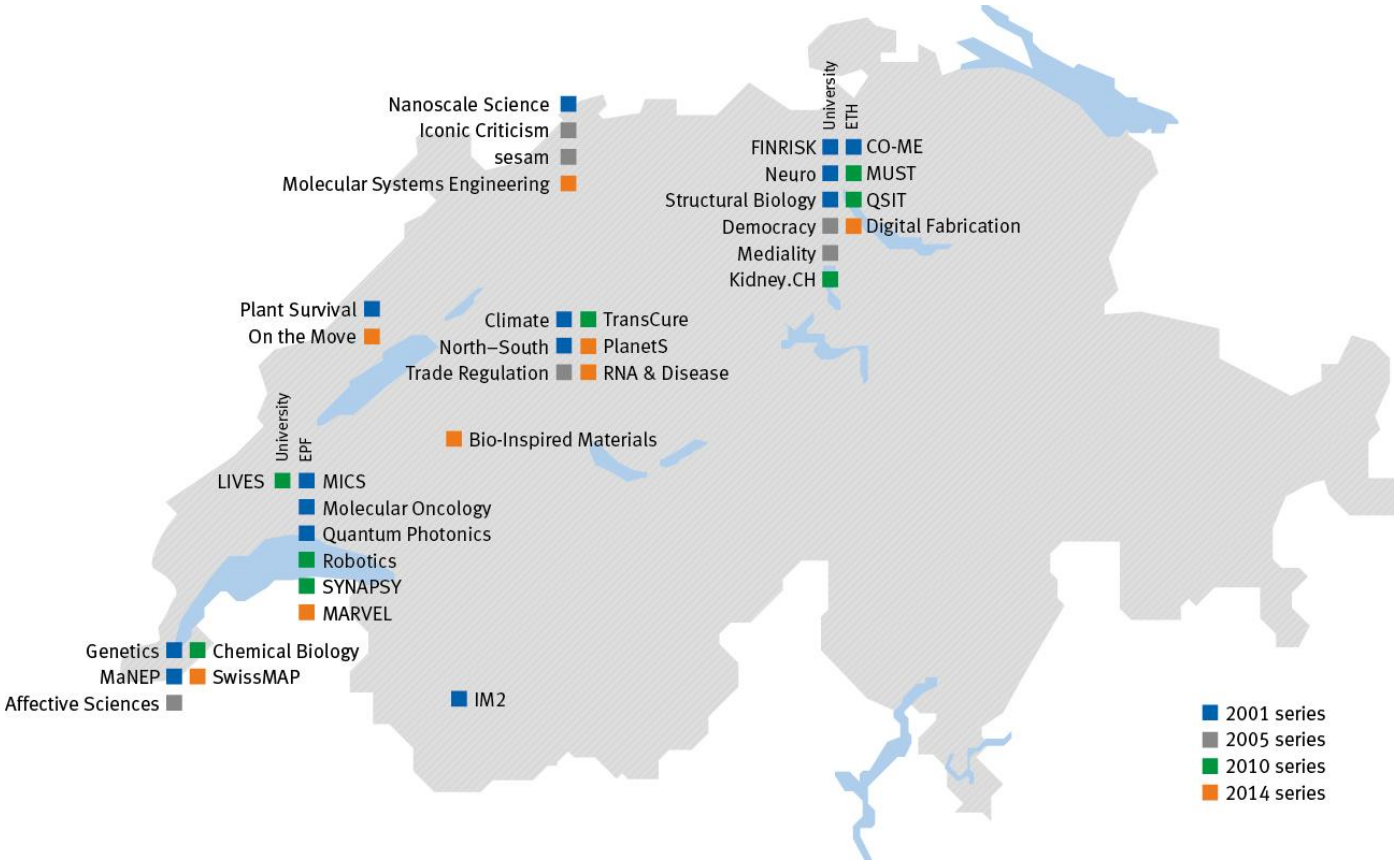

Swiss National Centres of Competence in Research (NCCR)

Evaluation of the selection process

Liv Langfeldt and Siri Brorstad Borlaug

Report 2016:42

NIFU

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Preface

Starting up in 2001, the Swiss National Centres of Competence in Research (NCCR) support long-term research networks in areas of importance for Swiss science, economy and society. Four calls for proposals have been issued and in total 36 NCCRs funded.

This report was commissioned by the Swiss National Science Foundation (SNSF) and presents the results of an evaluation of the NCCR selection process. The purpose is to provide information for developing the procedures for the next call for NCCR proposals.

The report is written by Liv Langfeldt (project leader) and Siri Brorstad Borlaug. Inge Ramberg managed the survey to the NCCR applicants.

We are grateful to all the participants in the NCCR application and selection process who contributed with input to the evaluation through interviews and survey replies: NCCR applicants, members of the review panels, representatives of NCCR home institutions, members of the SNSF National Research Council, the SNSF administrative office and the State Secretariat for Education, Research and Innovation (SERI).

Oslo, December 2016

Sveinung Skule
Director

Espen Solberg
Head of Research

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Executive summary

National Centres of Competence in Research (NCCR) is a key funding scheme for long-term collaborative efforts for cutting-edge research in Switzerland, expected to have substantial structural effects on the research at the home institutions and the Swiss research landscape. The centres are selected based on open calls for proposals and an extensive review process. Four calls for NCCR proposals have been issued since the start (1999), and the purpose of the present evaluation is to provide information for developing the selection procedures for the upcoming 5th call for proposals.

The evaluation report is based on analysis of application and review data from the two last NCCR calls, a survey to the applicants participating in these two calls, interviews with reviewers, home institutions and other stakeholders in the last call for proposals, as well as comparative data on Centre of Excellence schemes in Denmark and Norway. Four main topics are addressed: Attractiveness and outreach of the NCCR calls; reviewer competence and adequacy of review organisation and procedures; impartiality, transparency and trust, and the effectiveness and efficiency of the process.

Key findings: Overall the NCCR selection process, as set up by the SNSF, is well organised, functions according to intentions, stakeholders are generally satisfied and the NCCR scheme has been a success. Still, the process is not fully in line with international standards and practices we have compared with. There are some unclarities, weaknesses and ineffective features in the selection process, which the SNSF ought to consider adjusting in advance of the next call for proposals. These concern the amount of reviewer competence involved, the transparency and clarity of the basis for review and more generally the complexity and length of the selection process.

Attractiveness and outreach of the NCCR calls

The attractiveness and outreach of the NCCR scheme is good. The grants are highly attractive and applications come from a broad set of research fields and often encompass research in multiple research areas. NCCR applicants/potential directors below 45 years have had higher success rates than older applicants. In terms of distribution on institutions, the outreach of the scheme shows much the same pattern as the overall distribution of SNSF funds: Mainly the larger universities apply for and are awarded NCCRs. So far the scheme's aim of advancing female researchers has not been fulfilled at the top level; there are very few female NCCR directors.

There are some general concerns with the NCCR scheme at the home institutions, impacting both attractiveness and outreach: The NCCR funding from the SNSF does not cover overhead costs, and substantial co-funding and long-time prioritising of particular fields of research is required from the home institutions. The priorities and degree of pre-selection of the proposals to be submitted vary between the home institutions, hence the degree of free submission of NCCR ideas to the SNSF varies between them. This is a consequence of key aims of the NCCR scheme (optimising the

distribution of tasks between the universities and structural transformation of the research landscape) implying that home institutions ought to have strategic priorities for NCCRs. In this, the universities seem to struggle with finding a good way to combine bottom-up initiatives and top-down priorities for the NCCRs.

Reviewer competence and the review procedures

Review forms and guidance to external reviewers and panels ensure that the many NCCR selection criteria are taken into account, and the interview data and review documents indicate that the scientific quality and coherence of the team and the proposed research, as well as the academic management and the added value of the NCCRs, are the prime concerns in the selection process. This is well in line with the overall aims of the scheme. The number of expert reviewers per proposal on the full proposal stage, however, is lower than in other Centre of Excellence (CoE) selection processes, and the NCCR applicants express dissatisfaction with the reviewers' ability to assess all fields of their proposals. Moreover, the full proposal stage of the NCCR selection process includes proposals that did not obtain a top score at the pre-proposal stage. This implies that the screening of the proposals is not as strict as we find in comparable selection processes – an NCCR can be funded even if supported only by the experts in the last of the two review stages, consequently a lower number of expert reviewers may have supported it. Notably, the NCCR selection process also stand out in the sense that there is more emphasis on including the concerns and priorities of the home institutions. In this respect, the 'openness' of the full proposal stage can serve as an additional screening, as a second round of endorsement/priority from the home institution is needed for submitting a full proposal.

Two specific challenges in the NCCR selection process have been how to organise the assessments of the structural aspects of the proposals, and finding a common basis for comparing across research areas when putting together a shortlist of proposals recommended for funding:

(1) In the last NCCR call, assessments of the structural aspects of the proposals were done in parallel. The SNSF Research Council provided separate assessments of both the pre-proposals and the full proposals. Structural aspects were also part of the assessments of the international panels (along with assessments of scientific aspects), but these panels were not provided with any information on the assessments done by the Research Council. As the rates given the pre-proposals and the recommendations on the full proposals were based on the panel assessments, the structural assessments by the SNSF Research Council did not have a defined entry point into the selection process. Hence, much weight was put on doing structural assessments outside the expert panels, and the role of these assessments in the selection process was unclear.

(2) Concerning the shortlist, the SNSF has spent time and efforts trying to find a basis for agreeing on a ranked list of proposals, without succeeding. Hence, an 'open' shortlist has been sent to State Secretariat for Education, Research and Innovation (SERI). The most obvious reason for this is that it is difficult to compare proposals across research areas, and the SNSF does not have in place a procedure or clear criteria for such assessments. Moreover, there are different views on the need to provide a ranked list.

Impartiality, transparency and confidence

A substantial proportion of the applicants gives the NCCR selection process a low score on *transparency*. A likely reason for the limited satisfaction with transparency is the mere complexity of the selection process, involving both scientific and structural criteria, and international experts, Research Council members, the home institutions and SERI – over a period of 31 months. Moreover, some applicants are not convinced about the *impartiality* of the selection process, and point to what they perceive as biased reviewers, low number of experts per proposal, the role of the Research Council in the assessment or unclear strategic priorities. Still, the home institutions, the international experts and other participants involved in the selection seem to have high confidence in the selection process. Several home institutions emphasise that they do not have the required expertise to select their best NCCR applications, but trust the expertise involved in the SNSF selection process. Hence,

the SNSF's assessments of the pre-proposals serve as their main basis for deciding which full proposals to support.

Efficiency and effectiveness

The NCCR selection process is more complex and time-consuming than we find in other CoE schemes. There are 31 months from the call for pre-proposals to the announcement of the winners, including the possible pre-selection by the home institutions (both for pre-proposals and full proposals), in-depth separate assessments of scientific quality and structural aspects in both stages, separate meetings with all applicant institutions discussing the outcome of the review of the pre-proposals and interviews with all applicants submitting a full proposal. In comparison, the selection processes for the Danish and Norwegian CoEs takes less time (16-20 months) and do not include meetings with the home institutions discussing the outcome for the pre-proposals or separate assessments of structural aspects. Taking into consideration the size of the NCCR grants and the importance of the structural aims of the schemes, it is reasonable that the NCCR selection process have more procedures for involving the home institutions and devote more resources to structural assessments, and hence takes more time, than the two Scandinavian CoE schemes. 31 months still seem too long for an CoE selection process.

Moreover, as noted above, the number of experts per proposal at the full proposal stage is below the minimum recommended in international guidelines. Costs for the NCCR selection process as measured in reviewers per proposal, are higher at the pre-proposal stage and lower at the full proposal stage than in the two Scandinavian CoE schemes we have compared with. Due to the higher number of pre-proposals than full proposals, this implies higher total reviewer costs for the NCCR scheme, even when involving a lower number of reviewers per proposal at the decisive/full proposal stage.

Recommendations

In order to better ensure the quality of the review and to increase transparency, the SNSF is recommended to increase the number of experts per full proposal, allowing rebuttals from applicants, and to increase procedural and task clarity and possibly simplify procedures. Clarifying and simplifying review procedures may in turn give basis for shortening the timeline of the selection process and reduce review costs.

- *Increase the number of experts per proposal:* The SNSF should consider to increase the number of experts per full proposals, having a *minimum* of three assigned experts for each proposal. More experts would better cover all fields in the proposals, and would also reduce the potential for reviewer bias, e.g. that the particular match or mismatch between topics and perspectives of a proposal and those of the assigned reviewers influences the outcome of the review.

- *Consider allowing rebuttals from applicants:* Other funding agencies have good experiences with allowing applicants to comment on the written reviews from external experts, and so to provide the panel(s)/board which compare the full proposals with both expert reviews and applicants' rebuttals to these reviews. Rebuttals may modify reviewer bias, clarify misunderstandings and mistakes, and increase the transparency and the quality of review.

- *Procedural and task clarity:*
  - The role of the assessments of the structural aspects, and the procedures for using and integrating these assessments in the decision-making at each stage of the selection process, should be clarified in advance and explained in the call documents.
  - The applicants should be provided with clearer information, in advance, on the criteria emphasised at the various stages of the process and the role of the different actors involved, including the task division between the international experts and the Research Council members in the panels.

- It should be clear in advance whether or not the shortlist of recommended full proposals is to be ranked. If ranking, the rules and criteria for producing a ranked shortlist should be in place in advance. Also the panels' role and tasks in comparing the proposals, and the need for ranking the NCCRs they recommend, should be clear from the start.

1 Introduction

1.1 The NCCR scheme

National Centres of Competence in Research (NCCR) is a key funding scheme for long-term collaborative efforts for cutting-edge research in Switzerland. The NCCRs have objectives similar to those of Centre of Excellence (CoE) schemes in many other countries (OECD 2014), and are set up to provide outstanding, internationally visible research, knowledge and technology transfer from basic research, and training of young researchers and promotion of gender equality in science. Currently, there are 21 active centres with total annual funds about 160 mill CHF (of which on average 3.5 mill CHF per centre is from the NCCR scheme/ SNSF[1]), involving a large number of researchers (2015 figures/NCCR Guide 2015). The Centres are expected to have substantial effects on Swiss research and organisation/structural aspects, and competent, fair and effective selection procedures are vital. Table 1.1 gives an overview of the proposals and awarded centres in the four calls for proposals issued since the start in 1999.

Table 1.1 Number of applications and awarded centres in the four NCCR Calls

Call and year (pre-proposals)	**Submitted pre-proposals**	**Submitted full proposals**	**Approved NCCRs**	**Years of NCCR operation**
1st Call (1999)	82	34	14	2001-2013
2nd Call (2003)	44	17	6	2005-2017
3rd Call (2008)	54	28	8	2010-2022
4th Call (2011)	63	23	8	2014-2026

Source: Guide 2015 National Centres of Competence in Research, SNSF.

The NCCR scheme is open in the sense that any qualified researcher with a permanent position at a higher education/research institution based in Switzerland may submit a pre-proposal, given that his/her institution is willing to support the proposal in terms of a letter of support and co-funding. Moreover, the home institution may organise an internal process in order to pre-select the proposals to be given support (e.g. only support topics/groups that fit the institutional strategy). The NCCR scheme aims to optimise collaboration and the distribution of tasks between academic institutions, as well as collaboration with the private and public sectors. Section 2.2 gives an overview of the terms and requirements of the scheme.

The full proposal stage is also partly open. The applicants with the most highly rated pre-proposals (A) are invited to submit a full proposal. Still, researchers with lower-ranked pre-proposals (B or C) are not

[1] Figure from the NCCR brochure http://www.snf.ch/SiteCollectionDocuments/nccr_brochure_e.pdf.

explicitly excluded from submitting a full proposal. The only formal requirement for submitting a full proposal is that you participated in the pre-proposal stage, and that your institution (still) supports you.

The scientific aspects of the proposals (pre-proposals and full proposals) are evaluated by international remote/external experts and international expert panels. The SNSF assesses the proposals according to structural criteria (such as structural plans/potential for restructuring the research field, suitability of home institution and budget) and makes a shortlist of the best proposals to be forwarded to the State Secretariat for Education, Research and Innovation (SERI) and the Swiss Federal Council/ Department of Economic Affairs, Education and Research (EAER) for final decisions (see Section 1.3 for details and differences between calls).

1.2 Terms of reference for the evaluation: Key issues

The purpose of this evaluation is to gain better insight in the selection procedures of the NCCR scheme, and to provide SNSF with advice on how the selection process could be improved before launching the 5th call for proposals.

Previous studies of grant selection processes show that peer review is prone to different kinds of biases, and may disfavour e.g. interdisciplinary and non-conventional research, and the outcome of review may depend on how the review is organised[2]. Hence, transparency, legitimacy and impartiality of the procedures and the selection, as well as competent and effective selection procedures, should be key concerns in the organisation of peer review. The Terms of Reference for the present evaluation of the NCCR selection process addresses all these topics, and in addition asks some questions related to the attractiveness and outreach of the NCCR calls.

In this report, the questions addressed are grouped under four general topics with one chapter dedicated to each:

(a) *Attractiveness and outreach* of the NCCR calls: Chapter 2 discusses the ability of the NCCR call to reach its target groups.
(b) *Reviewer competence and adequacy of review organisation and procedures:* Chapter 3 addresses the general set up and organisation of the NCCR selection processes, and discusses the competence profile of the reviewers, as well as the adequacy of procedures reviewing pre-proposals and full proposals.
(c) *Impartiality, transparency, comprehensibility, legitimacy and trust:* Chapter 4 addresses the transparency and comprehensibility of procedures and criteria, as well as impartiality and stakeholders' trust in the process.
(d) *Effectiveness and efficiency:* Chapter 5 discusses whether the NCCR selection process is adequately organised to achieve its objectives (effective) and optimal in terms of time and resources spent (efficient).

A full list of the 37 questions in the ToR is given in Appendix 1.

1.3 Overview of the NCCR selection process

Table 1.2 gives a short overview of some key characteristics of the NCCR selection process and main differences between the four calls for proposals in the period 1999 to 2013. With the exception of the first call, the NCCR selection process has had two main stages – pre-proposals and full proposals (in the first call there was in addition a letter of intent stage). The flowchart in Appendix 2 (based on Call 4) provides a more detailed picture of the process and the actors involved at the different stages, including call definition, external reviews and panel meetings for assessing the pre-proposals, assessment of structural aspects by the SNSF, meetings with home institutions, the various stages of

[2] See e.g. Lamont 2009; Langfeldt 2006; Chubin & Hackett 1990; Cicchetti 1991; Cole et al. 1981; Langfeldt 2001.

the assessments of the full proposals, and finally funding decision by the State Secretariat/the Swiss Federal Council. The full process, from the publication of the pre-proposal call to the final funding decision takes about 2.5 years.

This report focuses on the selection processes of the forth call and the amendments and learning from the third call, and only concerns the SNSF part of the selection process (not the final selection by the State Secretariat). The section below gives a more detailed overview of the selection process for the 4th NCCR call and comments on differences between the two last calls.

Table 1.2 Overview NCCR selection processes, main differences between calls

	Call 1 (1999/2000)	**Call 2 (2003/2004)**	**Call 3 (2008/2009)**	**Call 4 (2011/2013)**
Procedure	3 steps: letters of intent, pre-proposals, full proposals	2 steps: pre-proposals, full proposals	2 steps: pre-proposals, full proposals	2 steps: pre-proposals, full proposals
Call topics	Call with very broad topics (including category "Other topics")	Call restricted to Social Sciences and Humanities	Open call	Open call
Structural aspects in pre- / full proposals	No chapter on structural aspects	Chapter "Qualification of the Home Institution"	Chapter "Structuring plans of the Home Institution"	Chapter "Structural measures" (incl. possible measures outside the Home Institution)
Letter of support from Home Institution	No standardisation of information	Some standardised requirements listed in call document	Some standardised requirements, form for financial support in full proposal	Fully standardised (forms for financial support and structural plans)
Scientific assessment of **pre-proposals**	Written external reviews; cross-comparison and rating (A; B; C) of pre-proposals by the Research Council (Div. IV)	Assessment and rating of the pre-proposals by one international, interdisciplinary panel (rating: A; B; C).	Assessment and rating of the pre-proposals by one interdisciplinary panel with 16 international experts (A; B; C)	Written external assessments (2-3 per proposal), cross-comparison and rating by one interdisciplinary panel, with 9 international experts Clearer definition of the rating categories (A;B;C)
Assessment of centre-related aspects (KTT, Educ, Equal Opp., Comm.)	Part of scientific assessment	Part of scientific assessment	Part of scientific assessment	Part of scientific (international experts) and of structural assessment (research council)
Structural assessment	None (some aspects mentioned in the scientific assessment)	None (some aspects mentioned in the scientific assessment)	None (some aspects mentioned in the scientific assessment)	In-depth analyses of budgets (SNSF Office) and structural plans (Research Council)
Feedback on pre-proposal to applicants	Rating and scientific assessment	Rating and scientific assessment	Rating and scientific assessment	Rating, clearly separated feedback assessment by peers (mainly science) and by research council (structural and center-related aspects)
Full proposals **Selection panels**	7 panels: Life sciences Medicine; Life sciences Genetics; Sustainable dev. and environment; SSH Life Courses; SSH Globalisation; ICT; Others	3 panels (Social Sciences and Humanities)	4 panels (in total 56 experts on 23 proposals): Humanities/ Social Sciences; Biology/life sciences; Medicine; Natural Sciences/ engineering	5 panels (in total 49 experts on 23 proposals): Humanities/Social Sciences; Nano/Bio; Medicine; Basic Sciences; Technology and Ecology
Panels' **rating and ranking of full proposals**	Rating A; B; C, plus some ranking. (Text on strengths and-weaknesses per proposal, as in all the calls).	Rating: Recommend/ Not recommended. Ranking per panel with justification.	Rating: Recommended/ Not recommended. Ranking vary by panel (ranking without justification/ranking with justification/no ranking).	Rating: Recommended /Not recommended. Clear ranking between the recommended in 1 panel; tentative/conditional ranking in 2 panels, and no ranking in 2 panels.

Source: The SNSF.

Selection process of the 4th NCCR call – and main differences between the 3rd and the 4th call

In the *call preparation phase* – taken care of by the SNSF Programmes Division and also involving communication with SERI and academic institutions – the programme terms, the selection criteria and

the selection process are defined/revised and described (development of call documents). As illustrated in the flowchart in Appendix 2, the preparation starts about 10 months before the publication of the call for pre-proposals. This stage also includes plans for the scholarly profile of the panel of experts to assess the pre-proposals.

Institutional preselection: After the announcement of the NCCR call, the applicant institutions may organise their own preselection in two phases, first for the pre-proposals to be summited, then for the full proposals. The extent to which this has been done, is examined in Section 2.1.

Experts and panels for the pre-proposals: In the SNSF pre-selection phase, pre-proposals are first assigned to individual foreign experts providing a scientific review of the proposals (international remote review: 2-4 reviewers per pre-proposal, in total 193 experts in Call 4). The remote review by individual experts was new to Call 4, and finding competent and available experts for all pre-proposals within a limited time-slot was a demanding task for the SNSF[3]. In Call 3, the pre-proposals were assessed by one large interdisciplinary, international panel (16 expert members), without prior review by individual experts. In Call 4, an interdisciplinary panel with nine international experts rated the pre-proposals based on their own assessments as well as the written reviews from the individual experts. In addition to the written reviews by the individual experts, each proposal was assigned to two panel members of which one prepared a written assessment in advance of the panel meeting, the other gave an oral assessment (adding up to a total of 2-4 written reviews per pre-proposal). The review forms for the individual experts and the panel members were somewhat different: The individual experts were asked to comment on a number of criteria and give overall assessments in terms of strong and weak points. The panel members were in addition asked to rate key criteria on a scale from 1 to 6 (but not give an overall rate in advance of the panel meeting). The overall set of criteria were the same in both forms: The individual research projects of the NCCR (2-3 sub-criteria)[4], the applicants (2-3 sub-criteria)[5], the NCCR as a whole (6 sub-criteria), and overall assessment of the pre-proposal (3 sub-criteria). All information was provided in advance of a two-day panel meeting in which each proposal was discussed and given an overall rate, A, B or C:

- A) Chances of success: good. All evaluation criteria are met.
- B) Chances of success: uncertain. Some criteria only partially met, but the flaws seem to be fixable in the given time span.
- C) Chances of success: slight. Some criteria are not met; the solving of the problems seems to be unrealistic in the given time span.

The role of the Research Council and structural evaluation: In the panel meeting, eight members of the Research Council and two SNSF officers participated in addition to the international experts. The Council members' role were to observe the process and give information and ask questions, not to rate the proposals. In a parallel process, new to Call 4, the Research Council was responsible for the structural evaluation of the pre-proposals (as well as of the full proposals). One Council member filled out a separate form for the structural evaluation of each pre-proposal (potential for restructuring the research field). The structural evaluation also included analysis of the pre-proposals' financial and structural aspects by the SNSF Administrative Office.

Separate scientific and structural assessments: The outcomes of the panel assessment (rate and comments) and the structural assessment (comments) were communicated to the applicants as separate assessments, making it clear that scientific assessments were that of the international experts and the SNSF Research Council was responsible for the structural assessments. In other words, there was no overall rating, uniting the scientific and the structural assessments: The Council did not change the rates given by the expert panel, implying that the key message given (A, B or C) was determined by the panel/scientific assessment alone and not including the structural

[3] 554 experts were contacted, of which 209 accepted, 221 declined and 123 did not answer. Of the 209 who accepted 193 submitted a review.
[4] Panel members assessed one more sub-criteria (coherence of the projects).
[5] Panel members assessed the NCCR director and the deputy director separately.

assessments. Hence, even if including structural assessments in Call 4, the basis for the *rating* of the pre-proposals was predominantly the same as in Call 3.

Meetings with applicant institutions: The final step of the pre-selection process is separate meetings with the applicant institutions (also including SERI) informing the institutional leaders about the evaluation process and the outcome for the pre-proposals of their institution, to hear their immediate reactions and clarify any open questions regarding the structural aspects and institutional commitments.

Full proposals: Following the evaluation of the pre-proposals, the applicants can submit a full proposal (nine months preparation time in Call 4). The full proposals are to be more comprehensive than the pre-proposals (pre-proposals may not exceed 14 pages excluding annexes and additional space per individual project, full proposals may be more than the double[6]), but address much the same issues (scientific questions and relevance to society, research programme, plans for the individual research projects, international cooperation, structural goals and organisation of the NCCR).

Evaluation of the full proposals: The full proposals are assigned to a review panel with international experts (see topical division in Table 1.2). The are also given an updated evaluation of structural aspects by the Research Council. Each panel consists of (normally) two international experts per proposal[7], preparing their assessments of (but not rating) the proposal in advance of the panel meeting, as well as Research Council members:

- Call 4: 5 panels with 8-14 international experts in each, plus 3 members from the Research Council, and two SNSF officers at the meeting.
- Call 3: 4 panels with 10-18 international experts in each, plus 3-4 members from the Research Council, and two SNSF officers at the meeting.

Interviews with applicants: The panel meetings include interviews with the applicants (NCCR director and three team members). For each proposal, the pre-set schedule includes 30 minutes for applicant to make a presentation, then there are 30 minutes for questions, and 45 minutes for discussion in panel.[8]

Roles and task division in the panels are the same as for the evaluation of the pre-proposals: The Council members' role are to participate in the discussion and give information on the NCCR scheme, Swiss science, the standing of applicants in other funding schemes etc., and not to rate the proposals. The foreign experts rate each proposal in terms of recommending or not recommending the proposals (hence, there are only two rates: Recommended or Not recommended). In both Call 3 and 4, the extent to which the individual panels also gave some indication of a ranking between the recommended proposals varied between panels (see Table 1.2). Similarly, as for the pre-proposals, the structural and scientific assessments are separate processes, and for each full proposal one Council member is in charge of filling out a separate form for the structural evaluation.

Shortlist: Based on these assessments, the SNSF makes a shortlist of proposals that is forwarded to the State Secretariat for Education, Research and Innovation (SERI) which is in charge of assessing how the proposed centres strategically fit into the Swiss research and higher education landscape. The formal funding decision is made by the Swiss Federal Council. At these final stages the number of

[6] These are the limits for Call 4, which allowed 2 additional pages per individual project in the pre-proposal and 6 per individual project in the full proposal. Page limits are per section, and the sections and limits varied somewhat between Call 3 and 4. In Call 3 there was no extra space for the individual projects in the pre-proposal, and also somewhat less space for individual projects in the full proposals (6 pages per project incl. publication referees, compared to 6 pages per project excl. publication referees in Call 4). On the other hand, Call 3 full proposals included a separate section (max 6 pages) on the 'general state of research an previous contributions on the topic by the NCCR participants' which in Call 4 would have to be divided on/included in other sections. Summing up differences between the two calls, for a proposal with *ten individual research projects* the total limit excluding annexes (i.e. budget, CVs, letter of support etc) would be 34 pages for Call 4 pre-proposals, 91 pages for Call 4 full proposals, 14 pages for Call 3 pre-proposals, and 96 pages for Call 3 full proposals.

[7] Call 4: 2 per proposal, in 4 cases 3 experts, in one case only one expert.

[8] In addition, comes 15 minutes in the panel for preparation in advance of each applicant presentation.

'successful' full proposals has been stepwise reduced: in Call 4, from 11 recommended full proposals (by the expert panel), to 10 full proposals shortlisted by the SNSF and 8 approved by SERI and funded; in Call 3, from 13 recommended full proposals, to 10 full proposals shortlisted by the SNSF and 8 approved by SERI and funded. In other words, differently from the pre-proposal stage, the Research Council has a crucial role in the selection. The Council merges the assessments and recommendations from different fields/panels into one shortlist of recommended proposals, also taking the structural aspects into consideration (or at least may do so, see Chapter 3.2).

The final step is an evaluation by SERI, which is not part of the present evaluation. The evaluation criteria at this policy stage are announced in the call for proposals as follows:

a) Conformity of the Leading House with the Home Institution's strategic planning
b) Division of work and co-ordination in the higher education sector
c) Incorporation into the regional and national overall distribution of leading houses in accordance with the goals of the National Centres of Competence in Research programme
d) Agreement with the federal government's research policy goals
e) Embedding in Switzerland's international scientific co-operation agreements and cooperation endeavours on an institutional level[9]

1.4 Data sources and methods of the evaluation

1.4.1 Analysis of background material

A wide range of background material is explored, providing basis for assessing all four evaluation topics.

- *Application data* to analyse applicant and awardee profiles, outreach of the calls, and variations in success rates between target groups (i.e. possible biases).
- *Review documents 4th call:* Reviewer guidelines, review reports/ evaluation documents on the pre-proposals and the full proposals. This is used for understanding the role/added value of the various stages in the selection process and the level of detail of the written statements.
- *Overview of international experts/members of review panels,* and documentation on how experts/panels were selected (for the preselection as well as the full proposals, 3rd and 4th call): This is used for studying competence profiles of reviewers/panels, potential conflicts of interest and gender balance.

1.4.2 Comparative data on CoE selection processes in other countries

Starting up in the early 2000s, the NCCR scheme has much in common with CoE schemes in other European countries. Denmark established a CoE scheme in 1994 and Norway in 2001 and both are very popular. Although an NCCR is larger than a Norwegian or Danish CoE in terms of funding, size and also time-length, a comparison of the schemes provides valuable insight into how the selection processes are organised in relatively similar schemes. We compare the NCCR scheme with these on the following issues:

- Attractiveness and outreach of the calls (including data on the number of applicants).
- Review organisation, the structure/composition and profile of panels/expert reviewers.
- Transparency of the section process and the regulations of conflicts of interest.
- The overall design, timelines (comparing time for the individual phases as well as total time), and cost in terms of number of experts per application.

We also use information from previous studies and evaluations/available documentation, and interviews with representatives/collect additional information from the responsible research councils.

[9] The criteria and process are set in state regulations, "Verordnung des WBF zur Forschungs- und Innovationsförderungsverordnung" https://www.admin.ch/opc/de/classified-compilation/20131577/index.html.

1.4.3 Survey to NCCR applicants

A survey to the applicants provides input on the attractiveness of the NCCR scheme, the applicants' perceptions of reviewer competence, the impartiality and transparency of the process, and their general trust in the selection process. The full questionnaire is included in Appendix 4.

The survey included all applicants in the 3rd and 4th NCCR calls. In total, 117 pre-proposals were submitted to these two calls, of which 51 submitted full proposals and 16 were awarded an NCCR (Table 1.1). Due to one repeated 3rd call application in the 4th call, and three deceased persons, the requested sample contained 113 applicants. From this sample, 58 applicants replied (51.3 per cent). The response rate is considerably higher among those who submitted a full proposal (63 per cent replies) and those who were funded (75 per cent replies) than among those who did not (Table 1.3). Moreover, the response rate was six percentage points higher among the applicants to the latest call (2011) than the previous one (2008).

The major bias in the sample of responses is underrepresentation of those who did not submit a full proposal, and especially Call 3 applicants who did not do so.

Table 1.3 Response rate by NCCR call and application stage

Sample	Requested sample	Replies		Response rate
	N	#	(Of these Call 3)	%
Total sample	113	58		51.3
Call 3 (2008)	50*	24		48.0
Call 4 (2011)	63	34		54.0
Only pre-proposal	64	27	(9)	42.2
Full proposals	49	31	(15)	63.3
Full proposals recommend by the selection panels	23	16	(8)	69.6
Full proposals shortlisted by SNSF	20	14	(7)	70.0
Approved/funded by Ministry	16	12	(6)	75.0

Source: NIFU survey to applicants to NCCR calls 3 and 4.

*One application repeated in the 4th call and three deceased persons are excluded from the Call 3 sample.

The respondents were given three reminders and close to four weeks to reply (from 14 April to 11 May 2016). Moreover, the SNSF sent an email to all respondents informing them about the evaluation and encouraging their participation in the survey.

1.4.4 Interviews with stakeholders

In interviews with the various stakeholder groups, we explored their experiences and views on the NCCR selection process and asked for elaboration of findings from the analysis of background material and the applicant survey. The following groups of stakeholders are covered:

- *Members of the SNSF National Research Council*: One group interview, as well as individual interviews with NCCR panel chairs.
- *International experts in the NCCR review panels*: In-depth interviews with selected panel members.
- *The Administrative offices of the SNSF*: Group interviews with key informants, as well as contact throughout the project for clarifying issues.
- *The NCCR applicants:* Individual interviews with selected applicants representing both grantees and non-grantees to elaborate issues from the applicant survey.
- *The home institutions* of NCCRs (individual interviews with representatives from key institutions): Key topics were attractiveness and transparency of the NCCR calls, the home institutions' strategies and experiences concerning the preselection, and their general trust in the selection process.

- *The State Secretariat for Education, Research and Innovation* (SERI): Addressing in particular SERI's views and experiences regarding the documentation made available for their evaluation of the proposals.

In total 34 persons were interviewed. List of informants is found in Appendix 4.

2 Attractiveness and outreach of the NCCR calls

Reaching out to the target groups and attracting the most competent and promising researchers/ groups to participate is essential for a research initiative/policy instrument to succeed. The call for proposal (the call documents) needs to present the funding scheme as attractive to the target group, and at the same time be reliable, clear and easy to understand (ESF 2011). There should be no unforeseen bias in which groups or fields of research who find the scheme attractive or have the opportunity to apply. In this chapter we look at how the NCCR scheme complies with such demands.

2.1 Outreach

In this section we look at the outreach of the NCCR call from three perspectives. First, how the target group is defined, and approached by the SNSF. Secondly, the extent to which the universities preselect proposals. Thirdly, we study the characteristics and success rates of the applicants (by field of science, institution, gender and age).

2.1.1 The SNSF preparation phase and support

In general, the applicants seem satisfied with their communication with the SNSF during the application process. In the applicant survey, a majority replied that they were satisfied with SNSF's support during the application process and only 9 per cent indicated dissatisfaction. On average, they score their satisfaction 3.7 on a scale from 1 to 5. This is slightly higher than we find in applicant surveys in other contexts.[10] Notably, a large part (24 per cent) of those who only submitted a pre-proposal answer 'cannot say' on this question, indicating that they did not have contact with the SNSF during the application process or cannot remember much about such contact (table below).

[10] See Table 4.3 (Chapter 4).

Table 2.1 Applicants' views on the support from the SNSF during the NCCR application process. Replies by call. Per cent.

	5 To a great extent	4	3	2	1 Not at all	Cannot say	N	Average (1-5)
The support during the application process (from the SNSF)								
Call3	13.6 %	40.9 %	22.7 %	4.5 %	4.5 %	13.6 %	22	3.6
Call4	20.6 %	32.4 %	20.6 %	8.8 %	0.0 %	17.6 %	34	3.8
Total	17.9 %	35.7 %	21.4 %	7.1 %	1.8 %	16.1 %	56	3.7

Source: NIFU survey to applicants to NCCR calls 3 and 4. Question 1: Considering your NCCR application, to what extent did you find the following issues/processes satisfactory?

Table 2.2 Applicants' views on the support from the SNSF during the NCCR application process. Replies by proposal stage. Per cent.

	5 To a great extent	4	3	2	1 Not at all	Cannot say	N	Average (1-5)
The support during the application process (from the SNSF)								
Only pre-proposal	24.0 %	36.0 %	4.0 %	12.0 %	0.0 %	24.0 %	25	4.0
Full proposal	12.9 %	35.5 %	35.5 %	3.2 %	3.2 %	9.7 %	31	3.6
Total	17.9 %	35.7 %	21.4 %	7.1 %	1.8 %	16.1 %	56	3.7

Source: NIFU survey to applicants to NCCR calls 3 and 4. Question 1: Considering your NCCR application, to what extent did you find the following issues/processes satisfactory?

2.1.2 The preselection at the research institutions

The home institutions are supposed to invest resources as well as strategic planning in their NCCRs[11] and may be involved in the pre-selection of proposals in many ways, e.g. in initiating or encouraging ideas for NCCRs and in formal or informal internal selection processes at department, faculty and/or institutional level.

According to the applicants who replied to our survey, the idea to apply most often comes from the research group itself (65 per cent answer that they themselves/their group launched the idea). There are some differences between Call 3 and Call 4, indicating that the faculty/school and department leadership were more involved in Call 3 than in Call 4, but the numbers are small and differences may simply indicate that Call 3 had more applicants that were part of the faculty/school and department leadership.

Table 2.3 Who launched the idea to apply for an NCCR? Replies by call. Per cent.

Who launched the idea to apply for an NCCR?	Call3	Call4	Total
I/my group/collaborators	47.8 %	76.5 %	64.9 %
I/my group in collaboration with the top leadership of the institution	13.0 %	17.6 %	15.8 %
Me/my group in collaboration with faculty/school level leadership	17.4 %	0.0 %	7.0 %
The leadership of the institution invited/asked me/my group to apply	17.4 %	5.9 %	10.5 %
Other*	4.3 %	0.0 %	1.8 %
N	**23**	**34**	**57**

Source: NIFU survey to applicants to NCCR calls 3 and 4. Only one alternative could be chosen.
* Other includes: Launched with collaborators in own institution and other Swiss Universities.

The applicants were asked to indicate the levels at their organisations which were involved in deciding whether or not to submit the pre-proposal, as well as which level(s) had a final say in this decision. The top leadership of the institution prevails as the most important in both ways: In 79 per cent of the

[11] Both the pre-proposals and the full proposals need to be accompanied by a letter of support from the home institutions.

cases they were involved in the decision and in 86 per cent they were among those with a final say. The department level was only involved in 25 per cent of the cases, and were among those with a final say in 6 per cent of the cases (tables below).

Of the 11 cases where the top leadership did not have a final say for submitting the pre-proposal, the final say was at the faculty/school level in 6 cases (in combination with department level in one case). In the remaining 5 cases, no one – apart from the research group itself – is indicated to have a final say.

Table 2.4 Involvement in NCCR preselection at home institution. Replies by call. Per cent.

Q8 Apart from you and your group, who was involved in deciding whether or not your application (pre-proposal) was to be submitted to the SNSF?	**Call3**	**Call4**	**Total**
The top leadership of the institution	78.3 %	78.8 %	78.6 %
Faculty/school level leadership	52.2 %	39.4 %	44.6 %
Department/institute level leadership	21.7 %	27.3 %	25.0 %
Other**	8.7 %	15.2 %	12.5 %
N*	**23**	**33**	**56**

Source: NIFU survey to applicants to NCCR calls 3 and 4.
*Percentages sum as to more than 100 as respondents could select multiple alternatives.
**Other includes: No preselection/think all applications were allowed (2); Co-applicants/Research collaborators/colleagues and leadership at other institution (3); Other faculties (1); Rectorate (which this respondent did not understand as 'top leadership of the institution') (1).

Table 2.5 Final say in NCCR pre-selection at home institution. Replies by call. Per cent.

Q9 Apart from you and your group, who had a final say in deciding whether or not your application (pre-proposal) was to be submitted to the SNSF? (in terms of a possible veto concerning the required letter of support and/or self-funding from home institution)	**Call3**	**Call4**	**Total**
The top leadership of the institution	90.9 %	81.8 %	85.5 %
Faculty/school level leadership	27.3 %	27.3 %	27.3 %
Department/institute level leadership	9.1 %	3.0 %	5.5 %
Other**	13.6 %	6.1 %	9.1 %
N*	**22**	**33**	**55**

Source: NIFU survey to applicants to NCCR calls 3 and 4.
*Percentages sum as to more than 100 as respondents could select multiple alternatives.
**Other includes: Nobody (2); Research office/president of the research commission (1); Collaborators at other Universities (1); Comment on non-transparent process and biases of the top leadership (1).

When asked about the pre-selection processes at their home institution, the majority answers that there was no preselection, or that it was informal. 18 per cent answer that there was formal pre-selection (same figure for the pre-proposal and full proposal stage, but some variation between calls when it comes to the full proposals, tables below). It should be added that the open comments in the questionnaire indicate that there is *not a clear cut distinction between what is perceived as a formal and what is perceived as an informal preselection process*. Both those who reply that the preselection was informal and those who reply that is was formal, point to their communication and meetings with – and need for support from – the leadership at their institution. Still, those who replied that the selection was informal more often found the bases for decisions unclear.

Table 2.6 Pre-selection of NCCR pre-proposals at home institution. Replies by call. Per cent.

How would you describe the pre-selection of NCCR pre-proposals at your home institution?	Call3	Call4	Total
Formal pre-selection process: There was a defined procedure for deciding which proposals to support	18.2 %	17.6 %	17.9 %
Informal pre-selection process: Support/not support of proposals were discussed and decided in informal meetings/settings	40.9 %	41.2 %	41.1 %
No pre-selection: All formally eligible applicants were allowed to submit a pre-proposal	36.4 %	32.4 %	33.9 %
Other*	4.5 %	8.8 %	7.1 %
N	**22**	**34**	**56**

Source: NIFU survey to applicants to NCCR calls 3 and 4. Only one alternative could be chosen.
*Other includes: I'm not sure if other pre-proposals were discouraged. We were certainly encouraged to participate (1); Probably Informal pre-selection process: yet the applicants were not involved (1); Cannot say (2).

Table 2.7 Pre-selection of NCCR full proposals at home institution. Replies by call. Per cent.

How would you describe the pre-selection of NCCR full proposals at your home institution?	Call3	Call4	Total
Formal pre-selection process: There was a defined procedure for deciding which proposals to support	11.1 %	25.0 %	18.4 %
Informal pre-selection process: Support/not support of proposals were discussed and decided in informal meetings/settings	61.1 %	45.0 %	52.6 %
No pre-selection, all formally eligible applicants were allowed to submit a full proposal	16.7 %	20.0 %	18.4 %
Other*	11.1 %	10.0 %	10.5 %
N	**18**	**20**	**38**

Source: NIFU survey to applicants to NCCR calls 3 and 4. Only one alternative could be chosen. Samples are small and differences between call not statistically significant.
*Other includes: All A-rated pre-proposals were supported by the home institution (1); Cannot say (1); Comment on biases of the top leadership (1).

The comments in the questionnaire point to different approaches to local preselection of proposals. In some cases, it was all bottom up: the applicants presented their ideas to the top leadership of the institution and were encouraged to apply, or there were meetings to discuss and coordinate ideas (to avoid overlap). In other cases, there were more top down steering.

Notably, several informants commented that the support for *full proposals* was based on the SNSF review, and in some cases prioritising between those who received an A in the SNSF review. Here are some examples of open statements:

- *There was no pre-selection for pre-proposals. All pre-proposals that were A rated were supported by the university leadership. Non A-rated pre-proposals were not supported.*
- *Everybody could submit a pre-proposal. Only the pre-proposals ranked with A were supported to submit a full proposal.*
- *From what I could recall, the coordinators of the pre-proposals who received the highest score were encouraged to submit a full proposal.*
- *The rectorate encouraged the groups whose pre-proposal got an A rating to compose a full proposal, but also made it clear from the beginning that they will only have money to finally support 1.5 NCCRs from this round.*
- *In the round in which we applied, many pre-proposals were allowed to be submitted. It seemed that far fewer proposals could have been supported by the institution. There was no formal process to decide which were favored - this was done based on the pre-proposal review.*
- *No pre-selection of pre-proposals. All formally eligible proposals could be submitted. Only 2 out of all pre-proposals that scored as A have been allowed to submit a full proposal.*

- *The rectorate decided which projects to fund, choosing a subset of those who had received an A grade in the first round. Some A grades were not supported in a decision that everybody perceived as arbitrary. A lot of effort was wasted.*

The applicants also commented on the clarity of, and different bases for, the local preselection:

- *it was not openly communicated which proposals had the highest priority, but everybody sort of knew it*
- *The dean chose one proposal and decided to push that forward. The dean then informed the other proposal PIs that they should better save their energy and not try to submit competing full proposals. In my opinion, that was a good action of the dean, so that other PIs would not work for the full proposal which is then killed by a dean who does not support it. I am thankful to our dean for having had the courage to communicate openly.*
- *Not clear. But it was clear that the leadership of my institution, although lacking any expertise, had preferences for certain pre proposals.*
- *Pre-selection was done based on scientific merit, innovation potential, and strategic fit.*

While the applicant survey gives an inconsistent result concerning the nature of the preselection at the various home institutions (in many cases replies from applicants at the same institution indicate informal and formal pre-selection as well as no preselection), the interviews with the representatives of the leadership at the institutions indicate that there are some notable differences between them. In general, the home institutions find it demanding to organise a preselection process combining bottom up processes and top down priorities. Several home institutions emphasise that they do not have the required basis for prioritising between proposals, while others seem more willing to make priorities and ensure that proposed NCCRs are in line with their institutional strategies. Some institutions give equal support to all applicants, some have more indirect preselection by expressing more support to certain applications in their support letter, while a few explicitly say no to some NCCR suggestions. To some extent these differences are linked to the size of the institutions, and hence the institution's ability to host multiple NCCRs: Some smaller institutions seem to have a rather thorough process where they end up sending in one to three pre-proposals, whereas the larger institutions allow for a large number of applications. For the full proposals, the 'general rule' (at least in Call 4) seems to be to support all A-rated pre-proposals for the full proposal stage. In some cases, B-rated proposals are also supported, partly depending on how promising (in terms of a successful full proposal) the comments/feedback following the B-rate were. In this way the home institutions use the SNSF review of their proposals as a major selection criterion: They support more pre-proposals than they can afford/host, and let the pre-selection for the full proposal stage depend on the SNSF review. It should be added that this was less so in call 1-3, where a larger number of B-rated (and also some C-rated) pre-proposals were submitted as full proposals.

More generally, both the leadership at home institutions and applicants underlined that experience from previous calls and knowledge about running centres are beneficial and even necessary in the application process. Such experiences are important for the home institutions in order to provide good support and to perform a good internal selection process.

2.1.3 The NCCR applicant profile and success rates

Below we look at the outreach of the two last NCCR calls by fields of research, institutions, age and gender – both at the pre-selection and full proposal stage.

Applications from a broad set of research fields and much interdisciplinarity: The NCCR proposals come from a variety of research fields and cover three main areas: In the third call the *life sciences* accounted for close to half the pre-proposals, whereas in the fourth call the *natural sciences/engineering* accounted for the largest proportion of the pre-proposals (41 per cent, Table 2.8). Although the humanities and social sciences were the smallest of the three areas in both calls (22-24 per cent), it should be taken into account that the previous call (Call 2) was open only to the

humanities and social sciences.[12] Furthermore, a substantial proportion of the proposals encompass different research areas (when categorised according to the SNSF divisions), e.g. research both within the humanities and life sciences or both natural sciences and life sciences. Moreover, the success rate of the proposals with such broader interdisciplinarity is substantially higher than for those which do not cross these broad research areas (except for the 4th call, first stage of the process, Table 2.9).

Table 2.8 Proposals in NCCR Call 3 and 4 by main research area. Proposals at different stages of the selection process, and success rates by research area. Per cent.

Call 3 distribution	**Humanities/ Social Sciences**	**Natural sciences/ engineering**	**Life sciences**	**N**
# Pre-proposals	13	15	26	54
Pre-proposals	24.1%	27.8%	48.1%	54
A-rated pre-proposals	25.0%	25.0%	50.0%	16
Full proposals submitted	28.6%	32.1%	39.3%	28
Recommended full proposals	23.1%	30.8%	46.2%	13
Shortlisted by SNSF	20.0%	30.0%	50.0%	10
Awarded (by ministry)	12.5%	37.5%	50.0%	8
Success rates				**Total %**
1: % of pre-proposals submitted as full proposals	61,5%	60,0%	42,3%	51,9%
2: % of full proposals shortlisted	25,0%	33,3%	45,5%	35,7%
Call 4 distribution				**N**
# Pre-proposals	14	26	23	63
Pre-proposals	22.2%	41.3%	36.5%	63
A-rated pre-proposals	20.0%	45.0%	35.0%	20
Full proposals submitted	17.4%	47.8%	34.8%	23
Recommended full proposals	27.3%	45.5%	27.3%	11
Shortlisted by SNSF	30.0%	50.0%	20.0%	10
Awarded (by ministry)	25.0%	62.5%	12.5%	8
Success rates				**Total %**
1: % of pre-proposals submitted as full proposals	28.6%	42.3%	34.8%	36.5%
2: % of full proposals shortlisted	75.0%	45.5%	25.0%	43.5%

Source: Analysis of data from the SNSF.
Field categorisation is according the SNF thematic division. 'Life sciences' include the medical and biological sciences. Several applications include research fields across these categories (see next table), but are only included under what is defined as their main research field in the data provided by the SNSF.

[12] In the first call, social sciences and humanities accounted for about one third of the pre-proposals, but had lower success rates than the applications from the other fields, see Appendix 3 Table A2.

Table 2.9 NCCR Call 3 and 4 applications across research areas: Proposals at the different stages of the selection process, and success rates. Per cent.

	Call 3			Call 4		
Proposal stage	# applications	*One division	*Multiple divisions	# applications	*One division	*Multiple divisions
Pre-proposals	54	68.5%	31.5%	63	63.5%	36.5%
A-rated pre-proposals	16	81.3%	18.3%	20	55.0%	45.0%
Full proposals submitted	28	64.3%	35.7%	23	65.2%	34.8%
A-rated/recommended full proposals	13	53.8%	46.2%	11	54.5%	45.5%
Shortlisted by SNSF	10	50.0%	50.0%	10	50.0%	50.0%
Awarded (by ministry)	8	62.5%	37.5%	8	50.0%	50.0%
Success rates						
1: % of pre-proposals submitted as full proposals	One area: 18/37 Multiple areas: 10/17	48.6%	58.8%	One area: 15/40 Multiple areas: 8/23	37.5%	34.8%
2: % of full proposals shortlisted	One area: 5/18 Multiple areas: 5/10	27.8%	50.0%	One area: 5/15 Multiple areas: 5/8	33.3%	62.5%

Source: Analysis of data from the SNSF.
* One division/area=all the research fields listed in the application belong to one of the three SNSF thematic division (Humanities and Social Sciences; Mathematics, Natural and Engineering Sciences; Biology and Medicine). Multiple divisions/areas= the application lists research fields under at least two of the three SNSF divisions.

Mainly larger institutions apply: All cantonal universities and federal universities of technology have submitted at least one NCCR pre-proposal in one of the two latest calls.[13] The exception is the University of St. Gallen, which did not apply, despite being larger in terms of number of academic staff and PhD graduations than four of those which applied.[14] In addition to the universities, three research institutes have applied in the last two calls (IDIAP with two proposals, and PSI and IRO with one each, tables 2.2 and 2.3). Moreover, *the applicant list was more diverse in prior calls*, also including the University of St. Gallen and universities of applied science, see Table A3 and A4 in Appendix 3.

The majority of the NCCRs have been awarded to the larger universities. Including all four calls, ETHZ, EPFL and the universities of Zurich, Bern, Geneva and Basel have been awarded 4 to 6 NCCRs each, whereas some of the medium and smaller universities have obtained one or two NCCRs (the universities of Neuchâtel, Fribourg and Lausanne), and two smaller universities have applied without success (USI and University of Luzern). In addition, an independent research institute has been awarded a centre (IDIAP, which is affiliated with EPFL). To some extent, the results of prior NCCR competitions and the high profile of the NCCR scheme (e.g. demands for applicants to have international visibility[15]), may discourage smaller institutions from applying. On the other hand, some smaller universities and one independent institute have succeeded, which should encourage strong research groups even when placed at smaller institutions, to apply. Moreover, several institutions which have not applied or not succeeded as home institution, participate as partners in the NCCRs. This includes USI, University of Luzern, University of St. Gallen and several universities of applied sciences (the partner networks are visualised in the 2010 edition of the NCCR Brochure, page 16-17).

Notably, the institutional outreach of the NCCR calls shows much the same pattern as the overall institutional distribution of SNSF funds. The federal universities of technology and the larger cantonal universities account for a large part of the funding, whereas USI/Ticino, Luzern and St. Gallen obtain

[13] None of the higher education institutions not awarding PhDs applied in these calls (this includs a substantial number of universities of applied sciences/Fachhochschulen and Teacher training universities/Pädagogische Hochschule). The exception is Haute École Arc which submitted a pre-proposal to the 4th call. Notably, the list of institutions applying was more diverse in Call 1 and 2, see Tables A3 and A4 in Appendix 3.
[14] Source: ETER data. The University of St. Gallen had more academic staff and PhD graduates than the universities of Luzern, Fribourg and Neuchâtel and USI in 2012.
[15] Under NCCR participation requirements, the SNSF webpage states that 'Experience has shown that only institutions already benefiting from high international visibility in the relevant field have real chances of success.' A similar statement is found in the 4th call for NCCR proposals, but not in the call text for the 3rd call.

only small amounts of SNSF funds (figure in SNSF Annual Report 2014, page 30). It should be added that other institutions (than the cantonal universities, the federal universities of technology and research institutes), accounted for 12 per cent of total SNSF funding in 2014 (10 per cent in 2011)[16], but has with the exception of Haute École Arc not applied in the two last NCCR calls (and never acquired any NCCR awards). A substantial larger part of this residual category is, however, individuals and organisations/companies that are not eligible for NCCR awards. Both in 2011 and 2014, universities of applied sciences/teacher education accounted for only 3 per cent of SNSF funding.[17]

Table 2.10 Call 3 NCCR applications by home institution. Number of proposals at different stages, and success rate for the SNSF part of the process. (Sorted by number of pre-proposals)

Home Institution	Pre-proposals	Full proposals submitted	Shortlisted by SNSF	Awarded by Ministry	*SNSF success
EPFL	11	7	2	2	18.2 %
Universität Bern	9	5	3	1	33.3 %
ETHZ	7	3	2	2	28.6 %
Université de Genève	6	3	1	1	16.7 %
Université de Lausanne	6	2	1	1	16.7 %
Universität Zürich	5	4	1	1	20.0 %
Universität Basel	3	2	0	0	0.0 %
Université de Fribourg	3	1	0	0	0.0 %
Université de Neuchâtel	1	1	0	0	0.0 %
Universita della Svizzera Italiana	1	0	0	0	0.0 %
IDIAP	1	0	0	0	0.0 %
Institut de Recherche en Ophtalmologie	1	0	0	0	0.0 %
Total	54	28	10	8	18.5 %

Source: Analysis of data from the SNSF.
*Full proposals shortlisted by the SNSF as percentage of pre-proposals.

[16] Source: SNSFs annual reports.
[17] Source: SNSFs annual reports.

Table 2.11 Call 4 NCCR applications by home institution. Number proposals at different stages, and success rate for the SNSF part of the process. (Sorted by number of pre-proposals)

Home Institution	Pre-proposals	Full proposals submitted	Shortlisted by SNSF	Awarded by Ministry	*SNSF success
EPFL	10	3	1	1	10.0 %
ETHZ	10	5	2	1	20.0 %
Université de Genève	10	2	1	1	10.0 %
Universität Bern	8	5	3	2	37.5 %
Universität Zürich	8	2	0	0	0.0 %
Universität Basel	6	2	1	1	16.7 %
Université de Fribourg	2	1	1	1	50.0 %
Université de Lausanne	2	0	0	0	0.0 %
Universita della Svizzera Italiana	2	0	0	0	0.0 %
Haute École Arc	1	0	0	0	0.0 %
IDIAP	1	1	0	0	0.0 %
Universität Luzern	1	1	0	0	0.0 %
Université de Neuchâtel	1	1	1	1	100.0 %
Paul Scherrer Institut	1	0	0	0	0.0 %
Total	63	23	10	8	15.9 %

Source: Analysis of data from the SNSF.
*Full proposals shortlisted by the SNSF as percentage of pre-proposals.

Lack of gender balance in outreach/Few female researchers with the role of NCCR director: The NCCR calls' outreach to groups led by female researchers seems limited. Both in Call 3 and 4, only 13 per cent of the pre-proposals had a female director (Table 2.5). In the last call, none of the submitted full proposals had a female director. The only pre-proposal with a female director that got an A-rating in this call was not submitted as full proposal[18], whereas three pre-proposals with male directors who did not achieve an A-rating were submitted as full proposals (two of these were C-rated and one B-rated). In the 3rd call, one (full) proposal with a female director was shortlisted and awarded. Hence, summing up the 3rd and 4th call, one of 16 successful applications had a female director. This is a result of a low number of proposals with a female director, and at some stages also a lower success rates for proposals with a female director. Comparing with prior NCCR calls, we see that female applicants were most successful in Call 1, with two awarded proposals (and a higher success rate than male applicants), whereas in Call 2 no proposals with female director reached the full proposal stage (see Appendix 3, Table A2).

In comparison, the overall distribution of SNSF funds by applicant gender was 78-22 per cent in favour of male applicants in 2014 (figure in Annual Report 2014, page 29). Hence, the gender distribution of NCCR awards (and applications) is substantially more skewed than the general allocation of SNSF grants. However, if we extend the figures from including only the NCCR director to including all senior researchers in the NCCRs, we find that women account for 22 per cent of the NCCR seniors – in terms of leaders of individual projects/units in the NCCRs.[19]

[18] All other A-rated preproposals in call 3 and 4 were submitted as full proposals.
[19] Source: NCCR Guide 2016 (SNSF 2016), page 7.

Table 2.12 NCCR Call 3 and 4. Per cent male and female directors at the different stages of the selection process, and success rates by gender.

	Call 3			Call 4		
Proposal stage	# applications	% with female directors	% with male directors	# applications	% with female directors	% with male directors
Pre-proposals	54	13%	87%	63	13%	87%
A-rated pre-proposals	16	19%	81%	20	5%	95%
Full proposals submitted	28	18%	82%	23	0%	100%
A-rated/recommended full proposals	13	8%	92%	11	-	100%
Shortlisted by SNSF	10	10%	90%	10	-	100%
Awarded (by ministry)	8	13%	87%	8	-	100%
Success rates		**female**	**male**		**female**	**male**
1: % of pre-proposals submitted as full proposals	Female: 5/7 Male: 23/47	71%	49%	Female: 0/8 Male: 23/55	0%	42%
2: % of full proposals shortlisted	Female: 1/5 Male: 9/23	20%	39%	Female: 0/0 Male: 10/23	-	44%

Source: Analysis of data from the SNSF.

Most NCCR applications have a director above 45 years old, but the younger have higher success rates: For the large proportion of the proposals, the assigned NCCR director is 46 to 55 years old (encompassing 61 per cent of pre-proposals in Call 3 and 57 per cent in Call 4, Table 2.6, age in Call year). Still, a substantial proportion of assigned leaders were below 46 years (19 per cent in Call 3 and 25 per cent in Call 4). Moreover, those with younger leaders often succeed in the selection process: in both calls they had higher success rates at the full proposal stage, and in the 4th call they also had a higher success rate at the pre-proposal stage (Table 2.6).

Table 2.13 Proposals in NCCR Call 3 and 4 by age of centre director (in call year). Proposals at different stages of the selection process, and success rates by age. Per cent.

Call 3 distribution	**38-45**	**46-55**	**56-65**	**N**
# Pre-proposals	10	33	11	54
Pre-proposals	18.5%	61.1%	20.4%	54
A-rated pre-proposals	12.5%	68.8%	18.8%	16
Full proposals submitted	14.3%	64.3%	21.4%	28
A-rated/recommended full proposals	15.4%	61.5%	23.1%	13
Shortlisted by SNSF	20.0%	60.0%	20.0%	10
Awarded (by ministry)	25.0%	62.5%	12.5%	8
Success rates				**Total %**
1: % of pre-proposals submitted as full proposals	40.0%	54.5%	54.5%	51.9%
2: % of full proposals shortlisted	50.0%	33.3%	33.3%	35.7%
Call 4 distribution				**N**
# Pre-proposals	16	36	11	63
Pre-proposals	25.4%	57.1%	17.5%	63
A-rated pre-proposals	45.0%	40.0%	15.0%	20
Full proposals submitted	43.5%	43.5%	13.0%	23
A-rated/recommended full proposals	54.5%	27.3%	18.2%	11
Shortlisted by SNSF	60.0%	30.0%	10.0%	10
Awarded (by ministry)	62.5%	25.0%	12.5%	8
Success rates				**Total %**
1: % of pre-proposals submitted as full proposals	62.5%	27.8%	27.3%	36.5%
2: % of full proposals shortlisted	60.0%	30.0%	33.3%	43.5%

Source: Analysis of data from the SNSF.

2.2 Attractiveness

Call documents and requirements

The aims of the NCCR scheme are relevant and important for a large part of the research community. They encompass general and broad concerns, including maintaining and strengthening important fields of research, supporting the highest quality, basic research as well as knowledge transfer, training the next generation of researchers, and optimising research structures/coordination between research institutions. In this way the NCCR scheme combines key policy aims that in some cases may be perceived as (at least partly) conflicting when prioritising proposals, e.g. supporting the highest quality and at the same time strengthening strategically important fields, and supporting basic research as well as knowledge transfer.

The NCCR terms and requirements are described in one common call document. Key issues include:

- *Research scopes and topics:* The research must be of long-term nature, clearly rooted in basic research, and include interdisciplinary or new approaches within disciplines. The proposed research agenda/programme needs to be coherent and add value to the individual projects of the NCCR. Moreover, it must comply with and be designed to strengthen existing research and teaching focus points/priorities of the home institution, and should contribute to strengthening networks and concentration of efforts. Call 3 and 4 were open to all fields of research, whereas call 2 were open to the social sciences and humanities.
- *Funding scope:* The SNSF provides annual funding of 3-5 Mill CHF per centre. The maximum length is 12 years. Funding is assured for 4 years at the time, with interim evaluations. The NCCR cannot receive any overhead from the SNSF.
- *Co-funding:* The home institution 'must afford a significant contribution in financial and structural respects', and support the NCCR with personnel and funding and necessary structural measures. There are no formal requirements for co-funding from partner institutions, but as the NCCR funding does not cover overhead, all partners must be expected to contribute with own resources.
- *Autonomy and leadership:* The NCCRs are expected to enjoy a high degree of academic, organisational and financial autonomy. The NCCR directors must devote at least 30 per cent of their working time to the NCCR and have a permanent position at the home institution, enjoy high international reputation in their field and have experience in heading and coordinating large research networks.
- *Eligibility*: All higher education and research institutions recognised by the federal government may apply as home institution. Hence, also universities of applied sciences and other types of institutions which has yet been awarded any NCCR are eligible. However, after outlining the formal eligibility requirements, the 4th call for NCCR proposals states that 'Experience has shown that only institutions already benefiting from high international visibility in their field have real chances of success.'[20]
- *Partners:* There are no limiting requirements concerning number or type of partners included in the NCCRs. All types of higher education and research institutions may participate, as well as private companies.[21] Also groups outside Switzerland may be included and funded as far as their expertise is needed for the success of the NCCR and not available in Switzerland.

In sum, the funding terms should be attractive (large, long-term and stable funding), at least to larger organisations that can afford the co-funding. The scheme is open to all fields of research and all relevant types of research and higher education institutions, and there are few requirements which formally delimit the target group of the scheme. It is also a high-profile/prestigious scheme which is attractive to obtain – adding prestige to the awardees. On the other hand, the high profile may

[20] This text was not in the 3rd call.
[21] The terms simply say 'a network of partners and partner institutions from the academic or non-academic Sectors'.

discourage smaller organisations and groups without international visibility from applying. The scheme also demands a long planning horizon; the applicants need to outline a research programme that starts two years after the pre-proposal deadline and lasts for up to 12 years (the first four years are expected to be described in more detail).

The views of the stakeholders

According to the applicant survey, the NCCR scheme is attractive in terms of funding amount, the flexibility of use of funds as well as in terms of prestige and career impact. The survey applicants were asked to compare the attractiveness of the NCCR scheme to other relevant funding sources, as well as to ERC grants. Compared to other national schemes, the NCCR scheme is rated higher on all three aspects – prestige/career impact, funding amount and flexibility (few answer that it is poorer, a substantial amount (35 to 60 per cent) answer that it is better and the remaining answer 'about the same' or 'cannot say', Table 2.14). Also compared to results in a previous researcher survey, the NCCR scheme comes out better on these questions than SNSF Project Funding and Sinergia Grants[22].

Table 2.14 NCCR's attractiveness compared to applicants' other relevant national funding sources. Replies by NCCR proposal stage. Per cent.

	The NCCR scheme is				N	PP difference
	Better	About the same	Poorer	Cannot say/NA		Better-Poorer
Impact on the prestige and career of the awarded investigators/researchers						
Only pre-proposal	65.4 %	26.9 %	0.0 %	7.7 %	26	65.4
Full proposal	51.6 %	22.6 %	12.9 %	12.9 %	31	38.7
Total	57.9 %	24.6 %	7.0 %	10.5 %	57	50.9
Amount of funding						
Only pre-proposal	57.7 %	30.8 %	3.8 %	7.7 %	26	53.9
Full proposal	61.3 %	29.0 %	0.0 %	9.7 %	31	61.3
Total	59.6 %	29.8 %	1.8 %	8.8 %	57	57.8
Flexibility of use of funds						
Only pre-proposal	24.0 %	40.0 %	4.0 %	32.0 %	25	20.0
Full proposal	43.3 %	33.3 %	0.0 %	23.3 %	30	43.3
Total	34.5 %	36.4 %	1.8 %	27.3 %	55	32.7

Source: NIFU survey to applicants to NCCR calls 3 and 4. Question: When comparing the NCCR scheme to your other relevant national funding sources, is the NCCR poorer, about the same or better, concerning [prestige/funding/flexibility].

Compared to ERC grants, the NCCR scheme is rated lower on prestige/career impact, somewhat lower on funding amount[23], but somewhat higher on flexibility (Table 2.15).

[22] In the previous survey including SNSF, questions did not differentiate between national sources and the ERC. Respondents were simply asked to compare with their other relevant funding sources. Results are given in Langfeldt et al. 2015, Tables 4.15, 4.16 and 4.17.

[23] In absolute amount the NCCR grants are far larger than ERC grant. Many informants probably assess the funding amount relative to the research to be done.

Table 2.15 NCCR's attractiveness compared to the ERC. Replies by NCCR proposal stage. Per cent.

	The NCCR scheme is				N	PP difference
	Better	About the same	Poorer	Cannot say/NA		Better-Poorer
Impact on the prestige and career of the awarded investigators/researchers						
Only pre-proposal	11.5 %	38.5 %	26.9 %	23.1 %	26	-15.4
Full proposal	3.2 %	38.7 %	35.5 %	22.6 %	31	-32.3
Total	7.0 %	38.6 %	31.6 %	22.8 %	57	-24.6
Amount of funding						
Only pre-proposal	26.9 %	26.9 %	26.9 %	19.2 %	26	0.0
Full proposal	19.4 %	19.4 %	38.7 %	22.6 %	31	-19.3
Total	22.8 %	22.8 %	33.3 %	21.1 %	57	-10.5
Flexibility of use of funds						
Only pre-proposal	23.1 %	23.1 %	15.4 %	38.5 %	26	7.7
Full proposal	25.8 %	25.8 %	6.5 %	41.9 %	31	19.3
Total	24.6 %	24.6 %	10.5 %	40.4 %	57	14.1

Source: NIFU survey to applicants to NCCR calls 3 and 4. Question: When comparing the NCCR scheme to the selection process of the European Research Council, is the NCCR poorer, about the same or better, concerning [prestige/funding/flexibility].

The general impression of the NCCR scheme as very attractive and prestigious was confirmed in the interviews with the home institutions. It was added that due to the lack of coverage of overhead cost and the demands for co-funding more generally, the NCCRs are primarily an instrument for big universities that have the financial means to support the NCCRs. Some were also concerned about an inherent tension in the scheme, between the goal of enhancing the competition between the institutions and the goal of developing networks across institutions. Moreover, some of the interviewees found the broad set of aims of the NCCRs demanding – fulfilling demands both for the highest quality, basic research, strengthening strategically important fields, knowledge transfer, and advancement of young researchers and women. More specifically, the size of the expected research networks/centres poses a challenge for some fields within the humanities.

2.3 CoE calls in other countries

The Danish and Norwegian CoE schemes are considerable smaller than the NCCR scheme – the latter is more than three times larger than the Danish CoE scheme in terms of funding. Despite this fact, the schemes share several similarities with the NCCRs; they grant funding for a longer time period; with their additional funding (co-funding from home institution and third party funding) the Danish and Norwegians centres may be much larger (the centre grant accounts on average for 20 per cent of the budget for the Norwegian centres and 40 per cent of the Danish[24]). As measured in scientific staff the Scandinavian CoEs are relatively large: the Norwegian centres comprise on average 33 professors/researchers and 34 PhDs/postdocs; the Danish on average 25.5 full time equivalent faculty and postdocs/PhDs.[25] In comparison, an NCCR on average involves 30 senior researchers and 54 postdocs/PhDs.[26] Table 2.16 shows a comparison on size, numbers of centres, time-length and financial conditions.

[24] Evaluation of the Danish National Research Foundation (2013). Danish Agency for Science, Technology and Innovation; Annual report Norwegian CoE (2015). Research Council of Norway http://www.forskningsradet.no/prognett-sff/Sentrale_dokumenter/1224067001860. The centres can be virtual or they may physically co-locate researchers.
[25] http://dg.dk/filer/Publikationer/Evaluering2013/Self%20assessment_report.pdf; http://www.forskningsradet.no/prognett-sff/Sentrale_dokumenter/1224067001860.
[26] NCCR Guide 2016, page 7. The figures are not directly comparable, as only the Danish figures are full time equivalents and criteria for counting who are involved/part of in the centre may vary.

Table 2.16 Size and terms of CoE schemes in Switzerland, Norway and Denmark

	NCCR	N CoE	DK CoE
Scheme funding per centre (annual average)	3-5 mill CHF	1-2 mill CHF	1 mill CHF
Number of centres in the scheme (2016)	21	21	39
Number of pre-proposals/full proposals/awarded centres last call	63/23/8	139/29/13	173/30/12
Centre period	12 years (4+4+4)	10 years (5+5)	10 years (6+4)
Co-funding	Financial and structural co-funding, no fixed percentage	Co-funding required (in kind)	Co-funding expected
Overhead covered	No	Yes	Yes (44%)

Both the Danish and the Norwegian CoE-schemes are very attractive. They have since their inception experienced increased interest in terms of number of applicants. The Danish scheme receives between 140-200 pre-proposals and the Norwegian scheme between 100-150 (last call).

The 'biases' in outreach are not very different from the NCCRs. The majority of the applicants/directors in both schemes are male: In the last call the distribution of pre-proposals was 73 per cent male and 27 per cent female in DK CoE, and 79 per cent male and 21 per cent female in N CoE. In both countries there are fewer applicants from the humanities/social sciences compared to the natural sciences and the life sciences (in all cases the centres are quite interdisciplinary).[27] Moreover, both schemes favour big universities. In Denmark, the four biggest universities host 90 per cent of the centres, and in Norway the scheme is considered as an instrument primarily for the universities (not for the independent institutes or university colleges).

In Denmark, there is extensive activity to ensure outreach. The institutions get much information up front to the deadline of the pre-proposal, and the director of the Foundation (dg.dk) visits the universities where individual applicants may book a meeting.

2.4 Conclusions

The outreach of the NCCR scheme

- *A broad and interdisciplinary scheme:* Applications come from a broad set of research fields and a large part of them encompass research in multiple research areas.
- *Concentration of grants:* In principle, the NCCR scheme is open to all Swiss higher education and research institutions. Still, it is mainly the larger universities which apply for and are awarded NCCRs. In this sense, the outreach of the NCCR scheme shows much the same pattern as the overall institutional distribution of SNSF funds.
- *Male dominance:* The NCCR calls' outreach to groups led by female researchers seems limited. There are few female researchers with the role of NCCR director. This is a result of a low number of proposals with a female director, and at some stages also a lower success rates for proposals with a female director. Including all senior researchers in the funded NCCRs the gender distribution equals that of the overall distribution of SNSF grants (22 per cent women).
- *Good success rates for younger leaders:* Most NCCR applications have a director above 45 years old, but the younger have had higher success rates.
- *Factors possibly limiting outreach:* To reduce the resources spent on unsuccessful applications, in the last NCCR call applicants were informed that 'Experience has shown that only institutions already benefiting from high international visibility in their field have real chances of success.' Moreover, the degree to which the universities/research institutions preselect their NCCR

[27] In the Norwegian CoEs, the distribution between fields in the last call was: 37 pre-proposals/2 selected centres in the humanities/social sciences, 56 pre-proposals/6 selected centres in the natural sciences, 46 pre-proposals/5 selected centres in the life sciences.

proposals varies, implying that a research group's possibilities to participate in the competition for NCCR grants vary by their institutional affiliation.
- *Inherent tensions in the scheme:* Informants point to that the process is supposed to be bottom-up and research driven, but that a main goal is a structural change in the home institutions. This requires close collaboration with the home institutions as the researchers depend upon their support.

Attractiveness

- *Highly attractive prestigious scheme:* In general, the home institutions and the applicants find the NCCR scheme highly attractive. Most applicants rate the prestige of the NCCR scheme as higher than their relevant national funding, but lower or on level with ERC grants.
- *Concerns limiting the attractiveness:* The home institutions express some financial concerns with the NCCR scheme, as the NCCR funding does not cover overhead and the home institutions are required to dedicate resources to a specified field of research over a long period of time.
- *Limited attractiveness in the humanities:* The size of the expected research networks/centres poses a challenge for some fields within the humanities.

3 Reviewer competence and adequacy of review organisation and procedures

In order to select the proposals most likely to achieve programme objectives, funding agencies are reliant upon competent reviewers and adequate review and selection procedures. Attracting the best reviewers – and more generally to find willing, competent and impartial expertise for the assessment of proposals – is often a challenge. Impartiality and conflicts of interest, are general challenges in smaller countries, whereas willingness/increasing 'reviewer fatigue' is an increasing problem in the recruiting of international expertise. The amount of review work is increasing and the most competent reviewers get far more review requests than they can handle. Moreover, the review process needs to be designed to allow competent assessments of all (eligible) proposals, including assessments of cutting-edge and interdisciplinary research, and adequate procedures for comparing and rating proposals, and for taking decisions. Additional concerns for centre schemes often include the evaluation of strategic aspects such as national priorities and the development of the research system (ESF 2011 p. 67; OECD 2014 p. 57). In sum, the panel composition and organisation, the review and selection criteria, the review guidelines and the general set up of the process should effectively promote programme objectives.

The NCCR selection process involves a number of stages and actors (see Section 1.3 and Appendix 2). This chapter addresses the general set up and organisation of the NCCR selection process at all stages and the reviewer competence and adequacy of review procedures at the pre-proposal and full proposal stages.

3.1 Reviewer competence

3.1.1 Recruitment and profile of experts

Pre-proposals external experts: In the 4th call, a list of experts covering the different fields of each application – including both suggestions from SNSF and the applicants – were used by the SNSF when recruiting expert reviewers. This work was challenging. In total 554 experts were contacted with the aim of finding 2-3 reviewers for each of the 63 pre-proposals. Of the 554 contacted experts, 209 accepted and 193 delivered a review.[28] The resulting number of reviews per application partly depended on the number of experts accepting the invitation and how many of these who delivered a review. With three exceptions, the result was two to four delivered reviews for each pre-proposal (in

[28] 221 declined and 123 did not answer.

one case there was only one review and in two cases more than four reviewers).[29] Applicants had been invited to suggest experts for their proposal (conflicts of interests were checked before using these), which made it easier to find relevant expertise and reduced the time needed for this task. In sum it was still quite demanding and time-consuming to recruit the individual experts, whereas difficulty varied between fields (being most difficult within medicine and biology).

Pre-proposals panels: Finding experts for the panels was easier. For the Call 4 pre-proposal panel, there was a defined need for experts in 9 research fields (one in each). For 6 of these, the first expert on the list accepted, for the remaining number 2 or 3 accepted. Each proposal was assigned to two panel members, one responsible for providing a written review ('first reviewer), the other for a short oral statement ('second reviewer'). Hence, each of the 9 panel members on average provided 7 written reviews and had a secondary responsibility for another 7 pre-proposals.

The full proposal panels: Both for Call 3 and Call 4, the full proposal panels were composed to combine the advantages of panel review (joint discussion and calibration of assessments) and individual reviewers (selecting reviewers with competence adjusted to each application). The composition of the Call 4 panels was decided after the proposals were submitted (2 experts per proposal, in one panel 3 experts per proposal). According to the involved staff it was easier than recruiting the external experts for the pre-proposals.[30] It still took a lot of time to compose the panels. Outstanding researchers willing and able to review the proposals are hard to find, and recruiting the last 10-20 per cent of a panel is often difficult.

Gender balance in the Call 4 panels: The proportion of women among the experts was low both on the pre-proposal panel (11 per cent; 1 of 9) and among the external experts for the pre-proposals (12 per cent; 23 of 193). In the panels for the full proposals the proportion of women was somewhat higher, 22 per cent (11 of 49 international experts).

International profile of experts: The external experts for the pre-proposals (Call 4) had a broad international profile, with experts located in 25 different countries. A large part of them were located in the US (63) or in Germany (38). One of the 193 experts were located in Switzerland. The full proposal panels had a similar profile, with experts from 14 different countries, and a majority from the US, Germany and the UK. In the pre-proposal panel, 5 of the 9 international experts were affiliated to a German institution, the rest were from the Netherlands, US and Canada.

Tables 3.1 and 3.2 shows the size of panels and the number of experts per proposal in Call 3 and Call 4. The number of experts per proposals increased from Call 3 to Call 4. In Call 3 there were 16 international experts (panel members) for the 54 pre-proposals (0.3 per proposal), whereas in Call 4 there were 193 international experts and 9 panel members for the 63 pre-proposals (3.2 per proposal). Hence, the possibility of matching expertise for each pre-proposal was considerably better in Call 4 than in Call 3. The review reports on the pre-proposals were not available to the full proposal panel members. Consequently, for the decisive assessments of the proposals, the basis in terms of number of reviewers was much the same in Call 3 and 4: For the full proposals in Call 3, there were 2 international experts (panel members) for each proposal. This was also the case in Call 4, with the exception of the humanities and social science panel where there were 3 experts for each proposal.

[29] For 37 of the proposals there were 3 reviews, in 11 cases there were two and in 12 cases 4. In one case there were 5 experts, and in another case 6, who delivered a review. In the cases with only one review, 7 experts had been contacted, 3 had accepted and of these only one expert delivered a review.
[30] Moreover, some of the interviewed international panel members said they would rather review NCCR applications than doing certain other kinds of review work – it was both interesting work and well organised by the SNSF.

Table 3.1 Overview proposals and panels Call 4

Panel	Number of repr from SNSF*	Number of experts	Number of proposals	A rated/ recommended	Short-listed	Granted
Pre-proposal panel	8	9**	63	20		
Full Proposals						
Humanities/Social Sciences	3	9	3	2	2	1
Nano/Bio	3	8	4	2	2	2
Medicine	3	8	4	2	1	1
Basic Sciences	3	10	5	3	3	3
Technology and Ecology	3	14	7	2	2	1
Total full proposal panel	(14 diff. Council members)	49	23	11	10	8

*Staff from the SNSF Office are not included (2 in each panel), only the Research Council members. In total, 14 different Council members in the full proposal panels (1 overlap Nano/Bio and Technology and Ecology). Three of the Council members in the pre-proposal panel also served in the full proposal panels. There was no overlap in the international experts.
** In addition comes 193 individual reviewers (2-4 per pre-proposal).

Table 3.2 Overview proposals and panels Call 3

Panel	Number of repr from SNSF*	Number of experts	Number of proposals	A rated/ recommended	Short-listed	Granted
Pre-proposal panel	9	16	54	16		
Full Proposals						
Humanities/Social Sciences	4	16	8	3	2	1
Biology/life sciences	3	12	6	4	3	2
Medicine	3	10	5	2	2	2
Natural Sciences/engineering	4	18	9	4	3	3
Total full proposal panel	(13 diff. Council members)	56	28	13	10	8

*Staff from the SNSF Office are not included (2 in each panel), only the Research Council members. In total, 13 different Council members in the full proposal panels (1 overlap Medicine and Biology). Four of the Council members in the pre-proposal panel also served in the full proposal panels.

Matching expertise to broad proposals and to a broad set of proposals: According to the interviewed panel members, the panels had a well matched competence profile. The 2-3 experts for each full proposal provided both overlapping and supplementary competences (the degree of overlap varied). With only 2-3 people it is still hard to match all expertise in a centre comprising several laboratories /organisations – the reviewers did not have full expertise in each discipline involved. Some experts who had expertise from selection processes with more experts – e.g. a separate panel for each centre proposal – thought that two experts were not enough to cover a centre proposal. Still, most of the interviewed panel members had no concerns with the competence profile of their panel: There were very high and broad-based competence, covering the key parts of the proposals. On the more general issues, the panel members could contribute with comments and assessments outside their immediate area of expertise, providing broad discussion on each proposal. Moreover, in some cases the panel members had relevant competence also for (parts of the) other proposals than the one they were assigned to review. In general, the interviewed experts seemed used to, and comfortable with, reviewing interdisciplinary proposals, but to what extent they read the other proposals, and were able to comment on them, varied.

3.1.2 Applicants' opinions

The applicants are moderately satisfied with the competence of the experts who assessed their applications. On a scale from 1 to 5, the average rate given is 3.3 for the expertise on the pre-proposals and 3.5 on the full proposals. Whereas on the pre-proposal stage the applicants may have limited information about the reviewers, on the full proposal stage they meet the experts and have a better basis for judging their experience. Hence, a substantial proportion (16 per cent) answer 'cannot say' when asked about the competence for the pre-proposal reviewers, whereas for the full proposals the opinions are more split: there is higher proportion giving top score as well as higher proportion

giving bottom score (compared to the pre-proposal stage). Differences between the two calls for proposals are not statistically significant.

As one would expect, those who got a favourable assessment/reached the next stage are far more satisfied than those who did not. Those who ended their application process at the pre-proposal stage give the expertise for the proposals an average rate of 2.9, whereas those who moved on to the next stage give 3.6. Those who obtained an NCCR, on average give 4.3 to the reviewers' competence for the full proposals, whereas the other applicants at the full proposal stage give 3.0 (table below, the samples are small, the difference is still statistically significant).

Table 3.3 The NCCR applicants' opinions on the reviewers' competence. Replies by call and proposal stage. Per cent and average rate.

Considering your NCCR application. to what extent did you find the following issues/processes satisfactory?	**5 To a great extent**	**4**	**3**	**2**	**1 Not at all**	**Cannot say**	**N**	**Average (1-5)**
The competence of the experts reviewing the pre-proposals								
Call3 applicants	9.1 %	27.3 %	22.7 %	9.1 %	13.6 %	18.2 %	22	3.1
Call4 applicants	15.2 %	18.2 %	39.4 %	9.1 %	3.0 %	15.2 %	33	3.4
No full proposal submitted (C3+4)	0.0 %	12.0 %	56.0 %	8.0 %	8.0 %	16.0 %	25	2.9*
Submitted full proposal (C3+4)	23.3 %	30.0 %	13.3 %	10.0 %	6.7 %	16.7 %	30	3.6*
*Total	12.7 %	21.8 %	32.7 %	9.1 %	7.3 %	16.4 %	55	3.3
The competence of the experts reviewing the full proposals								
Call3 applicants	26.7 %	20.0 %	26.7 %	6.7 %	20.0 %	0.0 %	15	3.3
Call4 applicants	43.8 %	6.2 %	31.2 %	12.5 %	6.2 %	0.0 %	16	3.7
Not funded (Call 3 and 4)	21.1%	5.3 %	42.1 %	10.5 %	21.1 %	0.0 %	19	3.0*
Funded (Call 3 and 4)	58.3%	25.0 %	8.3 %	8.3 %	0.0 %	0.0 %	12	4.3*
Total	35.5 %	12.9 %	29.0 %	9.7 %	12.9 %	0.0 %	31	3.5

Source: NIFU survey to applicants to NCCR calls 3 and 4. Question 1.
*The difference between the funded and not funded is statistically significant. The difference between those who submitted a full proposal and those who did not is statistically significant.

Also when asked more specific questions – about the evaluation panels' ability to assess all the fields of research involved and the thoroughness of the review – the applicants are moderately satisfied. For the pre-proposals the average rate is 3.2 on the ability to assess all the fields and 3.0 on the thoroughness of the review (Table 3.4).

The overall figures are much the same for the full proposals (3.0 on the ability to assess all the fields and 3.1 on the thoroughness of the review, Table 3.5). For the full proposals, the applicants were also asked whether the evaluation panel was able to understand and respond to the presentation of their proposal (during their meeting with the selection panel). Here the replies are slightly more positive (average 3.5), and we see a high proportion of top rates from those who were awarded an NCCR: 58 per cent of them answer that the panel to a great extent were able to understand and respond to their presentation.

Table 3.4 Pre-proposals: The NCCR applicants' opinions on the thoroughness of the review of the pre-proposals. Replies by call. Per cent and average rate.

To what degree do you think the evaluation panel:	5 To a great extent	4	3	2	1 Not at all	Cannot say	N	Average (1-5)
Was able to assess all the fields of research involved in the application?								
Call3	13.6 %	27.3 %	13.6 %	13.6 %	18.2 %	13.6 %	22	3.1
Call4	5.9 %	35.3 %	29.4 %	17.6 %	2.9 %	8.8 %	34	3.3
No full proposal submitted (C3+4)	0.0%	30.8%	34.6%	19.2%	7.7%	7.7%	26	3.0
Submitted full proposal (C3+4)	16.7%	33.3%	13.3%	13.3%	10.0%	13.3%	30	3.4
Total	8.9 %	32.1 %	23.2 %	16.1 %	8.9 %	10.7 %	56	3.2
Provided a thorough assessment of your application?								
Call3	13.6 %	18.2 %	18.2 %	27.3 %	13.6 %	9.1 %	22	2.9
Call4	2.9 %	32.4 %	32.4 %	14.7 %	11.8 %	5.9 %	34	3.0
No full proposal submitted (C3+4)	3.8%	15.4%	34.6%	23.1%	15.4%	7.7%	26	2.7
Submitted full proposal (C3+4)	10.0%	36.7%	20.0%	16.7%	10.0%	6.7%	30	3.2
Total	7.1 %	26.8 %	26.8 %	19.6 %	12.5 %	7.1 %	56	3.0

Source: NIFU survey to applicants to NCCR calls 3 and 4. Question 2: To what degree do you think the evaluation panel that assessed your pre-proposal was able to/provided.

Table 3.5 Full proposals: The NCCR applicants' opinions on the thoroughness of the review of the full proposals. Replies by call. Per cent and average rate.

To what degree do you think the evaluation panel:	5 To a great extent	4	3	2	1 Not at all	Cannot say	N	Average (1-5)
Was able to understand and respond to the presentation of your proposal (during your meeting with the selection panel)?								
Call3	33.3 %	26.7 %	6.7 %	20.0 %	13.3 %		15	3.5
Call4	37.5 %	6.2 %	18.8 %	31.2 %	6.2 %		16	3.4
Not funded (Call 3 and 4)	21.1%	10.5%	15.8%	36.8%	15.8%		19	2.8
Funded (Call 3 and 4)	58.3%	25.0%	8.3%	8.3%	0.0%		12	4.3
Total	35.5 %	16.1 %	12.9 %	25.8 %	9.7 %	0%	31	3.4
Was able to assess all the fields of research involved in the application?								
Call3	33.3 %	6.7 %	13.3 %	13.3 %	33.3 %		15	2.9
Call4	12.5 %	25.0 %	31.2 %	18.8 %	12.5 %		16	3.1
Not funded (Call 3 and 4)	15.8%	5.3%	21.1%	21.1%	36.8%		19	2.4
Funded (Call 3 and 4)	33.3%	33.3%	25.0%	8.3%	0.0%		12	3.9
Total	22.6 %	16.1 %	22.6 %	16.1 %	22.6 %	0%	31	3.0
Provided a thorough assessment of your application?								
Call3	26.7 %	26.7 %	13.3 %	0.0 %	33.3 %		15	3.1
Call4	18.8 %	31.2 %	6.2 %	31.2 %	12.5 %		16	3.1
Not funded (Call 3 and 4)	21.1%	5.3%	10.5%	26.3%	36.8%		19	2.4
Funded (Call 3 and 4)	25.0%	66.7%	8.3%	0.0%	0.0%		12	4.2
Total	22.6 %	29.0 %	9.7 %	16.1 %	22.6 %	0%	31	3.1

Source: NIFU survey to applicants to NCCR calls 3 and 4. Question 3: To what degree do you think the evaluation panel that assessed your full proposal was able to/provided.

Notably, the reviewer competence for the NCCR scheme comes out negative when the applicants compare it with the competence used in other funding schemes. In particular, the NCCR schemes comes out poorer than other national sources (which mostly are other SNSF funding schemes[31]). About half of the respondents reply that the competence is about the same, 40 per cent think other national sources are better, and only 4 per cent think the NCCR is better. Compared to the ERC, the figures are somewhat less negative for the NCCRs, but still those who think ERC is better outweigh those who think the NCCR scheme is better (a large proportion answer 'cannot say', table below).

[31] 30 of the 33 who used the free text box to indicate the national source they compared with, listed SNSF schemes (individual grants/projects; Sinergia etc).

Table 3.6 Reviewer competence in the NCCR scheme compared to other national funding sources and to ERC. Replies by proposal stage. Per cent.

	The NCCR scheme is				N	PP difference
Reviewer competence	Better	About the same	Poorer	Cannot say/NA		Better-poorer
NCCR compared to your relevant national funding sources						
Only NCCR pre-proposal	3.8 %	34.6 %	50.0 %	11.5 %	26	-46.2
Full NCCR proposal	3.2 %	61.3 %	32.3 %	3.2 %	31	-29.1
Total	3.5 %	49.1 %	40.4 %	7.0 %	57	-36.9
NCCR compared to the European Research Council						
Only NCCR pre-proposal	11.5 %	38.5 %	26.9 %	23.1 %	26	-15.4
Full NCCR proposal	9.7 %	48.4 %	12.9 %	29.0 %	31	-3.2
Total	10.5 %	43.9 %	19.3 %	26.3 %	57	-8.8

Source: NIFU survey to applicants to NCCR calls 3 and 4. Question 6 and 7: When comparing the NCCR scheme to your other relevant national funding sources/ to the selection process of the European Research Council, is the NCCR poorer, about the same or better, concerning Reviewer competence.

Still the perception of the thoroughness of the assessments in the NCCR process is about the same as in other funding schemes for which we have applicant survey data. When splitting replies by awarded and non-awarded applicants, the NCCR comes out about as good as the he Human Frontier Science Program (HFSP) and the Norwegian and Sweden schemes in Table 3.7.

Table 3.7 Applicants' views on competence and thoroughness of assessment. NCCR average rates compared to figures from surveys for the Human Frontier Science Program (HFSP) and for individual project support schemes in Sweden and Norway. Average rates on a scale from 1 to 5.

To what degree do you think the evaluation panel that assessed your proposal	**NCCR (full prop)**		**Sweden (RJ)**		**Norway (FRIPRO)**		**HFSP**	
	*Aw	No	Aw	No	Aw	No	Aw	No
Was **able to assess all the fields** of research involved in the application?	3.9	2.4	4.1	2.8	3.7	2.9	4.5	2.9
Provided an **impartial and unbiased assessment** of your application?**	4.3	2.7	4.3	2.8	3.9	3.1	4.5	2.9
Provided **a thorough assessment** of your application?	4.2	2.5	4.3	2.9	3.7	2.9	4.4	2.5

Sources: Survey to RCN Independent Project support (FRIPRO; www.rcn.no) applicants 2005-2007 (Langfeldt et al 2012); survey to applicants to the Human Frontier Science Program (HFSP; www.hfsp.org) 2000-2005 (Langfeldt 2006); Independent project support by Riksbankens Jubileumsfond (RJ; www.rj.se) (reanalysis of data in Vabø et al. 2012).
*Aw=replies from awarded/successful applicants. No= replies from rejected applicants (all non-funded applications are included in this category, regardless of stage reached).
** This question is discussed in Chapter 4.2

3.2 Adequacy of review organisation and procedures

Review of the pre-proposals

As explained in Section 1.3, the review of the pre-proposals in Call 4 was done by 2-4 individual experts per pre-proposals and a 9-member interdisciplinary panel, whereas in Call 3 it was done by a 16-member interdisciplinary panel and no individual experts. According to informants, the individual reviews were helpful in the panel work, still their usefulness varied and all together it was perceived somewhat more difficult to handle the full scope of fields and interdisciplinarity in the smaller Call 4 panel than in the larger Call 3 panel. Each panel member had competence on – and had read – a subset of the applications, and it was hard for the panel to compare proposals and find a basis/standard across fields of research for rating the proposals. Still, even outside one's field it is possible to assess structural aspects, e.g. the centre organisation and the plans for integrating the centre – and this was emphasised.

Full proposal panels

In Call 4, each full proposal was reviewed by one of five interdisciplinary panels composed specifically to provide expertise on the specific proposals (this organisation was done much the same as in Call 3,

see Section 1.3). Broad panels with mixed competence have inherent limitations in terms of a low number of experts with competence on each proposal (except for the social sciences and humanities panel, there were only two experts per proposal). Compared to more disciplinary panels, this may lead to less thorough panel discussion of the scientific assessments. For several of the panels it also seems to have given a 'competitive' group dynamic in the panel discussion: the experts on each field/ proposal tried to convince the other experts about the qualities of the proposal they were assigned.[32] The interviewed panel members expressed different views on how strongly one should argue for the proposal one was assigned, and on whether one could voice criticism outside one's own field of expertise in the panel discussion. In sum, finding a common ground for comparing assessments of scientific quality was difficult. They were asked to rank the proposals, but often found no common basis for this – explaining that this was like comparing apples and pears, or more a fight between research fields than scientific assessments. Still, in most cases broad consensus on *which* proposals to recommended for funding seems to have been reached (but not on a relative ranking of these). In reaching this consensus, the panels' interviews with the applicants were often important. The interviews provided a common ground for assessments, e.g. on the integration/interaction of the projects and on leadership, and the clarity of the vision of the centre. Hence, in the final assessments and conclusions of the panels, more overall and structural aspects of the centres that were easier to compare across fields of research seem to have been important. Often it was difficult to distinguish/prioritise the written proposals based on such structural aspects. From the text in the proposals these issues could appear much the same across proposals (due to e.g. blue print/standardised text), and the strengths and weaknesses did not appear until the interview.

Structural evaluation and shortlist

In addition to the assessments by the panels and the individual experts, the SNSF Research Council and Office provided assessments of the structural aspects of the NCCRs (Call 4). This included separate review for these aspects for the pre-proposals and full proposals (see Section 1.3). There was no direct link between the scientific and structural assessments: the structural assessments by the SNSF were *not* communicated to the expert panels, and the scientific and structural assessments were communicated as two separate texts to the applicants. However, some key structural aspects (added value; scientific organisation; management/administrative support; budget; education/training/ equal opportunities; knowledge and technology transfer) were included in the panel assessments and thereby integrated in the scientific assessments. In particular, the organisation and management of the research and centre cohesion was considered vital in assessing the added value of the centres and their possibilities to succeed.

In all calls the Research Council (Division 4) has been responsible for selecting the proposals for the shortlist of NCCRs recommended for SERI. For this, the Research Council needs to merge the assessments and conclusions from the different international panels. This is reported to have been difficult. There has been an aim to provide SERI with a ranked shortlist, but this has not been accomplished in any of the calls. There is no procedure or criteria for making such priorities, and there have also been different opinions on the need to rank the shortlisted proposals.

In Call 4, the natural point for integrating the separate structural assessments into the decision-making, would be when the Research Council selected the proposals for the shortlist. Looking at the recommended proposals which were excluded when putting together the shortlist we find some differences between Call 3 and 4. The one excluded at this stage in Call 4 was ranked as clearly weaker by the (assigned) expert panel than the one shortlisted from the same panel. Hence, the shortlist followed the recommendations of the corresponding panel. In the 3rd call, the three panels which had recommended the most proposals were cut by one proposal each, whereas the panel who had only recommended two proposals were not cut. In two of these cases, the shortlist does not follow the tentative ranking of the panel, indicating that the SNSF shortlist was based on more than the panels' assessments scientific quality. Reading the minutes from the Research Council meeting on the

[32] The composition of the social sciences and humanities panel – with 3 reviewers per proposal and only 3 proposals, seemed to have generated less competitive group dynamics.

shortlist, the additional concerns seem to be coherence of centre plans and the structural measures of the centres. In conclusion, there is no indication that the increased focus in Call 4 (compared to Call 3) on assessing the structural aspects of the proposed NCCRs, and the formalised procedures for this, resulted in an increased role of these aspects when putting together the shortlist. On the contrary, the structural aspects seem to have been a more explicit concern for the shortlist in Call 3 than in Call 4. The emphasis on separate structural assessments in Call 4, may still indirectly have influenced the outcome of the process, e.g. by making the importance of these concerns clearer in the oral information and guidelines to the international experts and/or more specific feedback to applicants and home institution, and so ensuring that no proposal that was not considered strong on structural aspects reached the last stage of the process.

It should be added that the issues addressed in the separate structural assessments did not all seem meaningful to the home institutions. Some commented that the decisions for e.g. the allocation of full professorships were taken by other governing bodies than the university management. Hence, it is hard for the universities to have detailed long-term plans for the resources to be allocated to the centres.

Applicants' opinions

According to the applicants, the policies and review procedures of the NCCR schemes are better at supporting well founded and solid research (average rate 3.7), than at supporting high-risk research (2.6) original and ground-breaking research (3.0) or the most promising and important research (3.2). Moreover, they seem reasonably satisfied with the NCCR when it comes to supporting interdisciplinary research (average score 3.6). Results by proposal stage are found in Appendix 3, Tables A6 and A7.

Table 3.8 Applicants' views on the NCCR policies and review processes. Per cent and rate average.

In your opinion. to what degree does the NCCR scheme provide the appropriate policies and review processes to	5 To a great extent	4	3	2	1 Not at all	Cannot say	N	Average (1-5)
Support the most promising and important research?	14.0 %	22.8 %	29.8 %	19.3 %	8.8 %	5.3 %	57	3.2
Facilitate interdisciplinary research?	22.8 %	31.6 %	22.8 %	10.5 %	7.0 %	5.3 %	57	3.6
Support high-risk research?	5.3 %	12.3 %	24.6 %	26.3 %	17.5 %	14.0 %	57	2.6
Support well founded and solid research?	22.8 %	40.4 %	19.3 %	8.8 %	5.3 %	3.5 %	57	3.7
Support original and ground-breaking research?	12.3 %	22.8 %	26.3 %	19.3 %	14.0 %	5.3 %	57	3.0

Source: NIFU survey to applicants to NCCR calls 3 and 4.

These differences – higher score on solid research – are found also in applicant surveys to other funding schemes (table below). The applicants reply that the schemes are better at supporting well-founded than high-risk research. Moreover, the awarded applicants are far more satisfied with the policies and review processes than are the non-awarded applicants. This goes for the NCCR scheme as well as the other schemes from which we have data.[33] Comparing only the replies from the awarded applicants, the NCCR scheme rates quite high on supporting the most promising and important research, original and ground-breaking and well-founded and solid research. The rates on facilitating interdisciplinary research is also quite good, but not as good as the Human Frontier Science Program (HFSP) which is specially dedicated to interdisciplinary research and is rated 4.6 by awarded applicants on this issue (similar figure for the NCCR is 4.0).[34]

[33] The NCCR scheme is the only centre scheme in the table; the other schemes provide a variety of individual and collaborative grants.

[34] Questions on support for high-risk and interdisciplinary research were also asked in a previous survey including applicants for SNSF Project Funding and Sinergia Grants. Here respondents were asked to compare SNSF Project Funding and Sinergia Grants respectively with their other relevant funding sources, and not rate the schemes on the 5-point scale, hence replies are not comparable. Focusing on the results for Sinergia Grants, which is the most relevant for comparisons with the NCCR scheme, we find that a large part Sinergia applicants find that Sinergia is better than their

Table 3.9 Applicants' views on the NCCR policies and review processes. NCCR average rates compared to figures from surveys for the HFSP and for individual project support schemes in Sweden and Norway. Average rates on a scale from 1 to 5.

In your opinion to what degree does the [] scheme provide the appropriate policies and review processes to	NCCR		RJ		FRIPRO		HFSP	
	*Aw	No	Aw	No	Aw	No	Aw	No
Support the most promising and important research?	4.3	2.8	4.1	3.1	3.8	3.0	4.5	3.4
Facilitate interdisciplinary research	4.0	3.4	-	-	3.5	2.9	4.6	3.8
Support high-risk research?	3.7	2.2	3.1	2.3	2.9	2.3	4.0	2.7
Support well founded and solid research?	4.4	3.5	4.2	3.7	4.0	3.6	4.1	3.5
Support original and ground-breaking research?	4.3	2.6	3.8	2.8	3.6	2.9	-	-

Sources: Survey to RCN Independent Project support (FRIPRO; www.rcn.no) applicants 2005-2007 (Langfeldt et al 2012); survey to applicants to the Human Frontier Science Program (HFSP; www.hfsp.org) 2000-2005 (Langfeldt 2006,); Independent project support by Riksbankens Jubileumsfond (RJ; www.rj.se) (reanalysis of data in Vabø et al. 2012).
*Aw=replies from awarded/successful applicants. No= replies from rejected applicants (all non-funded applications are included in this category, regardless of stage reached).

3.3 Experiences from other CoE schemes

The review process is composed differently in Norway and Denmark. We will here first describe the Norwegian process followed by the Danish. Table 3.10 summarises the main features of the review and decision processes in Switzerland, Norway and Denmark.

Table 3.10 The review and decision process of CoEs schemes in Switzerland, Norway and Denmark

	NCCR (SNSF)	N CoE (RCN)	DK CoE (DNRF)
Review **pre-proposal** (last call)	• 2-3 external reviewers per proposal • Interdisciplinary committee of 9 international experts • Score: A-C	• One panel (28 internat. experts) • 3 subpanels • 4 days meeting • Score: A-C	• The DNRF Board reviews all (5 internat., 4 national). • 2 days meeting. • Score: A-C and P for potential/high risk
Who can send full proposal	All (provided HI support)	Only A	Only A and/or P
Review **full proposal** (last call)	5 panels with 8-14 int. experts/2 (or 3) experts per proposal. Recommendation: A or B	3 int. experts per proposal (a common eval). **Rebuttals**. One panel (9 int. experts)	3 individual int. experts per proposal. **Rebuttals**.
Interviews	By the 5 panels	All by one panel	DNFR Board
Shortlist	By SNSF/RC (no ranking)	By the panel (ranked)	(DNFR Board)
Final decision	State Secretariat/ Ministry	RCN's CoE Board Committee	DNFR Board

The Norwegian CoE scheme

The Research Council of Norway (RCN) has tried out several models for the review process. In the latest call – Call 4 (the process is still running), a large interdisciplinary panel of 28 international researchers evaluated the *pre-proposals* in a four-day meeting. The panel was divided into three subpanels:

- Natural sciences, mathematics, technology 10 members
- Life science, biology 9 members
- Social sciences and humanities 9 members

alternative funding sources when it comes to offering opportunities for interdisciplinary and comes out about as good as the alternatives when it comes to high-risk research (results are reported in Langfeldt et al. 2015, page 60).

None of the members of the panel had a (permanent) position in Norway. Their fields of research were chosen so as they roughly represented the ERC panels. All read and wrote pre-assessments of all proposals in their subpanel in front of the panel meeting and the responsibility for leading the discussion of each proposal was dedicated to one panel member. To ensure legitimacy of the process, the names of the panel members were published before the call deadline and the applicants chose their own subpanels. Multidisciplinary proposals could choose to be evaluated by two subpanels and then discussed in meetings between the subpanels.

Each subpanel reviewed approximately 60 pre-proposals. The subpanels wrote a short feedback text for each proposal and graded them A-C. Those graded A were invited to submit a full-proposal. The subpanels of natural sciences and life sciences agreed upon 8-9 pre-proposals that all members supported, while the social sciences and humanities had 6-7. According the secretariat of the scheme, it was not difficult for the subpanels to reach agreement on the list. Pre-proposals that generated disagreement in the subpanels were discussed in plenary. If they were considered as representing potential breakthrough research the applicants were invited to submit a full proposal.

A board with representatives from the different divisions and the main board of the RCN quality assured the process before the results were communicated to the applicants.

The CoE scheme has become very popular and has also been perceived as a programme where researchers get thorough reviews of their applications. In previous calls each pre-proposal (which was larger than the ones in Call 4) was reviewed by three international experts, but to reduce the amount of applications and simplify the process, the applicants now submit shorter pre-proposal and are given a shorter evaluation by the subpanels. The RCN seems to be content with the organisation of the review process of the pre-proposals. Many of the changes in the organisation process has been inspired by the Danish model (see below) which the Board of the RCN sees as a good model.

For the review of the *full proposals* the RCN (in Call 4) had three international experts per proposal. Applicants had the opportunity to suggest four-six reviewers and if one of them were willing and had no conflicts of interest he/she was used. According to the secretariat, it was time consuming to identify and attract reviewers that covered all research fields of the centres, and whom were either more acknowledged than the potential centre directors or ‘rising stars’. For each reviewer they asked about four.

The three reviewers agreed upon a grade and gave a common evaluation of the proposal or they clearly wrote that they disagree and showed their individual grades. The applicants got the opportunity to comment on the review report (rebuttal) to correct potential misunderstandings and the three reviewers in some cases changed their opinion in their final evaluation. Finally, one common scientific panel of nine international acknowledged professors reviewed the proposals and the expert-evaluations and performed interviews with the potential CoE-leaders. Prior to the meeting they had written pre-evaluations that formed a basis for the discussions. Each member of the panel had the responsibility for leading the discussion on specific proposals. On this background the panel will submit a ranked list to the board of the CoE scheme (the same as in the pre-proposal stage) – which mandate is to assure the quality of the review process.

The main selection criteria are the scientific quality of the proposals and the proposed team. If there are applications just around the bar for financing, gender balance will be taken into consideration. There is no quota per research field, and the secretariat points to that there are difficulties in comparing the different applications from different fields – as the panel compares ‘apple and pears’.

According to the secretariat, it was time consuming to locate competent panel members as they could not be associated with or be in a position so that they may favour any of the full proposal applications. Moreover, the RCN had also an ambition to find members with experience from similar funding instruments as this is seen as important knowledge.

The Danish CoE scheme

While the Norwegian CoE scheme is administrated by the only national research council in Norway responsible for a large portfolio of funding programmes (funding basic and applied research as well as innovation), the Danish CoE scheme is administrated by a smaller organisation set up specifically for the CoEs (the Danish National Research Foundation, DNRF). The DNRF has a scientific board composed out of five international and four national academics representing different fields, at present including Life science (clinical medicine), chemistry, physics, engineering, geology, biotechnology, culture research, economics and philosophy. Different stakeholders like ministries, agencies and foundations nominate their candidates to the board, and the board has a central role in the review process.

In the *pre-proposal* stage (Call 8) the scientific board members read each pre-proposal and gathered for a two-day meeting where they discussed and gave a short written feedback to the rejected applicants. The pre-proposals were graded on the scale A-C and a P for proposals characterised by potential high risk. Proposals graded A or P may submit a full proposal – which were about 20 per cent of the applications. Distribution on research fields are seen as irrelevant.

A challenge for this part of the review process in general is that the Board does not have scientific expertise in all fields, which means that the pre-proposals must be written in a popular science way to make it comprehensible to the reviewers. Not everyone manages to do so and this may be challenge for the Board. So far, the members' impartiality has not been a pronounced challenge for the review.

Three international experts reviewed the *full proposals*. The reviewers were 'true' peers and, at a minimum, possessed the same international standing as the applicants. Each applicant could submit the names of three experts, one of whom was chosen by the foundation to serve on the panel of reviewers that assessed the application. The foundation chose the other two reviewers based on recommendations from external or internal sources. The identity of the reviewers was known.

Each reviewer was asked to deliver a report of between three to five pages according to the Terms of Reference. The applicants got the opportunity to comment on the reports. The review reports and the comments were then presented to the scientific board, which on this background and interviews with the centre leaders took the final decision. Important selection criteria were the quality and the potential of the proposed research alongside with the centre leader's scientific merits and abilities to lead and assemble a team of colleagues. The envisioned structure of the proposed centre and the nurturing environment in which it is placed was also seen as important. However, structural issues become more important in the DNRF's close follow-up of the centres – each year members of the Board and the secretariat perform site-visits to the centres.

The secretariat is very content with the organisation of the review processes and claims that so are the applicants. Furthermore, an evaluation of the DNRF concluded that the selection process seemed to 'work very well' and that: 'There were no indications that the selection procedure of the CoEs needs to be changed. The DNRF board is very successful in identifying the best talents. Introduction of peer-review elements in the first stage of selection might lower the chances of unconventional, risky projects in between the established disciplines' (DNRF, page 38 and 42).

3.4 Conclusions

Moderate satisfaction with reviewer competence: The applicants are moderately satisfied with the competence of the experts who assessed their applications, and with the evaluation panels' ability to assess all the fields of research involved and the thoroughness of the review. They are slightly more positive when it comes to the evaluation panel's ability to understand and respond to the presentation of their proposal during their meeting with the selection panel for the full proposals. In particular, the successful applicants – those who were awarded an NCCR – express high satisfaction on this issue.

Less satisfaction with reviewer competence than in other national funding schemes: Notably, the reviewer competence for the NCCR scheme comes out negative when the applicants compare it with the competence used in other funding schemes: In direct comparisons the NCCR scheme comes out as clearly poorer than the applicants' other national funding sources, and slightly poorer than the ERC. It should be added that the NCCRs are larger and more interdisciplinary and complex than the schemes compared with, and hence ensuring a good match of reviewer competence is more difficult for the NCCR scheme.

Better at supporting interdisciplinary than original research: According to the applicants, the policies and review procedures of the NCCR schemes are reasonably good at supporting well-founded and solid research and facilitate interdisciplinary research, but less so at supporting high-risk, original and ground-breaking research. The awarded applicants are far more satisfied with the policies and review processes than are the non-awarded applicants. This goes for the NCCR scheme as well as the other schemes from which we have data.

The organisation of the scientific and structural assessments: In the last call, the scientific and structural assessments were separate tasks and communicated to the applicants as separate texts – scientific assessment by the international panel, and structural assessments by the SNSF (the structural assessments addressed potential for restructuring the research field/added value, support from home institution, financial aspects etc.). The structural assessments by the SNSF were done in parallel to the scientific (expert panel) assessments, and did not have a defined entry point into the SNSF selection process (the rates given the pre-proposals and the recommendations on the full proposals were based on the panel assessments/international experts). The structural assessments may still have been important input to the selection processes taking place outside the SNSF (in the preselection of full proposals at the universities and in the funding decisions by SERI/EAER). Moreover, some structural aspects were included in the panel assessments, i.e. integrated in the scientific assessments (added value of the centre; management/administrative support; education/training/equal opportunities; KTT). In sum, much weight was put on doing structural assessments outside the expert panel, and the role of these assessments in the selection process was unclear.

Challenges in providing a ranked list of the (full) proposals recommended for funding (the shortlist sent to SERI): The SNSF has spent time and efforts trying to find a basis for agreeing on a ranked shortlist, without succeeding. Hence, an 'open' shortlist has been sent to SERI. The most obvious reason for this is that it is difficult to compare proposals across all different research areas, and the SNSF does not have in place a procedure or clear criteria for such assessments. Moreover, there are different views on the need to provide a ranked list. As the final decisions are taken by SERI/EAER, the SNSF can leave the final priorities to SERI/EAER.

4 Impartiality, transparency, comprehensibility, legitimacy and trust

In order for the research community to have trust in the process and its outcome, transparent selection processes, comprehensible information and clear measures to ensure impartiality and confidentiality are crucial. Moreover, in order to serve their purpose, the criteria, procedures and results need to be clear to the applicants, to the expert reviewers and panels and to all other stakeholders in the selection process. They all need to properly understand the review procedure and criteria.

In this chapter we explore how such demands are fulfilled in the NCCR selection process.

4.1 Communication, comprehensibility and transparency

The criteria communicated to applicants

The NCCR proposals are assessed according to predefined criteria, separately defined for the pre-proposals and the full proposals. They are communicated to the applications as follows on the SNSF web site and in the calls for proposals:

Pre-proposals
a. Significance of the research topic for Swiss research ***
*b. Originality, innovation potential and interdisciplinary nature**
*c. Critical mass and added value of the NCCR in comparison with the sum total of the individual projects**
*d. Potential of the NCCR to attain a leading international role**
*e. Plausibility of the goals/measures with respect to knowledge and technology transfer, advancement of young researchers and women***
*f. Academic reputation of the NCCR Director or Deputy, and leadership experience of the management team**
*g. Academic reputation of the project leaders**
*h. Suitability of the Home Institution***

Full proposals
a. Scientific quality of the research plan as a whole
b. Added value of the NCCR in comparison with the sum total of the individual projects; potential for stimulating interdisciplinary research, new scientific approaches/methods within disciplines, and collaboration in new research fields
c. Scientific quality of the individual projects including the potential for stimulating new scientific approaches and methods in individual disciplines
d. Quality of the concepts concerning knowledge and technology transfer, advancement of young researchers and women
e. Suitability of the Leading House as the organisational and academic management office of the NCCR
f. Adequacy of the financing by the SNSF that is being applied for, as well as its own and third-party funds
g. Support by the Home Institution

For Call 4 pre-proposals, the information to the applicants moreover distinguished between criteria to be assessed by international experts and criteria to be assessed by the Research Council: a., e. and h. were to be assessed by the Research Council (marked ** above), whereas the scientific evaluation would focus on a., b., c., d., f. and g (marked * above).

For the full proposals, the call document explained that there would be separate scientific and structural assessments, but did not specify which of the criteria would be focused in the respective assessments. Moreover, there was no information on which of the criteria that would be most emphasised in the assessments of the pre-proposals or of the full proposals.

Review guidelines/forms

The criteria are more comprehensively described in the review forms to the external experts and panel members. For Call 4 there were in total four different review forms for the pre-proposals and three for the full proposals, including:

- Pre-proposals:
    - The external experts were asked to fill in a 4-pages form, giving text comments on 10 questions, plus an overall assessment (without rating). The three main topics/headings were: the individual research projects (in the expert's field of expertise); the applicants; the NCCR as a whole.
    - The international panel members were asked to fill in a 5-pages form, rating and commenting on 9 questions regarding the NCCR as a whole and the reputation of the directors/project leaders. The form also contained a section for summarising external experts' and own assessments of the individual research projects, and a section for overall assessment (but no overall rating).
    - For the Research Council's structural assessments there was a 5-pages form with specified questions concerning the aims for restructuring the research field, the suitability and structural measures/plans of the home institution, relations to other NCCRs, and the plans regarding knowledge and technology transfer, and advancement of young researchers and women.
    - The SNSF Administrative Office provided an analysis of the cash and in-kind support from the home institutions (separate document for each pre-proposal).
- Full Proposals:
    - A form to fill in in advance of the panel meeting for the 2-3 experts assigned the proposal, containing questions and comment boxes for each criterion. The experts were not asked to rate the proposals, but to answer nine questions under two main headings – 'Scientific quality and coherence of the research programme' and 'Scientific leadership/management and organizational structure' – and give an overall assessment commenting on the strong and weak points of the proposal. The form addressed all aspects in the list of criteria for the full proposal (above) with the exception of 'Support by the home institution'. The reviews were distributed to all panel members at the meeting.
    - For the Research Council's structural assessments there was a 5-pages form with specified questions on the same topics as for the pre-proposals (see above).
    - The SNSF Administrative Office provided an analysis of the budget and the cash and in-kind support from the home institutions (separate document for each full proposal).

Comparing the criteria communicated to the applicants and the review forms (not available to the applicants) we find some differences: In the review forms, the criteria are more specifically formulated and guidelines for what to include in the review of the pre-proposals vs. full proposals vary somewhat from the criteria communicated to the applicants. For example, the review forms contain separate questions on the individual research projects for the pre-proposals and separate questions on the scientific reputation of the applicants for the full proposals. This was the other way around in the criteria communicated to the applicants (listed above): the quality of the individual projects is part of

the criteria for the full proposals, not the preproposals; the academic reputation is part of the criteria for the pre-proposals, not the full proposals.

Applicants' and home institutions' views on transparency and feedback

When it comes to transparency, the applicants are quite satisfied with the clarity of the terms and requirements for proposals (average 3.9 on a scale from 1 to 5) [35], but less satisfied with the transparency of the selection process (average 2.7) and the clarity and completeness of the feedback to applicants (average 2.7). Those who participated in the full proposal stage are somewhat more satisfied than those who only submitted a pre-proposal (Table 4.1). The most obvious reason for this would be that the interviews/meeting with the review panel at the full proposal stage increase the transparency of the process. (There is little difference in satisfaction between Call 3 and Call 4, see Table A8 in Appendix 3).

Table 4.1 NCCR applicants' views on clarity, transparency and feedback. Replies by proposal stage reached. Per cent.

Considering your NCCR application, to what extent did you find the following issues/processes satisfactory?	5 To a great extent	4	3	2	1 Not at all	Cannot say	N	Average (1-5)
The clarity of the terms and requirements for proposals (call documents)								
Only pre-proposal	24.0 %	28.0 %	40.0 %	8.0 %	0.0 %	0.0 %	25	3.7
Full proposal	22.6 %	61.3 %	6.5 %	3.2 %	3.2 %	3.2 %	31	4.0
Total	23.2 %	46.4 %	21.4 %	5.4 %	1.8 %	1.8 %	56	3.9
The transparency regarding the SNSF selection process								
Only pre-proposal	4.0 %	12.0 %	32.0 %	24.0 %	24.0 %	4.0 %	25	2.5
Full proposal	9.7 %	22.6 %	32.3 %	12.9 %	19.4 %	3.2 %	31	2.9
Total	7.1 %	17.9 %	32.1 %	17.9 %	21.4 %	3.6 %	56	2.7
The clarity and completeness of the feedback to applicants								
Only pre-proposal	0.0 %	16.7 %	33.3 %	41.7 %	8.3 %		24	2.6
Full proposal	3.2 %	32.3 %	22.6 %	25.8 %	16.1 %		31	2.8
Total	1.8 %	25.5 %	27.3 %	32.7 %	12.7 %	0.0 %	55	2.7

Source: NIFU survey to applicants to NCCR calls 3 and 4.

When we compare with results from applicant surveys to other funding schemes[36], the NCCR *awardees* seem somewhat more satisfied than those of Norwegian and Swedish schemes (for project grants). Among the *non-awarded* there is more variation in how the schemes are rated: The NCCR scheme comes out as the best on satisfaction of *non-awarded* applicants when it comes to support during the application process, but the poorest on clarity and completeness of the feedback to these applicants (table below).

[35] In a larger general survey encompassing 2831 SNSF applicants, the SNSF score 4.1 in average on 'Easy to understand information about schemes and options' (Langfeldt et al. 2015, page 51).
[36] Surveys with the same questions, but to applicants to other kinds of grant schemes, see note to table.

Table 4.2 Applicants' views on clarity, transparency and feedback. NCCR average rates compared to figures from surveys for the HFSP and for individual project support schemes in Sweden and Norway. Average rates on a scale from 1 to 5.

Considering your [] application(s), to what extent did you find the following issues/processes satisfactory?	NCCR		RJ		FRIPRO	
	*Aw	No	Aw	No	Aw	No
The support during the application process (from funding agency)	4.0	3.6	3.9	3.4	3.7	3.0
The clarity of the terms and requirements for proposals (call documents)*	4.5	3.7	4.3	4.0	4.1	3.7
The transparency regarding the selection process	3.8	2.4	3.6	2.8	3.0	2.3
The clarity and completeness of the feedback to applicants	3.7	2.4	3.9	3.0	3.4	2.7

Sources: Source: NIFU survey to applicants to NCCR calls 3 and 4. Survey to RCN Independent Project support (FRIPRO; www.rcn.no) applicants 2005-2007 (Langfeldt et al 2012); Independent project support by Riksbankens Jubileumsfond (RJ; www.rj.se) (reanalysis of data for Vabø et al. 2012).
*Aw=replies from awarded/successful applicants. No= replies from rejected applicants (all non-funded applications are included in this category, regardless of stage reached).
* For FRIPRO and RJ the formulation was: 'Clarity and easy to understand information about the call'.

The NCCR applicants were moreover asked to compare the transparency of the NCCR selection process with the transparency in other national funding sources and the ERC. A large majority (64 per cent) of those who only submitted a pre-proposal reply that the transparency of the NCCR process is poorer than for their other national funding sources. Among those who submitted a full proposal there are somewhat fewer negative responses, but the balance between those who think the NCCR scheme is better vs those who think it is poorer on transparency is still 29 percentage point in favour of other national funding sources.[37] Notably, the NCCR transparency comes somewhat better out when compared to the ERC than when compared to national alternatives. Among those who submitted a full proposal (and hence met the panel reviewing their proposal, as is also the case in the ERC selection process) the NCCR scheme and the ERC comes out equally good at transparency. Among those who only submitted a pre-proposal however, the NCCR scheme comes out as somewhat poorer (15 percentage point in favour of ERC, and a substantial proposition answering 'cannot say').

Table 4.3 The transparency of the NCCR selection process compared to other national funding sources and to ERC. Replies by proposal stage. Per cent.

The transparency of the selection process	The NCCR scheme is				N	PP difference
	Better	About the same	Poorer	Cannot say/NA		Better-poorer
NCCR compared to your relevant national funding sources						
Only NCCR pre-proposal	4.0 %	20.0 %	64.0 %	12.0 %	25	-60.0
Full NCCR proposal	12.9 %	41.9 %	41.9 %	3.2 %	31	-29.0
Total	8.9 %	32.1 %	51.8 %	7.1 %	56	-42.9
NCCR compared to the European Research Council						
Only NCCR pre-proposal	11.5 %	34.6 %	26.9 %	26.9 %	26	-15.4
Full NCCR proposal	22.6 %	22.6 %	22.6 %	32.3 %	31	0.0
Total	17.5 %	28.1 %	24.6 %	29.8 %	57	-7.1

Source: NIFU survey to applicants to NCCR calls 3 and 4. Question: When comparing the NCCR scheme to your other relevant national funding sources/ to the selection process of the European Research Council, is the NCCR poorer, about the same or better, concerning: The transparency of the selection process.

While the scientific assessment process in general is perceived as transparent by the interviewed applicants and home institutions, the structural assessment and its role is seen as unclear, and something outside the applicants' control. Further, the home institutions are positive to the dialogue meetings with the SNSF/SERI, but somewhat lukewarm to the structural and financial assessments. There is also some dissatisfaction with communication of the goals: Overall, informants (home

[37] Whereas the question on transparency in Table 4.1 specifies the SNSF selection process, the question in Table 4.3 addresses the NCCR selection process more generally – hence, in the latter respondents' views on the home institution's pre-selection or the final selection outside SNSF may potentially be included. However, checking for consistency in replies between the two questions we find a high degree of correlation: 80 per cent of those who reply that the NCCR is better on transparency than their other national funding sources, rate the SNSF selection process 4 or 5, and 54 per cent of those who reply that the NCCR is poorer on transparency rate the SNSF selection process 1 or 2. Still, 7 per cent (i.e. 2 respondents) of the last group (those who reply that the NCCR is poorer on transparency) rate the SNSF selection process 4 or 5. Hence, a small group (2 respondents) thinks the SNSF part of the selection process is good on transparency even if they think the overall NCCR selection process is less transparent than their other national funding sources.

institutions and applicants) perceived the selection criteria as clear. However, the scheme includes plural overarching goals and it is not clear how much weight that is given to each of them. This relates especially to the various structural criteria. Applicants further pointed to that the selection process at the home institutions sometimes are intransparent. Moreover, the final stage of the process is characterised as a black box by some home institutions and applicants. They are aware of that policy priorities can play an important role in the evaluation, but would prefer that policy comes in at an earlier stage in the process. The development of a full proposal is perceived as challenging and demanding in terms of time and resources, and some informants suggest that SERI should be involved in the priorities already at the pre-proposal stage – or that such priorities in other ways should be clarified earlier on in the process.

4.2 Impartiality, legitimacy and trust

The handling of conflicts of interest

According to the 'Organisational Regulations of the National Research Council', persons involved in the funding activities of the SNSF, including external reviewers and employees at the administrative offices, shall withdraw if they have any personal interest in the matter, are related to or in close collaboration with the applicant or there are any other conflicts of interest.[38] The members of the Research Council are active researchers of which some are involved in the NCCR applications. For the 4th call, 9 members of the Div IV of the Research Council were involved in pre-proposals[39] and 7 were involved in the full proposals. This implied that a substantial part of the (24) Div. IV Council members were excluded from parts of – or the whole – selection process.[40]

The foreign experts are specifically selected, potential conflicts of interests are checked in advance and there are no indications that conflicts of interest issues arose among these experts. The interviewed experts recalled no conflicts of interest issues.[41] They moreover emphasised that there had been a strict task division between the members of the Research Council and the international experts in the panels: The Research Council members provided information on the scheme and the context but did not interfere in the assessments.

The role of the Research Council members in the selection process can be understood in different ways. As chairs of the panel meetings and responsible for the shortlist of proposals to be recommended for funding, they are in a position to influence the selection. As active Swiss researchers affiliated to the applicant institutions, they are trying to be as neutral as possible. In such a situation, actors will often put extra emphasises on ensuring thorough and fair processes. The disadvantage is that this may easily make it more difficult to make clear priorities. In the NCCR selection process, we have seen that the Research Council provides separate structural assessments, but – as it seems – base the decisions entirely on the scientific assessments of the international panels, and moreover the Research Council has refrained from ranking the shortlist of recommended proposals (Chapter 3.2).

Applicants' views

Taken together, the applicants seem moderately satisfied with the impartiality of the review of their proposals. However, their views are split, specifically concerning the full proposal stage. As much as 29 per cent give the highest rate on the impartiality of the panel reviewing their full proposal, whereas

[38] http://www.snf.ch/SiteCollectionDocuments/por_org_rec_reglement_e.pdf.
[39] Of which two were involved in two pre-proposals each.
[40] Moreover, in two cases in Call 4 a Research Council member withdraw from parts of the panel meeting because of affiliation to the same department as the applicant.
[41] In the minutes from the panel meetings (full proposal Call 4), it is noted only one case in which a potential conflict of interest was discuss concerning the international reviewers. In this case the expert had been contacted by the applicant and asked if he would be willing to be on the NCCR Advisory Board if the application was funded. This was found not to represent any conflict of interest.

19 per cent give the lowest rate on this. For the pre-proposal panel, the rates are more in the middle range (Table 4.4).

There is little difference between Call 3 and Call 4 on this issue, but there is a notable difference between the awarded and the non-awarded's perceptions of the impartiality of the review panel for the full proposals (average 4.3 vs. 2.7, Table 4.4), explaining much of the split opinions on this stage of the process. Still, as much of 21 per cent of the non-awarded give the highest rate to the impartiality of their full proposal panel – indicating clearly divided views in this group. Focusing on those giving the lowest rate on impartiality, we see that a substantial share of the non-awarded distrust the impartiality (32 per cent give the lowest rate), whereas none of the awarded do so.

It should be underlined that the perception of the impartiality in the NCCR process is about the same as in other funding schemes for which we have applicant survey data. When splitting replies by awarded and non-awarded applicants, the NCCR comes out about as good the other scheme for which we have data (Table 3.7 in Chapter 3).

Table 4.4 Applicants' perceptions of the impartiality of the review panel. Replies by call and funding. Per cent.

To what degree do you think the evaluation panel that assessed your pre-proposal/full proposal provided an **impartial and unbiased assessment** of your application?	**5 To a great extent**	**4**	**3**	**2**	**1 Not at all**	**Cannot say**	**N**	**Average (1-5)**
Pre-proposal								
Call3	13.6 %	13.6 %	22.7 %	18.2 %	9.1 %	22.7 %	22	3.1
Call4	8.8 %	38.2 %	23.5 %	20.6 %	2.9 %	5.9 %	34	3.3
Total	10.7 %	28.6 %	23.2 %	19.6 %	5.4 %	12.5 %	56	3.2
Full proposal								
Call3	26.7 %	20.0 %	6.7 %	13.3 %	20.0 %	13.3 %	15	3.2
Call4	31.2 %	18.8 %	12.5 %	6.2 %	18.8 %	12.5 %	16	3.4
Not funded (C3+4)	21.1%	5.3%	15.8%	10.5%	31.6%	15.8%	19	2.7
Funded (C3+4)	41.7%	41.7%	0.0%	8.3%	0.0%	8.3%	12	4.3
Total	29.0 %	19.4 %	9.7 %	9.7 %	19.4 %	12.9 %	31	3.3

Source: NIFU survey to applicants to NCCR calls 3 and 4. Question 2 (pre-proposal) and Question 3 (full proposal).

Furthermore, the applicants were asked to compare the NCCR scheme with other national funding sources, and with the ERC, regarding impartiality and confidence. Here, the NCCR comes out as equally good regarding the handling of intellectual property and confidential information – compared to other national funding sources as well as to the ERC (i.e. most applicants reply 'about the same', 'cannot say' and/or there are equally many who reply 'better' and 'poorer').[42] However, the NCCR scheme comes out as poorer than other national funding sources on the 'impartiality and ethical standard' of the selection process, and especially on general confidence in the selection process. Of those who only submitted a pre-proposal, as much as 73 per cent reply that their general confidence is poorer for the NCCR scheme than for their other national funding sources. No one in this group replies that they have more confidence in the NCCR process. Of those who only submitted a full proposal, 48 per cent reply that their general confidence is poorer for the NCCR scheme than for their other national funding sources, and 3 per cent that is better.

When comparing the NCCR to the ERC, the applicants' views are more 'balanced': Among those who submitted a full proposal the NCCR scheme and the ERC comes out as equally good on 'general confidence' (the majority answer 'about the same' or cannot say, the rest are equally split on better and poorer). Among those who only submitted a pre-proposal the ERC comes out as somewhat better (19 pp more on better than poorer, Table 4.6). On the more specific question, concerning the impartiality and ethical standard of the selection process, there are more who answer 'cannot say'.

[42] Still, the survey includes one comment from an applicant who was not satisfied with reviewer behaviour in this respect, finding that ideas in the proposal were later used by one of the external reviewers.

Among those who have an opinion the NCCR scheme comes out somewhat poorer than both other national sources and the ERC (tables 4.5 and 4.6).

Table 4.5 Impartiality and confidence of the NCCR scheme compared to applicants' other relevant national funding sources. Replies by NCCR proposal stage. Per cent.

	The NCCR scheme is				N	PP difference
	Better	About the same	Poorer	Cannot say/NA		Better-Poorer
The handling of intellectual property and confidential information						
Only pre-proposal	0.0 %	42.3 %	0.0 %	57.7 %	26	0.0
Full proposal	6.5 %	51.6 %	6.5 %	35.5 %	31	0.0
Total	3.5 %	47.4 %	3.5 %	45.6 %	57	0.0
The impartiality and ethical standard of the selection process						
Only pre-proposal	0.0 %	46.2 %	23.1 %	30.8 %	26	-23.1
Full proposal	0.0 %	61.3 %	22.6 %	16.1 %	31	-22.6
Total	0.0 %	54.4 %	22.8 %	22.8 %	57	-22.8
Your general confidence in the selection process						
Only pre-proposal	0.0 %	23.1 %	73.1 %	3.8 %	26	-73.1
Full proposal	3.2 %	45.2 %	48.4 %	3.2 %	31	-45.2
Total	1.8 %	35.1 %	59.6 %	3.5 %	57	-57.8

Source: NIFU survey to applicants to NCCR calls 3 and 4. Question: When comparing the NCCR scheme to your other relevant national funding sources, is the NCCR poorer, about the same or better, concerning [IP handling/impartiality/confidence].

Table 4.6 Impartiality and confidence of the NCCR scheme compared to the ERC. Replies by NCCR proposal stage. Per cent.

	The NCCR scheme is				N	PP difference
	Better	About the same	Poorer	Cannot say/NA		Better-Poorer
The handling of intellectual property and confidential information						
Only pre-proposal	8.0 %	24.0 %	0.0 %	68.0 %	25	8.0
Full proposal	3.2 %	22.6 %	3.2 %	71.0 %	31	0.0
Total	5.4 %	23.2 %	1.8 %	69.6 %	56	3.6
The impartiality and ethical standard of the selection process						
Only pre-proposal	7.7 %	30.8 %	23.1 %	38.5 %	26	-15.4
Full proposal	6.5 %	32.3 %	16.1 %	45.2 %	31	-9.6
Total	7.0 %	31.6 %	19.3 %	42.1 %	57	-12.3
Your general confidence in the selection process						
Only pre-proposal	11.5 %	34.6 %	30.8 %	23.1 %	26	-19.3
Full proposal	16.1 %	45.2 %	16.1 %	22.6 %	31	0.0
Total	14.0 %	40.4 %	22.8 %	22.8 %	57	-8.8

Source: NIFU survey to applicants to NCCR calls 3 and 4. Question: When comparing the NCCR scheme to the selection process of the European Research Council, is the NCCR poorer, about the same or better, concerning [IP handling/impartiality/confidence].

4.3 International guidelines, and transparency and impartiality in other CoE schemes

The European Peer Review Guide includes impartiality, transparency, confidentiality and 'ethical and integrity considerations' as the core principles of peer review (ESF 2011, page 13).[43] The criteria, rules and procedure should be clear to applicants in advance, and they should receive adequate feedback on the outcome of the review of their proposal, preferably with a right to reply to the review (rebuttal). Transparency is also important for safeguarding impartiality of the review. Together with rules for handling conflicts of interest, transparency may reduce biases in the review process.

Moreover for CoE schemes, the European Peer Review Guide emphasises the importance of clarity in the procedures for making funding decision. The guide states that 'Internal agency procedures for assessing the case for final funding decisions should be decided upon before the launch of the call to ensure fairness and consistency' (ESF 2011, page 69). In the NCCR selection processes, the basis for setting final priorities and making funding decisions has not been fully clear in advance: it has not

[43] These principles are much the same in the 'Statement of Principles for Scientific Merit Review' from the Global Summit on Merit Review, http://www.globalresearchcouncil.org/sites/default/files/pdfs/gs_principles-English.pdf.

been clear whether the bases for the final funding decisions would be ranked priorities by the panels, by the Research Council or an unranked list (see Section 5.2).

In the two Scandinavian schemes we have looked at, it is perceived important to achieve a transparent, impartial and legitimate evaluation process. Both schemes therefore emphasis that the reviewers (also the external experts) shall be known to the applicants, and applicants have the possibility to reply to the external reviews. In this respect, the transparency is higher than in the Swiss selection process. More generally, we may say that the selection process for the two Scandinavian schemes are less complex than for the NCCRs, and it is therefore easier to achieve transparency. There are fewer bodies involved, an integrated set of selection criteria[44] for all stages and no parallel assessments of structural aspects (see Section 3.3).

The regulations of conflicts of interest are much the same for the Danish selection process as in the SNSF: personal interests, family and close collaboration are specified issues that disqualify for participating in the review and selection process. The RCN has somewhat more elaborated rules which apply for the Norwegian selection process. Here also relations including e.g. leading/senior position at an involved organisation, tutoring and personal or scholarly adversary are specified issues disqualifying for participating in the process.[45] Looking at the participants in the selection process we see that whereas members of the SNSF Research Council formally chair the panel meetings and the Research Council is responsible for putting together the shortlist of proposals to be recommended for funding, this is done by international experts only (in the Norwegian scheme) or by a body with a majority of international scholars (in the Danish scheme).

4.4 Conclusions

Some dissatisfaction with transparency, particularly at the pre-proposal stage: The applicants are quite satisfied with the clarity of the terms and requirements for proposals, but less satisfied with the transparency of the selection process and the clarity and completeness of the feedback to applicants. The interviews/meetings with the review panel at the full proposal stage increase the transparency, and those participating at this stage express higher satisfaction with the transparency of the selection process. The NCCR applicants' satisfaction with transparency is on the same level, or better, than we find in applicant surveys for project grant schemes in Norway and Sweden. Moreover, full proposal NCCR applicants' think that the NCCR scheme and the ERC are equally good at transparency. However, when the applicants compare the transparency of the NCCR selection process to their other national funding sources, the NCCR scheme comes out as inferior. A likely reason for this is the mere complexity of the NCCR selection process, involving both scientific and structural criteria, and international experts, Research Council members, the home institutions and SERI – over a period of 31 months.

Non-transparent priorities: While the scientific assessment process in general is perceived as transparent by the interviewed applicants and home institutions, the structural assessment and its role is seen as unclear, and something outside the applicants' control (i.e. the level of support from the home institution). There is also some dissatisfaction with communication of the goals; the scheme includes plural overarching goals and it is not clear how much weight that is given to each of them. This relates especially to the various structural criteria, and the final stage of the process is characterised as a black box by some home institutions and applicants. Moreover, the review criteria

[44] For the Norwegian CoEs, four different aspects are assessed ('the research', the centre director, 'the principal investigators' and 'the organisation of the centre'), with some additional concerns for the full proposals under 'the research' and 'the organisation of the centre' https://www.uio.no/for-ansatte/arbeidsstotte/fa/finansiering/nasjonale/norges-forskningsraad/sff-iv/dokumenter/assessment-sffiv.pdf. The same four aspects are assessed for the Danish CoEs http://dg.dk/en/centers-of-excellence-2/assessment-and-selection-of-applications/assessment-criteria/.

[45] http://www.forskningsradet.no/servlet/Satellite?c=Page&cid=1138882216256&pagename=ForskningsradetEngelsk%2FHovedsidemal.

communicated to the applicants was less detailed than, and not fully consistent with, the criteria in the review forms used by the external experts and panels when assessing the proposals.

Split views on impartiality: The NCCR applicants have divergent views on the impartiality of the review of their proposals, especially on the full proposal stage. There is a substantial proportion of full proposal applicants who gives the lowest rate on impartiality, as well as a substantial proportion giving the highest rate (also among those who did not obtain an NCCR). Taken together, their perception of the impartiality is about the same as we find for other funding schemes for which we have applicant survey data. Still, when the NCCR applicants make a direct comparison with their other national funding sources we get the same kind of result as for transparency: the NCCR scheme comes out as inferior to other national sources on the 'impartiality and ethical standard' of the selection process, as well as on general confidence in the selection process. Part of the explanation of the higher confidence in other national/SNSF funding sources, than in the NCCR process, can be that the NCCR applicants are more familiar with the 'regular' SNSF schemes; they will normally have years of experiences with regular SNSF schemes and also greater funding success in these schemes (there is high correlation between funding success and confidence). Moreover, as noted above, the NCCR selection process involve more actors and both structural and scientific criteria.

Lower emphasis on transparency and more challenges in handling conflicts of interest than in other countries: Comparing with CoE selection processes in Denmark and Norway, we find that these have more emphasis (than the NCCR scheme) on transparency in terms of allowing rebuttals to the external reviews. They also have an easier task in handling potential conflicts of interest when putting together the shortlist of recommended proposals, as the panel/board members involved are all/mostly foreign scholars.

5 Effectiveness and efficiency

This chapter addresses the effectiveness and efficiency of the NCCR selection process. A selection process should be adequately organized to achieve objectives (be effective) and at the same time optimal in terms of time and resources spent (be efficient). International guidelines state that the review process should be appropriate to the funding scheme, in proportion with the investment and complexity of the work, and efficient and simple (ESF 2011 p. 13).

5.1 Efficiency: Time and resources spent

The NCCR selection process is extensive. For the 4th call for proposals it included separate assessments of scientific quality and structural aspects in two stages (pre-proposals and full proposals) involving external experts and expert panel members as well as Research Council members, separate meetings with all applicant institutions discussing the outcome for the pre-proposals and interviews with all applicants submitting a full proposal. In addition comes (possible) preselection at the home institutions first of pre-proposals, then the full proposals.

The selection process demands extensive efforts and resources from all involved parties: from the applicants and home institutions in preparing the applications, from the SNSF administration in preparing and administrating the review and selection procedures, from all the international experts involved in the scientific review, and from the Research Council members.[46] The only part of the process for which we have data on expenditures, are the direct expenses for the evaluation panels (CHF 335 154 on daily allowances and travel and meeting cost in Call 4, not including expenses for the external experts for the pre-proposals). We also have some estimates on the time spent by the panel members. Furthermore, we have the applicants' views on the timeline and demanded resources in the application process.

Reviewer time

Comparing with the size of the NCCR grants, the reviewer costs of the scheme seem moderate. Call 4 involved on average 3.2 international experts per pre-proposal and 2.1 per full proposal. A rough estimate of the reviewer time spent on the NCCR Call 4 proposals, sums up to close to two working years, including an estimated *minimum* time spend by each external expert and international panel member for the pre-proposals and the full proposals.[47] In addition, Research Council members spent time on the structural assessments.

[46] Who prepare structural assessments, take part in the panel meetings and put together the shortlist of recommended proposal.

[47] The estimate includes 193 experts spending on average one day each on the pre-proposal they assessed (193 days), 9 members of the pre-proposal panel spending on average 4 working days in advance of the 2-days meeting (in sum 54

The last call, with 2-4 external experts for each pre-proposal, involved more reviewer resources per pre-proposals than we find in the Danish and Norwegian CoE schemes, but less reviewer resources per full proposals than in these Scandinavian schemes (see Section 5.3). The Scandinavian schemes prioritising review resources – in terms of external experts in addition to panel members – for the full proposals rather than all the pre-proposals, imply considerably lower total review costs.

Applicant time

Large teams are involved in the NCCR applications, and we can expect that each of them spend much time on discussing and formulating their research projects and writing the applications – both for the pre-proposals and the full proposals. Hence, much time and resources are spent on the applications, of which the majority are not funded. An aim of the SNSF has been to reduce the number of (unsuccessful) pre-proposals, and in the last call it was informed that only world leading scientists have a chance of success. Still, the number of pre-proposals was higher than in the previous call. In general, reducing the researcher time spend on NCCR proposals do not seem a prime concern of the home institutions. They are concerned to give their research groups a fair chance and have limited possibilities of anticipating the outcome of the scientific review of the NCCR proposals (i.e. home institutions' incentives and basis for pre-selection is limited, see Section 2.1.2).

Comparing the 'applicant costs' in the NCCR schemes with those in the (smaller) Scandinavian CoE schemes gives divergent results. On the one hand, the NCCR applicants need to submit far more extensive project descriptions – both for the pre-proposals and the full proposals (see Section 5.3). On the other hand, the overall success rate is higher for the NCCR scheme than in the two Scandinavian CoE schemes (Table 2.16): The Scandinavian schemes attract far more pre-proposals compared to the final number of proposals funded. Hence, there are proportionally more applicants who spend time on preparing unsuccessful pre-proposals for the Scandinavian schemes than for the NCCR scheme, perhaps a results of the shorter – and presumably less time demanding – pre-proposals in the Scandinavian CoE schemes.

Applicants' opinions

The NCCR applicants seem reasonably well satisfied with the timeline and demanded resources in the application process. A majority of the applicants used the upper side of the scale when indicating their satisfaction with the time and efforts needed to prepare a pre-proposal or a full proposal, and with the time from submitting a proposal to the result was announced. Few applicants used the lower side of the scale on these issues (Table 5.1, figures by proposal stage are presented in Table A9, Appendix 3). Views are somewhat less positive when it comes to the 'overall cost efficiency of the application and selection process'. This question is less specific and more applicants answer 'cannot say'. Still, some uses the lower side of the scale on this question, especially the 3rd call applicants among whom we find 41 per cent indicating 1 or 2 (on the scale from 1 to 5).[48] The similar figure for Call 4 is 27 per cent. Hence, a substantial proportion of the applicants think the cost efficiency could be improved.

Respondents may understand 'overall cost efficiency of the application and selection process' differently, and the survey gives little guidance on how to interpret their replies. It may relate to the amount of application work compared to the chances of funding, as well as to the organisation of the selection process. Only a few of the applicants addressed efficiency issues in the open comment space in the survey. Of these one thought that (what he/she perceived to be) policy priorities should

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days, 6 for each panel member), and 49 members of the full proposal panel spending on average 2 working days in advance of the meeting (in sum 210 days, including the meeting time which was 2 days for 35 of the panel members and 3 days for the remaining 14 panel members). This sums up to 50 working weeks for the pre-proposals and 42 working weeks for the full proposals. For the full proposal, the estimate is based on information given by interviewed panel members (7 of them provided estimates of the time they had spent, varying from 1 to 3 days in advance of the panel meeting, the average and median was 2 days). For the pre-preproposals, the estimate is based on what seems a reasonable *minimum* time (one working day for an external expert reviewing one pre-proposal and 4 days for a panel member preparing a written review of 7 pre-proposals and an oral statement on another 7).

[48] Views are more split on this issue among the 3rd call applicants (that among the 4th call), with a smaller proportion giving middle rates and larger proportion giving low and high rates.

be better communicated in advance to avoid spending time on research topics that would not be given priority:

- Apparently, since the political decision [] was made in the beginning, a lot of work for a lot of people could have been saved by just communicating "we will not fund your project, no matter what the referees will say". The SNF should apologize to the expert panel for abusing their time, since their opinion was ignored.

Three others commented that the process took too much time, one commenting as follows:

- A more timely evaluation process would be a clear improvement (reduction of time between pre-proposal and final decision) in times of rapid progress on science.

Table 5.1 Considering your NCCR application, to what extent did you find the following issues/processes satisfactory? Replies by call. Per cent.

Call	5 To a great extent	4	3	2	1 Not at all	Cannot say	N	Average (1-5)
The time and efforts needed to prepare a pre-proposal								
Call3	18.2 %	31.8 %	31.8 %	9.1 %	9.1 %	0.0 %	22	3.4
Call4	17.6 %	50.0 %	17.6 %	8.8 %	2.9 %	2.9 %	34	3.7
Total	17.9 %	42.9 %	23.2 %	8.9 %	5.4 %	1.8 %	56	3.6
The time and efforts needed to prepare a full proposal								
Call3	26.7 %	33.3 %	13.3 %	13.3 %	13.3 %	0.0 %	15	3.5
Call4	18.8 %	56.2 %	0.0 %	25.0 %	0.0 %	0.0 %	16	3.7
Total	22.6 %	45.2 %	6.5 %	19.4 %	6.5 %	0.0 %	31	3.6
The time from submitting the pre-proposal to the result of the pre-proposal round was announced								
Call3	18.2 %	40.9 %	31.8 %	4.5 %	0.0 %	4.5 %	22	3.8
Call4	11.8 %	52.9 %	23.5 %	5.9 %	2.9 %	2.9 %	34	3.7
Total	14.3 %	48.2 %	26.8 %	5.4 %	1.8 %	3.6 %	56	3.7
The time from submitting the full proposal to the final result was announced								
Call3	13.3 %	33.3 %	33.3 %	6.7 %	6.7 %	6.7 %	15	3.4
Call4	12.5 %	56.2 %	25.0 %	6.2 %	0.0 %	0.0 %	16	3.8
Total	12.9 %	45.2 %	29.0 %	6.5 %	3.2 %	3.2 %	31	3.6
The overall cost efficiency of the application and selection process								
Call3	9.1 %	27.3 %	9.1 %	27.3 %	13.6 %	13.6 %	22	2.9
Call4	2.9 %	23.5 %	32.4 %	20.6 %	5.9 %	14.7 %	34	3.0
Total	5.4 %	25.0 %	23.2 %	23.2 %	8.9 %	14.3 %	56	2.9

Source: NIFU survey to applicants to NCCR calls 3 and 4.

The applicants were also asked to compare the time and efficiency of the NCCR application and selection process with other national funding sources and with ERC grants, in both cases implying a comparison with less complex grants and selection processes. In these comparisons the NCCR scheme comes out as poorer than other national processes (29 percentage points more on ‘poorer than on ‘better), but about the same or better than ERC (4 percentage points more ‘better’ than ‘poorer’, Table 5.2). For a complex selection process taking 2.5 years, lower scores on ‘time and efficiency’ than other national sources/less complex grants seem reasonable, and being on par with the ERC selection process should be satisfactory. Moreover, the average rate the NCCR scheme obtain on ‘overall cost efficiency’ (2.9 in sum for Call 3 and 4, Table 5.1) is not inferior to what we have seen elsewhere.[49]

[49] In a survey to applicants for independent project grants in Norway (FRIPRO, Langfeldt et al. 2012), the overall rate was 2.6 (the average rate given by awarded applicants was 3.2, the average from the non-awarded was 2.4). Figures are however not fully comparable, as the Norwegian survey asked about ‘the overall cost efficiency of the application process’, and not ‘the application and selection process’ as in the NCCR survey.

Table 5.2 Time and efficiency of the NCCR application and selection process compared to other national funding sources and to ERC. Replies by proposal stage. Per cent.

Time and efficiency of the application and selection process	The NCCR scheme is				N	PP difference Better-poorer
	Better	About the same	Poorer	Cannot say/NA		
NCCR compared to your relevant national funding sources						
Only NCCR pre-proposal	0.0 %	69.2 %	23.1 %	7.7 %	26	-23.1
Full NCCR proposal	3.3 %	56.7 %	36.7 %	3.3 %	30	-33.4
Total	1.8 %	62.5 %	30.4 %	5.4 %	56	-28.6
NCCR compared to the European Research Council						
Only NCCR pre-proposal	19.2 %	42.3 %	11.5 %	26.9 %	26	7.7
Full NCCR proposal	12.9 %	45.2 %	12.9 %	29.0 %	31	0.0
Total	15.8 %	43.9 %	12.3 %	28.1 %	57	3.5

Source: NIFU survey to applicants to NCCR calls 3 and 4. Question: When comparing the NCCR scheme to your other relevant national funding sources/ to the selection process of the European Research Council, is the NCCR poorer, about the same or better, concerning Time and efficiency of the application and selection process.

5.2 Effectiveness: Organisation and goal achievement

Overall, the SNSF section process is well organised, a previous outcome evaluation of the NCCR scheme found that the scheme functioned according to intentions (CSSI 2015), and the grants have high prestige. Moreover, the international experts involved in the review in general found the selection process very well organised by the SNSF.

Still, as noted in Chapter 3 and 4, there are concerns regarding the number/competence of expert reviewers for the full proposals, as well as the transparency of the process, and there are some elements in the process that prevail as duplicate or non-productive work, making the process more time-consuming and complex than necessary. Below we look at three issues regarding the latter: separate assessment of structural aspects, non-conclusive pre-proposal review and fruitless efforts spent on trying to rank the full proposals.

Separate assessment of structural aspects: In Call 4, the structural aspects of the NCCRs were assessed both by the international panels and by the Research Council, first at the pre-proposal stage, then at the full proposal stage. The international experts were involved in parts of the structural assessments (criteria: added value of the centre; knowledge transfer; advancement of young researchers and women; leading house/academic management), and this part of the structural assessments was integrated into the overall assessment and selection process. The structural assessments prepared by the Research Council was not available to the international experts, and did not feed directly into the SNSF part of the selection process. The Research Council's structural assessments were still part of the of the feedback to the applicants, and for the pre-proposals this may have provided basis for the preselection at the home institutions, as well as for the work with the full proposals. Moreover, the Research Council's structural assessments of the full proposals were communicated to the State Secretariat and may so be used in the final stage of the selection process. In conclusion, this part of the review process for Call 4 did not have a clear objective, nor a clear entry point in the selection process/decision-making. It may indirectly have influenced the outcome of the selection, but from available data it appears as a side-track of the selection process, making the overall picture of the process more complicated and unclear to applicants, and it was not (explicitly) used in the SNSF part of the selection process. As far as there was no defined procedure for integrating the scientific and structural assessments, the decision to keep them apart (and the parallel/double work this involved) does not seem sufficiently justified.

Non-conclusive pre-proposal review: The NCCR pre-selection is only advisory; all who submit a pre-proposal to the SNSF is allowed to submit a full proposal. This implies:

(a) higher review costs than with a closed full proposal stage, as the number of full proposals is higher than the number of pre-proposals that was top-rated;

(b) the home institutions are invited to preselect proposals in two stages, first for the pre-proposals, then for the full proposals.

Given the openness of the full proposal stage, the distribution of review resources – with more experts per pre-proposal than per full proposal in Call 4 – does not seem optimal. The pre-proposal review seems too comprehensive and thorough for an advisory conclusion, whereas the full proposal review in most cases only involve 2 experts per proposal. Still, the openness of the full proposal stage is supported by many of the stakeholders as several of the B-rated pre-proposals has ended up on the shortlist of full proposals; in total 23 per cent (10 of 44) of shortlisted in the four calls was B-rated at the pre-proposal stage (still fewer in recent calls).[50] Moreover, the rating scale for the pre-proposal defines 'B' as a pre-proposal with 'uncertain' chances of success: 'Some criteria are only partly met, the flaws seem to be fixable in the given time span'. Still, as far as there are more expert reviewers per pre-proposal than per full proposal and no (direct) transfer of information between the expert reviews at the two stages assessment, the openness of the full proposal stage do not seem optimal.

Efforts to rank the full proposals: In all calls, the full proposal panels have been asked to provide a ranked list of recommended proposals, in order to facilitate the task of the Research Council when integrating the recommendations from the panels into a shortlist. The panels have to varying degree been able to rank the proposals. Moreover, the Research Council has attempted to rank the proposals on the shortlist. Due to difficulties in comparing scientific excellence across fields of research the Research Council has not been able to rank the shortlist: time and efforts have been spent on discussing possible bases for comparing proposals, without reaching a conclusion. As a consequence, it has not been clear in advance of the process whether the bases for the final funding decisions would be ranked priorities by the panels, by the Research Council or an unranked list sent to the State Secretariat.

The issues above are further addressed in the recommendation in Section 6.5.

5.3 Comparisons with other CoE schemes

Table 5.3 gives a comparison of timelines, reviewer resources and proposal size in CoE schemes in Switzerland, Norway and Denmark. As noted in Section 5.1, the Danish and Norwegian CoE schemes spend less reviewer resources per pre-proposals, and more reviewer resources per full proposals than the NCCR scheme. Moreover, both for the pre-proposal and the full proposal stage the Danish and Norwegian CoE proposals are far shorter than the NCCR proposals (pre-proposal project descriptions of 5 pages compared to 14 pages plus 2 pages per individual research project, and full proposal project descriptions of 15 pages compared to 29 pages plus 6 pages per individual research project). Table 5.4 also shows that the NCCR selection process takes more time than those of the two Scandinavian schemes. Whereas the NCCR selection takes 31 months from announcing the call for pre-proposals to the funding decision, the Danish and Norwegian selection processes takes from 16 to 20 months. The difference derives from the last stages of the process: the NCCR applicants have much more time for preparing their full proposals than the Danish and Norwegian CoE applicants, and the selection of the full proposals takes more time (12 months from submitting deadline to the result is announced for the NCCRs, compared to 4 months for the Danish scheme and 6-8 months for the Norwegian scheme). Moreover, the two Scandinavian schemes are more streamlined in the sense that there are no separate assessments of structural issues, no meetings with the home institutions as part of the selection process, and the eligibility for the full proposal stage depend on the review outcome at the pre-proposal.

[50] Including four in Call 1, three in Call 2, two in Call 3, and one and Call 4.

Table 5.3 Time, proposal requirements and reviewer resources in CoEs schemes in Switzerland, Norway and Denmark

Time frames, terms and review resources in last call	NCCR (SNSF)	Norwegian CoEs (RCN)	Danish CoEs (DNRF)
Months from call to decision	31	18-20	16
• Pre-proposals: Call to deadline for pre-proposals	5	6	6.5
• Pre-proposals: From submitted to results are announced	5	4	3
• From announcement of pre-proposal results to deadline for full proposals	9	2	2.5
• Full proposals: From submitted to final selection is announced	12	6-8	4
Size pre-proposal project description (excluding description of staff, CV, budget etc)	14 pages+2 per ind. project	5 pages	5 pages
Size full proposal project description (excluding description of staff, CV, budget etc)	29 pages+6 per ind. project	15 pages	15 pages
Reviewers per pre-proposal (external reviewers + panel members/proposals)	193+9/63=**3.2**	28/150=**0.2**	9/173=**0.1**
Reviewers per full proposal (external reviewers + panel members/proposals)	49/23=**2.1**	((3x34)+9)/34=**3.3**	((3x30)+9)/30=**3.3**

5.4 Conclusions

Time and resources in the selection process: The NCCR selection process is longer and more complex than for ordinary project grants: there are 31 months from the call for proposals to the announcement of the winners, including (possible) preselection at the home institutions, in-depth assessments of scientific quality and structural aspects in two stages (pre-proposals and full proposals), separate meetings with all applicant institutions discussing the outcome for the pre-proposals and interviews with all applicants submitting a full proposal. Reviewer costs seem moderate.

More time and more extensive structural assessments than in other CoE schemes: Compared to the Danish and Norwegian CoE schemes, the NCCR selection takes more time (31 months compared to 18-20 months), and devotes far more efforts in assessments of structural aspects. The selection processes for the Danish and Norwegian CoEs do not include meetings with the home institutions discussing the outcome for the pre-proposals or separate assessments of structural aspects. Notably, the NCCRs are larger than the Danish and Norwegian CoEs (grant of 3-5 mill CHF per year for 12 years compared to 1-2 mill CHF per year for 10 years). The NCCR proposals are also far more extensive (for Danish and Norwegian CoEs the (full proposal) project description cannot exceed 15 pages).

General satisfaction with efficiency: The applicants seem reasonably well satisfied with the timeline and demanded resources in the application process. Views are somewhat less positive when it comes to the 'overall cost efficiency of the application and selection process'. Still, the NCCR applicants rate the time and efficiency of the NCCR application and selection process similarly as for the ERC (but as seems reasonable, lower than as for other national sources/less complex grants).

Questions regarding effectiveness and efficiency: When comparing with other CoE selection processes, there are three particular elements of the NCCR selection process that may be questioned with regard to effectiveness and efficiency: (a) the non-conclusiveness of assessments of the pre-proposals (all may submit a full proposal), (b) the amount of review resources spent on pre-proposals compared to full proposals, and (c) the parallel (rather than integrated) assessments of scientific quality and structural aspects.

- The non-conclusiveness for the pre-proposal stage implies extra resources spent on writing and assessing full proposals. Still, the openness of the process may be justified by the many cases of B-rated pre-proposals which ended up on the shortlist of full proposals (in total 23 per cent (10 of 44) of shortlisted proposals in the four call got a B at the pre-proposal stage).

- Using more review resources on the pre-proposals than on the full proposals do not seem well justified in a scheme where the full proposal stage is open, and the panels reviewing the full proposals do not have access to the reviews of the pre-proposals.

- The separate assessments of structural aspects ensure focus on important objectives and ambitions of the NCCRs, but it is hard to see how the (separate) structural aspects enter into the selection process.

6 Conclusions and recommendations

In this chapter, we summarise the conclusions to the questions in the invitation to tender (listed in Appendix 1) and provide recommendations for future calls. Section 6.1 addresses the questions on the preparation phase of the selection process (questions 13-15), Section 6.2 addresses the questions on the pre-selection phase (questions 16-25), Section 6.3 addresses the questions on the full proposal phase (questions 26-37), Section 6.4 addresses the overarching and general questions of the evaluation (questions 1-11) and Section 6.5 the recommendations (question 9).

6.1 The NCCR preparation phase

The planning and implementation of the selection procedure: The Research Council and the Administrative Office of the SNSF are in charge of preparing the call for NCCR proposals and planning the selection procedure. The formulation of the call documents and the design of the selection processes are done in dialogue with the relevant stakeholders, and based on discussion and evaluation of experiences from previous calls.[51] All parties seem pleased with the professionality and capacity of the SNSF in planning, organising and implementing the selection process.

Call documents and outreach: The majority of the NCCR applicants are well satisfied with the clarity of terms and requirements for proposals. The NCCR scheme is highly attractive and the outreach of the calls shows much of the same patterns as for the institutional distribution of NCCR funds in general – with a concentration on the larger universities. Notably, applications with a younger director (38-45 years) have a higher success rate than those with older directors. There is however, a low number of proposals with a female director, and at some stages also a lower success rates for proposals with a female director. Moreover, there are indications that the scheme is more attractive for researchers in the fields of science, technology and life science, than in humanities and to some extent the social sciences. Further, the issue whether research institutes may apply as home institutions seem unclear given that some of the requirements target only universities. (See Section 6.4 for more general concerns regarding the attractiveness and outreach of the NCCR scheme.)

Pre-selection at the home institutions: Due to the demands for co-funding and the size of the NCCRs, hosting an NCCR can be demanding and the home institutions are encouraged to organise internal preselection of the proposals to be submitted to the SNSF. This is done in various ways and to varying extent. Over the years the institutions have developed different internal procedures. Some smaller institutions seem to have a rather thorough process where they end up sending in one to three pre-proposals. The larger institutions allow for a large number of applications. In many cases the potential

[51] The scope for adjustments in the call and the procedure (including the selection criteria) are limited by the federal regulations of the NCCRs scheme.

applicants present/discuss their ideas to the university leadership. At some institutions all are encouraged to apply, while others encourage those in alignment with the institution's strategy and discourage proposal which they perceive as having low quality. Not surprisingly, the home institutions find it demanding to organise a preselection process combining bottom up processes and top down priorities. Further, while some institutions give equal support to all applicants, some engage in an indirect preselection by expressing more support to certain applications in their support letter – but without making such priorities clear to the applicants. An alternative for the SNSF would be to set fixed limits to the number of applications per home institution and so force them to prioritise harder. Several home institutions emphasise that they do not have the required basis for such priorities, and it is hard to say whether fixed limits would yield more well-defined priorities and transparent pre-selection at the home institutions or closed and lobbying-based processes. It might, however, imply more equal terms for participation across universities in the sense that no-one could submit a proposal without a preselection at their own institution. Notably, the purpose of engaging the home institutions in the selection process is to enable them to fill their important role in contributing to the strategic and structural aims of the NCCR scheme, i.e. structural transformation of the Swiss research landscape. So far there are substantial differences between the home institutions in how actively they have filled this role.

6.2 The selection of pre-proposals

External experts and panel members: The pool of experts reviewing the 4th call pre-proposals had a good international profile, but low share of women. A large number of international external experts from a wide set of countries were used for the external review of the pre-proposals, only one of these were located at a Swiss institution. In the pre-proposal panel, all expert reviewers were from outside Switzerland. Potential conflicts of interest were handled according to standard SNSF procedures. The proportion of women among the external experts was 12 per cent, among the international experts in the pre-proposal panel it was 11 per cent. The data indicate that the recruitment of the external experts demanded much effort by the SNSF office. Requests to 554 experts resulted in 193 review reports (35 per cent successful requests). The number of reviews per proposal varied somewhat (from 2 to 4, in one case only 1 review) depending on the availability of willing reviewers. The applicant survey indicates moderate satisfaction with the competences for the review of their pre-proposal, and also moderate satisfaction with the reviewer coverage of the various fields involved in the pre-proposal. This is still in line with what we have found in previous surveys to other kinds of funding schemes.

Basis for balanced assessments: All Call 4 pre-proposals were assessed by one interdisciplinary panel counting 9 international experts, and in addition input from 2-4 external reviewers on each pre-proposal. This was different from Call 3 where there was a larger panel (16 experts) but no external reviewers. In both calls the panel was chaired by a member of the Research Council. The chairing by the Research Council both helped communicate the aims and concerns of the NCCR scheme to the panel members, and communicating the nuances in experts' assessment to the Research Council. We cannot conclude on whether the adding of external reviewers provided a better basis for the scientific review and conclusions in Call 4 (than in Call 3): The Call 4 panel was smaller than the Call 3 panel and the use/value of the external review reports may vary. The applicant survey indicates a slightly higher satisfaction with the review competences for the pre-proposal in Call 4 than in Call 3, but the difference is not statistically significant.

Structural assessments: The Research Council contributes extensively to the assessments of structural aspects of the proposed NCCRs (first for the pre-proposals, then updated for the full proposals). For the Call 4 pre-proposals, these assessments were communicated to the applicants as separate assessments, and they were not integrated into the overall rating of the pre-proposals. They may still have provided important feedback to the applicants and input to dialogue with the home institutions. Still, from the point of view of the home institutions there seems to be little enthusiasm about structural assessments by the SNSF – some thought the universities should be more trusted

with regard to the structural and financial issues related to the NCCRs. Moreover, there are indications that the role of the structural assessments – to what extent they impacted the conclusion (the rating of the pre-proposals) – was not clear to the applicants.

Transparency and feedback: From the point of view of the applicants, there is a demand for improving transparency of the selection process, whereas the panel members seem to find the criteria and procedures clear and comprehensible. The applicants are generally satisfied with the clarity of the terms and requirements for proposals. However, applicants who only participated in the pre-proposal stage are slightly less satisfied with the clarity of these issues. Moreover, many applicants, and in particular those who only participated in the pre-proposal stage, express dissatisfaction with the transparency of the selection process and the clarity and completeness of the feedback to applicants.

Openness/non-conclusive pre-proposal phase: The NCCR selection process differs from other CoE selection processes we have studied in that the full proposal phase is open to all who submitted a pre-proposal, and that the home institutions give their support in two stages, first for the pre-proposal, then for the full proposal. In this way the home institutions are given a more important role in the selection process. The home institutions to a limited extent use their opportunity to 'withdraw support' to a proposal – in most cases they support all pre-proposals that received a top score (A) to submit a full proposal. In some cases, they also support proposals that did not obtain a top score. Hence, the NCCR selection process differs from other CoE selection processes we know in that the full proposal stage includes proposals that did not obtain top score as pre-proposals. Several of these proposals are also successful. Taking the four NCCR calls together, a total of 23 per cent of the shortlisted full proposals had not obtained a top score in the pre-proposal phase.

6.3 The selection of full proposals

Panel expertise and organisation: The panels reviewing the full proposal had a broad international profile, with experts from 14 different countries, and a majority from the US, Germany and the UK (Call 4). The gender balance was better than for the pre-proposal panel, with 22 per cent women among the international experts. The SNSF reports to have had less difficulties in recruiting the international panel members than the external experts for the pre-proposals. All full proposals were allocated to one of five panels and for each proposal there were at least two dedicated experts in the panel. In addition, other panel members could add comments/review parts of proposals according to their competencies. According to the persons involved in the selection of the panel members, and the panel members themselves, the panels had a high level of expertise and were able to assess all research in the involved research fields. Also the successful applicants, those awarded an NCCR, as well as some of the unsuccessful, were satisfied with the competence of the panels. Still, a large part of those not awarded an NCCR were quite critical to the competence of the experts and their ability to assess all the fields in their proposal.

Basis for balanced assessments: In the same way as for the pre-proposals, the panel meetings are chaired by Research Council members, which help communicate the aims and concerns of the NCCR scheme to the panels, as well as giving the Research Council a direct channel to the expert assessments and discussion. The latter is vital for the Research Council (Div. IV) when integrating the recommendations from the various panels into a shortlist of proposals. The Research Council still has not had enough information to rank the shortlisted proposals, but this is more a consequence of the inherent difficulty in comparing proposals across research fields, than the lack of (explicit) ranking in the panels' lists of recommended proposals. Notably, there were large differences in size between the 4th call panels, and the nature of the discussion varied. It seems to have been more interactive and productive in the panel with the fewest proposals and the most reviewers per proposals (i.e. the social science and humanities panel with only three proposals and three reviewers for each of these, Chapter 3.2).

Structural assessments: Whereas important structural aspects and added value of the NCCRs are assessed by the international panels, and well integrated into the scientific assessments of the full proposals, the Research Council's assessment of the structural aspects of the proposed NCCRs are not integrated into the overall rating and do not have any direct impact on the SNSF part of the selection process. The Research Council's assessments of the structural aspects are given as separate feedback to the applicants and serve as input to the State Secretariat's (SERI) final assessments. Hence, the separate structural assessments may have their main importance for the part of the selection process that is outside the scope of our evaluation.

Transparency: The full proposal applicants are quite satisfied with the clarity of the terms and requirements for proposals. As noted above, the panel members seem to find the criteria and procedures clear and comprehensible. SERI is involved and informed throughout the process and seems satisfied with the clarity of the outcome of the SNSF selection process. The applicants, however, have split views on transparency of the selection process: Some are quite satisfied, while others are quite critical. For many applicants the processes leading to the shortlist of recommended proposals do not seem clear. The scientific assessments and the assessments of the structural aspects are given as separate feedback to the applicants. Still, questions concerning the structural assessments and unclarities concerning the priorities of the Research Council in putting together the shortlist may be one of several reasons for why a substantial part of the applicants give the NCCR selection process a low score on transparency (see section on impartiality, transparency and confidence below).

6.4 Answers to the overarching and general questions for the evaluation

Outreach, reviewer competence and review procedures

An undistorted submission of potential NCCR ideas from the scientific community? As outlined above, the attractiveness and outreach of the NCCR scheme is good. There are still some general concerns regarding attractiveness and outreach: The NCCR funding from the SNSF does not cover overhead costs, and substantial co-funding and long-time prioritising of a particular field of research is required from the home institutions. As the priorities and degree of pre-selection vary between the institutions, the 'undistorted submission' of NCCR ideas to SNSF varies between institutions. On the one hand, this is a consequence of key aims of the NCCR scheme (optimising the distribution of tasks between the universities and structural transformation of the research landscape) implying that home institutions ought to have strategic priorities for NCCRs. On the other hand, some applicants express dissatisfaction with low transparency in the institutional priorities and pre-selection. The universities seem to struggle with finding a good way to combine bottom-up initiatives and top-down priorities for the NCCRs.

Identifying the applications with the best qualities with respect to the NCCR evaluation criteria (excellence)? Review forms and guidance for external reviewers and panels ensure that the many NCCR selection criteria are taken into account, and the interview data and review documents indicate that the scientific quality of the team and the proposed research, and the potential and added value of the NCCRs in terms of innovative research, coherence/a clear common vision of the involved research groups and academic management, are the prime concerns in the selection process. This is well in line with the overall aims of the scheme. Moreover, the SNSF's review of structural aspects of the proposed NCCRs ensures that the proposals have the needed strategic support and co-funding from their home institutions.

To what extent does the general set-up of the evaluation procedure promote an excellent evaluation? Shall the procedure be organised in different steps? The NCCR selection process is an extensive process with review in two stages, also including interviews with all applicants at the second stage. In this, the NCCR selection process is in line with CoE selection processes that we find elsewhere. The

number of expert reviewers per proposal on the full proposal stage, however, is lower than in other CoE selection processes. Moreover, the full proposal stage of the NCCR selection process includes proposals that did not obtain a top score at the pre-proposal stage. This implies that the screening of the proposals is not as strict as we find in comparable selection processes – an NCCR can be funded even if supported only by the experts in the last of the two review stages, consequently a lower number of expert reviewers may have supported it[52] (see 'Compliance with international standards' below). Notably, the NCCR selection process also stand out in the sense that there is more emphasis on including the concerns and priorities of the home institutions. In this respect, the 'openness' of the full proposal stage can serve as an additional screening, as a second round of endorsement/priority from the home institution is needed for submitting a full proposal. Hence, the 'openness' is for the home institutions, not the groups applying for NCCRs.

Impartiality, transparency and confidence

An impartial and transparent evaluation procedure? A substantial proportion of the applicants gives the NCCR selection process a low score on transparency. A likely reason for the limited satisfaction with transparency is the mere complexity of the selection process, involving both scientific and structural criteria, and international experts, Research Council members, the home institutions and SERI, over a period of 31 months. Some applicants are not convinced about the impartiality of the selection process, and point to in their comments what they perceive as biased reviewers, low number of experts per proposal, the role of the Research Council in the assessment or unclear strategic priorities. Concerning the role of Research Council members, some applicants seem not to have understood that there has been a strict task division between the international experts and the Research Council members in the scientific and structural assessments of the proposals. More generally, Research Council members have an unclear and challenging role in the selection process, as they, on the one hand, chair review panel meetings and are responsible for putting together the shortlist of proposals to be recommended for funding, and on the other hand, as active researchers affiliated to the applicant institutions, may want to take extra care to be as neutral and fair as possible.

The comprehensibility and acceptability of decisions by applicants, home institutions, SNSF internal bodies and other stakeholders: The home institutions, the international experts and other participants involved in the selection seem to have high confidence in the selection process. Several home institutions emphasise that they do not have the required expertise to select their best NCCR applications, but trust the expertise involved in the SNSF selection process. Hence, the SNSF's assessments of the pre-proposals serve as their main basis for deciding which full proposals to support. The applicants' confidence, however, varies. The large majority of those who only submitted a pre-proposal have lower confidence in the NCCR selection process than in other SNSF selection processes, whereas the full proposal applicants seem somewhat more confident (about half of them reply that their general confidence is lower for the NCCR selection process, the other half that it is about the same as for other SNSF processes). Moreover, among the full proposal applicants the NCCR selection process comes out equally good on general confidence as the ERC selection process. We believe that the reasons for limited confidence in the process are much the same as for the concerns with transparency: the complexity of the process, including the many actors and criteria involved.

Does the general set-up of the evaluation safeguard IP and confidentiality of data and documents, as well as the ethical and integrity standards of the SNSF? Intellectual property and confidentiality are handled as in other SNSF selection processes and there are no general concerns with these issues in the NCCR selection process. The applicants think the handling of IP and confidentiality is equally good in the NCCR scheme as in their other funding sources, or they have no opinion on the issue.

[52] If including expert reviewers from both review stages, each 4th call NCCR proposal had a minimum of 4 assigned expert reviewers (at least 2 for the pre-proposals and 2 for the full proposal). As the review of the full proposals were independent of the reviews and conclusions from the pre-proposal stage, it is still more correct to count only the full proposal expert reviews.

Efficiency and effectiveness

An efficient evaluation procedure? Is the timing of the process adapted to the procedures? The NCCR selection process is more complex and time-consuming than we find in other CoE schemes. There are 31 months from the call for pre-proposals to the announcement of the winners, including the possible pre-selection by the home institutions (both for pre-proposals and full proposals), in-depth separate assessments of scientific quality and structural aspects in both stages, separate meetings with all applicant institutions discussing the outcome of the review of the pre-proposals and interviews with all applicants submitting a full proposal. In comparison, the selection of Danish and Norwegian CoEs takes less time (16-20 months) and do not include meetings with the home institutions discussing the outcome for the pre-proposals or separate assessments of structural aspects. Still, the NCCR applicants and other stakeholders seem reasonably well satisfied with the timeline of the selection process. And even when giving the NCCR process moderate scores on 'overall cost efficiency', the NCCR applicants rate the time and efficiency of the NCCR application and selection process equally good as the ERC selection process. Moreover, taking into consideration the size of the NCCR grants and the importance of the structural aims of the schemes, it is reasonable that the NCCR selection process has more procedures for involving the home institutions and devote more resources to structural assessments, and hence takes more time, than the two Scandinavian CoE schemes. 31 months still seem too long for a CoE selection process.

Is the ratio between the costs of the selection process and the funds awarded per application reasonable? As noted in the previous paragraph, given the size of the NCCR grant, some extra time for dialogue and structural assessments seem reasonable. The number of expert reviewers per full proposal, however, is below what is reasonable to expect given the size of the grant. Costs as measured in reviewers per proposal, are higher at the pre-proposal stage and lower at the full proposal stage than in the two (smaller) Scandinavian CoE schemes we have compared with. Due to the higher number of pre-proposals, this implies higher total costs as measured in reviewer time. By redistributing reviewer resources – from the pre-proposal stage to the full proposal stage – it should be possible to reduce the total costs and still have a selection process that is more in line with international standards (see next section).

Compliance with international standards

Did the selection procedure proceed in compliance with international standards? The European Peer Review Guide (ESF 2011) gives extensive advice on how to design and organise the selection processes of competitive funding schemes – for research grants in general and also advice specifically for CoE schemes. The NCCR selection process is generally in line with the guidelines, but does not fully comply with the advices regarding the number of reviews per proposal, the clarity of procedures for funding decisions and the timeframe of the selection process:

Competence and number of expert reviewers: For research grant selection in general, the advice in the European Peer Review Guide is to have at least three expert assessments per proposal before the final funding decision. For larger funding, it is recommended to also have at least three panel members assigned to each proposal (ESF 2011, page 25). Moreover, for CoE schemes it is recommended to have external/remote reviews for the full proposals (but not necessarily for the pre-proposals). The last NCCR selection process in most cases included three or more experts for each pre-proposal, but not for the full proposals. It is also recommended that 'an international panel of experts with a broad range of expertise and experience' make a site visit to each full proposal applicant, in particular for large-scale centres (ESF 2011, page 67). In the NCCR selection process, as well as in the two Scandinavian CoE schemes we have looked at, the full proposal applicants are interviewed, but there are no site visits.[53]

[53] In comparison, the selection process for the German Collaborative Research Centres includes two days site visits to each full proposal applicant (http://www.dfg.de/en/research_funding/programmes/coordinated_programmes/collaborative_research_centres/index.html).

Clarity of procedures for funding decisions: The European Peer Review Guide states that 'Internal agency procedures for assessing the case for final funding decisions should be decided upon before the launch of the call to ensure fairness and consistency' (ESF 2011, page 69). In the NCCR selection processes, the basis for setting final priorities and making funding decisions has not been fully clear in advance. The individual panels have been asked to provide a ranked list of recommended full proposals, in order to facilitate the task of the Research Council when integrating the recommendations from the panels into a shortlist of recommended NCCRs for the State Secretariat. There has also been an intention to provide the State Secretariat with a ranked shortlist. Due to general difficulties in comparing scientific excellence across fields of research, the panels' lists of recommended proposals has to a limited extent been ranked and the Research Council has not ranked the shortlist. As a consequence, it has not been clear in advance whether the bases for the final funding decisions would be ranked priorities by the panels, by the Research Council or an unranked list.

Timeframe of the selection process: According to the guide, for CoE schemes an '18-month time frame would be usual between the call launch and the funding decision' (ESF 2011, page 68). With 31 months from call to decision, the NCCR selection process is considerably longer than other CoE processes we know.

6.5 Recommendations for the 5th NCCR call

Overall the NCCR selection process, as set up by the SNSF, is well organised and functions according to intentions. Stakeholders are generally satisfied (non-successful applicants are as can be expected less satisfied) and the NCCR scheme has been a success[54]. As seen from a critical outsider perspective there are still some unclarities, weaknesses and ineffective features in the selection process, which the SNSF ought to consider adjusting in advance of the next call for proposals. Moreover, the process is not fully in line with international standards and practices in the CoE schemes we have compared with. The recommendations below address how transparency and efficiency, as well as the quality of the review, can be better ensured:

- *Increase the number of experts per proposal:* The SNSF should consider to increase the number of experts per proposal, having a *minimum* of three assigned experts for each proposal. The number of experts per proposal has been below what is recommended in international guidelines, the proposals are large and multidisciplinary and applicants express dissatisfaction with the reviewers' ability to assess all the fields of their proposals. More experts would better cover all fields, and would also reduce the potential for reviewer bias, e.g. that the particular match or mismatch between topics and perspectives of a proposal and those of the assigned reviewers influences the outcome of the review. Also, the need for comprehensive review of the pre-proposals and the full proposals respectively, should be considered: As far as the full proposals can be submitted regardless of the pre-proposal rating, external reviews are more important for the full proposals than for the pre-proposals. Moreover, international practice includes more comprehensive review of the full proposals – which present the full and final description of the proposed research. Concentrating on the full proposals also demands less reviewer resources (due to the reduced number of proposals).

- *Consider allowing rebuttals from applicants:* Other funding agencies have good experiences with allowing CoE applicants to comment on the written reviews from external experts, and so to provide the panel(s)/board which compare the full proposals with both written external reviews and applicants' rebuttals to these reviews. Rebuttals may modify reviewer bias, clarify misunderstandings and mistakes, and increase the transparency and the quality of review. Combined with adding external expert reviews at the full proposal stage, rebuttals should provide a better basis for overall assessments and for comparing proposals and making funding

[54] Outcome assessment of the NCCRs, CSSI 2015.

recommendations. Notably, a rebuttal does not include the possibility to revise or extend the proposal, it only gives a short time for the applicants to directly comment on the external review reports.

- *Procedural and task clarity:* The role of the assessments of the structural aspects of the NCCRs, and procedures for using and integrating these assessments in the decision-making at each stage of the selection process, should be clarified in advance and explained in the call documents. This may also include reconsidering the need for the SNSF to thoroughly assess the structural aspects of both pre-proposals and full proposals. By clarifying e.g. threshold values for structural aspects, or asking the panels to more explicitly assess the structural aspects that are closely related with the scientific added value the NCCRs, the need for separate structural assessments by the Research Council may be reduced. Moreover, it should be made clearer to the applicants that only the international experts participate in the scientific review (e.g. by naming the Research Council members in the panels 'rapporteurs' or 'observers' rather than panel 'members'). More generally, the potential applicants would profit from increased clarity in requirements and priorities regarding structural and strategic aspects that would make their application unfit or irrelevant for the NCCR scheme. Hence, the applicants should be provided with more information, in advance, on the criteria emphasised at the various stages of the process, and the role of the different actors involved (including the review forms and guidelines/mandates).

- *Clarify the need for ranking full proposals:* It should be clear in advance whether or not the shortlist of recommended full proposals is to be ranked. If ranking, the rules and criteria for producing a ranked shortlist should be in place in advance (e.g. allocation on research fields, institutions/possibility for co-funding, gender, age, particular high added value of an NCCR or other criteria that make sense when prioritising across research fields). Also the panels' role and tasks in comparing the proposals, and the need for ranking the NCCRs they recommend, should be clear from the start.

Clarifying the process should make it more transparent to applicants as well as simplifying the work of the SNSF. Clarifying and simplifying review procedures may in turn give basis for shortening the timeline of the selection process and reduce review costs. It should also be possible to shorten the time from announcement of the pre-proposal review to the deadline of the full proposals, regardless of these issues.

In addition, increasing the number of experts per full proposal and allowing rebuttals should increase the quality of the review and transparency for applicants. It should still be kept in mind that there is no selection process that can guarantee that the future most successful research groups are selected, even with a large number of experts per proposal. It is always hard to anticipate success, and more reviewers per application may in some cases give more conservative review.

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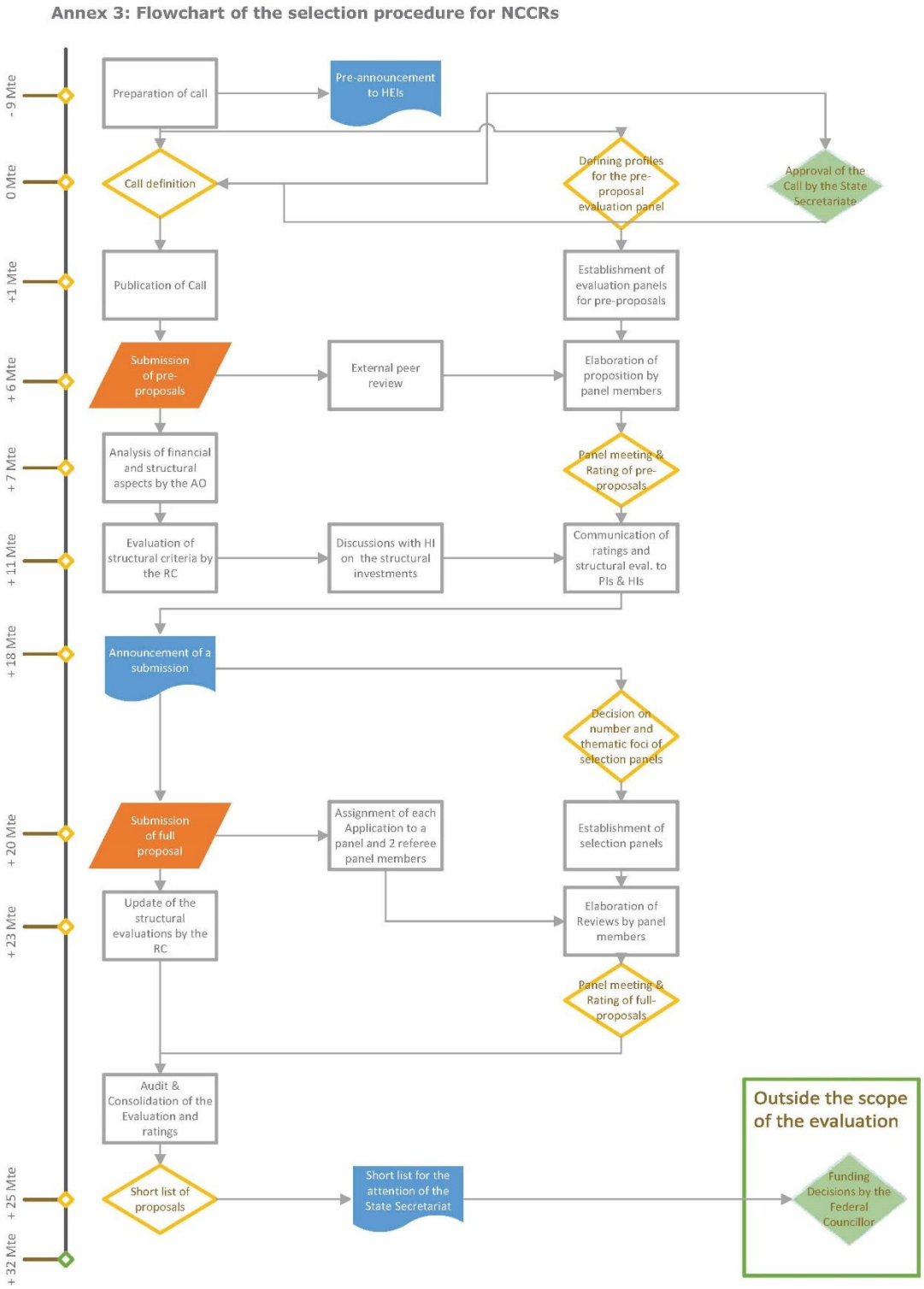
*Reports with some comparative applicant survey data on clarity of call information, transparency of funding decisions, impartiality, reviewer competence and trust.

Appendix 1 Questions in the invitation to tender

1. Overarching question
To what extent does the organization of the evaluation procedures (involved bodies/experts; their selection and the division of tasks; the guidelines, forms and technical aids used …) and their implementation (co-ordination, business processes management, leadership, timing ...) contribute to towards:
1. An undistorted submission of potential NCCR ideas from the scientific community
2. Identifying the applications with the best qualities with respect to the NCCR evaluation criteria (excellence).
3. An impartial and transparent evaluation procedure
4. the comprehensibility and acceptability of decisions by applicants, home institutions, SNSF internal bodies and other stakeholders
5. an efficient evaluation procedure
2. General questions
6. To what extent does the general set-up of the evaluation procedure promote an excellent evaluation? Shall the procedure be organised in different steps?
7. Is the timing of the process adapted to the procedures?
8. Does the general set-up of the evaluation safeguard IP and confidentiality of data and documents, as well as the ethical and integrity standards of the SNSF.
9. Based on the international experience of public research funding, what are the recommendations for enhancing the effectiveness and efficiency of the evaluation procedures?
10. Is the ratio between the costs of the selection process and the funds awarded per application reasonable?
11. Did the selection procedure proceeded in compliance with international standards (OECD or ESF best practices)?
12. Are there important questions/issues that could not be addressed with the retrospective evaluation approach?
3. Detailed questions
(1) Preparation phase
13. How coherently do the call documents reflect the NCCR programme? Are they transparent with respect to the requirements for applications and the evaluation procedure? Do they reach the target audiences?
14. How do the activities of the home institutions (support/no support; internal pre-selection…) influence the pool of submitted applications? How would limitations of the number of applications per HI affect the procedures?
15. How is the selection procedure perceived and implemented by the Research Council and the Administrative Office? To what degree are the procedures and their integrity, the methods, the criteria, the goals, the governance, the quality controls of the whole selection process discussed and established? Does the concept promote an excellent evaluation?
(2) Pre-selection
16. To what extent are the formal criteria, the evaluation criteria and the procedure of the pre- selection transparent to all stakeholder (applicants, panel, external experts, RC)?
17. To what extent do the selected external experts and panel members meet the standards by the SNSF in terms of standing, internationality, gender balance, CoI)?
18. To what degree does the search for experts identify peers that cover the topics of the application to be judged?
19. To what extent can the best suited experts be motivated to participate in the evaluation (as external expert or as panel member)?
20. To what extent do the documents, the information and the competences in the RC contribute to the evaluation of the structural aspects of the applications.
21. How does the Research Council integrate the structural and financial evaluation and the scientific evaluation by the panel?
22. To what extent does the organisational and operational structure, the management and the leadership in the panel contribute to a balanced/fair appraisal of all applications?
23. Are the ratings by the panel comprehensive to the RC?
24. Are the results of the evaluation comprehensible to the applicants?
25. How does the rigor / preset of the selection (i.e. how many applications have the right to submit a full proposal) influence the procedures?
(3) Selection of full proposals
26. To what extent are the formal criteria, the evaluation criteria and the procedure of the selection transparent to all stakeholder (applicants, panel, RC)?
27. To what extent do the panel members meet the standards by the SNSF in terms of standing, internationality, gender balance, CoI)?
28. Which effects have the number of panels to the quality of assignments and the quality of the assessment?
29. To what degree does the search for experts identify peers that cover the topics of the application to be judged?
30. To what extent can the best suited experts be motivated to participate in the evaluation?
31. How does the (thematically diverse) panel evaluate and compare the different applications?
32. To what extent does the organisational and operational structure, the management and the leadership in the panel contribute to a balanced/fair appraisal of all applications?
33. Are the ratings by the panels comprehensive to the RC?
34. How does the Research Council integrate the structural and financial evaluation and the scientific evaluation by the panel?
35. To what extent degree does the documentation of the evaluation processes and decisions by the panels contribute to the integration of ratings into a short list by the Research Council
36. Are the decisions leading to the short list comprehensible to the applicants?
37. ..and to the State Secretariate?

Appendix 2 Flowchart NCCR selection procedure



Source: SNSF.

Appendix 3 Tables

Table A 1 Proposals in NCCR Call 3 and 4 by main research area. Proposals at different stages of the selection process, and success rates by research area. Per cent.

Call 3 distribution	Humanities/ Social Sciences	Technology and ecology	Life sciences	(remaining) Natural sciences	N
# Pre-proposals	13	9	25	7	54
Pre-proposals	24.1%	16.7%	46.3%	13.0%	54
A-rated pre-proposals	25.0%	6.3%	50.0%	18.8%	16
Full proposals submitted	28.6%	10.7%	39.3%	21.4%	28
A-rated/recommended full proposals	23.1%	7.7%	46.2%	23.1%	13
Shortlisted by SNSF	20.0%	10.0%	50.0%	20.0%	10
Awarded (by ministry)	12.5%	12.5%	50.0%	25.0%	8
Success rates					**Total %**
1: % of pre-proposals submitted as full proposals	61.5%	33.3%	44.0%	85.7%	51.9%
2: % of full proposals shortlisted	25.0%	33.3%	45.5%	33.3%	35.7%
Call 4 distribution					**N**
# Pre-proposals	13	18	21	11	63
Pre-proposals	20.6%	28.6%	33.3%	17.5%	63
A-rated pre-proposals	15.0%	35.0%	25.0%	25.0%	20
Full proposals submitted	13.0%	39.1%	26.1%	21.7%	23
A-rated/recommended full proposals	18.2%	18.2%	18.2%	45.5%	11
Shortlisted by SNSF	20.0%	20.0%	10.0%	50.0%	10
Awarded (by ministry)	12.5%	12.5%	12.5%	62.5%	8
Success rates					**Total %**
1: % of pre-proposals submitted as full proposals	23.1%	50.0%	28.6%	45.5%	36.5%
2: % of full proposals shortlisted	66.7%	22.2%	16.7%	100.0%*	43.5%

Source: Analysis of data from the SNSF.
'Life sciences' include the medical and biological sciences. 'Natural sciences' include physics, chemistry, mathematics and materials science. Several applications include research fields across these categories, but are only included under what is defined as their main research field in the data provided by the SNSF.
*All 5 submitted full proposal were shortlisted by the SNSF and approved by ministry.

Table A 2 Proposals in NCCR Call 1 by main research area. Proposals at different stages of the selection process, and success rates by research area. Per cent.

Call 1 distribution	Humanities/ Social Sciences	Natural sciences/ engineering	Life sciences	N
# Pre-proposals	26	26	30	
Pre-proposals	31.7%	31.7%	36.6%	82
A-rated pre-proposals	14.8%	29.6%	55.6%	27
Full proposals submitted	26.5%	29.4%	44.1%	34
Arated/recommended full proposals	22.2%	38.9%	38.9%	18
Shortlisted by SNSF	22.2%	38.9%	38.9%	18
Awarded (by ministry)	14.3%	50.0%	35.7%	13
Success rates				**Total %**
1: % of pre-proposals submitted as full proposals	34.6%	38.5%	50.0%	41.5%
2: % of full proposals shortlisted	44.4%	70.0%	46.7%	52.9%

Source: Analysis of data from the SNSF.
Field categorisation is according the SNF thematic division. Proposals for which information about SNSF division is missing, is categorised by NIFU based on other information NCCR title, department etc. (concerns pre-proposals within 'Sustainable development and environment').

Table A 3 **Call 2 NCCR applications by home institution. Number proposals at different stages, and success rate for the SNSF part of the process. (Sorted by number of pre-proposals)**

Home Institution	Pre-proposals	Full proposal submitted	Shortlisted by SNSF	Awarded by Ministry	*SNSF success%
Universität Bern	6	3	1	1	16.7
Université de Genève	6	3	1	1	16.7
Université de Lausanne	5	2	0	0	0.0
Universität Basel	4	3	2	2	50.0
Université de Fribourg	4	1	0	0	0.0
Universität Zürich	4	3	2	2	50.0
Université de Neuchâtel	3	0	0	0	0.0
ETHZ	2	1	0	0	0.0
Institut Kurt Boesch, Sion	2	0	0	0	0.0
Universität St.Gallen	2	1	0	0	0.0
Universität Luzern	1	0	0	0	0.0
Universita della Svizzera Italiana	1	0	0	0	0.0
FHZ Luzern (Univ. of Applied Sciences)	1	0	0	0	0.0
HWZ Zürich (Univ. of Applied Siences)	1	0	0	0	0.0
Roman Museum Augst	1	0	0	0	0.0
The Graduate Institute Geneva	1	0	0	0	0.0
Total	44	17	6	6	13.6

Source: Analysis of data from the SNSF.
*Full proposals shortlisted by the SNSF as percentage of pre-proposals.

Table A 4 **Call 1 NCCR applications by home institution. Number proposals at different stages, and success rate for the SNSF part of the process. (Sorted by number of pre-proposals)**

Home Institution	Pre-proposals	Full proposal submitted	Shortlisted by SNSF	Awarded by Ministry	*SNSF success%
Université de Genève	12	4	4	2	33.3
Université de Lausanne	10	4	2	2	20.0
Universität Bern	10	5	3	2	30.0
EPFL	9	3	2	2	22.2
Universität Zürich	9	5	3	2	33.3
ETHZ	6	3	1	1	16.7
Universität Basel	6	3	1	1	16.7
Université de Fribourg	3	1	0	0	0.0
Paul Scherrer Institut	3	0	0	0	0.0
Université de Neuchâtel	3	1	1	1	33.3
IDHEAP	2	1	0	0	0.0
Universität St. Gallen	2	1	0	0	0.0
WSL Institut für Wald, Schnee und Landschaft	2	0	0	0	0.0
Università della Svizzera italiana	1	0	0	0	0.0
Universität Luzern	1	0	0	0	0.0
EAWAG	1	1	0	0	0.0
IDIAP	1	1	1	1	100.0
Hôpital Cantonal de Vaud	1	1	0	0	0.0
Total	82	34	18	14	22.0

Source: Analysis of data from the SNSF.
*Full proposals shortlisted by the SNSF as percentage of pre-proposals.

Table A 5 NCCR Call 1 and 2. Per cent male and female directors at the different stages of the selection process.

	Call 1			Call 2		
Proposal stage	# *applications	% with female directors	% with male directors	# applications	% with female directors	% with male directors
Pre-proposals	82	6.1%	93.9%	44	11.4%	88.6%
A-rated pre-proposals	27	11.1%	88.9%	5	20.0%	80.0%
Full proposals submitted	34	8.8%	91.2%	17	17.6%	82.4%
A-rated/recommended full proposals	18	5.6%	94.4%	8	0.0%	100.0%
Shortlisted by SNSF	18	11.1%	88.9%	6	0.0%	100.0%
Awarded (by ministry)	13	15.4%	84.6%	6	0.0%	100.0%

Source: Analysis of data from the SNSF. Success rates Call 1: 40 per cent of pre-proposals with female director and 14.3 per cent of those with male director were shortlisted by the SNSF (2 of 5 with female director and 11 of 77 with male director).
*The first call also included a letter-of-intent stage, in which 229 'Absichterklärungen' were received.

Table A 6 Applicants' views on the NCCR policies and review processes. Replies by proposal stage. Per cent and rate average.

In your opinion. to what degree does the NCCR scheme provide the appropriate policies and review processes to	5 To a great extent	4	3	2	1 Not at all	Cannot say	N	Average (1-5)
Support the most promising and important research?								
Only pre-proposal	7.7 %	19.2 %	46.2 %	15.4 %	7.7 %	3.8 %	26	3.0
Full proposal	19.4 %	25.8 %	16.1 %	22.6 %	9.7 %	6.5 %	31	3.2
Total	14.0 %	22.8 %	29.8 %	19.3 %	8.8 %	5.3 %	57	3.2
Facilitate interdisciplinary research?								
Only pre-proposal	15.4 %	42.3 %	23.1 %	11.5 %	3.8 %	3.8 %	26	3.6
Full proposal	29.0 %	22.6 %	22.6 %	9.7 %	9.7 %	6.5 %	31	3.6
Total	22.8 %	31.6 %	22.8 %	10.5 %	7.0 %	5.3 %	57	3.6
Support high-risk research?								
Only pre-proposal	0.0 %	7.7 %	26.9 %	30.8 %	19.2 %	15.4 %	26	2.3
Full proposal	9.7 %	16.1 %	22.6 %	22.6 %	16.1 %	12.9 %	31	2.8
Total	5.3 %	12.3 %	24.6 %	26.3 %	17.5 %	14.0 %	57	2.6
Support well founded and solid research?								
Only pre-proposal	15.4 %	50.0 %	26.9 %	3.8 %	3.8 %	0.0 %	26	3.7
Full proposal	29.0 %	32.3 %	12.9 %	12.9 %	6.5 %	6.5 %	31	3.7
Total	22.8 %	40.4 %	19.3 %	8.8 %	5.3 %	3.5 %	57	3.7
Support original and ground-breaking research?								
Only pre-proposal	3.8 %	19.2 %	38.5 %	19.2 %	15.4 %	3.8 %	26	2.8
Full proposal	19.4 %	25.8 %	16.1 %	19.4 %	12.9 %	6.5 %	31	3.2
Total	12.3 %	22.8 %	26.3 %	19.3 %	14.0 %	5.3 %	57	3.0

Source: NIFU survey to applicants to NCCR calls 3 and 4.

Table A 7 Applicants' views on the NCCR policies and review processes. Replies by call. Per cent and rate average.

In your opinion to what degree does the NCCR scheme provide the appropriate policies and review processes to	5 To a great extent	4	3	2	1 Not at all	Cannot say	N	Average (1-5)
Support the most promising and important research?								
Call 3	17.4 %	13.0 %	39.1 %	13.0 %	13.0 %	4.3 %	23	3.1
Call 4	11.8 %	29.4 %	23.5 %	23.5 %	5.9 %	5.9 %	34	3.2
Total	14.0 %	22.8 %	29.8 %	19.3 %	8.8 %	5.3 %	57	3.2
Facilitate interdisciplinary research?								
Call 3	13.0 %	39.1 %	13.0 %	17.4 %	13.0 %	4.3 %	23	3.2
Call 4	29.4 %	26.5 %	29.4 %	5.9 %	2.9 %	5.9 %	34	3.8
Total	22.8 %	31.6 %	22.8 %	10.5 %	7.0 %	5.3 %	57	3.6
Support high-risk research?								
Call 3	4.3 %	13.0 %	21.7 %	34.8 %	17.4 %	8.7 %	23	2.5
Call 4	5.9 %	11.8 %	26.5 %	20.6 %	17.6 %	17.6 %	34	2.6
Total	5.3 %	12.3 %	24.6 %	26.3 %	17.5 %	14.0 %	57	2.6
Support well founded and solid research?								
Call 3	26.1 %	26.1 %	21.7 %	17.4 %	8.7 %	0.0 %	23	3.4
Call 4	20.6 %	50.0 %	17.6 %	2.9 %	2.9 %	5.9 %	34	3.9
Total	22.8 %	40.4 %	19.3 %	8.8 %	5.3 %	3.5 %	57	3.7
Support original and ground-breaking research?								
Call 3	13.0 %	21.7 %	17.4 %	21.7 %	17.4 %	8.7 %	23	2.9
Call 4	11.8 %	23.5 %	32.4 %	17.6 %	11.8 %	2.9 %	34	3.1
Total	12.3 %	22.8 %	26.3 %	19.3 %	14.0 %	5.3 %	57	3.0

Source: NIFU survey to applicants to NCCR calls 3 and 4.

Table A 8 Considering your NCCR application, to what extent did you find the following issues/processes satisfactory? Replies by call. Per cent.

Considering your NCCR application, to what extent did you find the following issues/processes satisfactory?	5 To a great extent	4	3	2	1 Not at all	Cannot say	N	Average (1-5)
The clarity of the terms and requirements for proposals (call documents)								
Call3	27.3 %	50.0 %	13.6 %	4.5 %	4.5 %	0.0 %	22	3.9
Call4	20.6 %	44.1 %	26.5 %	5.9 %	0.0 %	2.9 %	34	3.8
Total	23.2 %	46.4 %	21.4 %	5.4 %	1.8 %	1.8 %	56	3.9
The transparency regarding the SNSF selection process								
Call3	9.1 %	22.7 %	22.7 %	22.7 %	18.2 %	4.5 %	22	2.8
Call4	5.9 %	14.7 %	38.2 %	14.7 %	23.5 %	2.9 %	34	2.6
Total	7.1 %	17.9 %	32.1 %	17.9 %	21.4 %	3.6 %	56	2.7
The clarity and completeness of the feedback to applicants								
Call3	0.0 %	31.8 %	27.3 %	22.7 %	18.2 %	0.0 %	22	2.7
Call4	3.0 %	21.2 %	27.3 %	39.4 %	9.1 %	0.0 %	33	2.7
Total	1.8 %	25.5 %	27.3 %	32.7 %	12.7 %	0.0 %	55	2.7

Source: NIFU survey to applicants to NCCR calls 3 and 4.

Table A 9 Considering your NCCR application, to what extent did you find the following issues/processes satisfactory? Replies by proposal stage reached. Per cent.

	5 To a great extent	4	3	2	1 Not at all	Cannot say	N	Average (1-5)
The time and efforts needed to prepare a pre-proposal								
Only pre-proposal	12.0 %	32.0 %	36.0 %	8.0 %	8.0 %	4.0 %	25	3.3
Full proposal	22.6 %	51.6 %	12.9 %	9.7 %	3.2 %	0.0 %	31	3.8
Total	17.9 %	42.9 %	23.2 %	8.9 %	5.4 %	1.8 %	56	3.6
The time from submitting the pre-proposal to the result of the pre-proposal round was announced								
Only pre-proposal	16.0 %	48.0 %	20.0 %	8.0 %	4.0 %	4.0 %	25	3.7
Full proposal	12.9 %	48.4 %	32.3 %	3.2 %	0.0 %	3.2 %	31	3.7
Total	14.3 %	48.2 %	26.8 %	5.4 %	1.8 %	3.6 %	56	3.7
The overall cost efficiency of the application and selection process								
Only pre-proposal	0.0 %	28.0 %	28.0 %	24.0 %	8.0 %	12.0 %	25	2.9
Full proposal	9.7 %	22.6 %	19.4 %	22.6 %	9.7 %	16.1 %	31	3.0
Total	5.4 %	25.0 %	23.2 %	23.2 %	8.9 %	14.3 %	56	2.9

Source: NIFU survey to applicants to NCCR calls 3 and 4.

Appendix 4 Overview interviewees

SNSF The National Research Council

- Prof. Thomas Bernauer, C4: Chair Pre-proposal panel
- Prof. Fabrizio Butera, C4: Chair Humanities / Social Sciences Panel
- Prof. Christoph Dehio, C4: Chair Nano/Bio Panel. C3: Chair Life Science Panel and Pre-proposal Panel.
- Prof. Friedrich Eisenbrand, C4: Chair Humanities / Social Sciences Panel
- Prof. Katharina Fromm
- Prof. Alexander Grob, C4: Participated in the meeting of the Medical Sciences Panel
- Prof. Jürg Ulrich Steiger, C4: Chair Medical Sciences Panel
- Prof. Philipp Rudolf von Rohr, C4: Chair Basic Sciences Panel
- Prof. Frédéric Varone
- Prof. Martin Vetterli

SNSF Office

- Stefan Bachmann (assisted C4: Pre-proposal panel, Technology and Ecology Panel, and Humanities / Social Sciences Panel. C3: Pre-proposal panel and two of the full proposal panels)
- Thomas Griessen (assisted C4: Pre-proposal panel, Basic Sciences Panel, Nano/Bio Panel, Technology and Ecology Panel, and Humanities / Social Sciences Panel.)
- Dimitri Sudan
- Marc Zbinden

International experts/NCCR panel members Call 4

- Prof. Jeroen van den Brink, Basic Sciences Panel
- Prof. Hellmut Augustin, Medical Sciences Panel
- Prof. Bryan R. Cullen, Medical Sciences Panel
- Prof. Rachel K. O'Reilly, Nano/Bio Panel
- Prof. Han Entzinger, Humanities / Social Sciences Panel
- Prof. Ethel Matala, Humanities / Social Sciences Panel
- Prof. Kent E. Holsinger, Technology and Ecology Panel
- Prof. Mette Ramsgaard Thomsen, Technology and Ecology Panel
- Prof. Hans Bressers, Pre-proposal panel

The State Secretariat for Education, Research and Innovation (SERI)

Vice Director Gregor Haefliger

University leadership

- Prof. Benoît Deveaud, former Vice President for Research, EPFL
- Prof. Daniel Wyler, former Vice President for Research, University of Zürich
- Prof. Martine Rahier, President, University of Neuchâtel
- Prof. Guillemette Bolens, former Vice President for Research University of Geneva
- Prof. Christian Leumann, President University of Bern

NCCR Applicants Call 4

Five (potential) NCCR directors/applicants in different fields were interviewed. These were from five different institutions/universities, and cover applicants reaching different stages in the NCCR selection process stages (1 pre-proposal stage only, 2 full proposal not funded and 2 funded).

Appendix 5 Questionnaire to NCCR applicants

NIFU

Nordic Institute for Studies in Innovation, Research and Education

The NCCR selection process: Survey to applicants

The purpose of this survey is to gain insight into the applicants' views and experiences with the NCCR application and selection processes. The survey goes to all who have applied (as main applicant/designated NCCR Director) in the 3rd (2008) or 4th NCCR (2011) call for proposals. The experiences of both successful and unsuccessful applicants are of great value to the improvements of the NCCR selection process and we kindly ask you to participate.

Your experiences of the NCCR application and selection process

1. Considering your NCCR application, to what extent did you find the following issues/processes satisfactory?

	5 = To a great extent	4	3	2	1 = not at all	Cannot say
The clarity of the terms and requirements for proposals (call documents)	○	○	○	○	○	○
The support during the application process (from the SNSF)	○	○	○	○	○	○
The competence of the experts reviewing the pre-proposals	○	○	○	○	○	○
*The competence of the experts reviewing the full proposals	○	○	○	○	○	○
The transparency regarding the SNSF selection process	○	○	○	○	○	○
The clarity and completeness of the feedback to applicants	○	○	○	○	○	○
The time and efforts needed to prepare a pre-proposal	○	○	○	○	○	○
*The time and efforts needed to prepare a full proposal	○	○	○	○	○	○
The time from submitting the pre-proposal to the result of the pre-proposal round was announced	○	○	○	○	○	○
*The time from submitting the full proposal to the final result was announced	○	○	○	○	○	○
The overall cost efficiency of the application and selection process	○	○	○	○	○	○

*Leave open if you did not submit a full proposal.

2. To what degree do you think the evaluation panel that assessed your pre-proposal:

	5 = To a great extent	4	3	2	1 = not at all	Cannot say
Was able to assess all the fields of research involved in the application?	○	○	○	○	○	○
Provided an impartial and unbiased assessment of your application?	○	○	○	○	○	○
Provided a thorough assessment of your application?	○	○	○	○	○	○

3. *To what degree do you think the panel that assessed your full proposal:

	5 = To a great extent	4	3	2	1 = not at all	Cannot say
Was able to understand and respond to the presentation of your proposal (during your meeting with the selection panel)?	○	○	○	○	○	○
Was able to assess all the fields of research involved in the application?	○	○	○	○	○	○
Provided an impartial and unbiased assessment of your application?	○	○	○	○	○	○
Provided a thorough assessment of your application?	○	○	○	○	○	○

*Leave open if you did not submit a full proposal.

4. In your opinion, to what degree does the NCCR scheme provide the appropriate policies and review processes to:

	5 = To a great extent	4	3	2	1 = not at all	Cannot say
Support the most promising and important research?	○	○	○	○	○	○
Facilitate interdisciplinary research?	○	○	○	○	○	○
Support high-risk research?	○	○	○	○	○	○
Support well founded and solid research?	○	○	○	○	○	○
Support original and ground-breaking research?	○	○	○	○	○	○

5. When comparing the NCCR scheme to your other relevant national funding sources, is the NCCR poorer, about the same or better, concerning:

	Better	About the same	Poorer	Cannot say/NA
Reviewer competence	○	○	○	○
The transparency of the selection process	○	○	○	○
The handling of intellectual property and confidential information	○	○	○	○
The impartiality and ethical standard of the selection process	○	○	○	○
Your general confidence in the selection process	○	○	○	○
Time and efficiency of the application and selection process	○	○	○	○
Impact on the prestige and career of the awarded investigators/researchers	○	○	○	○
Amount of funding	○	○	○	○
Flexibility of use of funds	○	○	○	○
Which other national funding source/scheme is your main reference? (please specify below)				

6. When comparing the NCCR scheme to the selection process of the European Research Council, is the NCCR poorer, about the same or better, concerning:

	Better	About the same	Poorer	Cannot say/NA
Reviewer competence	○	○	○	○
The transparency of the selection process	○	○	○	○
The handling of intellectual property and confidential information	○	○	○	○
The impartiality and ethical standard of the selection process	○	○	○	○
Your general confidence in the selection process	○	○	○	○
Time and efficiency of the application and selection process	○	○	○	○
Impact on the prestige and career of the awarded investigators/researchers	○	○	○	○
Amount of funding	○	○	○	○
Flexibility of use of funds	○	○	○	○

The pre-selection processes at your home institution

7. Who launched the idea to apply for a NCCR?

- ○ I/my group/collaborators
- ○ I/my group in collaboration with the top leadership of the institution
- ○ Me/my group in collaboration with faculty/school level leadership
- ○ The leadership of the institution invited/asked me/my group to apply
- ○ Cannot remember
- ○ Other

8. Apart from you and your group, who was involved in deciding whether or not your application (pre-proposal) was to be submitted to the SNSF? (multiple replies possible)

- ☐ The top leadership of the institution
- ☐ Faculty/school level leadership
- ☐ Department/institute level leadership
- ☐ Other:

9. Apart from you and your group, who had a final say in deciding whether or not your application (pre-proposal) was to be submitted to the SNSF? (in terms of a possible veto concerning the required letter of support and/or self-funding from home institution) (multiple replies possible)

- [ ] The top leadership of the institution
- [ ] Faculty/school level leadership
- [ ] Department/institute level leadership
- [ ] Other:

10. How would you describe the pre-selection of NCCR pre-proposals at your home institution?

- ○ No pre-selection: All formally eligible applicants were allowed to submit a pre-proposal
- ○ Informal pre-selection process: Support/not support of proposals were discussed and decided in informal meetings/settings
- ○ Formal pre-selection process: There was a defined procedure for deciding which proposals to support
- ○ Other:

11. How would you describe the pre-selection of NCCR full proposals at your home institution?

- ○ No pre-selection, all formally eligible applicants were allowed to submit a full proposal
- ○ Informal pre-selection process: Support/not support of proposals were discussed and decided in informal meetings/settings
- ○ Formal pre-selection process: There was a defined procedure for deciding which proposals to support
- ○ Other:

12. Please describe briefly how pre-selection of NCCR proposals was done at your institution:

Open comments/Free text

13. Below you may enter comments and experiences concerning the NCCR selection process. Of particular interest are your ideas for improvement of the application and review process.

Finish

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