)
- that the guideline recommend two case studies per 50 FTE employees (FTEs), and two case studies in total if there are fewer than 50 but more than 10 FTEs
- that the impact beyond academia component be assigned a weight of 15 per cent in the model

Table 4 illustrates, for a few different HEIs as well as for the country as a whole, how the number of case studies is affected by this proposal. We estimate that our proposal implies that about 930 case studies will be produced and assessed.⁸¹

Table 4. *Estimates of the total number of case studies for Uppsala University, Karlstad University and Halmstad University College, and estimates of the total number of case studies per area and nationally*

Proposed number of case studies per field of research	Examples of the number of case studies per HEI	National total per field of research
2 per at least 10 and at most 50 FTEs	Uppsala 107 Karlstad 14 Halmstad 10	NA: 179 E: 199 M: 203 SS: 232 HA: 120 <i>Total: approx. 933</i>

*Data on FTEs were obtained from the Swedish Higher Education Authority and refer to 2012.

During the course of the study, the principled point has been raised that a fixed quota of the kind proposed here (two case studies per at least 10 and at most 50 FTEs) may mean that small units (research areas) submit too few case studies, while large units (fields of research or entire HEIs whose research falls within one field of research only) submit an unreasonably large number. An alternative approach, in order to adapt the number of case studies, might be a tapered selection in which the number of case studies submitted is greater if units are small but decreases in proportion to units' increasing size.⁸² In order not to make the model unnecessarily complex, however, we have chosen to propose, for now, a fixed quota that applies equally to all HEIs.⁸³ The Swedish Research Council would like to point out, however, that this quota may of course be changed if pilot exercises or other considerations indicate a need for it – and without changing the proposed model as such.

⁸¹ If we were instead to choose research areas as the reporting unit for case studies, all else being equal, the total number of case studies for the country would be about 4000.

⁸² This procedure, known as a *tapered approach* is described in greater detail in Technopolis (2010). *REF Research Impact Pilot Exercise, Lessons-Learned Project: Feedback on the Pilot Submissions*, p 13.

⁸³ If, for example, we were to introduce a threshold value to the effect that an HEI had to submit at least five case studies per field of research (where the HEI is qualified to participate), that would mean an increase by 247 case studies to be reviewed. It would also imply an uneven burden of proof – from ten FTEs at a smaller HEI, five case studies would be required, while only one more, or six case studies, would be required from 150 FTEs at a large HEI.

5.5.5 Expertise for the assessment of the impact of research beyond academia

The assessment of impact beyond academia will be made within the framework of the main panels which will also be responsible for assessing the quality enhancing factor component. The assessment is thus separate from the assessment of scientific/artistic quality. Chapter 6 contains a comprehensive and more detailed presentation of our proposal for the structure, composition and tasks of the evaluation panels.

6 STRUCTURE, COMPOSITION AND TASKS OF EVALUATION PANELS

6.1 Proposed panel structure: 24 research area panels and five main panels

Our proposal is that the assessment of scientific/artistic quality be carried out at the research area level, while the components quality enhancing factors and the impact of research beyond academia be assessed at the field of research level. We therefore propose two sets of panels:

- 1) 24 research area panels at the research area level, assessing scientific/artistic quality.
- 2) Five main panels in the fields of research: natural and agricultural sciences, engineering sciences, medicine, social sciences, and humanities and artistic research, assessing quality enhancing factors and impact beyond academia.

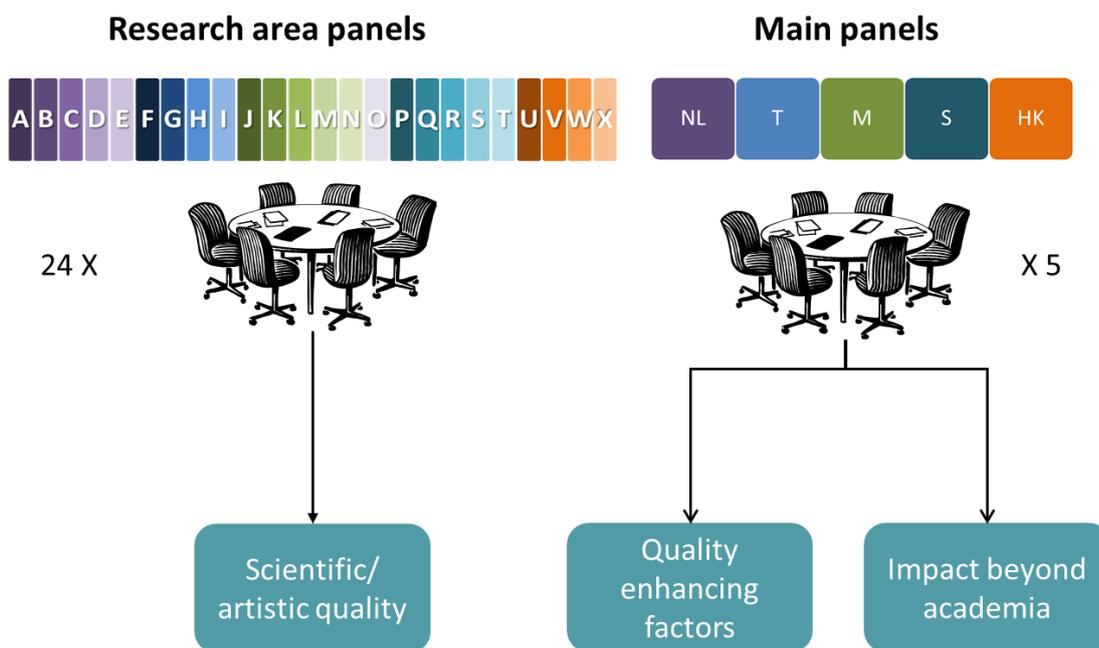


Figure 5. *Summary of the panels' tasks and structure*

Feedback to each HEI will consist of, for scientific/artistic quality, up to a total of 24 grade profiles and explanatory statements for the grade profiles, and up to five grades and explanatory statements each for quality enhancing factors and the impact of research beyond academia (i.e. a total of ten grades and explanatory statements). The proposal assumes, however, that the funds for research and doctoral education the HEI receives as a result of the evaluation and resource allocation will continue as not earmarked for any specific area. Suggestions for how the evaluation results could be translated into the allocation of a share of the block grant are described in greater detail in Chapter 9.

6.2 Research area panels

Each research area panel will present an overall grade profile, and an explanatory statement for the grade profile, for each HEI in its research area. The research area panels will be made up of experts, mainly international experts, with subject-specific scientific/artistic expertise. Some representation of expertise specific to the Nordic context is deemed necessary on the research area panels to ensure that the assessment of scientific/artistic quality is carried out with sufficient consideration of the national context. This is suggested by experiences from the British and Australian evaluation systems, REF and ERA. For example, one requirement could be that the chairs of the research area panels must have worked in a Nordic context. The necessity of appointing experts with experience of a Nordic context may naturally vary from one research area to another. It seems appropriate that the specifics of panel composition and size be tested in some form of pilot exercise.

The Swedish Research Council's view, on principle, is that scientific/artistic quality should be assessed independently of the language in which a research work was written or executed. In cases where English is not used, it is usually a matter of research outputs in Swedish. By proposing some representation of Nordic expertise on the research area panels, the feasibility of review and assessment of research outputs in Swedish is guaranteed. Where the language is neither English nor Swedish, external experts will be recruited who possess both the scientific expertise and knowledge of the language in question.

The research area panels will be given access to information about the interdisciplinary research being carried out at each unit to be assessed, and will receive clear instructions to take this into account in their evaluation.⁸⁴ It must also be possible, when necessary, for several different research area panels to deal with research of an interdisciplinary nature.⁸⁵ Further, it must be possible for the initiative or proposal for such "referrals" between research area panels to be made, when necessary, at several different levels: by the reporting units concerned, by the research area panels, by external reviewers and at the special chair conferences proposed below.

The calibration of grades between research areas could be carried out at special chair conferences attended by the chairs of the panels in each research area. This is a working method which has been applied in the Swedish Research Council's regular project funding processes. The chairs of each main panel (see further below) can chair these conferences as well. More precise instructions for how grading calibration is to be carried out must be established by means of pilot exercises.

A further issue that should be dealt with at the proposed chair conferences is, as mentioned earlier, the mapping and highlighting of the extent to which interdisciplinary research has featured and how it has been dealt with in the research area panels' assessment work. For example, the chair conferences could be empowered to refer assessments of interdisciplinary research back to the relevant panels (or to research area panels in some other fields of research) for reconsideration, when necessary.

6.3 The main panels

Each main panel makes an assessment of quality enhancing factors and awards one grade with an explanatory statement per HEI in its designated field of research. The same main panel also makes the assessment of the impact of research beyond academia, and awards one grade with an explanatory statement per HEI in its field of research. Main panels should mainly consist of experts with experience of a Swedish/Nordic context, since it is our view that an understanding of the national context is essential to the assessment of both quality enhancing factors and the impact of research beyond academia. About half of the members should represent the expertise necessary for assessing quality enhancing factors, and the other half the expertise for assessing impact beyond academia.

⁸⁴ Cf how interdisciplinary research is dealt with in Australia's ERA.

⁸⁵ Cf how interdisciplinary research is dealt with in Britain's REF.

As indicated in Section 5.5, the assessment of impact beyond academia must be made separately from the assessment of scientific/artistic quality. Consequently the impact beyond academia component must be assessed by special experts representing societal and/or business interests within the field of research in question (“impact expertise”). The quality of the underlying research that each individual case study is based on must, as described in Section 5.5.3.1, first be assured by scientific expertise or the equivalent for artistic work. This should be done primarily by members of the research area panels, and secondly by external peer reviewers. The case study is then passed on to the main panel for assessment of impact beyond academia. A threshold value should be established for scientific/artistic quality to determine whether the case study will be passed on for assessment.⁸⁶

Peer reviewers with experience of, and expertise in, management of academic activities are to be recruited to the main panels for the assessment of quality enhancing factors.

Since the assessment of impact beyond academia is to be made by special impact experts, we have considered whether these experts should constitute a separate, special panel. However, international as well as the Swedish Research Council’s own experience suggests that it is more productive to have different types of expertise in the same (main) panel. This facilitates dialogue between, on the one hand, peer reviewers with experience and expertise in management of academic activities and, on the other, experts representing societal and business interests. As mentioned, main panels will also be made up primarily of experts with experience of a Swedish/Nordic context, and this applies to both categories of expertise.

The recruitment of members of both research area panels and main panels should be based on nomination procedures from universities and university colleges. Regarding impact expertise, the nomination procedure should also include nominations from organisations representing relevant societal and/or business interests in each field of research.

6.4 Estimate of number of reviewers necessary and of assessment material

Between 350 and 400 is a rough estimate of the number of members necessary for the research area panels; for the main panels a rough estimate is between 50 and 75. This means that roughly 450 experts must be recruited for work as panel members. Additionally, about 320 external reviewers will be necessary to review research outputs in the areas that do not use citation analysis as a basis for assessment. A further estimated 175 external reviewers will also be necessary for external quality review of the underlying research in a number of case studies.⁸⁷ This makes a total of just over 900 experts that must be hired every six years (of which about 175 for quite a modest amount of work). This is roughly of the same order as that of the Swedish Research Council’s project grant review process, in which a total of around 800 experts is hired *annually*.⁸⁸

⁸⁶ In Britain’s REF, the corresponding threshold is 2* on the five-point grading scale for scientific quality which goes from 0 (“unclassified”) to 4* (“world-leading”). In REF, the grade 2* indicates “internationally recognised” research. See also the Swedish Research Council’s *Kartläggning av olika nationella system för utvärdering av forskningens kvalitet* (2013).

⁸⁷ The estimated number of such case studies is 175, but this estimate is probably on the high side. It is based on the assumption that every case study will require specific scientific specialist knowledge, which is unlikely to be the case in reality.

⁸⁸ The Swedish Research Council’s 2013 Annual Report, Table X, lists a total of 767 working group members linked to Swedish Research Council committees for the assessment of research applications in 2013. This number does not include experts linked to the Committee for Clinical Treatment Research, which was instituted later; neither does it include external reviewers for the assessment of applications for journal support and conference grants.

6.4.1 Research area panels and external reviewers for the assessment of scientific/artistic quality

24 research area panels with 10–20 scientific/artistic experts on each one makes an estimated total of 350–400 research area panel members. The number of members on individual research area panels may, of course, vary due to the size of the research area and the number of research outputs being assessed.

Each research area panel will receive the following information as a basis for its assessment of scientific/artistic quality in the research area:

- background information about the reporting unit's research profile, the scope and focus of research, available resources (financial resources, staff, doctoral students, infrastructure), volume of publication and publication profile
- the unit's description of the focus in the research area (a maximum of 28 for one panel, see Annex 4)
- each panel member reviews up to 50 outputs of the unit's nominated top research
- citation analysis for areas with good coverage in citation databases (to capture overall quality as well as the top research)
- external peer review of a part of the unit's research production (to capture overall quality for areas without citation analysis)⁸⁹

An estimated additional 320 reviewers will be needed to review research outputs from areas that do not use citation analysis as a basis.

6.4.2 Main panels and external reviewers for the assessment of quality enhancing factors and the impact of research beyond academia

Five main panels, each with an average of 10–15 members qualified to assess quality enhancing factors and the impact of research beyond academia, makes a total of 50–75 panel members. For each main panel, we propose that about half of the members have experience of, and expertise in, management of academic activities, and that these primarily assess quality enhancing factors; and that the other half be made up of experts representing societal and/or industry interests, whose main task will be to assess impact beyond academia. It would be beneficial if both types of expert had academic qualifications in the relevant field of research.

In addition to this, about 175 external reviewers are needed, whose task will be to quality assure, as necessary, the research that underlies the case studies which are to be assessed as part of the evaluation of impact beyond academia. It may be assumed, however, that these quality assurance tasks will constitute a fairly small workload per external reviewer involved.⁹⁰

The main panels will receive the following material:

- quantitative data for the factors included in the quality enhancing factor component

⁸⁹ There are an estimated 200 reporting units in the Social Sciences and Humanities and Artistic research fields. These will be divided between around nine panels. The largest of these will have 28 units (HEIs) to review (Panel R: educational sciences) and the smallest will have 12 (Panel W: philosophy, ethics and religious studies). Each unit should normally have at least three external reviewers who read the unit's research production. Each external reviewer should normally review the production of at least three units per HEI.

⁹⁰ In estimating the resource needs for this quality assurance, we have assumed that it will be possible for quality assurance of case studies in Social Sciences and Humanities and Artistic research areas to be carried out largely by the external reviewers already hired for the assessment of research outputs, and that approximately two thirds of the case studies in Natural Sciences and Agricultural Sciences, Engineering Sciences and Medicine areas can be quality assured by the scientific/artistic experts on the research area panels concerned. This means that external reviewers will need to be hired for quality assurance of the remaining third of case studies, principally in N, E and M areas.

- the unit's brief explanations of and comments on the quantitative data in relation to overall strategies
- case studies (a maximum of just over 200, for the Social Sciences main panel, and a minimum of just over 100, for the Humanities and Artistic research main panel⁹¹; the underlying research in the case studies will have been quality assured when each main panel receives them)
- the unit's description/account of strategies and resources for working with results dissemination, collaboration with society at large, and promoting the use of research results beyond academia

⁹¹ See also Section 5.5.3.1.

7 GRADING SCALES, GRADE PROFILES AND EXPLANATORY STATEMENTS

The Swedish Research Council recommends that a five-point grading scale be applied by the panels in grading the three components scientific/artistic quality, quality enhancing factors and the impact of research beyond academia. For the scientific/artistic quality component, grades will be awarded in the form of grade profiles, while an overall grade will be awarded for each of the other two components. Panels must provide explanatory statements for grade profiles as well as for overall grades. Individual grade profiles or overall grades will be awarded to each reporting unit included in the evaluation. In other words, no overall grade is awarded at the HEI level.

7.1 A single five-point grading scale

Five-point grading scales are used in Britain's REF as well as in the Australian and Dutch evaluation systems.⁹² The final design of the scale needs to be considered further and to be tested in connection with the pilot exercise suggested by the Swedish Research Council (see also Chapter 12).

The fundamental assessment principle in the proposed five-point grading scale is that the same grading scale be used for all three assessment components. Assessing different research areas and fields of research according to their own premises, but according to a common grading scale whose grade points are equivalent across the various assessments, should contribute to fairness and equivalence in the evaluation. British experience of applying a five-point grading scale in REF suggests that this is the case. Another advantage of a five-point grading scale is that international reviewers can be expected to be familiar with such assessment scales. Finally, a single grading scale will also contribute to the clarity and transparency of the principles that underlie resource allocation.

The Swedish Research Council has also considered a solution which lies closer to its own established practice and which would involve applying a more detailed seven-point grading scale for the central component – scientific/artistic quality – while a less detailed three-point grading scale would be used for the other two components. These assessment scales correspond, at least in part, to those used in the Swedish Research Council's project grant review process, and are therefore recognised among many Swedish researchers in expert assessments of research.⁹³ On balance, however, the Swedish Research Council's opinion is that the advantages of a five-point grading scale are much greater for a national evaluation system of the FOKUS type, in which so much will also be based on assessments made – and grades awarded – by international experts.

7.2 Grades: grade profiles and overall grades

The Swedish Research Council thus proposes that grades for all components be awarded by the panels according to a five-point scale from 1 to 5, with 5 as the highest grade. However, we propose that grading be

⁹² However, the application of these five-point grading scales differs between the British, Australian and Dutch evaluation systems, see the Swedish Research Council (2013) *Kartläggning av olika nationella system för utvärdering av forskningens kvalitet – förstudie inför regeringsuppdrag U2013/1700/F*; Swedish Research Council (2014). *ERA – Excellence in Research for Australia. Rapport inom ramen för Vetenskapsrådets uppdrag Forskningskvalitetsutvärdering i Sverige – FOKUS*; and Swedish Research Council (2013). *Kvalitetsutvärdering av forskning i Nederländerna – rapport från studiebesök i oktober 2013 för projektet FOKUS*.

⁹³ A model using seven and three-point assessment scales was, moreover, proposed in the Swedish Research Council's report *En utvecklad modell för kvalitetsutvärdering av klinisk forskning finansierad av ALF-medel* (2013) [A developed model for quality evaluations of clinical research financed with ALF funds. Report of a government commission Report 2:2013].

carried out in one way for the scientific/artistic quality component and in another for the components quality enhancing factors and impact beyond academia.

For assessment of scientific/artistic quality, we propose in the first instance that the panels award grades for each reporting unit's research production in the form of *grade profiles*. Instead of each panel awarding an average grade per reporting unit, we propose a grade profile for the unit, in which the panel specifies what proportion (percentage) of the unit's research production achieves each grade on the scale. The grade profile for each reporting unit is established on the basis of a balanced assessment of the total material at the research area panel's disposal (i.e. material exemplifying the unit's top research production, material indicating the unit's overall research quality, and the unit's own description of the focus of research in the research area). Additionally, productivity is considered with the help of background information about the extent of the unit's research production in relation to available staff and financial resources. Thus each grade profile will express a panel's balanced assessment of a unit's scientific/artistic quality.

Grade profiles have several advantages compared with awarding *one* grade per evaluated unit. Among the foremost of these is that we gain a model that not only provides greater precision in grading, but which is also less sensitive to individual grades. Another advantage is that profiles provide a fuller picture of the quality of the evaluated unit's research production. This is demonstrated in the figure below, which shows fictitious grade profiles – with 5 the highest grade and 1 the lowest – for two different units, both with an average grade of 3.

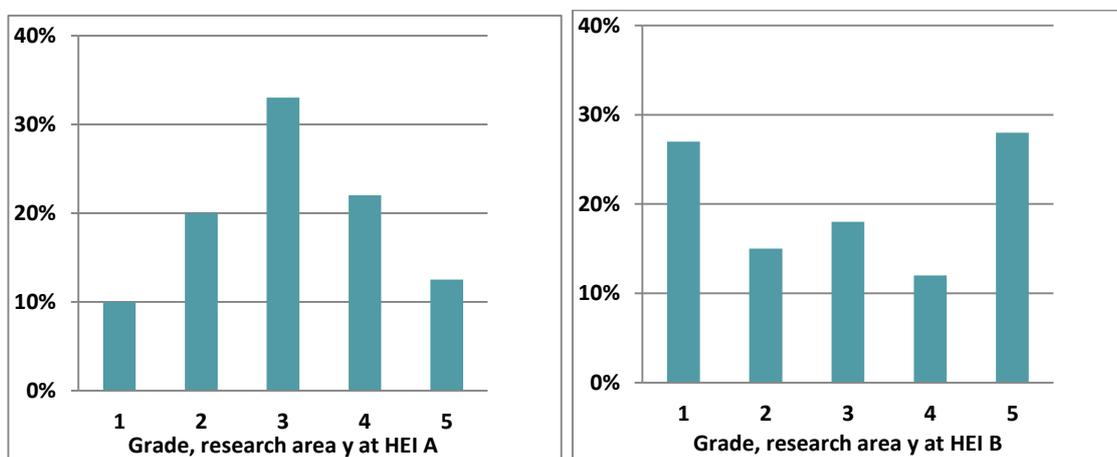


Figure 6. *Examples of balanced overall grade profiles for two different reporting units (e.g. research area y at HEI A and B). The profile gives the panel's consolidated assessment of each unit's research production, with the bars showing what share of each unit's total research production has been awarded a particular grade between 1 and 5 (both units have an average grade of 3).*⁹⁴

As can be seen, the distribution of grades differs between the two while the average is 3 for both. A grade profile visualises such differences, at the national level and when HEIs are compared within the same research area, and at the HEI level for the field of research in question. Once the panels have submitted their grade profiles, the grades can be translated into a number which is then used in the calculation algorithm (see also Chapter 9), thus providing greater precision in connection with resource allocation.

Grade profiles are used in Britain's REF for assessing scientific quality, and to some extent also in Australia's ERA. The possibility of using grade profiles in FOKUS must be tested in detail in a pilot exercise, however. We would like to point out that the calculation model for resource allocation proposed in Chapter 9

⁹⁴ The grade profiles show the panels' balanced assessment of a reporting unit's scientific/artistic quality when all the material has been considered and productivity taken into account. Thus the bars do not show the share of *individual* publications or the equivalent that have received the specified grade.

could also, in principle, be applied if average grades were to be used instead of grade profiles – albeit with the loss of the advantages of grade profiles described above.

For the components quality enhancing factors and impact beyond academia, we instead propose that the main panels award an overall average grade for each field of research. These overall grade averages can then be used in the proposed calculation algorithm for resource allocation, see Chapter 9.

7.3 Explanatory statements

For grade profiles as well as overall grades, assessment panels must also provide explanatory statements. These explanatory statements are intended to explain the reasons for the grades awarded, and must be clearly based on the assessment criteria for each component. The aim is for these written statements to serve as valuable feedback to HEIs and reporting units; however, they should not be written in the form of concrete advice or recommendations regarding suitable measures. Such measures as may be necessary in response to the results of the evaluation and to the explanatory statements are unequivocally the responsibility of the HEI.

8 COLLECTION OF ASSESSMENT MATERIAL

8.1 The Swedish Research Council's proposal

The preparation and collection of assessment material and statistics are among the more expensive elements of all research evaluations, in particular when these are to be carried out uniformly and on a national basis. In other countries with evaluation models based on peer review, data is typically collected by means of a *submission* – large amounts of data are produced specifically for the evaluation and reported directly to the organisation responsible for the evaluation. It is the Swedish Research Council's view that Sweden, owing to statistics collection procedures already in place, and the ongoing project to develop SwePub⁹⁵ and *Forskningsinformation* (Research Information)⁹⁶, is in a position to be able to apply a considerably more time and cost-effective procedure for bringing together material. The Swedish Research Council further considers that information collected about researchers and research output should not only be tailored to FOKUS, but should have a broader relevance. In other words, reported statistics and data should also be available to other actors, funding bodies, decision makers and, not least, the HEIs themselves. In Australia it has been shown that a significant added value of the ERA evaluation system is in fact a general improvement in R&D statistics.⁹⁷ In the same way, we maintain that FOKUS in itself can be an incentive for all those involved to improve the reporting of research-related data.

The main principles for the Swedish Research Council's considerations regarding data and statistics collection have thus been

- that double reporting of similar statistics to different agencies be avoided
- that FOKUS-specific reporting of data and information be minimised
- that only necessary data be collected and that demands for quality assurance and the estimated workload be proportional to the added value of collecting the data
- that it be clear to the HEIs which data is to be reported to which agencies

The Swedish Research Council therefore proposes a more indirect data collection method in which data is almost exclusively collected from existing sources. This is deemed to be an important step in order to minimise both the workload and the costs that fall to the HEIs for participating in the evaluation. *This means that the subject classification of the various data entries (e.g. of publications in SwePub) exclusively determines which research area the data will be attributed to.* The drawback is that the research areas described by the different statistics do not always match each other fully, while they match the HEIs' own organisational structures to varying degrees. However, it is all but impossible for an evaluation at the national level to achieve a classification that corresponds to all of the different organisational units at the HEIs – something which has not proven an easy matter in the HEIs' own evaluations either.⁹⁸ The Swedish Research Council has judged data quality in Sweden to be of a sufficiently high level for this to be feasible, but that a certain amount of development is necessary in order to get there. Procedures for data reporting and quality assurance should be worked out by means of a pilot exercise.

⁹⁵ In 2013 the National Library, KB, was commissioned by the government to further develop SwePub, in collaboration with the Swedish Research Council and with HEIs through the Association of Swedish Higher Education, to enable and quality assure statistical analyses. The commission is to be completed in the spring of 2015, see <http://www.kb.se/aktuellt/nyheter/2014/SwePub-blir-ett-kugghjul-i-forskningens-infrastruktur/>

⁹⁶ Swedish Research Council (2013). *Forskningsinformation 3.0 - Fokus på processstöd och kunskapsdelning*.

⁹⁷ Swedish Research Council (2014). *ERA – Excellence in Research for Australia. Rapport inom ramen för Vetenskapsrådets uppdrag Forskningskvalitetsutvärdering i Sverige – FOKUS*.

⁹⁸ Swedish Research Council (2013). *Kartläggning av olika nationella system för utvärdering av forskningen – förstudie inför regeringsuppdrag U2013/1700/F*.

The Swedish Research Council has considered the alternative of using a more traditional method of collection, in which research results are linked to individual researchers, who are in turn linked to a particular organisational unit at the HEI (institutions, centres, schools and similar) and that these organisational units then produce a submission. The advantage is that research production is linked to named researchers. However, this is a very unwieldy and time-consuming procedure requiring the involvement, and therefore a lot of time, of the individual researcher. The procedure would be facilitated if all researchers were to open an account in the Prisma system⁹⁹, where publications in SwePub are linked to researchers' accounts and in which everyone uses ORCID¹⁰⁰ (a researcher ID), but this would also entail a considerable amount of work. Moreover, links to data provided by other actors (Statistics Sweden and the Swedish Higher Education Authority) would not be improved by such a procedure, nor could it guarantee that the quality of data be improved. We find it unjustified to demand this kind of effort of the HEIs, as the aim is not to evaluate individual researchers, but to evaluate the quality of the HEI's research.¹⁰¹

The Swedish Research Council has made an inventory of the statistical data that should be included, but exact requirements must be further specified in a manual, following discussions with the relevant statistics authorities and HEIs themselves (see also Annex 9). A pilot exercise is an important step for monitoring data quality and identifying the support and guidelines HEIs need in order to make submissions as uniform as possible.

8.2 Responsible authorities and data collection

The government commission includes proposing statistical data to be included and considering which authorities or parties could take part in producing the data. The Swedish Research Council's proposal for this part of the commission is laid out below.

8.2.1 Responsible authorities

The Swedish Research Council proposes that the following four authorities be responsible for the collection of data and statistics for FOKUS:

- Statistics Sweden (SCB)
- The Swedish Higher Education Authority (UKÄ)
- The Swedish Research Council (VR)
- The National Library (KB)

In addition, FOKUS-specific material – i.e. *case studies* (see also under Section 5.5) and the *units' own descriptions* (see also Chapter 5, sections 5.2.1.1, 5.3.2.1 and 5.5.3.2) – must be submitted directly to the organisation charged with administering FOKUS. The administrative organisation will also be responsible for specifying requirements for the data to be submitted, in consultation with each authority concerned. Statistics are to be collected annually and statistics for the whole period between evaluations, i.e. for a six-year period (or less if the initial intervals are made shorter), are to form the basis of the material presented to the panels. However, for the first evaluation we suggest that the statistics relate to the period from 2012 onwards, so that

⁹⁹ Prisma is a joint application and case management system developed by the Swedish Research Council, Forte and Formas, which other public authorities and agencies may also join. As a platform, Prisma is already compatible with most data items that the present proposal would involve collecting, and with managing data from e.g. SwePub.

¹⁰⁰ www.orcid.org

¹⁰¹ Evaluating individual researchers could also open the door to what is known as *game-playing*, in which researchers are "purchased" by HEIs prior to the special census date for a submission. This is a phenomenon which has led to a great deal of criticism, particularly in Britain but also in Australia.

the burden of retroactive reporting of data is not too heavy on the HEIs.¹⁰² The table below shows the authorities proposed to bear the main responsibility for providing statistics for the evaluation. Annex 9 specifies the data entries each category refers to.

Table 5. *Authorities responsible for collecting data for FOKUS. AO = the administrative organisation for FOKUS.*

Data	Responsible (system)
Finance	UKÄ/SCB
Finance – external grants	VR (SweCRIS)
Staff	UKÄ/SCB
Doctoral students	UKÄ
Students	UKÄ
Qualifications	UKÄ
Publications	KB (SwePub)
Citations	VR (WoS data)
Case studies	AO (Prisma)
Units' own descriptions	AO (Prisma)

8.2.2 The data reporting process

The HEIs will be responsible, as they are today, for annual reporting of data regarding finances, staff, students, doctoral students and qualifications to Statistics Sweden and the Swedish Higher Education Authority. All data must be reported in accordance with the *Standard för svensk indelning av forskningsämnen (National Standard for Research Subject Classification)* at the 3 or 5-digit level. It is in the HEI's interest to apply a unified and comprehensive approach to classifying data consistently by subject and reporting them to these authorities, which is not currently the case. However, HEIs may need support in this regard in the form of national guidelines and standards. Some research is currently classified as "other", which makes it difficult to attribute it to a specific research area. For example, just under four per cent of researchers have been reported as belonging to "other" research subjects. The Swedish Research Council's view is that the use of the classification "other" should be more sparing than currently, and that it should be reviewed.

Using their local publication databases, HEIs must also continually report their publications to SwePub. For research areas whose classification does not fully correspond to the standard at the 3-digit level, in particular medicine and artistic research, publications should be reported at the 5-digit level. In this way the HEIs must be able to see, at any given time, which data and publications have been reported within the different research areas, and thus be able to spread the workload over the entire evaluation period.

HEIs will be responsible for the correctness of the data reported to the collecting authorities. They will be able to check, at all times, the data held at each authority. The authorities will share the responsibility in that they must point out any uncertainties in the data so that these can be corrected. The responsible authorities will then submit the data to the organisation administering FOKUS. The National Library will also submit SwePub data to the Swedish Research Council, which will then produce citation statistics for the evaluation using its existing database, built on the content of the *Web of Science* (Thomson ISI). Financial data may possibly be supplemented with data from SweCRIS – a contracts database administered by the Swedish Research Council

¹⁰² Moreover, statistics collection under the *Standard för svensk indelning av forskningsämnen 2011* only began for the 2012 calendar year.

that can supply information on external funding obtained in competition from a number of different research funders after 2008.¹⁰³ The funding bodies themselves are responsible for reporting data to SweCRIS.

Ahead of an evaluation, each HEI should appoint a rapporteur for each research area and field of research that is going to be evaluated. The rapporteur will be responsible for ensuring that relevant *brief descriptions* and *case studies* are produced for each area, and that the *nominated works* for assessment of scientific/artistic quality are selected. The Swedish Research Council recommends that the possibility of doing this in the Prisma case management system (where HEIs already have administration accounts) be explored. In that case, a special FOKUS module must be created in Prisma with an interface for the HEI rapporteurs and an interface for panel members and external reviewers. The latter must be kept separate from the part of Prisma that handles applications to research councils and other funding institutions, see also the discussion regarding organisation in Section 12.3. The timetable for FOKUS matches the timetable for launching Prisma well. The system was tested in a small call for applications in the autumn of 2014, and is expected to be operational in time for the Swedish Research Council's major call for applications in 2015. Prisma's evaluation module will be built in 2015 and should be developed so as to be compatible with the present proposal.

It would be a good idea to organise the assessment material in the form of an interactive instrument panel for reviewers, where basic information about each unit is presented, e.g. data on staff, funding and volume of publication. The reviewer should then be able to look at each of these in greater detail, e.g. how the volume of publication is distributed between subjects and publication types, and also be able to see, for each publication type, the channels research has been published through. A similar presentation of assessment material is successfully being used in Australia, in what is known as the *System to Evaluate the Excellence of Research* (SEER).¹⁰⁴

We suggest that the assessment material produced be accessible to the HEIs concerned via Prisma. It should also be possible to make case studies accessible after the evaluation, to demonstrate the impact of research beyond academia to other actors, including the general public, provided there are no intellectual property right obstacles to this.

The process for producing the assessment material with data from different sources, as well as who is responsible for reporting data, is summarised in Figure 7 below.

¹⁰³ At the time of writing, the following funding bodies submit data to SweCRIS: the Swedish Research Council, Vinnova, Forte, Formas, the Swedish Foundation for Strategic Research (SSF), the Swedish Foundation for Humanities and Social Sciences (RJ), the Ragnar Söderberg Foundation, the Swedish National Space Board, the Swedish Radiation Safety Authority and the Institute for Evaluation of Labour Market and Education Policy (IFAU).

¹⁰⁴ Swedish Research Council (2014). *ERA – Excellence in Research for Australia. Rapport inom ramen för Vetenskapsrådets uppdrag Forskningskvalitetsutvärdering i Sverige – FOKUS*.

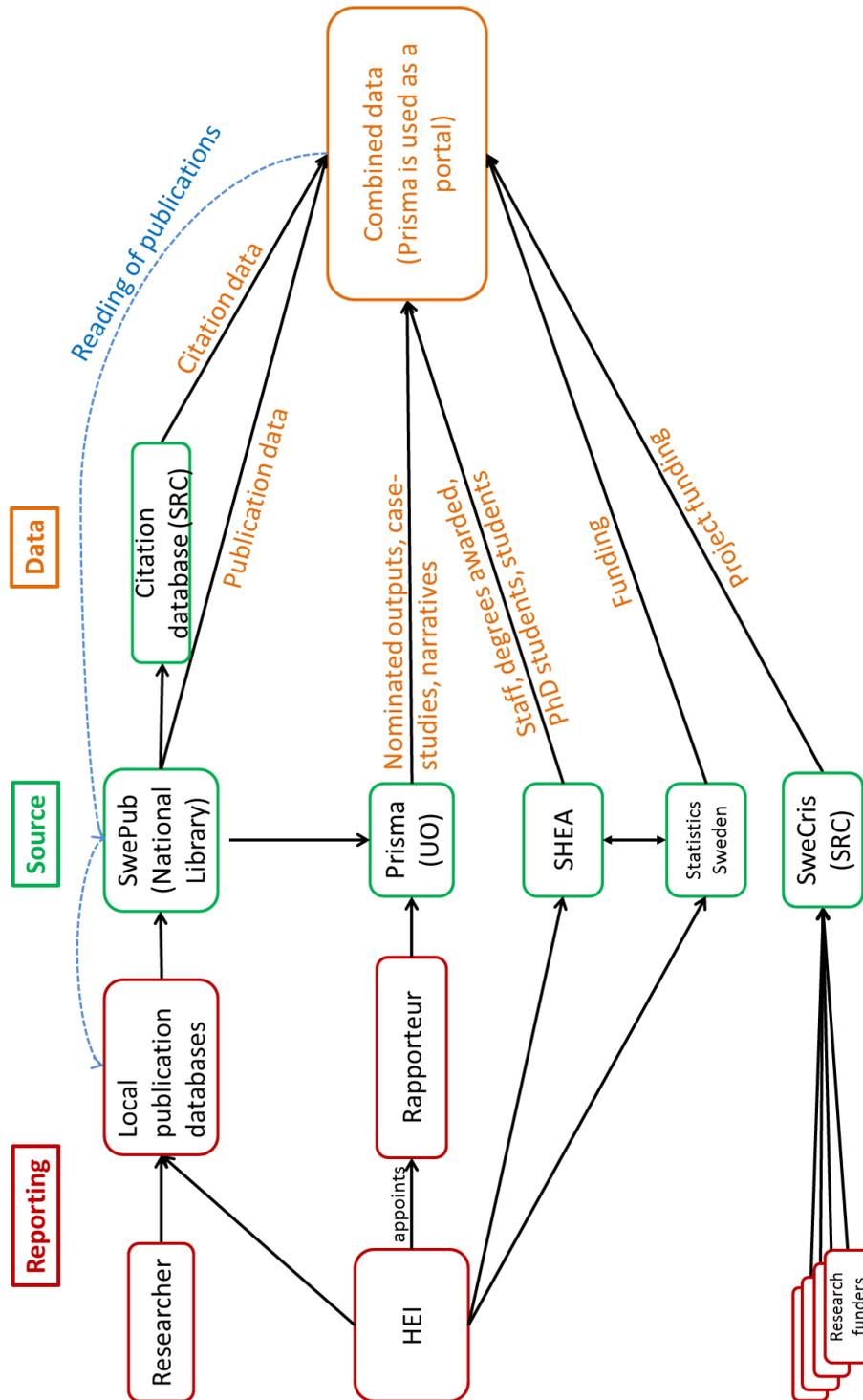


Figure 7. *Diagram showing how the data for FOKUS can be reported to, and obtained from, different sources. The assessment material will be compiled using data obtained from SwePub, the Swedish Higher Education Authority, Statistics Sweden and the Swedish Research Council, in addition to the FOKUS-specific material obtained via Prisma. The authorities responsible are identified, with AO being the administrative organisation for FOKUS. Research outputs to be reviewed should be accessible via links in SwePub/the HEI’s local database (the broken blue line).*

8.2.3 The national publications database – SwePub

SwePub is a national database for research publications, administered by the National Library. SwePub is essential to FOKUS and the model presupposes that all HEIs join and deliver data to it according to specified format. Over the course of the study, the Swedish Research Council has maintained a close dialogue with the SwePub project to ensure that the ongoing development of SwePub will allow for a future national evaluation system. The research area in which a research work is evaluated will be determined by how the work is classified in SwePub. A research work must have at least one and at most three subject classifications, and can thus be attributed to several research areas. The research outputs in SwePub relevant to FOKUS are a part of SwePub's total content, and a list of publishing channels regarded as research-oriented must be included in the assessment. The basis for this list should be drawn up by the National Library and the Swedish Research Council. This work would benefit from coordination at the Nordic level, as similar lists already exist in Norway, Denmark and Finland – albeit without using the weighting or points awarded in those countries.

As selected research outputs will be reviewed by panel members as well as external reviewers, they must be accessible. In order to keep costs down, this should be done digitally, which means that SwePub also has to contain links to full-text publications on the publisher's website, to a digital repository provided by the HEI, or to some other digital archive.¹⁰⁵ The panels and external reviewers will then be able to access the publications to be reviewed by logging into Prisma and then following a link to the source of the text – this guarantees access to all publications regardless of whether they have copyright protection or are open access.¹⁰⁶

8.3 Specific recommendations

In summary, to ensure that the collection of data for the assessments is carried out in a systematic, uniform and legally correct manner, a number of measures must be undertaken by different authorities prior to a decision on implementing FOKUS. Recommendations for these measures are listed below. It would be appropriate if the authorities concerned were promptly – preferably during 2015 – instructed by the Government to undertake some of these preparatory measures. It may be necessary in some cases to allocate additional resources on a special one-off basis.¹⁰⁷ If this is the case, the Swedish Research Council assumes that these authorities will specify such additional resource needs, e.g. in connection with their consultation on the present proposal.

1. Statistics Sweden and the Swedish Higher Education Authority should, in consultation with the Swedish Research Council, immediately review their procedures for collection and data quality assurance, as well as periodicity, in accordance with proposals in this report.
2. Statistics Sweden and the Swedish Higher Education Authority should be instructed to submit the following statistics, on an annual basis, to the administrative organisation for FOKUS:
 - a. staff statistics for universities and university colleges
 - b. financial statistics for universities and university colleges
 - c. statistics about students and qualifications on first and second-cycle programmes

¹⁰⁵ The latter two are preferable, so that the executive authority is not obliged to draw up costly subscription contracts with a series of publishers. Otherwise, it may be possible to arrange subscriptions via e.g. the BIBSAM consortium.

¹⁰⁶ We are aware of the ongoing work to establish national guidelines for open access to research publications, but is of the opinion that it is too early to require that all publications be open access, as the guidelines have yet to be adopted.

¹⁰⁷ Prior to the implementation of the ERA system in Australia, for instance, special additional resources were granted for the development of the collection and presentation platform SEER (*System to Evaluate the Excellence of Research*).

- d. statistics about students and qualifications on research programmes
3. The financial statistics submitted by Statistics Sweden must include research and doctoral education.¹⁰⁸
 4. The Swedish Research Council should be responsible for producing the bibliometric analyses that underlie part of the assessment material, and for submitting these to the administrative organisation. We suggest that these analyses be based on the content in SwePub and the existing citation database at the Swedish Research Council.
 5. The National Library should continue to administer the SwePub database and make its contents accessible to the Swedish Research Council and the administrative organisation. Specifications for the metadata format should be reviewed regularly, in consultation with the Swedish Research Council and the administrative organisation for FOKUS.
 6. All HEIs should join SwePub and supply it with data on their research outputs. This data should refer to research outputs from 2012 and later. The National Library may initially need extra resources in order to assist the HEIs in their efforts with this. The HEIs may, at least initially, need to earmark more resources for their libraries in order to ensure that reporting to SwePub is uniform and maintains a high quality.
 7. The Swedish Research Council, in consultation with the National Library, should be responsible for drawing up and maintaining a list of ‘authorised publication channels’, i.e. channels regarded as being sufficiently peer-reviewed and research-oriented to be included in FOKUS. It would preferable to coordinate these efforts with similar work in the other Nordic countries.
 8. Each HEI should be responsible for making their research outputs accessible via a link in SwePub. This can either be a link to a text in an open archive (the HEI’s, the publisher’s or some other) or to a password-protected archive.
 9. The Swedish Research Council recommends that FOKUS use the Prisma case management system as a platform, regardless of its administrative organisation. However, data on individuals in the CV database in Prisma are not to be used. Prisma should be developed to enable it to collect *case studies* and *HEI descriptions* and to allow for access to a selection of research outputs for external review. The Swedish Research Council should be responsible for this development until an administrative organisation for FOKUS has been appointed.
 10. The Swedish Research Council is responsible for developing SweCRIS to supplement other information about research funds obtained in competition.
 11. Special recommendations apply for the artistic area – see also Section 4.3.

¹⁰⁸ The statistics currently published by Statistics Sweden are for research and development, with costs for doctoral education subtracted. However, data on research and doctoral education are available.

9 HOW EVALUATION RESULTS CAN BE TRANSLATED INTO ALLOCATION OF RESOURCES

9.1 Summary

The Swedish Research Council has regarded it as part of its commission to propose principles for how the evaluation results could be used as a basis for calculating the allocation of resources. In devising these principles for calculation, the Swedish Research Council has assumed that the share of the block grant distributed is 20 per cent. On this basis, we propose the following:

1. The components scientific/artistic quality, quality enhancing factors and impact beyond academia are assigned weights of 70:15:15, respectively, in the distribution key.
2. In order to be able to translate the results of the evaluation into resources, a *combined volume measure* is used, based on the HEI's share of the total block grant, combined with each research area's share of the HEI's research staff. The combined volume measure expresses the relative size of each research area and field of research and is intended to be used to calculate allocation of resources on the basis of the evaluation results. The purpose of the combined volume measure is thus *not* to express the absolute size of the area or field of research in terms of money or staff, and for this reason neither should it be used by the panels in their assessments.
3. The grade is multiplied by the combined volume measure to obtain a *distribution score* for the resource allocation.
4. For scientific/artistic quality, we propose that the calculation model be capable of allowing competition over distribution scores for resource allocation between research areas within the same field of research, based on differences in the quality evaluation. This assumes a calibration of grades between panels in each field of research, in order to guarantee the equivalence of assessments across all research areas. The calibration mechanism needs to be tested in greater detail in pilot exercises.
5. For each HEI, a separate *distribution index* is then calculated for each field of research. This index constitutes a *share measure* for each HEI, calculated as a share of the sum total of all the HEIs' distribution scores in each field of research.
6. Calculations are made separately for each field of research. To calculate the total amount of allocated resources for the scientific/artistic quality component at each HEI, the results of these calculations for all fields of research are added up.
7. For the quality enhancing factor and impact beyond academia components, the corresponding calculations are made by calculating a distribution index for each field of research – separately for either component – and then using these index values in calculating resource allocation.
8. Finally, the outcome for the three components – scientific/artistic quality, quality enhancing factors and impact beyond academia – are added up into the sum total of the performance-based funds to be allocated to an HEI. The HEI is then free to distribute this allocation as it sees fit.
9. The calculation model is designed in such a way that any resource allocation redistribution effects will be from HEIs with lower grades to HEIs with higher grades.
10. In calculating resource allocation, a slightly non-linear weighting of grades is applied.
11. The model has been designed in such a way that any effects in the form of redistribution of resources between HEIs are neither very considerable nor negligible – i.e. large enough to constitute an incentive for quality improvements.

9.2 Principles for resource allocation

As of 2014, one fifth of the government's total block grant for research and doctoral education to universities and university colleges – or SEK 3 billion of 14.5 billion – is distributed on the basis of two quality indicators (publications and citations, and external funds). New funds added are also distributed on the basis of these two indicators. In order to draw up a proposal for calculation principles for resource allocation, the Swedish Research Council has, in its calculations and simulations, assumed that 20 per cent of the block grant to HEIs will continue to be performance-based, with a proposed distribution key of 70:15:15 for the three components. This means that of the *total block grant*, 14 per cent will be distributed on the basis of scientific/artistic quality, while 2 x 3 per cent will be distributed on the basis of quality enhancing factors and impact beyond academia.¹⁰⁹ Further, the calculation model proposes that an HEI should not be able to lose more than the percentage share being distributed, i.e. 20 per cent. However, an HEI may gain a greater share than 20 per cent on the basis of the evaluation result. In the simulations carried out, see Section 9.3, effects in the form of resource allocation have resulted in a redistribution between HEIs of at most +/- 3-5 per cent. It is important to underline that if the performance-based share of the block grant were to increase – or decrease – it would produce other outcomes, and the proposed calculation model would therefore need to be adjusted.

An overarching principle is that effects in the form of any redistribution of funds between HEIs must be due exclusively to quality differences, i.e. *if everyone received the same grade there would be no change in the allocation of funds*. In addition to these overarching principles, we propose several other principles which are discussed below.

9.2.1 Grades to be related to the relative size of the research area

The evaluation will result in either a grade profile or an overall grade (i.e. a *performance-based measure of outcome*) for each of the three components scientific/artistic quality, quality enhancing factors and impact beyond academia.¹¹⁰ For the conversion of grades into resources, the Swedish Research Council proposes that a distribution key of 70:15:15 be used together with a volume measure that expresses the graded unit's (the research area or field of research) relative size and is intended to be used for calculating the allocation of resources on the basis of the evaluation results.

What does the unit's size refer to in this context? Common measures in similar contexts include the volume of research output, the number of FTE research staff, and total research revenue. All of these have their limitations, however.

The Swedish Research Council does not consider it appropriate for the calculation model to use a measure of volume in which the unit's size is expressed in terms of the size of its output, i.e. volume of publication, since this could be interpreted as an incentive to increase quantity rather than quality. The Swedish Research Council finds it more reasonable to measure volume in terms of input. Common measures of input include the volume of staff resources and/or financial resources.

However, applying a measure of volume in the calculation model that is *solely* based on the number of FTE research staff could lead to undesired effects in the form of resources being redistributed – between areas, and above all between HEIs – despite there being no quality differences.

It is not reasonable either, in the view of the Swedish Research Council, for the calculation model to use the amount of external funding as a measure of volume, since this could lead to undesired effects in the form of resources being transferred from areas that have less access to alternative funding to areas that have a

¹⁰⁹ The model proposes that scientific/artistic quality be assigned a weight of 70 per cent of the share of the block grant that is performance-based, i.e. 70% of 20%, which is equivalent to 14% of the performance-based share. Quality enhancing factors and impact beyond academia are each assigned a weight of 15% of 20%, or 3% each of the performance-based share.

¹¹⁰ For scientific/artistic quality, the panels will deliver their assessments in the form of grade profiles (see also Section 7.2). As is described in greater detail in Section 9.2.3, grade profiles will then be weighted and translated into a decimal figure to be used in the calculation model.

considerably higher degree of external funding.¹¹¹ Another undesired effect is for an expensive area to be allocated more resources simply because it is expensive; instead the calculation model should be designed to reward high research quality or – when applicable – units where quality enhancing factors and impact beyond academia respectively have been assessed a holding good quality,.

The Swedish Research Council therefore recommends a *combined volume measure* that combines an HEI's *share of the block grant with the research area's share of each HEI's research staff*.¹¹² As explained above, the combined volume measure is an expression of the graded unit's relative size, and is only intended to be used to enable the calculation of resource allocation on the basis of the evaluation result. We would like to underline that the purpose of the volume measure is thus *not* to express the area's absolute size in terms of e.g. SEK, FTEs or similar, and the measure should consequently not be used by the panels in their assessments.

As shown above, all measurements have their distinct limitations. We would argue, however, that the combined volume measurement described here is the most reasonable for the proposed calculation model, with the aim that the effects in the form of possible redistribution of resources between HEIs are neither very large nor negligible.

Below is a mathematical formula for how a research area's proposed *combined volume measure* ($Comb.VM_{research\ area}$) is calculated. $Block\ grant_{HEI}$ is the HEI's share of the total block grant. The formula below includes the number of research FTEs in each research area at the HEI ($FTEs\ res.\ research\ area$) and the total number of research FTEs at the HEI subject to the evaluation ($FTEs\ res.\ HEI$).¹¹³

$$Comb.VM_{research\ area} = Block\ grant_{HEI} \times \frac{FTEs\ res.\ research\ area}{FTEs\ res.\ HEI}$$

For the scientific/artistic quality component, a *distribution score* (DS) is then calculated for each research area and HEI. The distribution score is made up of the research area's grade calculated on the basis of the grade profile, multiplied by the combined volume measure. Below is an example for medicine (as a field of research) of how grades and the combined volume measure in the calculation model are translated into a distribution score for the scientific/artistic quality component. The distribution scores of the various research areas can then be used to calculate allocation of resources.

There are five research areas in the medical sciences field (J, K, L, M and N). When the evaluation is complete, a distribution score is thus calculated for each research area at the HEI. The total distribution score for an HEI in medicine is calculated as the sum of the distribution scores of all its research areas, by:

$$DS_{Medicine} = Grade_J \times Comb.VM_J + Grade_K \times Comb.VM_K + \dots + Grade_N \times Comb.VM_N$$

where *Grade* is the research area's grade¹¹⁴ and $Comb.VM_{J,K\ etc.}$ is each research area's combined volume measure for the respective HEI (the same is done for all research areas at the HEI).

¹¹¹ The block grant's share of total funding, and thus its importance, varies from area to area. It covers approximately 49, 36, 27, 46 and 61 per cent, respectively, of total operating costs in natural and agricultural sciences, engineering sciences, medicine, social sciences, and humanities and artistic research, see Annex 8 (data from 2011). Access to other sources of funding also affects the number of researchers and doctoral students that can be hired, and thus the number of FTEs and publications. Furthermore, laboratory sciences have considerably higher operating costs than most of the research areas in the Humanities and Social Sciences (psychology, geography and arts excepted).

¹¹² Existing staff statistics are not without certain problems in this connection, since they cover research *and* teaching staff. The statistics include the employment categories professor, senior lecturer, early career development positions, other research and teaching staff as defined by the Swedish Higher Education Authority. The term "research staff" does not include lecturers ("adjunkter"), however.

¹¹³ I.e. the sum of all ($FTEs\ res.\ research\ area$) equals ($FTEs\ res.\ HEI$).

¹¹⁴ Note that the grade may be weighted when applicable, see Section 9.2.3 below.

A *distribution index* is then calculated for the field of research at each HEI – the index is a *share measure* for each HEI, calculated as the share of the sum total of all the HEIs' distribution scores within each field of research (medicine in the example above). The distribution index can also be described as an HEI's share, recalculated on the basis of the evaluation results, of the funds to be distributed for each field of research (medicine in the example above). Calculations are made separately for each field of research. To calculate the total amount of resources allocated to each HEI for the scientific/artistic quality component, the results of these calculations in all fields of research are added up.

With respect to the assessment components quality enhancing factors and impact beyond academia, corresponding calculations are made by computing, for each field of research at the HEI, a distribution index for either component separately, and these indexes are then used to calculate resource allocation.

The outcomes for the three components scientific/artistic quality, quality enhancing factors and impact beyond academia are finally added up to make up the sum total of the performance-based funding to be allocated to an HEI. The HEI is then free to distribute this allocation as it sees fit.

9.2.2 Competition between research areas, but not between fields of research

FOKUS is to evaluate different areas according to their distinctive character, and therefore it is not reasonable or meaningful to compare scientific/artistic quality or impact beyond academia between, for instance, natural sciences and humanities. The block grant is not currently earmarked for different fields of research, and it is not the intention of FOKUS to reintroduce such earmarking in the proposed calculation model; instead the HEI itself will continue to decide how to distribute funds internally.

However, the Swedish Research Council proposes that research areas be able to compete via distribution scores for resource allocation within a field of research, on the basis of the outcome of the quality evaluation. By allowing HEIs to compete via distribution scores within each field of research, effects in the form of altered resource allocation between fields of research at the national level can be avoided. In practice, this means that four to six research areas within one field of research can compete with each other (see Chapter 4 for the proposed classification). The Swedish Research Council's view is that a certain amount of competition between research areas is a driver of quality. This is moreover something which features in the Swedish Research Council's current project grant review process, for example.

The Swedish Research Council wishes to emphasise that research areas are competing in these cases for *distribution scores* rather than resources as such. The allocation of resources to HEIs on the basis of the evaluation results is an effect of the outcome of the calculations in the calculation model (the algorithm). In the end, of course, it is the HEI itself that decides how the performance-based funds are to be distributed within the HEI.

Competition between research areas can, however, imply a certain risk of grade inflation. A panel might, consciously or not, wish to favour a particular area and therefore award high grades. For this reason, grade calibration between research areas will be particularly important. In this context, grade calibration means – in simple terms – that the research area panels' suggested grades and grade distribution in specific research areas are compared, and that this process ensures that grades are understood to mean the same thing for the various research area panels. Experience from other countries' national evaluation systems, as well as from the Swedish Research Council's own project grant application procedure, shows that such calibration is necessary in order to guarantee fair and just grading. Experience also suggests that this is best carried out in the form of consensus-seeking face-to-face meetings and dialogue between people who have taken part in the assessment work on the panels concerned. As described in Chapter 6, we therefore propose that calibration be carried out in the form of special chair conferences attended by the chairs of the research panels in each field of research.

With the aim of ensuring that competition between research areas does not lead to undesired effects, it is very important that the calibration mechanism works. It will therefore be necessary to use pilot exercises to test and specify instructions to the chair conferences regarding the calibration process. This applies not least in the cases where research areas with different publication traditions and types of assessment material are in the same field of research.

For the quality enhancing factor and impact beyond academia components, competition over distribution scores is between HEIs within each field of research. To assess impact beyond academia, case studies in e.g. social sciences at HEI A are compared with case studies in social sciences at HEI B, and so on.

9.2.3 Weighting of grades

By weighting grades in the calculation model, it is possible to check whether the model rewards the highest grades additionally, at the expense of the lower grades. With totally linear weighting of grades, the highest grade corresponds to 5 and the lowest to 1 (5, 4, 3, 2, 1). Non-linear weighting is used in the British HEFCE's resource allocation to British HEIs, based on the results of HEFCE's research evaluations (the weighting is 9, 3, 0, 0, 0).¹¹⁵ This type of grade weighting rewards the very best research by exponential weighting of top grades. It means that those who receive the grade *2 or lower do not receive any funds at all. This may be an incentive for an HEI to invest more in the very best research and to focus on narrow research areas where quality is already high. Australia's ERA also weights grades, albeit somewhat less steeply (7, 3, 1, 0, 0).

The objective of FOKUS is to be a driver of quality by rewarding performance and quality, and to raise quality overall, not merely reward excellence. The Swedish Research Council therefore proposes, for now, a relatively modest but not entirely linear weighting of grades according to the structure 6, 4, 3, 2, 0 – where grade 5 is translated to 6 and grade 1 to 0. The aim is to give HEIs an incentive to invest in the best research, while at the same time also rewarding HEIs that maintain high, even quality in their research. By making the weighting less extreme than it is in e.g. Britain and Australia, redistribution effects are also lessened, which has been demonstrated in the simulations carried out. The Swedish Research Council's proposal for grade weighting can handle a broader spectrum of grades without having excessive effects on resource allocation.

In the case of grade profiles, which are proposed for the scientific/artistic quality component (see section 7.2), the grades in the profile are weighted before they are translated to a decimal. Grade profiles with the proposed weighting reward higher grades at the expense of low grades to a greater extent than a model in which the calculation is only on the basis of a comprehensive average grade.

In the case of average grades, where a single grade is awarded per research area for the components quality enhancing factors and impact beyond academia, respectively, the grade is weighted after it has been awarded. Section 9.3 below presents conclusions from the simulations carried out showing the effects of different weightings on grade profiles and overall grades.

9.3 Simulations

Simulations have been carried out for the scientific/artistic quality component, and these underlie the choices made in the Swedish Research Council's proposal for a calculation model (algorithm) for resource allocation. Simulations were made in accordance with the proposed algorithm, using data on block grants and research FTEs for 27 Swedish HEIs, as well as grade simulations from the Swedish Research Council's review panels or, alternatively, bibliometric data. How much an HEI will actually gain or lose in the application of the FOKUS model is of course ultimately dependent on the results of the evaluation.

The simulations show, first, that the spectrum of grades is wider when bibliometric data are used than when data from the Swedish Research Council's review panels are used. It is of course difficult to know how the panels in FOKUS will award their grades, and if they will stick to the middle of the grading scale or use all of it. If the entire grading scale is used, differences – and hence reallocations – become greater. Our premise has been that the calculation model we propose should be capable of handling a relatively wide spectrum of grades without causing excessive redistribution. Simulation results also suggest that an evaluation model based on peer review may in itself exert a restraining effect on the spectrum of grades, and therefore on effects in the form of a possible redistribution of resources.

¹¹⁵ Weighting is 9, 3, 0, 0, 0 since 2012; previously it was 9, 3, 1, 0, 0.

Second, simulations were carried out with both grade profiles and overall grades in order to allow for a comparison of these two methods. The simulations with *grade profiles* overall demonstrated effects in the form of redistribution between HEIs of at most +/- 3 per cent, while those with *overall grades* had such effects of at most +/- 5 per cent. The differences are due to the grade profiles having been simulated using grades from the Swedish Research Council's project grant review process which, as mentioned, has a smaller grade spectrum at the aggregated HEI level than citation scores do. Differences are further due to the fact that grade profiles are less sensitive to individual grades. This is one of the reasons why the Swedish Research Council proposes grade profiles for the most important assessment component, i.e. scientific/artistic quality.

Finally, the simulations show that the calculation model is most sensitive to the actual weighting of the grades. For this reason the Swedish Research Council proposes, as mentioned, a fairly modest but not entirely linear weighting of grades: 6, 4, 3, 2, 0. Applying more extreme weightings – such as the one used in Britain's REF, for example – led to fairly drastic redistribution effects in the simulations.

No simulations were carried out for the components quality enhancing factors and impact beyond academia, since no realistic input material was available. The size of the gain is of course dependent on the evaluation results, but also on how grades are weighted. For now we propose the same weighting as for scientific/artistic quality, i.e. 6, 4, 3, 2, 0. A pilot exercise enabling a better prediction of the effects of such a weighting is a matter of some urgency.

10 COST ESTIMATE

The Swedish Research Council has estimated the costs of introducing FOKUS based on the proposals in the present report. In keeping with the instructions for the commission, estimates are discussed in relation to costs for similar systems in other countries, as well as to the likely costs of alternative mechanisms for quality assurance of research at universities and university colleges.

The figures presented are estimates, and assume that FOKUS becomes an integrated part of activities at an existing authority.¹¹⁶ Should FOKUS be implemented, more exact calculations must be made. On current estimates, the cost of carrying out one FOKUS evaluation – running over a six-year period – would be in the region of SEK 170 million, of which SEK 75 million are costs for the administrative organisation and SEK 95 million are costs for the HEIs. Costs attributed to the administrative organisation and other authorities involved are mainly for staff, administration and technical systems. Fees to panel members and reviewers, and costs in connection with panel meetings, also make up a significant share of expenditure. Costs for HEIs include those for coordination of assessment material, data reporting, production of case studies and the units' own descriptions, and nominations of research outputs and reviewers.

Introducing the model implies a start-up cost – an investment cost – which is estimated at SEK 65 million overall. These are costs primarily for the administrative organisation and the HEIs, but also for the National Library, Statistics Sweden and the Swedish Higher Education Authority. Costs attributed to the responsible authorities are above all for quality assurance of data and the building of relevant data systems, but also for administrative and communication costs, and are estimated at SEK 20 million.¹¹⁷ Costs attributed to HEIs are also mainly for work on data systems and reporting procedures, and are estimated at SEK 45 million.

The SEK 170 million cost of one evaluation – not including start-up costs – corresponds to about 0.2 per cent of the block grant over a six-year period (or just under one per cent of the performance-based part of the block grant over the same period).¹¹⁸ This can be compared with the current indicator-based model, which costs about SEK 1 million per year, or SEK 6 million over a six-year evaluation period. Compared to the costs of running the national evaluation systems in Italy, VQR (between 2.2 and 3 per cent of the performance-based grant), and REF in Britain (about 1 per cent of the competitive grant),¹¹⁹ the present proposal can be deemed reasonably resource efficient. For more information on the costs of these countries' systems, see Section 13.7.

In addition to comparisons with other countries' evaluation models, the cost can be compared with other alternatives for quality assurance in allocation of state research funds. The *dual support* mechanism is an important aspect of the research system in many countries, and refers to a government's two main instruments for distributing research funds: (1) as direct and unspecified allocations to HEIs, or (2) as project or programme funding via research councils. It is interesting to compare the cost-effectiveness of these two instruments, even if they have separate functions in the research system. A study comparing Britain and Italy concluded that it is more cost-effective to subject research funds to competition via performance-based allocation than by having research councils distribute project funds. The review of project grants at the Swedish Research Council

¹¹⁶ Estimated costs are much higher if a new authority or equivalent were to be charged with running FOKUS. All stated costs have been calculated using price information for 2014.

¹¹⁷ Some of the costs for technical solutions coincide with other ongoing development projects, in particular Prisma and SwePub, but it is difficult to estimate the monetary value of such coordination, and these calculations regard all costs as part of FOKUS.

¹¹⁸ Provided that the block grant remains at approx. SEK 14.5 billion a year, i.e. 14.5 x 6 years = SEK 87 billion; and that the performance-based share remains at 20 per cent of the block grant, i.e. SEK 3 bn x 6 years = SEK 18 bn.

¹¹⁹ Geuna, A. & Piolatto, M. (2014). The development of research assessment in the UK and Italy: costly and difficult, but probably worth it (for a while). *Working Paper series 16/2014*, Department of Economics, University of Turin. Considering the fact that Britain and Italy have much larger populations than Sweden, they may be regarded as better placed to reap the benefits of economies of scale, and should be able to hire more of their reviewers nationally.

annually costs 2.7 per cent¹²⁰ of the total budget for project grants. This does not include the time researchers spend writing applications.

It is interesting, finally, to compare the costs of running an evaluation system on a national basis with the costs of individual HEI evaluations carried out in recent years. The HEI evaluations are estimated to have cost between SEK 10 and 22 million per HEI and occasion.¹²¹ A national evaluation covering 34 HEIs is a significantly bigger undertaking, and will cost about SEK 170 million, or on average about SEK 5 million per HEI, which indicates that there are clear economies of scale in coordinating this at the national level, compared with individual efforts at each HEI.

The Swedish Research Council's overall assessment is that the costs of implementing FOKUS are reasonable in relation to the expected added value, and also in comparison with similar systems in other countries, as well as with alternative methods of exposing research funding to competition. FOKUS thus offers the opportunity of a cost-efficient method of promoting the quality of research at Swedish HEIs, and its impact beyond academia.

¹²⁰ The Swedish Research Council's 2013 Annual Report.

¹²¹ Uppsala University estimated direct costs at SEK 6.5 million (KoF07) and SEK 7.5 million (KoF11), of which approx. 75 per cent were costs for the expert panels (travel, hotel, meals, fees etc.). Costs in terms of working hours were estimated at twice the direct costs, i.e. SEK 13 million (KoF07) and SEK 15 million (KoF11). Lund University also estimated direct costs at about SEK 7 million, and indirect costs – i.e. the work it put into reporting results etc. – at about the same amount. For the Swedish University of Agricultural Sciences costs were SEK 10 million, while for the Royal Institute of Technology direct costs were SEK 6 million and indirect costs about the same. See Swedish Research Council (2013). *Kartläggning av olika nationella system för utvärdering av forskningskvalitet – förstudie inför regeringsuppdraget U2013/1700/F*.

11 ANALYSIS OF CONSEQUENCES

If FOKUS is implemented according to this proposal, it will have a number of consequences for the research system. The Swedish Research Council has identified the strengths and opportunities as well as the weaknesses and challenges of the model. The most important effects that the model is designed to achieve include improved research quality and a greater impact of research results on societal development. It is also reasonable to envisage further positive effects as a consequence. A number of mechanisms and factors have been built into FOKUS to prevent, to the greatest extent possible, potential negative consequences, but it is difficult to predict and prevent every such consequence. This is one of the reasons why we consider it necessary to conduct pilot exercises before the model is fully applied.

This chapter analyses the consequences in greater detail and, in accordance with the Government's instructions, also assesses the advantages and disadvantages of making peer review part of a national model for resource allocation as compared with peer review at the HEI level.

11.1 Strengths and opportunities of a national evaluation

FOKUS is designed to promote and provide incentives for improved quality in Swedish research and, by extension, improve Sweden's international competitiveness. Examples from other countries with national evaluation systems for research, e.g. Britain, the Netherlands and Australia, indicate improvements in quality – most notably initially – when an evaluation system is implemented.¹²² It is our view, gained through the dialogue we have maintained with the different actors during the course of this study, that the quality aspects included in the model are widely accepted. "Quality" refers to

- scientific/artistic quality, both of top research and overall
- good-quality research having an impact beyond academia
- HEIs working proactively and successfully with factors that promote sustainable research quality

FOKUS will allow good-quality research to be identified and rewarded regardless of its focus, volume or HEI. This means that smaller and newer HEIs will have the same opportunities as larger, more established universities of being rewarded for their research, if its quality is high. FOKUS affords small and specialised HEIs better opportunities to demonstrate their strengths than the current model, which does not take the different circumstances of HEIs into consideration. As in Britain's REF, it will be possible to identify "pockets of excellence".¹²³ By being clear about its underlying premises and about what it rewards, the model can serve as support for the HEIs' own strategic work and thus become a driver of quality.

In comparison with the current performance-based model of resource allocation, which has two indicators (publications and citations, and external funds), FOKUS has several advantages. *First*, FOKUS takes account of the fact that quality is a multifaceted concept and that HEIs have a multifaceted mission. It does this by including several aspects of quality in the model, and also by making background information available in

¹²² Swedish Research Council (2013). *Kartläggning av olika nationella system för utvärdering av forskningskvalitet – förstudie inför regeringsuppdraget U2013/1700/F*;

Swedish Research Council (2013). *Kvalitetsutvärdering av forskning i Nederländerna – rapport från studiebesök i oktober 2013 för projektet FOKUS*;

van Drooge L., de Jong S., Faber M. and Westerheijden D. (2013). *Twenty years of research evaluation. Fact & Figures*, Rathenau Instituut;

Swedish Research Council (2012). *Swedish production of highly cited papers*. Vetenskapsrådets lilla rapportserie 5:2012;

Öquist, G. & Benner, M. (2012) *Fostering breakthrough research: A comparative study*. Academy report. Royal Swedish Academy of Sciences;

Swedish Research Council (2014). *ERA – Excellence in Research for Australia. Rapport inom ramen för Vetenskapsrådets uppdrag Forskningskvalitetsutvärdering i Sverige – FOKUS*.

¹²³ Swedish Research Council (2013). *Kartläggning av olika nationella system för utvärdering av forskningens kvalitet – förstudie inför regeringsuppdraget*.

order to provide the panels with the necessary contextual information. This creates conditions for a better overall assessment. *Second*, the content and future potential of research can also be evaluated by means of peer review and actual review of research outputs – as opposed to bibliometrics, which is a retrospective method of analysis. There is international consensus that bibliometrics must be supplemented with expert assessments in order to be usefully applied in the evaluation of research. *Third*, peer review also provides greater scope for feedback which can be used in the HEIs’ own quality development work. *Last but not least*, FOKUS can be used for all research areas, and not only for those in which bibliometric analyses can be carried out.

In this report, the Swedish Research Council also proposes (see Chapter 9) a method for translating the result of the evaluation into resource allocation. The ambition is to make the proposal easier-to-understand and more transparent than the current resource allocation model. Ultimately, however, resource allocation remains a policy issue.

We have attempted to prevent several potentially negative consequences, e.g. by highlighting and rewarding, in the quality enhancing factor component, successful efforts in doctoral education and for early career researchers, collaboration and mobility, collaboration with society at large, how research is integrated with first and second-cycle programmes, and gender equality.

In FOKUS, a sample of *all research outputs* is to be included in the evaluation. This is a different approach from that of Britain’s REF, where a much time and effort is spent making a *selection of individuals* who in turn nominate up to four research outputs to be included in the evaluation, in order to try to optimise the outcome. This is an element Swedish HEIs will not be saddled with in FOKUS. The fact that publications are attributed to HEIs and not to individuals in FOKUS will discourage extensive “trading” of individuals just before an evaluation.

The introduction of FOKUS could lead to improved systems for uniform reporting of statistics and speed up the development of SwePub, which would be an advantage for many actors, not least the HEIs themselves. It implies access to better data, even during the periods between evaluations, which can be used in follow-ups and analyses. In Australia’s ERA this has been a clear positive side effect.¹²⁴

Carrying out a national evaluation as a single exercise at one point in time provides a result that amounts to a mapping of the state of research, with good opportunities for identifying areas of strength both at the national level and at the HEI level. For a small country like Sweden, it is important to be able to see the country’s research from an international quality perspective and to follow its development over time in a systematic manner. This provides a basis for identifying where measures need to be prioritised, both at the HEI level and at the policy level. It further provides a good basis for showing taxpayers and opinion makers what investments in research can lead to, and why these investments are important.

With a national evaluation system, all HEIs receive a basic evaluation to build on – and one which can be compared with research in the entire country, by research area and field of research. It is the Swedish Research Council’s viewpoint that comparisons between HEIs are, in themselves, drivers of quality and that this is more resource-efficient for the research system as a whole, in part because of the economies of scale it achieves. While FOKUS cannot claim to satisfy HEIs’ need for internal evaluations, a national evaluation can serve as a benchmark and a basis for strategic decisions at HEIs and other actors, e.g. ahead of research bills. Depending on the HEIs’ own priorities, FOKUS can also lead them to make better use of their comparative advantages and create a sustainable profile for their research. This, together with the fact that FOKUS contains a threshold value for inclusion in the evaluation, could lead to a less fragmented research landscape.

¹²⁴ Swedish Research Council (2014). *ERA – Excellence in Research for Australia. Rapport inom ramen för Vetenskapsrådets uppdrag Forskningskvalitetsutvärdering i Sverige – FOKUS*.

11.2 Weaknesses and challenges, and how these are dealt with in FOKUS

FOKUS is based on a classification by discipline, into research areas and fields of research. This may, in some cases, imply difficulties in evaluating interdisciplinary research and new, emerging areas. On the other hand, the assessment of interdisciplinary research can be facilitated by the fact that the 24 research areas proposed as the smallest reporting unit are fairly broad in nature when compared with a more detailed classification.

It is very important, not least with interdisciplinary research in mind, to consider the focus of research when appointing the panels, and to ensure that competence and experience of assessing interdisciplinary research is included. Panels will have access to information about the occurrence, scope and focus of interdisciplinary research, and will receive clear instructions to be attentive to and consider interdisciplinary research in their evaluation, in the same way as in Australia's ERA¹²⁵ and in Britain's REF. It is also possible to use a referral process between panels when necessary, as in REF, to guarantee the assessment.¹²⁶ An important issue at the chair conferences planned for the research area panels will be to highlight interdisciplinary research, and there will be the opportunity of referring assessments back to the panels in question, see also Section 6.2.

Another way for HEIs to increase the visibility of interdisciplinary research is to describe their research profile, e.g. if it is interdisciplinary, in the background information and in their own descriptions which serve as a basis for assessment of scientific/artistic quality. Furthermore, a single publication may be classified in up to three different research areas in SwePub. Although assessment of interdisciplinary research requires special considerations and measures of various kinds, the Swedish Research Council's view is that with the proposed procedure, FOKUS can guarantee that high-quality research will be identified regardless of its degree of disciplinary unity.

Carrying out regular national, peer-reviewed research evaluations is resource intensive. It is nevertheless the Swedish Research Council's view that a sensibly-designed model, implemented at the national level, has more advantages than disadvantages compared with having each HEI carry out its own research evaluation. It is the Swedish Research Council's assessment that national evaluations are more resource efficient than if each HEI were to carry out its own comprehensive evaluation. However, there will most likely always be a need for more HEI-specific follow-ups and evaluations – needs which a national evaluation is not and should not be designed to meet.

The costs of implementing FOKUS, which is based on peer review, will be higher than for today's indicator-based resource allocation system – an estimated SEK 170 million over a six-year period compared with SEK 6 million, see also Chapter 10. However, the Swedish Research Council's view is that FOKUS is a fairer, more useful system, and that it will be a better driver of quality – meaning that its benefits will more than compensate for the extra cost. In designing the model we have strived to achieve a balance between how resource efficient and how informative it should be, which has led us to make several adjustments. For example, the number of reporting units has been limited, as has the number of experts and the extent of their work. Compared with other countries that have performance-based research funding systems with peer review, FOKUS is efficient, see also chapters 10 and 13. In order to limit work input at the HEIs, the model assumes that existing data sources will be used to the greatest possible extent and that the material to be produced by the HEIs is limited in scope. Carrying out the evaluations with a certain periodicity, instead of on a continuous basis, gives HEIs undisturbed work periods between evaluations and the possibility of longer-term planning.

A challenge for the implementation of FOKUS is that it may prove difficult to recruit sufficient numbers of experts. A comparison can be made with the Swedish Research Council's regular review of applications, which

¹²⁵ Swedish Research Council (2014). *ERA – Excellence in Research for Australia. Rapport inom ramen för Vetenskapsrådets uppdrag Forskningskvalitetsutvärdering i Sverige – FOKUS*.

¹²⁶ HEFCE (2012). *Interdisciplinary and collaborative research. REF Assessment framework and guidance on submissions*, updated version January 2012, pp. 15–16. <http://www.ref.ac.uk/media/ref/content/pub/assessmentframeworkandguidanceonsubmissions/GOS%20including%20addendum.pdf>

involves almost 800 reviewers in 70 review panels. The Swedish Research Council's estimate is that FOKUS will require a slightly larger number, in the region of 900 (most of them recruited internationally), but considering the fact that the evaluation is intended to be carried out every six years, this should still be feasible.

The HEIs are also subject to other national evaluations of higher and postgraduate (doctoral) education, which could lead to evaluation fatigue, or to the perception that they rob energy from research and teaching, and to over-exploitation of experts. It will be important for all actors to manage the evaluation instrument judiciously, in consideration of internal resource use at the HEIs.

The concern has been raised that the system could have a preserving effect – that HEIs will not dare to take risks and so will only make safe bets. This critique is sometimes also levelled at the system of peer review as such.¹²⁷ Major breakthroughs have often been preceded by high risk-taking, but risk-taking is also associated with a high probability of failure. One of the criteria that the panels have to consider in assessing scientific/artistic quality in FOKUS is novelty and originality, which can at least to some extent favour risk-taking in research. Compared with a purely indicator-based model, which only uses historical bibliometric analysis, FOKUS has the advantage, through peer review governed by criteria such as the one above, of providing greater scope for highlighting and rewarding the potential of research.

There is also a concern that the model could discriminate against doctoral education – that instead of recruiting doctoral students, HEIs will focus on recruiting fewer, but well established, researchers (i.e. safe best). If this were to happen it would, of course, be an undesired development for Swedish research. However, we do not regard it as likely that the HEIs would adopt this strategy. The model has been designed in such a way that, without doctoral students, it is difficult to achieve a high grade in either scientific/artistic quality (the novelty and originality assessment criteria) or quality enhancing factors (the potential for renewal and sustainability assessment criteria), where doctoral education and early career researchers are among the factors.

The number of doctoral students and PhDs will also be included in the background information, so that the panel can see the context and take it into account in its assessment and grading. Doctoral education is also considered indirectly, as the research production to be assessed may include output from doctoral students. This means that good results produced by doctoral students will also be noted and rewarded as good research results within the framework of FOKUS.

On a more general level, the issue of how to treat doctoral education in the resource allocation system is a policy matter, since it involves the use of the block grant – which funds both research and doctoral education.¹²⁸ The Swedish Research Council believes that special incentives to reward doctoral education may be necessary from time to time, in the form of parallel mechanisms in the resource allocation system for research and doctoral education.

A similar concern is that the model would push the university and university college system towards an increased, and undesired, separation of research and teaching staff. The Swedish Research Council's view is that significant synergies can be achieved by increased integration of research and education. In the proposal we have tried to counter separation tendencies by rewarding the integration of research and education as part of the assessment of quality enhancing factors.

The model has not been designed to identify and promote excellence only; its aim is to raise *overall* research quality in Sweden. HEIs are given incentives to make priorities where there is potential for improvement. We do not regard this as in any way detrimental to excellence, since both the top research and overall quality are assessed and since our proposal weights the highest grade slightly more in the process of translating the evaluation result into actual allocation of resources. It should also be pointed that many other funding streams

¹²⁷ For an overview, see Swedish Research Council (2010), *Kollegial bedömning av vetenskaplig kvalitet – en forskningsöversikt*, Vetenskapsrådets rapportserie 4:2010.

¹²⁸ It is estimated that between just under a third and half of the block grant goes to doctoral education; this share would appear to be considerably higher at university colleges and new universities than at the older universities, see Swedish National Audit Office (2011). *Användningen av basanslaget för forskning och forskarutbildning*, RiR 2011:21, p 11.

within the research system are designed more specifically to reward excellence; this applies not least to grants from research councils.

One criticism which has often been heard in discussions about national resource allocation models in a Swedish context is that it is difficult to translate evaluation results into allocations. The Swedish Research Council recognises that this is a challenge, but hardly an impossibility – as demonstrated, not least, by experiences from Britain and Australia. The fact that evaluations affect a part of the block grant can be a driver of quality in itself. It is particularly important in this connection that the conversion of evaluation results into resource allocations is carried out in a transparent manner. At the same time, the Swedish Research Council would like to emphasise that the model itself has been designed to be a driver of quality and provide an improved basis for research policy decisions, even if it were not primarily to be used for resource allocation in the proposed manner, or in some other way.

The impact beyond academia component is a relatively new element of research evaluation. It may possibly be easier for some research areas to demonstrate impact beyond academia than for others. This justifies making the assessment at the field of research level in FOKUS, and that no comparison be made between fields of research. There has been concern that case studies as a basis for assessment will prove a blunt instrument, and worries have been voiced that it will favour those who are merely good at writing a convincing account. However, the model requires that descriptive case studies are verifiable with data. Positive experiences of evaluating the impact of research beyond academia have been made in Britain and Australia, as well as at Swedish HEIs.¹²⁹ In conclusion, the Swedish Research Council's view is that peer review of case studies is preferable to a purely indicator-based system in an evaluation and resource allocation model intended to reward impact beyond academia. It also allows all fields of research to be embraced by the model.

Every evaluation system will have some steering effect. Those being evaluated will adapt to the prevailing criteria and benchmarks. In FOKUS, as in all evaluation systems, there will always be the risk that attempts are made to manipulate the system in various ways in order to maximise outcome. This is, of course, difficult to prevent if someone really puts their mind to it. Nevertheless, the model's intention is that by using diversified material, including information from existing data sources, as the basis for assessment the panels will be able to spot apparent "tricks". The point is that putting a lot of effort into achieving good research should be more profitable than putting that effort into trying to manipulate the system.

¹²⁹ Swedish Research Council (2013). *Kartläggning av olika nationella system för utvärdering av forskningens kvalitet – förstudie inför regeringsuppdraget U2013/1700/F*; Swedish Research Council (2014). *ERA – Excellence in Research for Australia. Rapport inom ramen för Vetenskapsrådets uppdrag Forskningskvalitetsutvärdering i Sverige – FOKUS*.

12 IMPLEMENTATION ISSUES

12.1 Timetable for implementing the model

There are various possible alternatives in respect of a timetable for implementing the Swedish Research Council's proposal. The Swedish Research Council recommends that one or more pilot exercises be carried out first, with the aim of testing various aspects of the proposed methodology and also to provide a basis for any changes to the model as such. The model can then be introduced – initially, we suggest, with somewhat shorter evaluation intervals which will then be extended to the proposed six-year periodicity. We would reiterate in this regard that the model assumes that the evaluations take place *as a single exercise* at the stated times (during limited periods of time), rather than in the form of a continuous evaluation system.¹³⁰

12.1.1 Option 1: Resource allocation under the proposal begins in 2018

The first option considered is one based on the plan outlined in the 2012 Research and Innovation Bill.¹³¹ It states that any distribution of resources based on a model applying peer review of research quality can only be introduced in 2018 at the earliest.¹³² This can be interpreted in several ways, e.g. that the Swedish Riksdag decision on distribution of resources will only be taken in 2018 (or even later). A more rigorous interpretation, however, is that it must be possible to make the decision on how to distribute resources – with reference to a completed initial evaluation – on the basis of proposals made in the budget bill for 2018, i.e. in September-October 2017. In other words, the actual distribution of resources on the basis of the proposed new model will occur for the first time for the 2018 budget year.

This timetable means that the initial national evaluation according to the proposed model must take place in 2016, with the result being submitted to government in the spring of 2017 at the latest. This in turn assumes that the Swedish Research Council's proposal submitted to the government in December 2014 will be circulated for consideration during the first few months of 2015, and that any proposal for carrying out an initial evaluation round can be presented in the 2016 budget bill, i.e. in September-October 2015. It would furthermore mean that additional preparatory measures, e.g. pilot exercises and similar, would have to be carried out in parallel with consultation and drafting processes by the Government Offices during 2015. We estimate that one evaluation round will require at least about a year (12-month period) to complete – see also Section 12.2. With the timetable described above, numerous preparations (e.g. development of the reporting system) – at HEIs as well as at the administrative organisation – would inevitably have to be made in 2015.

The timetable described above clearly does not allow for more extensive testing or pilot exercises of the proposed model. It also means that there would be very little time between the preparations and testing required in 2015 and the implementation of a full-scale evaluation in 2016. Moreover, no special commissions or funds for the further development of the Swedish Research Council's proposal were earmarked in the 2015 budget bill, which was presented in September 2014.¹³³ *The Swedish Research Council therefore makes the overall assessment that this timetable is unrealistic.*

¹³⁰ A system of continuous evaluation would imply a completely different timetable than the one outlined here.

¹³¹ Government Bill 2012/13:30, p 63.

¹³² No such plan is specified in the Government commission to the Swedish Research Council of March 2013, however.

¹³³ Government Bill 2014/15:1.

12.1.2 Option 2: The Swedish Research Council recommends that resource allocation begins in 2019 at the earliest

The Swedish Research Council instead recommends that any proposal for implementation of the model be presented in the research bill expected in the autumn of 2016. This means that first allocation of resources on the basis of the new proposed model would occur, at the earliest, for the 2019 budget year.

In this option, consultation on the Swedish Research Council's proposal should also occur during the first half of 2015. We recommend that preparations for a pilot exercise begin in the autumn of 2015, most appropriately in the form of a commission to the Swedish Research Council and the other authorities involved. During 2016/17, practical pilot exercises would be carried out in which international assessment experts and a selection of HEIs – as well as other authorities such as the National Library, Statistics Sweden and the Swedish Higher Education Authority – would need to be included, requiring the provision of additional resources. The proposed pilot exercises are described in greater detail in Section 12.1.3.

Parallel with the 2016 pilot exercise, all possible preparations for the first evaluation would be made. Following the necessary adjustments to the evaluation model based on the pilot exercises, we recommend that the model be applied on a full scale for the *first time* in 2017/2018. The aim of this recommendation is to enable a relatively quick launch of the new model for resource allocation. The results of the evaluation would be submitted to the government in the spring of 2018, and the grades translated to resources in accordance with e.g. the proposals described in Chapter 9. This would allow for the government's proposal for allocation of resources on the basis of a full-scale evaluation to be presented in the budget bill for 2019, i.e. in the autumn of 2018. Resource allocation in accordance with the proposed new model would then occur for the first time in 2019, at the earliest.¹³⁴

There is also reason, in this connection, to consider the timetable for the national evaluation of clinical research which is to be held under the new ALF Agreement reached on 11 September 2014 between the Swedish state and relevant county councils.¹³⁵ Under the new agreement, which applies as of 1 January 2015, a new model for resource allocation for ALF funding, based on evaluation of the quality of clinical research, will be introduced as of 2019. The evaluation model will include expert assessments of various types of material and indicators such as the conditions for research, the clinical significance of research carried out, and a bibliometric evaluation. The agreement also specifies that an initial independent evaluation of the quality of clinical research is to be carried out in 2017/2018, and further that as of 2019, 20 per cent of ALF funding for clinical research will be distributed on the basis of that evaluation. The state is to carry out the evaluations and bear the costs for their implementation, according to the agreement. More detailed proposals for the design and implementation of these recurring evaluations are to be submitted by an ALF National Steering Committee composed of representatives from all parties involved, and there is thus no reason to speculate here on how the evaluations may come to be organised. Since the proposed FOKUS model for quality-based resource allocation naturally also covers clinical research, we would nevertheless like to emphasise the coordination opportunities, in terms of timing as well as content, the implementation of the first ALF evaluation, as regulated in the agreement, with the first FOKUS evaluation.

As mentioned earlier, Vinnova intends to present the final report of its ongoing commission to develop methods and criteria for assessing HEIs' collaboration with society at large in 2016. This means that, provided the Swedish Research Council is commissioned to carry out pilot exercises of the FOKUS proposal in 2016, a more informed basis will at that time be available for assessing the necessity, and the practical possibilities, of

¹³⁴ The proposed approach and timetable in terms of pilot exercises and implementation of an initial evaluation round are in line with experience and recommendations from the *Australian Research Council* regarding the introduction of the ERA system.

¹³⁵ Government of Sweden, *Avtal mellan svenska staten och vissa landsting om samarbete om utbildning av läkare, klinisk forskning och utveckling av hälso- och sjukvården*. 11 Sep 2014, see <http://www.regeringen.se/sb/d/18270/a/246494>

closer coordination/integration between the Swedish Research Council's and Vinnova's proposals – not least for the purpose of reducing, as much as possible, workloads and work overlap at the country's HEIs.¹³⁶

We recommend that the *second* evaluation round, with the subsequent allocation of resources, be carried out four years later, i.e. 2021/2022, with subsequent resource allocation beginning in 2023, after which it would be extended to the proposed six-year periodicity – meaning that the third evaluation round would be carried out in 2027/28 and resource allocation adjusted accordingly from 2029.

With the aim of avoiding excessive fluctuations in the funding system, the Swedish Research Council would like to point to the possibility of making the distribution, and possible redistribution, of resources as dictated by the national evaluations a gradual process over the period (six years, or shorter initially) between two evaluations. The previous performance-based research funding system should be phased out at the same rate as the new system is introduced.

The proposed timetable for implementing the model, as outlined above, is presented in schematic form in Figure 8 below.

¹³⁶ Similarly, coordination needs and possibilities between the first regulated ALF evaluation and Vinnova's pending final proposal may also need to be considered more closely at this time.

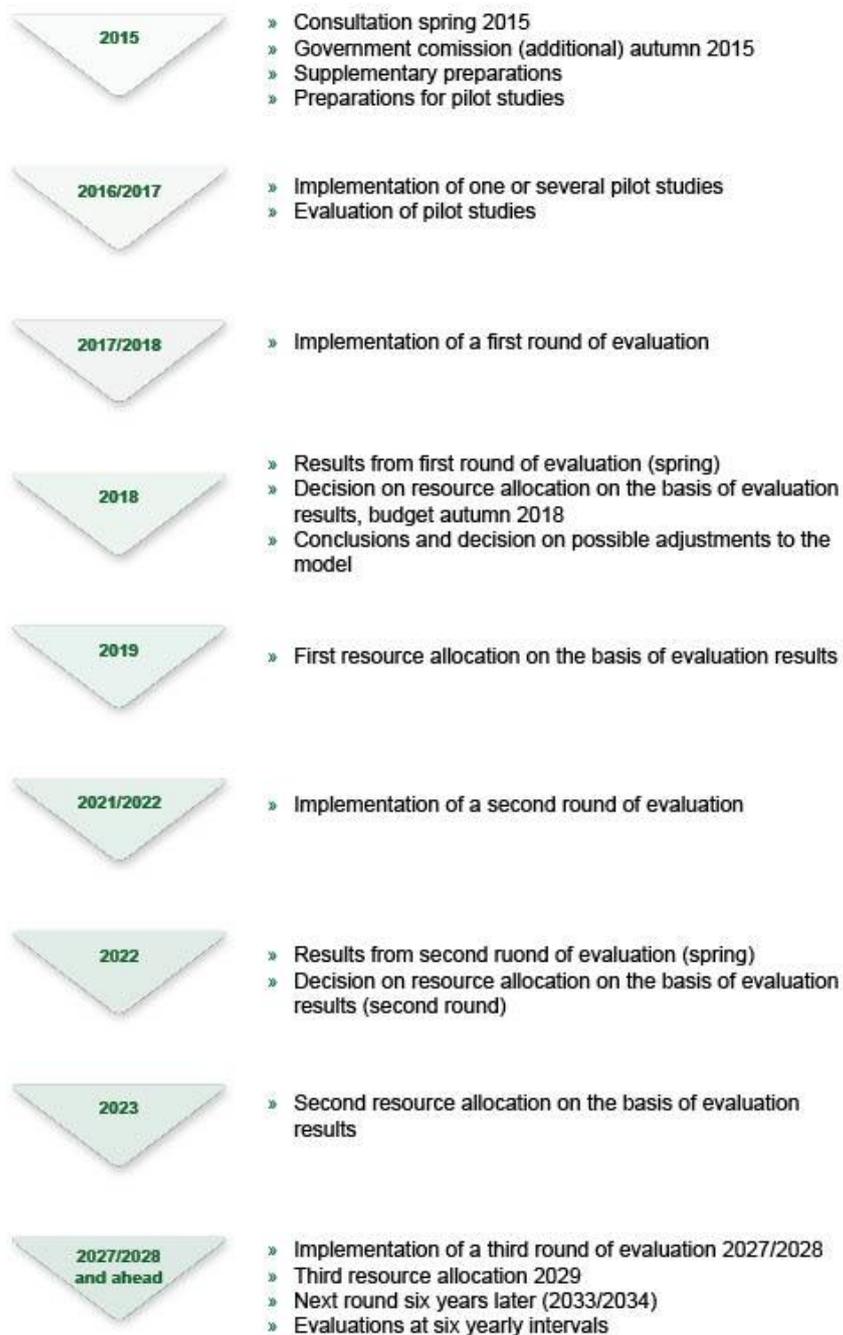


Figure 8. *Flow chart for the timetable proposed in Section 12.1.2, i.e. resource allocation begins in 2019 at the earliest, with a shorter interval initially.*

12.1.3 Pilot exercises 2015–2017

As previously mentioned, the Swedish Research Council recommends that one or several pilot exercises be carried out in order to further develop and adjust the methodology as well as to achieve sufficient consensus among the actors concerned, both inside and outside the Swedish research community, regarding the conditions for and implementation of the model. Pilot exercises will allow for practical testing of various aspects of the proposed methodology, but may also provide input regarding possible changes to the model as such. On the basis of these experiences, a more well-informed decision can be taken about the continued implementation and application of the model in the form of resource allocation.

Preparations for the pilot exercises must begin in the autumn of 2015, possibly in the form of a commission to the Swedish Research Council in consultation with Forte, Formas and Vinnova, as well as the other relevant authorities. In 2016/2017, pilot exercises would be carried out which included both international assessment experts and a selection of HEIs, as well as other authorities such as the National Library, Statistics Sweden and the Swedish Higher Education Authority. Carrying out the pilot exercises will require the provision of additional resources. During the course of the exercises, results will be analysed and discussed with the parties concerned on a continuous basis, and necessary adjustments to the model made. These may concern solutions to practical issues, but also alterations to the model as such. With this timetable, we propose that a first evaluation round using the FOKUS model be carried out in 2017/2018.

The pilot exercise or exercises to be carried out in 2016/2017 vary in character and scope. For data-based material and quality assurance of statistical data – i.e. material that does not need to be specially produced for the evaluation by HEIs – full-scale pilot exercises are required in the sense that they must encompass all HEIs, all the research areas and all requisite statistical information. For the evaluation model itself and its methodology, pilot exercises can readily be carried out using a selection of e.g. fields of research or research areas, HEIs or assessment components. The list below identifies the types of pilot exercises that would need to be carried out on a larger or smaller scale prior to a practical implementation of FOKUS, with a margin for subsequent adjustments. Several of them may need to be tested and adapted jointly rather than separately.

Full-scale pilot exercises comprising all areas and HEIs

- *Procedures for data collection, quality assurance, periodicity and reporting of research-related data, including requisite background information.* This includes procedural reviews at the authorities responsible for statistics, Statistics Sweden and Swedish Higher Education Authority, in consultation with the Swedish Research Council and in dialogue with the HEIs.
- More detailed testing of *threshold values for inclusion in the evaluation.* This includes testing reasonable thresholds for staff and production volumes. It also includes deciding how bibliometric analyses should count books, chapters and other publication types in relation to scientific articles.
- Testing of *data quality in SwePub.*
- Testing and adjustment of the proposed *classification into research areas*, in close cooperation with representatives of the areas.

Pilot exercises that may include a selection of areas, HEIs or assessment components

- For the scientific/artistic quality assessment component, *different types of evaluation material* must be tested in research areas with different publication traditions, with reference to access, selection and assessment. This applies to research areas with bibliometric information/citation analysis, research areas in which external review of research outputs must be used, including research areas with non-traditional output (such as artistic research). As this implies that representatives of the areas need to agree on the type of material that should be used nationally for each research area in question, it appears likely that all research areas will be affected – although perhaps not necessarily all HEIs.

- Testing of how *interdisciplinary research is handled* within FOKUS. Here, pilot exercises in different fields of research must be carried out for the entire evaluation process, from data reporting to the panels' final results in the form of grade profiles and explanatory statements.
- Testing of the *more detailed composition and scope of the panels, and of external reviewers*. For all assessment components, the panels' composition and working methods must be tested on the basis of e.g. the estimated extent of the evaluation material for different research areas and fields of research. This also includes drawing up guidelines for the external reviewers' working methods and testing suitable threshold values for their work input.
- For the *quality enhancing factor* assessment component, access to different types of data must be tested, as well as the quality and usability of the data. This refers to all elements of the component, i.e. doctoral education and early career researchers, collaboration and mobility within academia, collaboration, partnerships and mobility beyond academia, integration of research and education, and gender equality.
- Testing of the model for assessing *impact (the case study methodology)*. In this pilot exercise it is important to include examples from all five fields of research. Testing will cover the entire evaluation process, from HEIs' reporting of data to panels' assessment and grading.
- Testing of *design and use of the five-point grading scale*, of how the proposed *weighting of grades* turns out, and how *explanatory statements* can and should be formulated. Testing here must be done in different research areas and for all assessment components (i.e. scientific/artistic quality, quality enhancing factors and impact beyond academia).
- Testing of *grade profiles* for scientific/artistic quality. Testing can be carried out using a selection representing all fields of research and different publication traditions.
- Testing of the proposed *chair conferences*. Special chair conferences are proposed for the research area panels, with the aim of ensuring calibration between the panels. It is very important that calibration works, and it is therefore important to test and draw up the necessary instructions for the chair conferences. This applies not least in the cases where research areas with different publication traditions/types of assessment material (bibliometric information or opinions from external reviewers regarding publications or non-traditional material) are in the same field of research.¹³⁷ A further issue to address is the management of interdisciplinary research, including the possibility of referring assessments of interdisciplinary research back to the research area panels concerned. These aspects of the chair conferences' brief need to be tested for one or several fields of research with associated research areas.

12.2 Overview of the evaluation process as proposed in the model

Figure 9 below illustrates the practical implementation of an evaluation round estimated to require at least about a year (twelve-month period) to complete.

¹³⁷ Cf. section 5.3.2.



Figure 9. *Flow chart for an evaluation round*

12.3 Organisation

In a research funding system it is important to have diversity in the sense that there are different funding streams. Diversity of funding is regarded, not least, as a reflection of academic diversity, which by extension provides greater resistance to excessive fluctuations.¹³⁸ The *dual support system* used in most countries is intended to give governments two main instruments for distributing research funds: as direct grants to HEIs or as project and programme funds via research councils. The system presupposes that the two instruments are kept apart and that, for example, both instruments are not controlled by the same organisation.

For this reason, the arrangement in most countries is that a special authority or organisation is charged with carrying out evaluations using expert assessments of research – and often also of higher education – which will, in different ways and to different degrees, be used as a basis for resource allocation. Examples of such organisations include HEFCE in Britain¹³⁹, TEC in New Zealand¹⁴⁰, ANVUR in Italy¹⁴¹ and AERES in France¹⁴². In Australia, by contrast, responsibility for the ERA evaluation system lies with the largest research council, ARC (*Australian Research Council*). However, ERA is organisationally a completely separate activity within ARC, with its own IT system, for example.¹⁴³

The government commission does not specify where the responsibility for implementation of the evaluation model will lie. It follows that it will be possible to exercise this responsibility in two different ways: either as the remit of a research council, most aptly the Swedish Research Council, or as the role of a special authority charged principally with the evaluation of research (and perhaps of higher education).

It has been the Swedish Research Council's intention to make the proposal in an organisationally neutral manner, i.e. allowing for different organisational solutions. However, as the Swedish Research Council possesses the necessary institutional competence, and also extensive experience of recruiting and working with international scientific experts, the Council would be prepared to take on a possible implementation. Should the responsibility for FOKUS be entrusted to the Swedish Research Council, its organisational forms would need to be reviewed, e.g. along the lines of Australia's ERA. Regardless of the final organisational solution, we propose that responsibility for the pilot exercises be entrusted to the Swedish Research Council.

Independently of the administrative organisation, we also propose that two advisory bodies be created to monitor the process and offer opinions to the responsible organisation/authority in connection with the implementation of the evaluation model. One of these advisory bodies should include representatives of the higher education sector. The other advisory body should include international scientific and specialist evaluation experts with experience of similar evaluation activities in other countries. The advisory bodies are to be informed of, monitor and be able to comment on the evaluation process, from the planning through the implementation and conclusion stages. The advisory bodies' experiences and opinions are then to be summarised in a final report submitted by each following the evaluation. It is also important that time and resources be allocated to regular meta-evaluations of FOKUS, for analysis of its effects and consequences.

In addition to these two more formalised groups, it is important that representatives of businesses, public authorities, municipalities and county councils and other organisations concerned also be given the opportunity to follow the process and offer opinions to the organisation in charge, in connection with the process itself.

¹³⁸ Eriksson, L. & Heymann, U. (2014). *Resurser för utbildning och forskning*, Association of Swedish Higher Education, April 2014.

¹³⁹ Higher Education Funding Council of England, (<http://www.hefce.ac.uk/>)

¹⁴⁰ Tertiary Education Commission, (<http://www.tec.govt.nz/>).

¹⁴¹ Agenzia Nazionale di Valutazione del Sistema Universitario e della Ricerca (Italian National Agency for the Evaluation of the University and Research System), (<http://www.anvur.org/index.php?lang=it>).

¹⁴² Agence d'évaluation de la Recherche et de l'enseignement supérieur (French Evaluation Agency for Research and Higher Education), (<http://www.aeres-evaluation.com/>)

¹⁴³ Swedish Research Council (2014). *ERA – Excellence in Research for Australia. Rapport inom ramen för Vetenskapsrådets uppdrag Forskningskvalitetsutvärdering i Sverige – FOKUS*.

13 MODELS FOR RESOURCE ALLOCATION IN OTHER COUNTRIES

It is stated that the government commission should include a comparison with other relevant countries' models for resource allocation based on research quality, looking at aspects such as costs in relation to results for research quality, relevance, beneficial use and effects on collaboration with society at large, etc. This chapter will describe systems for performance-based research funding in a number of countries, but with the main focus on Britain, Australia, the Netherlands and Italy. Comparisons are made of e.g. the scope of the evaluation material and the panels. It also looks at how societal relevance is assessed and analyses costs and efficiency. The chapter concludes with a description of the continued international development of systems for performance-based research funding.

13.1 Background

National systems for performance-based research funding of block grants have been introduced in various countries' research policies as part of an international trend. At the same time, the systems are usually deeply rooted in national research systems and traditions, making direct comparisons between them difficult. It is also difficult to see a clear connection between different countries' resource allocation systems and their research performance, as well as to identify and analyse how costly evaluation systems are in relation to their expected benefits. There is nonetheless a trend towards more complex and composite systems, as countries are influenced by each other and adopt each other's methods.¹⁴⁴ At the same time, current systems are subject to constant discussion and development.

Throughout the work on FOKUS, lessons have been drawn from corresponding systems in other countries. A study visit was made to Britain in the run-up to the project (February 2013), and a preliminary study¹⁴⁵ of a number of different national systems was carried out, in which the British REF system (*Research Excellence Framework*) in particular is described in detail, while other countries' systems, e.g. Italy's VQR (*Valutazione Quinquennale della Ricerca*), are outlined. A detailed report on Australia's ERA system (*Excellence in Research for Australia*) is also among the background documents¹⁴⁶, and is based on written sources and interviews with representatives of the Australian research sector, including information which emerged during a visit by the *Australian Research Council* (ARC) to Stockholm in June 2014. A study visit was made to the Netherlands in October 2013, and the conclusions from that visit are included in a report on that country's quality evaluation system according to the *Standard Evaluation Protocol* (SEP).¹⁴⁷ SEP is not used as a basis for resource allocation of block grants, but has provided the FOKUS project with experience from a national system for evaluating research at HEIs. Additionally, the International Advisory Board, with nine experts from seven different countries, has contributed valuable knowledge about the advantages and disadvantages of various systems.

The different countries' systems have been compared in a number of surveys, e.g. in the government review *Prestationsbaserad resurstilldelning för universitet och högskolor* (2011)¹⁴⁸ and in an external analysis by the

¹⁴⁴ See e.g. Sivertsen, G. (2014). Performance-based funding. Presentation given at the workshop *The effectiveness of national research funding systems*, Brussels, 6 May 2014.

¹⁴⁵ Swedish Research Council (2013). *Kartläggning av olika nationella system för utvärdering av forskningens kvalitet – förstudie inför regeringsuppdrag U2013/1700/F*.

¹⁴⁶ Swedish Research Council (2014). *ERA – Excellence in Research for Australia. Rapport inom ramen för Vetenskapsrådets uppdrag Forskningskvalitetsutvärdering i Sverige – FOKUS*.

¹⁴⁷ Swedish Research Council (2013). *Kvalitetsutvärdering av forskning i Nederländerna – rapport från studiebesök i oktober 2013 för projektet FOKUS*.

¹⁴⁸ Flodström, A. (2011). *Prestationsbaserad resurstilldelning för universitet och högskolor*.

Swedish Agency for Growth Policy Analysis (2012).¹⁴⁹ Other sources include the OECD report *Performance-based Funding for Public Research in Tertiary Education Institutions* (2010)¹⁵⁰, a survey by Hicks (2012)¹⁵¹ and a survey by Nelhans and Eklund (2014).¹⁵²

13.2 Different types of systems for performance-based research funding

Research evaluations carried out in different countries differ in terms of their aim and scope. It is therefore important to define what distinguishes a national evaluation system for performance-based research funding from other types of quality evaluations. A performance-based research funding system refers to a *country-wide* system for the evaluation *ex post* (i.e. in retrospect) of research at HEIs, and is to be *used as a basis for resource allocation of block grants* to the HEIs.¹⁵³ Another distinguishing characteristic of such systems is that they *evaluate research output* – in other words, not just performance in terms of the number of qualifications awarded, external research funds etc. As defined by these criteria, there are currently around fifteen countries using national and comprehensive quality evaluation systems for performance-based research funding. The possibility of introducing such systems is also being studied in other countries – see the list of systems in Table 6 below.

Table 6. *Overview of current national systems for performance-based research funding*

Country and year of implementation	Current system	Model for evaluation	Responsible authority/organisation	Comment
Britain (UK) 1986	REF 2014 (Research Excellence Framework)	Peer review	HEFCE (Higher Education Funding Council of England)	Previously: 1996–2008 RAE (Research Assessment Exercise)
Australia 2010	ERA 2012 (next in 2015) (Excellence in Research for Australia)	Indicators and peer review	ARC (Australian Research Council)	Previously: Composite Index, RQF (Research Quality Framework)
Italy 2003/2011	VQR 2004–2010 (Valutazione Triennale della Ricerca)	Indicators and peer review	ANVUR (Agenzia Nazionale di Valutazione del Sistema Universitario e della Ricerca)	
Hong Kong 1993	RAE 2014 (Research Assessment Exercise)	Peer review	University Grants Committee	
New Zealand 2003	PBRF 2012 (Performance-based research Funding)	Peer review	Tertiary Education Commission	Level: individual researchers

¹⁴⁹ Swedish Agency for Growth Policy Analysis (2012). *Hur fördelas statsanslag till forskning och utbildning – en omvärldsanalys*. Svar direkt 2012:07.

¹⁵⁰ OECD (2010). *Performance-based Funding for Public Research in Tertiary Education Institutions: Workshop Proceedings*.

¹⁵¹ Hicks, D. (2012). Performance-based University research funding systems. *Research Policy* 41, pp. 251–261.

¹⁵² Nelhans, G. & Eklund, P. (2014). *Resursfördelningsmodeller på bibliometrisk grund vid ett urval svenska lärosäten*, University of Borås.

¹⁵³ Hicks, D. (2012). Performance-based University research funding systems. *Research Policy* 41, pp. 251–261.

Belgium (Flanders) 2003/2008	BOF-Key	Indicators	Steunpunt O&O Statistieken	
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Poland 1991	KBN Statutory Funding 'Parametric method'	Indicators	KNB Committee for Scientific Research	System revised in 1998
Spain 1989	Sexenio	Peer review	CNEAI National commission for the Evaluation	Level: individual researchers
Portugal 1996/2013	R&D Unit Evaluation Funding 2013	Peer review and indicators	FCT Science and Technology Foundation	FCT's research groups; ESF administered the evaluation in 2013
Slovakia 1992		Indicators		Revised in 2002
Norway 2003/2006	Publiseringskanaler	Indicators (graded publications)	UHR Universitets- og Høgskolerådet	
Denmark 2012	BFI Den Bibliometriske Forskningsindikator	Indicators (graded publications)	UFM Uddannelse- og Forskningsministeriet	
Finland 2015	Publikationsforum	Indicators	Undervisnings- och kulturministeriet	
Sweden 2009		Indicators		
Czech Republic 2010 (<i>new system in 2017?</i>)		Indicators	Council for Research, Development and Innovation	New system being developed
<i>Russia</i>			Russian Scientific Fund	Under development, concerns research institutes

Netherlands 1993	SEP Standard Evaluation Protocol	Peer review		Not basis of resource allocation
Germany	Forschungsrating	Peer review	Wissenschaftsrat	Not basis of resource allocation

The first nationwide performance-based research funding system was introduced in Britain in 1986, with the primary aim of distributing a reduced research budget on the basis of research performance and quality. The British system (from 1996 *Research Assessment Exercise*, RAE, and since 2014 REF) comprises regular evaluation rounds based on peer review, and has served as a model for several other countries including Hong Kong, New Zealand, Australia and Italy. Italy's system, VQR, is described as using indicator-informed peer review, and Portugal's *R&D Unit Evaluation* can be classified in the same way. Australia's ERA system (2010, 2012 and again in 2015) applies peer review on the basis of bibliometric indicators, supplemented on some subject panels with external peer review. The Nordic countries and Flanders use systems based only on metric indicators such as publications and citation analysis.

The Netherlands and Germany also have national quality systems based on peer review, but they are not (as yet) linked to resource allocation. The Netherlands has a strong tradition of evaluating its research institutions and their research, while Germany's *Research Rating* has so far only been carried out as pilot exercises by subject. Since 2012, however, the Netherlands has a separate, indicator-based element (so far only for the

education aspect) that exposes five per cent of the research block grant to competition.¹⁵⁴ The performance-based systems for resource allocation in use today can be grouped into systems that are wholly indicator-based, systems that use indicator-informed peer review and systems based mainly on peer review. They can also be grouped according to the level of the units they evaluate, i.e. individuals, institutions, subjects or universities. The figure below summarises different types of performance-based research funding systems.

Figure 10. *Different types of performance-based research funding systems*¹⁵⁵



13.3 Aims of introducing a performance-based system of research funding

By definition, a performance-based research funding system aims to provide a basis for the distribution of research resources – yet countries with such systems choose to put more or less emphasis on resource allocation as a principal aim. Quality, excellence and benefit are frequently-recurring words in mission statements, and most countries want the systems to be drivers of quality for the research carried out at their HEIs.

13.3.1 Selective resource allocation based on quality

One specific aim in Britain is to distribute, through previous RAE rounds and now with REF 2014, a significant part (25-30 per cent, equivalent to about SEK 18 billion in 2013) of block grants selectively according to quality and other indicators. Over the years, distribution keys have changed to decrease or increase selectivity, and in recent years resource allocation based on quality has led to a concentration of resources going to a small

¹⁵⁴ Swedish Research Council (2013). *Kvalitetsutvärdering av forskning i Nederländerna – rapport från studiebesök i oktober 2013 för projektet FOKUS*.

¹⁵⁵ Modified after Hicks, D. (2010). Overview of models of performance-based research funding systems. OECD (2010), *Performance-based Funding for Public Research in Tertiary Education Institutions: Workshop Proceedings*.

number of successful universities, while at the same time increased research quality cannot be linked to the same extent to these universities, but has rather occurred overall.¹⁵⁶

The Higher Education Funding Council of England (HEFCE) comes under *Ministry of Education* and is responsible for distributing the funding between subject areas. This is carried out on the basis of the share of reporting units within a subject area that receive a high grade in the evaluation.

The distribution of grants is also the main purpose of Hong Kong's RAE 2014.¹⁵⁷

13.3.2 Drivers of quality

A national system for evaluating research allows for national mapping and national comparisons, which in turn can be drivers of quality. In addition to providing the basis of selective resource allocation, the REF 2014 evaluation is also intended to enable benchmarking, for comparisons between universities.

The primary purpose of Australia's ERA 2012 is to map where the quality in research lies. With ERA, Australia wants to highlight areas of strength, identify development potential and describe research development over time in order to develop Australian research through a dialogue between the government and academia. Since the share of research resources distributed through ERA is relatively small, universities choose to participate in ERA for their reputation rather than to obtain more research funds. International university education is Australia's third biggest export, and ERA is an important advertising tool. ERA is seen to have had a marked effect on the position of Australian universities in international rankings.

In New Zealand, the goal is to guarantee and reward excellence in university research, with the focus on individuals.

The primary goal of Italy's VQR 2004–2010 is to provide a qualitative overview of research in Italy, and to introduce an element of competition and increased meritocracy at the country's universities.¹⁵⁸ For countries where the emphasis is on bibliometric indicators, such as Denmark and Norway, expectations for the system may include, in addition to being a general driver of quality, encouraging researchers to publish in well-reputed publication channels, and in Finland the goal is a "high-quality, profilised and effective international university".¹⁵⁹

13.3.3 Accounting for the relevance and impact of research

HEFCE introduced REF 2014 in the hope that university funding would develop and guarantee a dynamic and internationally-competitive research sector, contribute to national wealth and to the spreading of knowledge. One of the main goals is to account for how public funds are invested in research and the benefit society gains from the investment, as well as to reward HEIs that work to make research results useful to society. Even if Britain were the first country to introduce *impact* as part of the evaluation, their requirement for *accountability* is echoed as an aim in several other countries, among them Australia and the Netherlands. In the Netherlands, the system by which HEIs themselves are responsible for carrying out evaluations under SEP developed as a consequence of the country's autonomy reform in the higher education sector, which brought an expectation that HEIs would in return introduce systems for quality assurance of both research and education.

¹⁵⁶ Adams, J. & Gurney, K. (2010). Funding selectivity, concentration and excellence – how good is the UK's research? *Hepi* 46.

¹⁵⁷ University Grants Committee, *Research Assessment Exercise 2014, Guidance Notes* (June 2014). http://www.ugc.edu.hk/eng/doc/ugc/rae/gn_201406.pdf

¹⁵⁸ Owens, B. (2013). Judgement Day. *Nature* vol. 502, pp. 288–290.

¹⁵⁹ Ministry of Education and Culture (Finland), *Ett förslag till finansieringsmodell för universiteten fr.o.m. år 2013*

(<http://www.minedu.fi/OPM/Julkaisut/2011/yliopistot.html?lang=sv>) (http://www.minedu.fi/OPM/Julkaisut/2011/yliopistot.html?lang=sv&extra_locale=en)

13.4 The evaluation process

The following section will compare the systems in Britain, Australia, Italy and the Netherlands with respect to elements of each system's evaluation process.

13.4.1 The panels

The number of panels and their breadth in terms of subjects varies between the different systems. One important difference in the evaluation processes is whether the panel members themselves review research outputs or rely on external reviewers. Another difference is the proportion of international reviewers on the panels or among the external reviewers.

Table 7. *Comparison between the evaluation systems in Britain, Australia, Italy and the Netherlands*

	Panel structure	Expert review	Nomination
Britain – REF	4 main panels 36 sub-panels In total approx. 970 experts (of whom approx. 200 are representatives of interest groups).		Open nomination by 1950 nominating bodies (not universities) from a nominated pool of 4000 experts (2010).
Australia – ERA	8 panels with a total of 147 experts (2012), few of them international. Researchers only, no representatives of interest groups.	External reviewers from a pool of 1000 international researchers. In 2012, 867 external reviewers were used.	Appointed by ARC following nomination by HEIs.
Italy – VQR	14 panels with 450 experts; the number of experts (10–70) in each panel depends on the number of evaluation units.	Approx. 14 000 external reviewers, of which about 20 % are international experts.	Appointed by ANVUR
Netherlands – SEP	Expert panel with 6–8 international experts for each research unit.		Appointed by the respective board (universities, NWO, KNAW) in consultation with the research unit.

In REF 2014, research output is assessed by 36 expert panels corresponding to the reporting units. These sub-panels work under the auspices of four main panels which have developed specific assessment criteria for their sub-panels and which are also responsible for the assessment result. The 36 sub-panels have a total of just under 1000 members – between 10 and 30 on each one. The majority of these members are scientific experts, but each panel has added 2–6 experts who are users of research who are to contribute an assessment of the impact of research. Compared with RAE 2008 (67 sub-panels and 15 main panels), REF 2014 uses fewer and broader panels in order to achieve a more uniform working method. The total number of experts is about the same, however.

In ERA 2012, the evaluation was carried out by eight panels with a total of 147 members, assisted by a pool of about 1000 external reviewers, while Italy's VQR 2004–2010 was carried out by 14 subject panels and a very large number of external reviewers.

The majority of the panel members in REF 2014 are British reviewers. The justification for this is that Britain is big enough for conflicts of interest to be avoided, and that a system of international experts would be too expensive. ERA 2012, too, uses mainly Australian panel members and external experts. The principal argument here for using mostly national reviewers is the cost of flying international ones in. Italy's VQR had

about 20 per cent international experts among its external reviewers, and the Dutch evaluation system uses mainly international experts.

13.4.2 Assessment material

In order to make the evaluation system manageable, the volume of research output reviewed has to be kept within reasonable limits. Material and selection is therefore handled slightly differently in Britain, Italy and Australia. While REF 2014 only assesses a narrow selection of researchers and output, ERA assesses the total research output of all the country’s researchers.

REF 2014 comprises 155 institutions and upwards of 54 000 full-time researchers, which is only equivalent to 28 per cent of the total number of researchers. Each researcher was asked to contribute four research outputs from 2008–2014, but as many as 29 per cent of participating researchers contributed less than the stipulated number of works, which is partly explained by the large share (18 per cent) of young researchers, who had not yet published a sufficient number of articles. In total, more than 190 000 research outputs were submitted. The universities themselves decide which panel to send a contribution to. In addition to quantitative data (number of staff, information about doctoral qualifications and external resources), publication details are provided, and case studies describing specific societal impacts during the evaluation period.

Italy’s whole body of researchers participated in the country’s VQR, but with a limited number of research outputs (three for university teachers and six for full-time researchers at e.g. research institutes).

An interesting difference between REF and VQR is that in Britain’s RAE/REF all changes to assessment guidelines and criteria that had occurred since the last evaluation were published ahead of the following one, to inform all parties well before submission deadlines, while the universities in Italy only received the same information regarding VQR when the reference period (2004–2010) had already expired.¹⁶⁰

ERA 2012 measured all research output from all researchers. Over 400 000 research outputs were submitted in 2012, providing a complete and comprehensive picture of the country’s researchers and research. This is regarded as a great advantage, since the primary aim of the system is to map research and research quality throughout the country.

A study from 2009 indicates that research performance in New Zealand has improved since the system was introduced.¹⁶¹

Table 8. *Summary of what is included in the assessment material in Britain, Australia, Italy, the Netherlands and New Zealand*

	Selection	Number of researchers evaluated	Number of research outputs	Peer review and/or citation analysis	Comments
UK – REF 2014	Selection made by HEIs: 155 units; 28 % of all researchers; 4 publications per researcher	52 100*	191 200	Mainly peer review, no formal bibliometrics; indicators as supporting evidence	* of a total of 185 600 researchers

¹⁶⁰ Rebora, G. & Turri, M. (2013). The UK and Italian research assessment exercises face to face. *Research Policy* 42, pp. 1657–666.

¹⁶¹ Smart, W. (2009). The impact of the performance-based research fund on the research productivity of New Zealand universities. *Social Policy Journal of New Zealand* 34, pp. 136–151.

<https://www.msd.govt.nz/about-msd-and-our-work/publications-resources/journals-and-magazines/social-policy-journal/spj34/34-impact-on-research.html>

Australia – ERA 2012	All researchers and all publications	60 700	413 500	Some areas/panels only peer review, others only citation analysis	
Italy – VQR 2004–2010	All researchers; 3–6 publications per researcher	61 800	185 000	Peer review in all panels, share of citation analysis dependent on subject	
Netherlands – SEP (continuous)	All researchers/units and all research evaluated continuously over a period of six years	Approx. 53 700**		Peer review	**total number of researchers in NL; 150-200 units evaluated per year
New Zealand – BPRFS 2012	All researchers	Approx. 10 000		Peer review	

13.4.3 Expert assessment and bibliometric indicators

A significant difference between the different national systems lies in how expert assessment (peer review) and/or bibliometric indicators (citation analysis) are used as assessment methods for evaluation on the different panels.

REF 2014, Hong Kong’s RAE 2014 and Italy’s VQR 2006–2010 are all systems in which expert assessments are carried out on all panels. Citation analysis in REF 2014 is not formalised as a method, but instead is used only as a further source of information for assessments on some panels in natural sciences and medicine. Italy’s VQR used “indicator-informed expert assessments”, with evaluations in areas such as natural sciences, medicine, mathematics, technology and to some extent economics and statistics carried out using both expert assessment and citation analysis. The proportion of expert assessment varied between just under 25 per cent (chemistry) to almost 100 per cent (ancient history, linguistics, comparative literature and history of art). Taking all 14 panels into account, more than half of the research outputs were assessed through peer review.¹⁶²

ERA 2012 is described as an indicator-based system that uses peer review where bibliometric indicators cannot be used. Panels can decide to use either peer review or citation analysis as a basis for their assessment. In the areas where the share of publications indexed in journal databases was less than half of the total sum of works for a subject area, peer review was regarded as a more reliable method. The assessment method was determined by means of consultations and workshops with the sector. The ERA evaluation is regarded as having proven that citation analysis can be used as the principal assessment basis for quality in many research areas.¹⁶³

13.5 Societal relevance and impact

In Britain, the *impact* of research was first introduced as a component of the quality assessment in REF 2014. Impact is defined as “*an effect on, change or benefit to the economy, society, culture, public policy or services, health, the environment or quality of life, beyond academia*”. Every submission from a unit must include both

¹⁶² See table 3.3 in ANVUR (2013). *Valutazione della Qualità della Ricerca 2004-2010 (VQR 2004–2010) Rapporto finale 30 Giugno 2013*.

¹⁶³ See e.g. Sheil, M. (2014). Perspective: On the verge of a new ERA. *Nature* 511, p 67.

case studies and a statement of the HEIs' strategies for increasing the impact of research. The main element is the case studies, however, whose number is proportionate to the number of staff included in the university's submission. Impact makes up 20 per cent of the block grant distributed on the basis of REF.

In preparation for REF 2014, an international review of comparable impact assessment methods was made, with the greatest source of inspiration being the Australian evaluation system then still in its planning stages, *Research Quality Framework (RQF)*, in which research groups were to submit examples of their high impact research. However, RQF was never implemented due to a change of government, and the current Australian ERA system contains no such impact component.¹⁶⁴

In 2010, a REF pilot exercise was carried out of case study methodology for research impact. This was supplemented with special workshops to highlight impact issues in the humanities and in some areas of social science. The general conclusion from the pilot exercise and the workshops was that it was possible to introduce impact as an element of the system for all subject areas by using case studies that describe the effects of research results from a broader societal perspective. A further conclusion from the study was that accounting for impact implies a real, and not negligible, effort on the HEIs' part but that this effort was deemed reasonable in relation to the value it added. The evaluation of the impact pilot exercise also showed that the composition of the panels, i.e. with societal and scientific experts on the same assessment panel, worked well. The study also led to a clearer responsibility being laid on the HEIs, in REF 2014 this implied they would present, structure and limit information in the case studies in such a way that the panels could make their assessment without having to seek or request further information.¹⁶⁵ The outcome of impact as an assessment component in REF will – as explained in greater detail in Section 5.5 – be analysed in a special project following publication of the results in December 2014.

In the Netherlands' system for evaluation of university research under SEP (*Standard Evaluation Protocol*), societal relevance has been included for some time, and its role has become increasingly prominent. According to the current SEP (2009–2015), the *societal relevance* criterion refers to the social, economic and cultural relevance of research. Here the HEI can specify which aspect of societal relevance it wishes to evaluate: *societal quality of work* (how the institute/research group interacts productively with users of research), *societal impact of the work* (how the research has affected specific users or specific processes in society) and/or *valorisation of work* (how the HEI is working actively to make research results available and adapted for use in products, processes and services).

In the latest revision of SEP (2015–2021), even more emphasis is placed on societal relevance. It assesses the quality, scope and relevance with which research is directed at specific economic, societal and cultural user groups, how research is used as evidence to back policy, how it contributes to the general societal debate etc. The assessment is made in three dimensions: the products themselves (articles, books, data, designs, prototypes etc.), use of the products, and demonstrable signs that the products are valued, scientifically or by society. The highest assessment category is for research units that “make an outstanding contribution to society”.¹⁶⁶

The increasing emphasis on societal relevance in the Netherlands' research evaluations has led to the ERiC project (*Evaluating Research in Context*) and a guide to how societal relevance is to be evaluated, among other

¹⁶⁴ Grant, J., Brutsche, P-B, Kirk, S., Butler, L. & Wooding, S. (2010). *Capturing Research Impacts. A review of international practice*, RAND Europe. http://www.rand.org/content/dam/rand/pubs/documented_briefings/2010/RAND_DB578.sum.pdf

¹⁶⁵ A report is available with the findings of the panels (chairs of the five pilot panels – *Research Excellence Framework impact pilot exercise: Findings of the expert panels* (HEFCE, November 2010). The HEIs' opinions and experiences were summarised in a report from Technopolis – *REF Research Impact Pilot Exercise. Lessons-Learned Project: Feedback on Pilot Submissions, Final report*, November 2010. Five reports were presented (one for each evaluation unit in the pilot exercise) with 5–6 “*impact case studies*” for each evaluation unit that had received positive opinions from their respective pilot panel and in which the aim was “*to indicate good practice in terms of the pilot submissions*”. See <http://www.ref.ac.uk/background/pilot/>. Conclusions from the special workshops carried out are presented in *Workshops on the impacts of research in the practice-based creative and performing arts, the humanities and social sciences* (HEFCE, December 2010).

¹⁶⁶ KNAW, VSNU, NWO (2014). *Standard Evaluation Protocol 2015–2021. Protocol for Research Assessments in the Netherlands*, p 8. <https://www.knaw.nl/nl/actueel/publicaties/standard-evaluation-protocol-2015-2021>.

things. Relevance is defined here as 1) the extent to which research contributes to and creates an understanding of the development of societal sectors and practice, and how they contribute to solving social problems, and 2) a well-founded expectation that the research will provide such a contribution in the short or long term.¹⁶⁷

13.6 Resource allocation based on quality evaluation

The block grant’s share of total state funding of university research varies a great deal between countries, as does the share the block grant makes up of universities’ research revenue. The share of the block grant that is performance-based also varies, as does how this share affects the actual outcome for HEIs in different countries. It is with these reservations in mind that the figures presented in various sources should be compared, see compilation in Figure 11. Furthermore, resources need to be considered in relation to the structure and size of the research system, such as the number of universities and researchers.

In Britain, the share of state research funds distributed through the research councils is considerably bigger than the share distributed in the form of block grants to universities, while in Australia they are about equal in size. In Italy, a larger share of state research funds is distributed in the form of direct block grants.¹⁶⁸

A significant part of the block grant in Britain is distributed through RAE/REF, and of that share (GBP 1.6 billion in 2014/2015) 65 per cent is based on the quality of research output, 20 per cent on the impact assessment, and 15 per cent on the assessment of the research environment. In Australia, ERA results are used to distribute a part (67 per cent) of the block grant known as the *Sustainable Research Excellence Grant* and which makes up seven per cent of the total sum of block grants. This means that ERA only influences four per cent of the total block grant.



Figure 11. *Approximate share of the block grant for research distributed on the basis of quality evaluations*

¹⁶⁷ Rathenau Instituut (2010). *Evaluating the societal relevance of academic research: A guide*. http://www.rathenau.nl/uploads/tx_tferathenau/ERiC_guide.pdf

¹⁶⁸ In Sweden, just over 40 per cent of HEIs’ revenue for research and doctoral education is a block grant, and just under 60 per cent grants from e.g. research councils, other public authorities, foundations and businesses.

13.7 Cost and effectiveness

It is difficult to identify and analyse how costly the evaluation systems in other countries are in relation to the expected benefit. The systems' cost effectiveness is influenced by the balance between the distribution of state block grants for research and research funds distributed in competition, through research councils and other funding bodies.¹⁶⁹ Geuna and Piolatto have tried to compare cost effectiveness between RAE/REF and VQR, and have concluded that these systems are more cost effective than project funding through state research councils when it comes to distributing state research funds that universities compete for.¹⁷⁰

According to available figures, Australia's ERA (2010, 2012 and preparations for 2015) costs about SEK 277 million, which can be estimated at around one per cent of the universities' block grants over a three-year period.¹⁷¹ The Australian Research Council (ARC) has an annual budget of approx. SEK 44 million for administering the system. The ARC estimates that about a quarter of the costs revert to the universities in the form of fees paid to experts.

The estimated total cost of Britain's previous system, RAE 2008, was SEK 700 million, of which costs for the university sector were SEK 550 million and costs for HEFCE's administration about SEK 150 million. That comes to a total of about one per cent of the approx. SEK 70 billion to be distributed via RAE over the entire six-year period.¹⁷²

The total cost for Italy's VQR 2004–2010 was calculated at SEK 590 million, of which administrative costs were SEK 95 million, and is estimated to represent between 2.2 and 3 per cent of total distributed research funds.

The most recent evaluation in New Zealand cost around SEK 200 million, which is approx. 1.3 per cent of the total SEK 15.3 billion distributed through the *Performance Based Research Fund* (PBRF) between 2004 and 2016.

In planning a new, performance-based system for allocating block resources, the Czech Republic has decided that the system is to cost less than one per cent of the funds distributed over a five-year period.

For FOKUS, costs are estimated at approx. one per cent of the performance-based part of the block grant, which indicates a comparatively cost-effective proposal, see also Chapter 10.

13.8 Continuing development of systems for performance-based research funding

A survey of systems for performance-based research funding in different countries shows that the systems are rarely static; instead, they are developed more or less comprehensively before each new evaluation.

An evaluation system based mainly on peer review is usually labour intensive, and the use of bibliometric indicators in evaluations of research quality is an important issue. In this connection it appears increasingly common that bibliometric data is not collected and processed within the system, but rather obtained in finished form from providers such as Scopus. This is emphasised as a new element in the coming ERA 2015, and was also used in Portugal's latest (2013) evaluation of its research units.

Following the latest (2008) round of RAE in Britain, HEFCE carried out a pilot exercise on indicator-based evaluation, but the conclusion then was that indicators were not sufficiently robust as a primary measure of quality. The system of peer review was therefore kept largely unchanged in REF, albeit with the addition of experts who are users of research on the panels, to assess impact. In April 2014, however, HEFCE received a

¹⁶⁹ Hicks, D. (2012). Performance-based university research funding systems. *Research Policy* 41, pp. 251–261.

¹⁷⁰ Geuna, A. & Piolatto M. (2014). The development of research assessment in the UK and Italy: costly and difficult, but probably worth it (for a while). Department of Economics, University of Turin, *Working Paper series 16* (2014).

¹⁷¹ Byrne, A. (2013). *A great ERA for Australian Research*. Australian Research Council 24 December 2013.

¹⁷² HEFCE (2009). *RAE 2008 Accountability Review*. http://www.hefce.ac.uk/media/hefce/content/pubs/2009/rd0809/rd08_09.pdf

Government commission to examine how bibliometric indicators might be used in evaluating research, with the next round of REF (2020) partly in mind.¹⁷³ An independent steering committee consisting of representatives from universities, research funding bodies and academies, led by Professor James Wilsdon, is to review if and how indicators can be used in different fields of research to evaluate the quality and impact of research. The review is based on an open consultation and will be published in the spring of 2015, after the results of REF 2014 have been made public.¹⁷⁴

Another issue is how the evaluation systems should best evaluate the impact of research. In its future evaluations (according to SEP 2015–2021), the Netherlands will more clearly identify and evaluate the societal relevance of research. As the results of REF are made public, the nearly 7 000 impact case studies will be analysed in a HEFCE project carried out by *Digital Science*, *Nature* and *King's College*. The aim is to make the impact case studies available for analysis in a database, as well as to implement a qualitative and quantitative analysis of them. The project is due to be carried out in the spring of 2015.¹⁷⁵

New Zealand has recently, in preparation for its next evaluation in 2018, announced a series of minor changes in its *Performance-Based Research Fund* to make the system clearer and give greater weight to the user perspective and user-oriented research.¹⁷⁶

In connection with a major reform of Russian research institutions, a new system for quality evaluation linked to resource allocation is currently under discussion there. A large part of the research funds distributed through the Russian Academy of Science – around SEK 9.5 billion – will be allocated to the institutes in competition, following evaluations carried out by a new independent agency, the *Russian Scientific Fund*.¹⁷⁷

The Czech Republic is also planning a new system for performance-based research funding of research funds for universities. The system is currently under development by Technopolis and will, according to a first draft version, be based on both indicators and peer review, and will also include an assessment of societal impact.¹⁷⁸

¹⁷³ Jump, P. Overhaul of metrics usage could cut frequency of REF. *Times Higher Education*, 3 April 2014.

¹⁷⁴ HEFCE (2014). *Independent review of the role of metrics in research assessment*. <http://www.hefce.ac.uk/whatwedo/rsrch/howfundr/metrics/>

¹⁷⁵ HEFCE (2014). *REF impact case studies to be analysed*. <http://www.hefce.ac.uk/news/newsarchive/2014/news88461.html>, Analysis of the REF impact case studies, <http://www.hefce.ac.uk/whatwedo/rsrch/researchassessment/analysis/>

¹⁷⁶ New Zealand Ministry of Education 2014, *Changes to the Performance-Based Research Fund*, <http://www.minedu.govt.nz/NZEducation/EducationPolicies/TertiaryEducation/PolicyAndStrategy/PBRFChanges.aspx>

¹⁷⁷ Pokrovsky, V. (2014). Lean Times Ahead for Russian Science Academy. *Science Insider*, 2 April 2014. <http://news.sciencemag.org/people-events/2014/04/lean-times-ahead-russian-science-academy>

¹⁷⁸ Mahieu, B. & Arnold, E. (2014). *R&D Evaluation Methodology and Funding Principles. First Interim Report*. Draft version, Technopolis Group, 10 November 2014.

14 EVALUATIONS OF RESEARCH QUALITY AND ALLOCATION OF RESEARCH FUNDING AT SWEDISH HIGHER EDUCATION INSTITUTIONS

The government commission includes describing the systems for peer review that have already been developed for internal distribution of research resources at several HEIs. In addition to these descriptions, this chapter will also describe how research resources are distributed internally at Swedish HEIs.

14.1 Evaluations of research quality at Swedish HEIs

To date, approximately ten Swedish HEIs have carried out their own research quality assessments including peer review of their research.¹⁷⁹ Several HEIs are awaiting the results of this proposal before deciding on any (further) evaluations. None of those that have carried out evaluations have stated the redistribution of resources as their main aim, but it can nonetheless be described as an indirect aim, and many HEIs have redistributed resources on the basis of the evaluation results. One consistent overall aim for all the HEIs' evaluations has been to lay the groundwork for strategic development. By identifying strengths and weaknesses in their research, HEIs hoped to obtain a basis for improving scientific quality, e.g. by giving support to research groups showing potential, or phasing out less successful activities.

The HEIs describe these as instructive but laborious processes. One of the major challenges has been *how* to define a reporting unit and *who* should do it. For example, it has been problematic that the reporting units have differed in terms of size and circumstances, which has also made internal comparisons more difficult. The HEIs underline the importance of making it clear from the outset what the aims are as well as how to deal with the results. It has been fairly common for the reporting units to have unreasonable expectations as to what a completed evaluation would bring in terms of extra resources, etc. – which in turn has led to a certain amount of frustration and disappointment.¹⁸⁰

A meta-evaluation from 2013 of the Royal Institute of Technology's two HEI evaluations (*Research Assessment Exercise*), carried out in 2008 and 2012, noted that results improved in the second evaluation than the first. Low grades in the first evaluation had spurred individual environments to act more strategically and prepare better for site visits. The evaluation process itself had also been used as a springboard by some people. The same incentives for change were not, for obvious reasons, noted in those environments that received excellent results in the first evaluation. It is of course difficult to distinguish effects of the evaluations themselves from effects of other, more extensive trends. The increased number of reported publications could have to do with the evaluations, but also with changes to the research system since 2008, such as the increased importance of international rankings and bibliometrics, and new demands from funding bodies.¹⁸¹

¹⁷⁹ University of Gothenburg: *Research evaluation for development of research 2010* (RED10); Karolinska Institutet: *External Research Assessment* (ERA); Royal Institute of Technology: *Research Assessment Exercise* 2008 and 2012 (RAE2008 and RAE2012); Lund University: *Research Quality Assurance for the Future* (RQ08); Swedish University of Agricultural Sciences: *Kvalitet och nytta* (KoN09); Uppsala University: *Kvalitet och förnyelse* 2007 and 2011 (KoF07 and KoF11); Örebro University: *Örebro Research Evaluation* (ÖRE10); Mid-Sweden University, Halmstad University and University of Skövde: *Assessment of Research and Coproduction* (ARC13).

¹⁸⁰ Swedish Research Council (2013). *Kartläggning av olika nationella system för utvärdering av forskningens kvalitet – förstudie inför regeringsuppdraget U2013/1700*; Association of Swedish Higher Education (2013). *Slutrapport från SUHF:s arbetsgrupp för kvalitetsfrågor 2012–2013*, October 2013.

¹⁸¹ Karlsson, S. & Geschwind, L. (2013). *Metautvärdering av Research Assessment Exercise (RAE)*. KTH 2013-11-11.

14.2 How research resources are distributed internally at Swedish HEIs

Direct grants to universities and university colleges are determined annually by the Swedish Riksdag, on the government's proposal. The share not exposed to competition, which is to say 80 per cent, is distributed between the HEIs on the basis of what each HEI received when they were founded, or when the current system of direct grants was introduced. For that reason, the big HEIs receive a very large share of the block grant, upwards of 85 per cent. Two recent studies have described how grants for research and doctoral education are distributed internally at the HEIs. One of these, carried out by Faugert & Co for the Confederation of Swedish Enterprise (Svenskt Näringsliv), comprised a study of ten HEIs which focused on how the direct research grants were distributed internally.¹⁸² The other study, by Gustaf Nelhans and Pieta Eklund, describes resource allocation models on bibliometric grounds at 14 HEIs. An extended study of 27 Swedish HEIs, by the same research group, is underway.¹⁸³ The sections below summarise the studies' results.

The study for Svenskt Näringsliv describes how six of the ten HEIs examined have, over the past seven years, introduced performance-based distribution at the highest central level for a small part (about 10 per cent) of the funds, and that several of them use a model that reflects the government's current distribution model. The HEI evaluations carried out at approximately ten universities and university colleges have also, to some extent, determined the distribution. Performance-based allocations are more common and larger in scope at the faculty level, compared with the highest central level. The study shows that the exception to the rule is that the faculties at the ten HEIs *do not* apply performance-based research funding. Distribution is carried out within the same subject area, and three indicators are most common: the number of qualifications awarded on doctoral education, the size of external grants, and bibliometrics.¹⁸⁴ Throughput on undergraduate programmes is also used as a performance-based measurement, but the bibliometric indicators often made up half of the distribution, with external grants as the other indicator.¹⁸⁵

Hammarfelt, Nelhans and Eklund show that almost all HEIs in the ongoing study – 25 out of 27 – use, to some extent, bibliometric measurement for their internal resource allocation on one or more levels (levels here refers to faculties or equivalent, departments and individuals). However, there are considerable differences in the use of performance-based models/indicators. There is also a great deal of variation regarding the levels at which the allocations are made, and in the share of funds available for resource allocation. At the central level, anything from one or two per cent to half of the block grants are distributed on the basis of performance indicators.

The study for Svenskt Näringsliv concludes that the extent of performance-based allocation of research funds at the HEIs is most likely a direct consequence of the introduction of the Government's current distribution model. Most faculties applied performance-based allocation earlier as well, but since the model was introduced in 2009, application has expanded. Considering the small amount of funding that is actually redistributed in the current model, it appears as if simply flagging for the new resource allocation model has been enough to influence the HEIs' behaviour with regard to internal distribution.

Nelhans and Eklund warn that excessive influence from mechanistic and automated principles for evaluating research can get in the way HEIs' own control over their focus and specialisation. "There is a risk that a structure of incentives will develop, and lead to researchers trying to maximise their performance in the bibliometric model, thus making it performative, while management and support functions risk being left with a controlling accountancy function. (...) General evaluation instruments can perhaps be suitable at higher levels

¹⁸² Görnerup, E. (2013). *Från departement till doktorand: På vilka grunder fördelas de direkta statsanslagen för forskning?* Svenskt Näringsliv, January 2013.

¹⁸³ Nelhans, G. & Eklund, P. (2014). *Resursfördelningsmodeller på bibliometrisk grund vid ett urval svenska lärosäten*, Högskolan i Borås. 2014-10-07; Hammarfelt, B., Nelhans, G. & Eklund, P. (2014). The heterogeneous landscape of bibliometric indicators. Evaluating models for allocating resources at Swedish universities. Presentation at the 19th Workshop on Bibliometrics and Research Policy, 25–26 September, Reykjavik, Iceland.

¹⁸⁴ Görnerup, E. (2013).

¹⁸⁵ Nelhans, G. & Eklund, P. (2014). Executive summary.

in the research system, but it is not self-evident that they benefit research when they are applied at lower levels, or even at the individual level, at the HEIs.¹⁸⁶

¹⁸⁶ Ibid.

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ANNEX 1 THE GOVERNMENT COMMISSION

This translation was commissioned by the Swedish Research Council and the wording may differ somewhat from any translation arranged by the Government.

Government Decision	1:8
2013-03-14	U2013/1700F

Ministry of Education and Research	Swedish Research Council Box 1035 101 38 Stockholm
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Commission to investigate and submit a proposed model for resource allocation to universities and university colleges involving peer review of the quality and relevance of research

The Government's decision

The Government commissions the Swedish Research Council, in consultation with the Research Council for Working Life and Social Research, the Research Council Formas, and the Swedish Governmental Agency for Innovation Systems, to investigate and submit a proposed model for allocating resources to universities and university colleges involving peer review and enabling resource allocation that rewards quality and performance in research. The proposed model must comprise both academic assessments and assessment of the relevance of the research and its utility for society.

Peer review should include necessary aspects that reflect the quality of the research, the outcome of the research, and useful application of research-based knowledge. Peer review should be done bearing in mind the preconditions for the respective research area. One point of departure for peer review should be that all research is regularly assessed in subject-area based evaluations in a cycle of four to six years.

The commission includes the proposal of statistical data as a platform for, among other things, peer review of the quality, relevance, and usefulness to society of research and an investigation of what public authorities or parties may be able to assist in gathering these statistics.

The proposed model for resource allocation may include indicators besides peer review. The commission should comprise a description of peer review systems already in place for the internal allocation of research resources at several higher-education institutions, and an assessment of the advantages and disadvantages of including peer review in a model for resource allocation at the national level compared with the institutional level. The Swedish Research Council is to present a cost analysis for the model it proposes. The Swedish Research Council is also to provide an account of comparisons with models for

resource allocation based on research quality in other relevant countries, whereby aspects such as cost in relation to effects on the quality, relevance, usefulness, and effect on collaboration with the wider society, etc. are considered.

This commission is related to the commission the Government has given to the Agency for Innovation Systems to devise methods and criteria for assessing performance and quality in higher-education institutions' collaboration with the wider community, in terms of the relevance and useful application of research-based knowledge (N2013/1162/FIN).

The Swedish Research Council is to submit its report to the Government Offices (Ministry of Education and Research) no later than 31 December 2014 and is to regularly inform the Government Offices (Ministry of Education and Research) about its work with the commission.

Background

In the parliamentary bill Research and Innovation (Bill 2012/13:30) the Government deems that a system involving peer review may be able to provide a more comprehensive assessment in which the current potential of a research area could be factored in instead of basing resource allocation merely on historical data (report 2012/13:UbU3, gov. comm. 2012/13:151). In this way, as the bill states, a more finely balanced assessment of a higher-education institution's research can be carried out in which different subject areas are evaluated on the basis of their distinctive character. Furthermore, the bill states the following: Such a system rewards quality in a broader manner than today's allocation model, promotes quality, and may also provide a good platform for long-term planning at higher-education institutions. It is also a system that suits research areas whose traditions of publication are not fully covered by indicators such as citations and publications, as well as external funding. Peer review can also take into consideration a broader concept of quality than, for example, citations and external research funding can. For instance, it can include assessments of various forms of useful application of research-based knowledge.

On behalf of the Government

Maria Arnholm

Elin Allard

Copies to:

Ministry of Health and Social Affairs
Ministry of Finance
Ministry of Education and Research
Ministry for Rural Affairs
Ministry of the Environment
Ministry of Enterprise, Energy and Communications
Research Council for Working Life and Social Research
Uppsala University
Lund University
University of Gothenburg
Stockholm University
Umeå University
Linköping University
Karolinska Institutet (university)
Royal Institute of Technology
Luleå University of Technology
Karlstad University
Linnaeus University
Örebro University
Mid Sweden University
Swedish University of Agricultural Sciences
Blekinge Institute of Technology
University of Dance and Circus
National Defence College
Swedish School of Sport and Health Sciences
Borås University College
Dalarna University College
Gotland University College
Gävle University College
Halmstad University College
Kristianstad University College
Skövde University College
University West
University College of Arts, Crafts and Design
Royal Institute of Art
Royal College of Music
Malmö University College
Mälardalen University College
University College of Opera
Stockholm Academy of Dramatic Arts
Södertörn University College
Research Council Formas
Swedish Governmental Agency for Innovation Systems
RISE Holding AB

ANNEX 2 ADVISORY BOARDS

International Advisory Board

The project has been supported by an *International Advisory Board* made up of experts in performance-based allocation of research funds. The group includes researchers who specialise in evaluation and research policy issues as well as practitioners with experience of running evaluations. The group was appointed by the Director General of the Swedish Research Council for the period 1 October 2013 to 30 April 2015. The group held four working meetings between November 2013 and October 2014, of which two were in Stockholm and two via telephone.

Hanne Foss Hansen	Professor, Institut for statskundskap, Københavns Universitet, Denmark
Aldo Geuna	Professor, Department of Economic and Statistics, University of Torino, Italy (Visiting professor Stanford Institute for Economic Policy Research, SIEPR, USA 2013–2014)
Diana Hicks	Professor and Chair, School of Public Policy, Georgia Institute of Technology, USA
Liv Langfeldt	Deputy Head of Research, Nordisk institutt for studier av innovasjon, forskning og utdanning (NIFU), Norway
Hugh McKenna	Pro-Vice-Chancellor, Research and Innovation, University of Ulster, United Kingdom
Graeme Rosenberg	Research Excellence Framework (REF) manager, Higher Education Funding Council for England (HEFCE), United Kingdom
Gunnar Sivertsen	Research Professor, Nordisk institutt for studier av innovasjon, forskning og utdanning (NIFU), Norway
Jack Spaapen	Senior Policy Officer, Research and Knowledge Division, The Royal Netherlands Academy of Arts and Sciences (KNAW), Netherlands
Ilkka Turunen	Special Government Advisor, Undervisnings- och kulturministeriet, Finland

The advisory board of vice-chancellors

The advisory board has comprised eight vice-chancellors appointed by the Association of Swedish Higher Education (SUHF). The group held three meetings between October 2013 and October 2014.

Stefan Bengtsson	Malmö högskola (Malmö University)
Pam Fredman	Göteborgs universitet (University of Gothenburg)
Peter Gudmundson	Kungl. Tekniska högskolan (Royal Institute of Technology)
Lena Gustafsson	Umeå universitet (Umeå University)
Anita Hansbo	Högskolan i Jönköping (Jönköping University)
Stephen Hwang	Linnéuniversitetet (Linnaeus University)
Maria Lantz	Konstfack (University College of Arts, Crafts and Design)
Eva Åkesson	Uppsala universitet (Uppsala University)

ANNEX 3 RECORD OF EXTERNAL MEETINGS AND SEMINARS 2013–2014

2013

- 4–15/2 Study visit to the UK (part of the preliminary study)
- 1–3/10 Study visit to the Netherlands
- 16/10 Advisory board of vice-chancellors
- 23/10 SUHF's pre-seminar in connection with its General Assembly
- 13/11 International Advisory Board (Stockholm)
- 19/11 Teknikföretagen, R&D and SME reference group
- 19/11 RET/TUF (civil engineering education interest group) meeting at Uppsala University with vice-chancellors of technology faculties and institutes
- 4/12 Young Academy of Sweden (the Board)
- 12/12 Svenskt näringsliv (Confederation of Swedish Enterprise)

2014

- 5/2 Young Academy of Sweden spring meeting
- 7/2 Swedish Association of University Teachers' (SULF) Board
- 10/2 The Stakeholder Group
- 11/2 Swedish National Union of Students (SFS)
- 5/3 International Advisory Board (telephone meeting)
- 5/3 Chief Scientist & Engineer Mary O'Kane, New South Wales, Australia (Stockholm)
- 26/3 Advisory board of vice-chancellors
- 29/4 Network for postgraduate education (Västerås)
- 29/4 Workshop on artistic research
- 8/5 Meeting and hearing with universities and university colleges (Umeå)
- 8/5 Meeting and hearing with universities and university colleges (Malmö)
- 12/5 Meeting and hearing with universities and university colleges (Stockholm)
- 16/5 Meeting and hearing with universities and university colleges (Gothenburg)
- 22–23/5 International Advisory Board (in Stockholm)
- 4/6 Lunch seminar, Riksdagens utbildningsutskott (the Parliamentary Committee on Education), with Vinnova
- 4/6 The Stakeholder Group
- 12–13/6 Australian Research Council (Stockholm)
- 13/6 Meeting with vice-chancellors and representatives of HEIs with artistic research
- 1/10 Regional National Dialogue network (RND)
- 10/10 Royal Swedish Academy of Engineering Sciences (IVA) steering group "Utsiktsplats forskning"
- 13/10 Swedish Patent and Registration Office (PRV)
- 17/10 Advisory board of vice-chancellors
- 20/10 International Advisory Board (telephone meeting)
- 21/10 Conference Infrastructure for Research Information in Sweden (IFFIS 14)
- 18/11 Seminar organised by the Swedish Geotechnical Institute (SGI)
- 18/11 Teknikföretagen, R&D and SME reference group
- 19/11 Workshop with KonstEx (Stockholm)
- 26/11 The Stakeholder Group
- 5/12 Swedish Association of Higher Education (SUHF) seminar for research administrators
- 12/12 SULF and SFS

Additionally, regular presentations to the Swedish Research Council Board, scientific councils and committees, and debriefings with Formas, Forte, Vinnova, the National Library, Statistics Sweden and the Swedish Higher Education Authority.

ANNEX 5 BACKGROUND INFORMATION

The proposed content of the background information, obtained from the HEIs (HEI's own short descriptions) and existing databases (quantitative data), is presented below in table format. See also Section 5.2.

Table 9. *Proposal for what type of information HEIs are to report in the form of a text-based description as background information for the panels. The description is to refer to the HEI level as well as the field of research level.*

Type of information in the HEI's description
Profile, particularly with respect to research, e.g. interdisciplinary focus
Vision and strategy
Organisation and management – the HEI's approach
Recruiting of staff, career systems – the HEI's approach
Access to infrastructures for research

Table 10. *The Swedish Research Council proposes that the following quantitative data regarding revenue be used as background information for the panels. The data is to be presented on a per-year basis for the evaluation period in question, and at all three levels (research area, field of research and HEI).*

Revenue for research and doctoral education
Total revenue (SEK thousand) ¹⁸⁷
Grant revenue (external funds), in total and divided by funding body (SEK thousand) ¹⁸⁸
Share of external funding (per cent)

Table 11. *The Swedish Research Council proposes that the following quantitative data regarding staff be used as background information for the panels. The data is to be presented on a per-year basis for the evaluation period in question, e.g. 2012–2017¹⁸⁹ and at all three levels (research area, field of research and HEI).*

Staff statistics
Research and teaching staff (individuals and FTEs) specified by gender, age and employment category

¹⁸⁷ Currently this amount includes, in the Swedish Higher Education Authority's/Statistics Sweden's NU database: fee income to research, grants for research and doctoral education, financial income, income from commissioned research, revenue from the sector grant for research and doctoral education, other grants for research and doctoral education (this includes e.g. the grant for research and artistic development at certain HEIs and the ALF grant for clinical research).

¹⁸⁸ The following funding bodies are currently itemised in the Swedish Higher Education Authority's/Statistics Sweden's NU database: the Swedish Cancer Society, private education providers, the EU, companies in Sweden, companies abroad, the Swedish Heart-Lung Foundation, municipalities and county councils, the National Institute of Health, the National Science Foundation, public research foundations, non-profit organisations in Sweden, non-profit organisations abroad, and public authorities. Grants from public authorities are in turn itemised by: the Swedish Foundation for Humanities and Social Sciences, foundations administered by the HEI, the Swedish Research Council, and Other. Further specifications could be made if SweCRIS were developed.

¹⁸⁹ As of 2012, staff statistics are presented differently in the Swedish Higher Education Authority's/Statistics Sweden's NU database. Research and teaching staff are divided into the categories professor, senior lecturer, lecturer, career development position (includes junior researchers, associate senior lecturers, postdoctoral positions) and other research and teaching staff (researchers, junior researchers, technical and administrative staff with research or teaching tasks, and visiting lecturers and hourly-paid teachers).

Table 12. *The Swedish Research Council proposes that the following quantitative data regarding doctoral education be used as background information for the panels. The data is to be presented on a per-year basis for the evaluation period in question, and at all three levels (research area, field of research and HEI).*

Doctoral education
Number of active doctoral students enrolled at the HEI (individuals and FTEs, alternatively only individuals with a degree of activity of e.g. 20 per cent), divided by gender and age
Number of doctoral degrees, divided by gender and age

Table 13. *Background information on the publication profile. Examples of traditional and non-traditional publication types for a research area at an HEI, divided into full counts (each reporting unit is credited with all publications classified in that research area) and fractionalised publications (each unit is credited with a share of the publication corresponding to the share of its authors that belong to the HEI).^{190 191}*

Publication type	Full count			Number of fractionalised publications		
	N	Per cent of total production	Per cent of Sweden in total	Per cent with international collaboration	N	Per cent of Sweden in total
Books	0				0	
Chapters in anthology	0				0	
Articles in scientific journal	266	88%	11%	50%	200	10%
Conference contributions	38	13%	4%	14%	19	11%
Original creative works ¹⁹²	0					
Live performances of creative works	0					
Exhibitions	0					Not relevant
Total		100%				

¹⁹⁰ Fractionalisation can also be done on the basis of subject area, for publications classified in several subject areas within the same HEI. The sum of each article in Sweden cannot be greater than 1.

¹⁹¹ International standards should determine which channels may be included in a publication profile. An authorised list of which publication channels are regarded as peer reviewed and scientific, respectively, will be added to SwePub. The list is based on the lists used in Norway, Denmark and Finland (albeit without the weightings or scores of those lists).

¹⁹² Examples of non-traditional works are taken from Australian ERA. The development of national guidelines concerning artistic works is underway within the framework of the development of SwePub.

Table 14. *Background information on the publication profile. Each publication type (journal, book, conference contribution etc.) is in turn made up of publication lists, giving the panel members a more detailed picture of which publication channels the unit uses.*

Journals	Number of articles (N)	Share of articles (%)
Journal A	12	24
Journal B	7	14
Publisher C	5	10
Etc.		
Total	50	

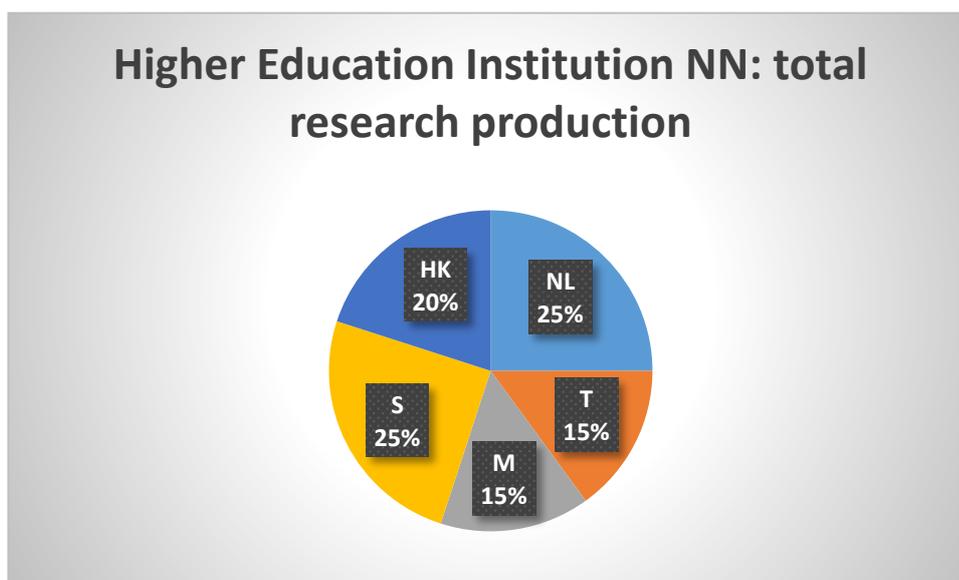


Figure 12. *Background information about the publication profile. Example of a pie chart showing in which fields of research an HEI is active (1-digit code from SCB, Statistics Sweden). Similar pie charts can also be made per field of research and research area (3-digit and 5-digit SCB codes, respectively).*

ANNEX 6 BIBLIOMETRIC MATERIAL

Below are explanations of the established bibliometric concepts and analyses proposed in FOKUS. Examples are given of what the material provided for panels for their assessment of scientific quality may look like *for the areas in which bibliometric material is to be used*.

Mean normalised citation scores relate the actual number of citations attained to the world average within a given field.¹⁹³ A reporting unit whose aggregate mean normalised citation score is one (1) is cited as much as the world average in the areas in question, while a unit whose mean normalised citation score is 1.5 is cited 50 per cent more than the world average.

Table 15 below shows a research area's total production, calculated by full count and fractionalised by author. For the full count, each publication produced by the unit is counted in its entirety, regardless of the number of external co-authors, while fractionalising by author means that the publication is divided between all the specified authors. If a publication is classified in several subjects by the HEI, it is also divided between these subjects (fractionalised by subject).¹⁹⁴ Publications classified in several subjects are fractionalised among subjects in full counts as well, so that the publication is counted once in total, across all the HEI's subject areas.

Table 15. *Summary of a research area's total production in comparison with the national average – an example.*

	Total number of original articles and review articles				Excluding the top research			
	Full count		Fractionalised count		Full count		Fractionalised	
	Volume	Cit. score	Volume	Cit. score	Volume	Cit. score	Volume	Cit. score.
Research area Y at HEI Z	410	0.89	200	0.83	390	0.82	190	0.77
Sweden	2581	0.93	1936	0.90	2452	0.87	1839	0.84

Citation scores as exemplified in Table 15 above can be attained in many different ways, e.g. by means of homogeneous production close to the mean, or a few highly cited publications in otherwise poorly cited production.

One way of visualising the variation in citation impact is presented below (Figure 13), and shows how the individual articles' normalised citation scores are divided into different citation levels. By dividing the articles into six suggested classes, from "not cited" to "cited more than four multiples of the world average during the period in question", a citation profile is created for the unit. The citation classes on the x axis can be adapted to the individualities of citation traditions in different research areas.

¹⁹³ Each individual article in a unit's research production is normalised against the mean for that specific type of article, published in the same year and in the same field. This means that research production which encompasses many fields and/or years will be normalised against the means in several different fields. The classification into fields is pre-defined in the database, independently of the proposed model's 24 research areas.

¹⁹⁴ Fractionalisation can also be done by research area, for publications classified in several research areas within the same HEI. The sum of each article in Sweden cannot be greater than 1.

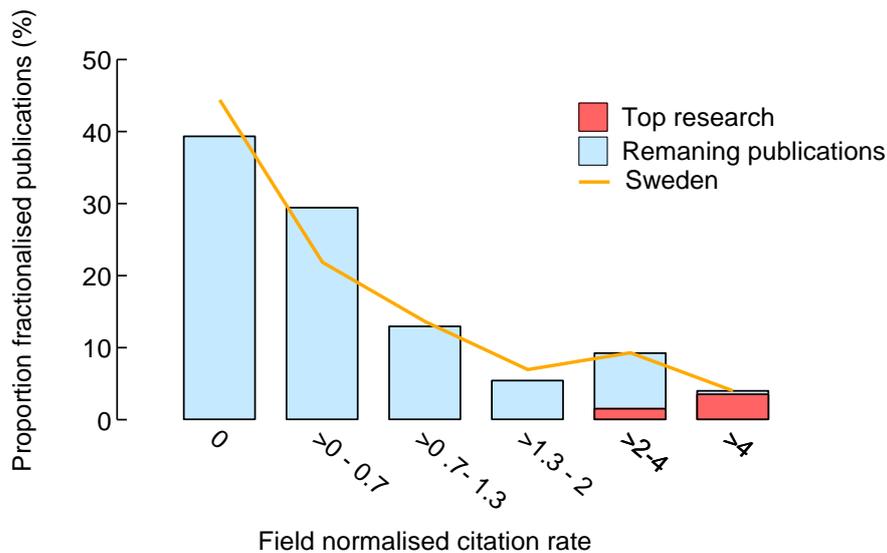


Figure 13. *Example of how the distribution of mean normalised citation scores may look for a reporting unit (i.e. a research area at an HEI). The curve shows the distribution of all Swedish publications on the subject.*

The normalisation used above is a standard method for adjusting for differences between subject areas in respect of the mean number of citations per publication. However, this normalisation does not adjust for differences in variation between articles within the area in terms of the number of citations per article. It is more common to attain a high mean normalised citation score in some areas than in others.

An *alternative measure*, which adjusts for this aspect, is to calculate the share of a unit's publications that fall within a certain percentile of global production¹⁹⁵, e.g. the most highly cited 10 per cent of world production. "Highly cited" is defined within a journal subject (the same subjects used for mean normalisation), meaning that less cited subjects get the same share of "highly cited" as subjects with high mean values. It is therefore recommended that the material include the shares of a research area's publications that are in the top 50 %, top 25 %, top 10 %, top 5 % and top 1 % of world production in the corresponding subjects. The share of Swedish production in the same subject is given as a reference value. Figure 14 below shows examples from a fictitious unit.

¹⁹⁵ "Global" here refers to all publications (original articles and review articles) recorded on the Web of Science.

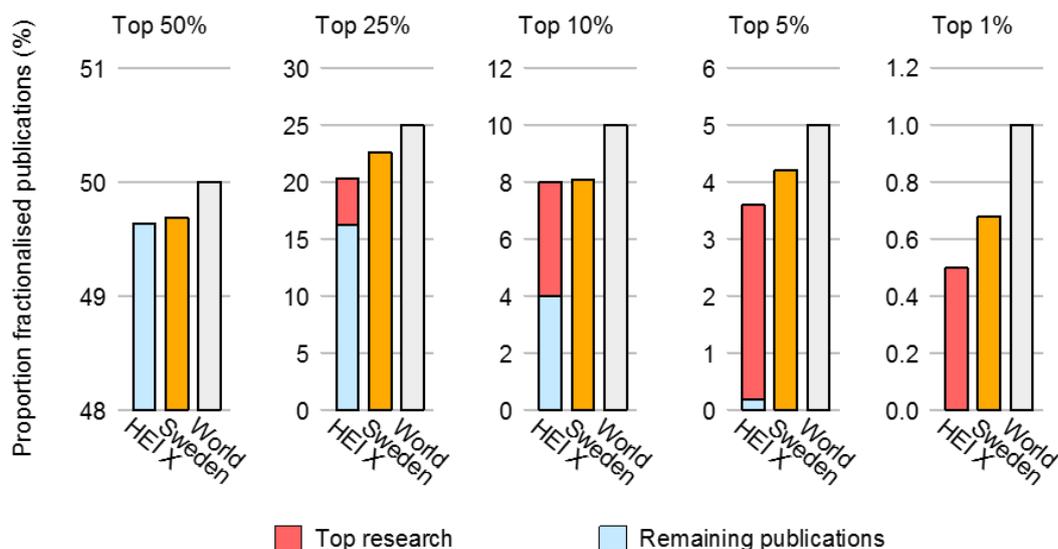


Figure 14. *Example of a graph showing a unit's share of works among the top 1 %, 5 %, 10 %, 25 % and 50 % most cited. Of the unit's total scientific production described above, publications nominated as the top research are marked in red, with other works in blue. Top research publications are not specified in the top 50 % graph.*

Collaboration is often regarded as an important aspect in promoting successful research. It may also be a complementary quality indicator, showing whether the research area has the capacity to produce good research on its own, how much collaboration of different kinds becomes cited, and how successful collaboration is. The Swedish Research Council recommends that the bibliometric statistics for research areas analysed also be broken down by the type of collaboration that led to the publications. Table 16 below shows an example of how volume of publication and citation scores divided into four types of collaboration can illustrate the collaboration patterns of a reporting unit.

Table 16. *The table below shows an example of a research area's collaboration pattern, and what citation impact it achieves with different types of collaboration, based on total scientific production as well as without the nominated top research.*

Publications in total

Type of collaboration	Volume				Citation score**	Statistics on authors and addresses*		
	Full count		Fractionalised count			No. of authors*	No. of org.*	No. of countries*
	N	%	N	%				
No collaboration	88	24	88	44	0.61	1		
Only internal authors	22	6	22	11	0.61	1.5	1	1
Only authors w. Swedish addresses	105	28	24	12	0.65	1.5	2.1	1
Internationally co-authored	157	42	66	33	1.26	2.7	3.1	2.3

* Based on full counts

** Does not apply for publications/works in SwePub

Excluding publications nominated as top research

Type of collaboration	Volume				Citation score **	Statistics on authors and addresses*		
	Full count		Fractionalised count			No. of authors*	No. of org.*	No. of countries*
	N	%	N	%				
No collaboration	86	24	87.5	25	0.60	1		
Only internal authors	21	6	21.5	6	0.55	1.5	1	1
Only authors w. Swedish addresses	102	29	22.0	6	0.35	1.4	2.0	1
Internationally co-authored	144	41	59.0	17	0.82	2.5	2.9	2.0

* Based on full counts

** Does not apply for publications/works in SwePub

ANNEX 7 QUALITY ENHANCING FACTORS

Below is an example of part of the assessment material on cooperation and collaboration that generated joint publications.

Co-publication patterns

Collaboration, both national and international, is an important element of today's research environments. It is also important that the research area has the capacity to produce good research on its own. The Swedish Research Council proposes that the share of co-publications be reported, when possible, as part of the documentation material for the two factors *collaboration within academia* and *collaboration beyond academia*. In cases where reliable bibliometric data can be obtained, the material could be produced by the authority charged with running FOKUS, and presented as in the examples below, where the extent and type of collaboration is shown (see Table 17 and Figure 15). However, currently it is not possible to obtain reliable bibliometric data for much of the humanities and social sciences. The development of SwePub may change this situation in the future. Access to information about collaboration in producing publications for research subjects where bibliometric data is not available assumes that information about e.g. the total number of authors, and the presence of foreign authors, will be included in SwePub.

Table 17. *Examples of reporting the extent and type of co-publication*

Type of collaboration	Volume of publication				Statistics on authors and addresses*		
	Full count		Fractionalised		No. of authors*	No. of org.*	No. of countries*
	N	%	N	%			
Articles with one author	88	24	88	44	1		
Only internal authors	22	6	22	11	1.5	1	1
Only Swedish authors	105	28	24	12	1.5	2.1	1
International authors	157	42	66	33	2.7	3.1	2.3

* based on full counts

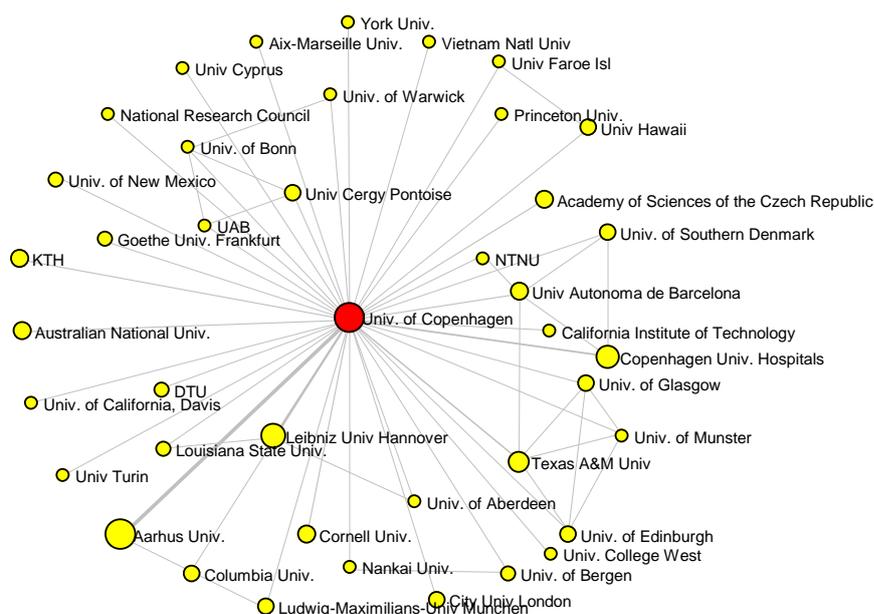
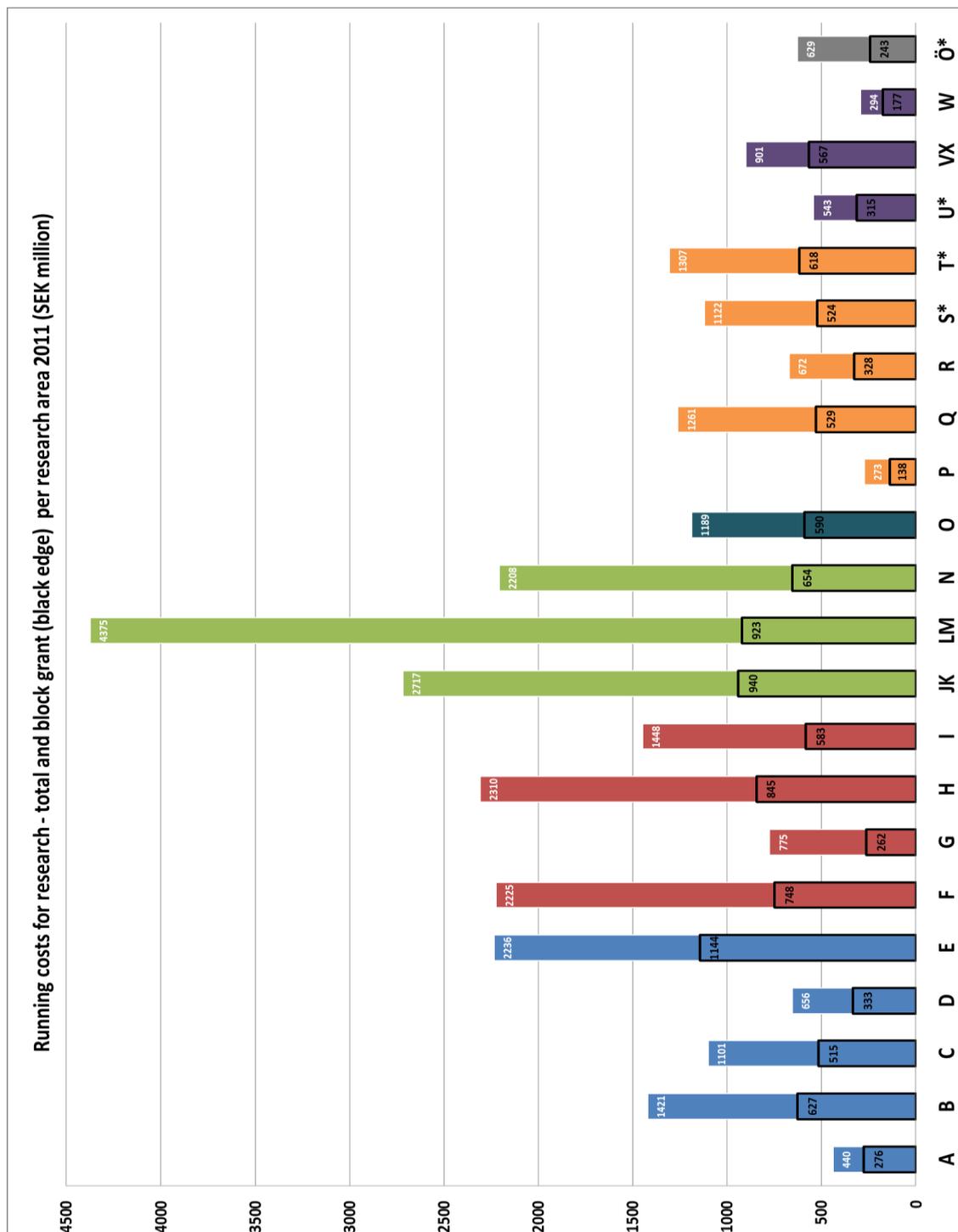


Figure 15. *Network map of collaboration. The map shows co-publication patterns for international collaboration, within and beyond academia. The size of the circles is proportionate to the number of co-publications. Example from Mathematics at the University of Copenhagen (includes collaboration partners with at least three joint publications).*

ANNEX 8 DISTRIBUTION OF THE BLOCK GRANT BY RESEARCH AREA

Below is a chart illustrating the block grant's share of total running costs in each research area. The bars framed in black represent revenue from the block grant; unframed grey bars represent other revenue. Note that some of the 24 research areas in FOKUS are shown here in pairs, due to the way the data was classified. Revenue classified as "other" are shown as Ö. Source: Statistics Sweden, data from 2011.



ANNEX 9 DATA FOR ASSESSMENT MATERIAL

Below is a list of the data that will need to be collected in order to produce the assessment material, to be reported as described in Chapter 5. The data is specified in the following way:

AREA

Indicator [responsible organisation]

Data field

Data field [other responsible organisation]

(Data field if available)

The information provided here is preliminary. Precise specifications regarding metadata and format need to be drawn up in consultation with all affected parties.

STAFF

Staff volume [UKÄ]

HEI

Year

Research subject/research subject group

Employment category

Highest degree [SCB]

Sex

Number of individuals

Number of full time equivalents

Renewal (early career researchers) [UKÄ]

HEI

Year

Research subject group/-research subject

Employment category

Highest degree [SCB]

Year of degree [SCB]

HEI awarding the degree [SCB]

Sex

Number of individuals

Number of full time equivalents

Distribution of working hours research/teaching [SCB]

HEI

Year

Research subject area

Employment category

Sex

Working task

Relative distribution of working hours (%)

Number of full time equivalents

ECONOMY

Income research and doctoral education [SCB]

HEI
Year
Research subject/-research subject group
Source of revenue
Amount

External funding [SCB, VR (SweCRIS)]

HEI
Year
Research subject/-research subject group
Funding body
Amount
(project ID) [SweCRIS]
(ORCID) [SweCRIS]

STUDENTS AND DEGREES UNDERGRADUATE LEVEL

Students undergraduate level [UKÄ]

HEI
Year
Level of education
Means of study (degree programme, course, distance)
Subject area (to be mapped to field of research)
Sex
Number of full time equivalents (students)

Degrees undergraduate level [UKÄ]

HEI
Budget year
Level of education
Specialisation (to be mapped to field of research)
Main research area (to be mapped to research area)
Sex
Number of awarded degrees

DOCTORAL STUDENTS AND DOCTORAL DEGREES

Doctoral students (admitted) total numbers [UKÄ]

HEI
Year
Research subject area
Sex
Number of individuals

Number of active doctoral students [UKÄ]

HEI
Year
Research subject area
Sex
Number of individuals
Number of full time equivalents

Beginners (doctoral students) [UKÄ]

HEI
Year
Research subject
Sex
number of individuals

Research degrees [UKÄ]

HEI
Year
Degree
Research subject (5-digit level)
Sex
Number of individuals

PUBLICATIONS (KB- SwePub)

SwePub ID [OAI]
Title
Resource identifier
Resource identifier type
Identifier
Subject classification
Research subject 1 [3- or 5-digit level]
(Research subject 2 [3- or 5-digit level])
(Research subject 3 [3- or 5-digit level])
Resource type
Publication type
Authority
Publication type
Publication date and publisher
Publication date [YEAR]
Publisher
(Place)
Source
Source title
Source identifier
Person name, identifier and affiliation
Name and affiliation [for each person]
namePart
Affiliation
Organisation
(Country)
(Person identifier)
(ORCID)
Creator count
Location and accessibility
URL

In March 2013, the Swedish Government commissioned the Swedish Research Council, in consultation with the Swedish Research Council for Health, Working Life and Social Research (Forte), the Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (Formas), and Vinnova, Sweden's innovation agency, to develop and propose a model for allocating resources to universities and university colleges involving peer review of the quality and relevance of research.

This report presents the principal features of the Swedish Research Council's proposed model, called FOKUS (Forskingskvalitetsutvärdering i Sverige – Research Quality Evaluation in Sweden).

The Swedish Research Council proposes that the new model for quality-based resource allocation should replace the current indicator-based research funding model.

The ultimate objective of FOKUS is to be a driver of quality, i.e. to promote improved quality of research carried out at Swedish universities and university colleges and also to promote the contribution of high quality research to societal development. Furthermore FOKUS can identify nationally strong research areas and areas for further improvement, and is expected to improve the basis for national and discipline-based overviews and comparisons.

