"la Caixa" Foundation

Doctoral INPhINIT Fellowships

Selection process *guidelines*

lacaixafoundation.org

Fellowships

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Introduction

The aim of this guidebook is to describe the evaluation process followed by "la Caixa" Foundation (LCF) fellowship programmes. It is specifically designed for candidates and evaluators who participate in the selection processes. It provides detailed information about the evaluation steps, the selection criteria, the scoring system and the evaluation procedures.

The evaluation process is the cornerstone of LCF programmes and it is driven by the following **principles**:

> **Transparency.** The candidate selection is based on clearly described rules and procedures that are available on the LCF public website. In addition, candidates receive timely information on the status of their applications at each stage of the selection process.
>
> **Equity.** All candidates are treated equally, pass through exactly the same evaluation steps and are assessed under identical evaluation criteria and procedures laid out in this document without considering any other factors.
>
> **Efficiency.** LCF's fellowship programmes are characterised by thorough and rigorous compliance with the established procedures. Punctuality in meeting deadlines, which are known in advance by applicants and evaluators, is of the utmost importance.
>
> **Quality.** The assessment of the candidates is conducted by independent experts who are carefully appointed considering their expertise, research performance and experience in conducting evaluations. "la Caixa" Foundation takes specific measures to ensure diversity (considering gender, geographical distribution, professional sector, disciplines, etc.) in the recruitment of experts and continuously populates its experts' database in order to assign appropriate evaluators to the applications and rotate at least one third of experts from call to call.

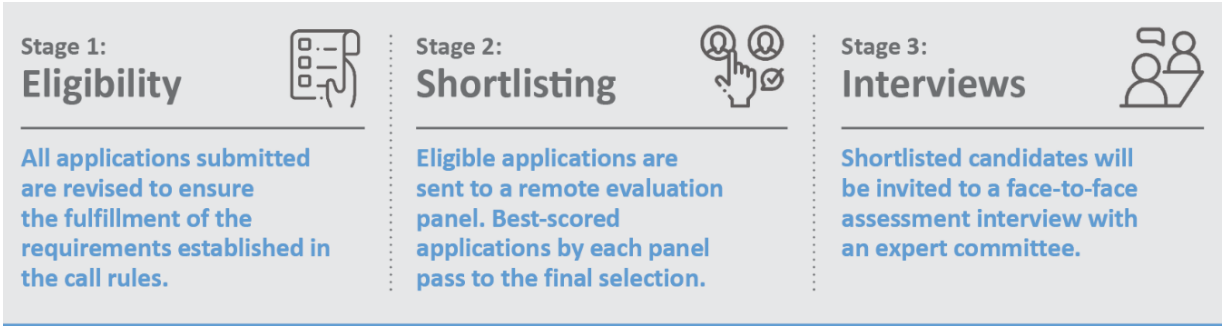
The evaluation and selection of applications takes into account the recommendations of the European Science Foundation published in the *Peer Review Guide*[1].

Likewise, the standards and principles to be followed by all evaluators who take part in the selection processes are ruled by a Code of Conduct that is publicly available on the LCF website.

LCF implements special measures to ensure that the selection process is designed to mitigate potential biases, with a particular focus on **reducing gender bias** and stereotypes. Know more about most common biases while conducting academic assessments here.

[1] *European Peer Review Guide*, European Science Foundation

The assessment process for an application comprises **three stages**:



Stage 1: *Eligibility Screening*

LCF checks all submitted applications to ensure the fulfilment of the requirements established in the call rules and guarantee that all applications sent for evaluation are eligible.

At this stage, candidates receive timely information about the eligibility of their proposals and they may be contacted during the process if any information included in the application needs to be added or amended.

Stage 2: *Shortlisting*

The objective of the shortlisting is to select the best candidates for the final interview stage. With this in mind, the shortlisting stage has been designed with a twofold purpose: to promote the best candidates to the final interview phase as well as to ensure the diversity of all disciplines considered in the programme.

2.1 Structure of the Panels

Shortlisting panels are formed on the basis of a research field classification. Each eligible application is sent to **a remote evaluation panel made up of at least two independent experts**, mainly university professors and researchers.

The composition of the remote panels is **double-blinded** to ensure independence: candidates do not know the identity of the evaluators and evaluators do not know the identity of the other evaluators. When the evaluation processes of all fellowship

programmes conclude, a complete list of the participating evaluators is published on LCF website.

With this same purpose, LCF takes specific measures to avoid, as much as possible, the disclosure of applicants' sensitive information in order to minimise biases.

HOW ARE THE APPLICATIONS ASSIGNED TO THE SHORTLISTING PANELS?

When filling their application in, candidates are self-assigned to the panel that better fits their discipline, and they indicate the field and subfield of the study or program they intend to pursue.

The evaluators who participate in the selection process are assigned to applications according to the candidate's selected panel and, where feasible, matched to the specific field indicated.

The number of applications to be assessed by each evaluator may vary depending on the distribution of submitted applications. To ensure evaluations are both timely and thorough, approximately 30 applications will be assigned per evaluator at most.

Panels with a low number of applications may be merged with others based on field affinity.

PANEL DISTRIBUTION

Shortlisting panels are grouped in 4 broad areas of knowledge following the **structure** below:

Interview Committees
Shortlisting Panels:

Humanities and Arts (HA)

- **HA1:** Languages, Linguistics, Philology, Translation and Interpretation
- **HA2:** Architecture, Urban and Landscape Planning
- **HA3:** Philosophy, Literary Studies, Gender Studies, Cultural Studies, Semiotics and Communication Studies, Humanities in General
- **HA4:** History, Archaeology, History of Art, Cultural Management
- **HA5:** Plastic and Visual Arts
- **HA6:** Cinema and Audiovisual Communication (Applied disciplines)
- **HA7:** Music and Performing Arts

Social Sciences (SS)

- **SS1:** Sociology and Anthropology
- **SS2:** International Cooperation, Social Development and Change
- **SS3:** International Relations
- **SS4:** Political and Public Administration, Geography, Regional Studies
- **SS5:** Economics
- **SS6:** Business Studies
- **SS7:** Law
- **SS8:** Journalism
- **SS9:** Psychology (except clinical) and Education

Interview Committees

Shortlisting Panels:

Life Sciences (LS)

LS1: Medicine, Public Health, Sport Sciences, Nutrition, Clinical Neuroscience and Clinical Psychology, Health Management

LS2: Plant, Animal and Environmental Biology, Physiology, Ecology and Conservation

LS3: Human Biology, Microbiology, Molecular Biology, Genetics, Cellular Biology, Genomics and Proteomics, Biochemistry, Basic Neuroscience

LS4: Agriculture, Veterinary Science, Animal Production, Forest Sciences

LS5: Biotechnology, Bioinformatics, Pharmaceuticals, Food Technology

Physical Sciences, Mathematics and Engineering (PME)

PME1: Theoretical and Applied Mathematics, Computer Sciences and IT

PME2: Physics

PME3: Geology, Earth Sciences, Environmental and Atmosphere Sciences, Mining, Geological Engineering, Oceanography, Hydrology

PME4: Civil and Construction Engineering, Energy, Nuclear Energy and Renewable Energy Engineering

PME5: Chemistry and Chemical Engineering

PME6: Telecommunications Engineering, Electronics, Robotics, Biomedical Engineering, Automation, ICT

PME7: Industrial Engineering, Mechanics, Metallurgy, Materials, Nanotechnology, Aeronautical, Naval and Aerospace Engineering

2.2 Evaluation of Candidates

The candidates' shortlisting is conducted remotely through an online platform specifically designed for this purpose. After logging into the platform, evaluators review and assess all their assigned applications.

The application evaluation mainly consists of **three parts**:

Expertise Level | *Evaluation Criteria and Scoring* | *Justification of the evaluation*

Expertise Level

All evaluators must indicate, for each application assessed, their level of expertise in the discipline of the application.

The definition of the expertise level is:
Level 1: The evaluator's expertise corresponds with the discipline of the application.
Level 2: The evaluator's expertise may not correspond with the discipline of the application. However, their background allows for a proper assessment.

Evaluators' expertise level weights the scores accordingly: level 1 experts have a greater impact on the candidate's shortlisting score than level 2 experts.

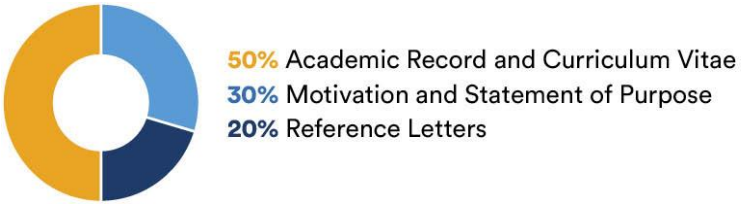
By default, all evaluators are labelled as level 2. Evaluators with a higher level of expertise must select level 1.

Evaluation Criteria and Scoring

For each application, three evaluation criteria must be assessed and scored using the following scale:

A final score is obtained by adding the scores for each criterion, considering the weight of each criterion as well as the level of expertise selected by each evaluator.

Each evaluator must score, for the same application, **three criteria**:



1. ACADEMIC RECORD AND CURRICULUM VITAE (50%)

Summary: the candidate's qualifications will be evaluated as well as the academic and/or professional curriculum in relation to the career stage and the opportunities they may have had.

Specifically, in regard to the **academic record**, the main elements assessed will be:

- **The average score of the academic record** and the difficulty of the studies accredited.
- **The relative position of the candidate** compared to other students in their class when this information is available.
- For equivalent qualifications, the following aspects will be valued positively:
  - Academic trajectories showing a clear progression;
  - Higher qualifications obtained on subjects that are linked to the statement of purpose;
  - Complementary training, awards and distinctions accredited.

The following will be evaluated with regard to the **curriculum vitae**:

- **The quality and depth of curriculum** in relation to the applicants' possibilities. In this respect, younger applicants accrediting incipient curricula cannot be penalised.

» **The scope, quality and depth of the activities accredited by the applicants** (courses, seminars attended, written and audio-visual publications, professional experience, etc.) that demonstrate their intellectual curiosity to complete their curriculum.

» **The consistency and focus of candidates' trajectory**: deviations in this sense must be justified.

Efforts shown by the candidate to **overcome a difficult family situation**, from a socioeconomic perspective, should be expressly considered, if any.

2. MOTIVATION AND STATEMENT OF PURPOSE (30%)

Summary: the excellence of the ideas introduced in the statement of purpose will be assessed, considering their originality, innovative approach and their potential impact as well as the suitability of the host institution chosen and the studies or research to pursue.

The following **aspects** should be considered:

» **The statement's consistency and structure**.

» **To what extent the studies proposed are well justified** representing a key step to achieve the candidate's objectives towards a broader and consistent career trajectory.

» **The suitability of the host institution/s chosen and the studies or research to pursue.** Note that candidates are not required to prove prior admission to the chosen studies' programme. Therefore, the candidates that do not give proof of said admission should not be penalised. However, the candidate's interest and concern in having a deep understanding of the programmes that best align with their personal project should be valued positively.

» **The societal impact of the studies or research proposed**, in its broadest sense: science progress, knowledge transfer, welfare and wealth creation.

» **The statement's originality**: innovative proposals that involve elements of risk, creativity, unconventional approaches as well as entrepreneurial initiatives should be valued positively.

» Applications that entail **contact with new academic, cultural or scientific environments** as well as interdisciplinary and intersectoral approaches will be valued positively.

» For equivalent applications, candidates who have not previously benefited from similar opportunities shall be given preference.

3. REFERENCE LETTERS (20%)

Summary: the reference letters received will be assessed, considering both the specificity of their content regarding the candidates as well as the profile of the referees.

Specifically, the following aspects will be assessed:

- **The profile and position of the referees,** as well as their expertise on the studies chosen by the candidate.
- **Letters written in a personal manner and related to the studies to be pursued** will be valued positively. Letters should refer not only to subjective and personal aspects of the candidate, but also to their intellectual abilities and their academic or professional trajectory.

ADDITIONAL EVALUATION

In addition to the three criteria mentioned above, evaluators must assess **four additional aspects**:

1	2	3	4
The candidate's academic and / or professional potential	*The societal impact of the statement of purpose*	*The impact of the fellowship on the candidate's trajectory*	*Expository clarity demonstrated in the statement of purpose*

Each of these aspects must be scored using the following scale:

Poor	Acceptable	Good	Very Good	Exceptional

The additional evaluation provides complementary information to the final interview evaluators. Moreover, it may be used to break draws in case of equal scores between candidates.

Justification of the evaluation

Evaluators must give a rationale for each application with a short, concise, written briefing, which includes the reasoning behind their evaluation. The rationale will be made available to members of the final selection committee.

*Those comments and observations **will not be reviewed or filtered** by LCF which is why evaluators should be extremely careful with their wording. In any case, comments should have a strictly professional and constructive tone.*

After completing the three steps in the shortlisting stage, experts must submit their evaluations within the established deadline.

DISCREPANCIES

Once the evaluations are submitted by each panel, the system may detect significant discrepancies among experts' scores for the same application. If any, these applications are referred back to those experts to review their original scores if deemed appropriate[2] within the established deadline.

2.3 Shortlisted Candidates

LIST OF SHORTLISTED CANDIDATES

The shortlisting of candidates is not based on consensus or discussion among evaluators. It is an individual assessment. More specifically, the ranking of shortlisted candidates results from the aggregation and weighting of the scores given by the evaluators to each application, sorted by highest to lowest score on each shortlisting panel.

The number of **shortlisted candidates who pass to the final stage** depends on the number of fellowships to be awarded and the distribution of applications received by discipline. Once the number of candidates to be shortlisted is settled, the shortlisting involves **two steps**:

STEP 1 / Selection of 70% of candidates to be shortlisted: Best scored candidates by each remote panel are selected following a proportional distribution.

See example below:

Interview Committee X

Total candidates to be shortlisted: **45** > **Step 1** / 70% of the candidates to be shortlisted: **32**

Shortlisting panels

Shortlisting Panel	Eligible applications	% over total eligible applications	Proportional Distribution (70%)
Panel 1	45	24.59%	8 (7.86)
Panel 2	30	16.39%	5 (5.24)
Panel 3	40	21.86%	7 (6.99)
Panel 4	15	8.20%	3 (2.62)
Panel 5	11	6.01%	2 (1.92)
Panel 6	22	12.02%	4 (3.84)
Panel 7	20	10.93%	3 (3.50)
Total	**183**	**100%**	**32**

Step 2 / Selection of 30% of candidates to be shortlisted: The remaining applications that were not shortlisted in the previous step are grouped under a single ranked list per committee[3]. The best scored applications on this list are shortlisted regardless of the panel they have been self-assigned to. Non-shortlisted applications remain in a single waiting list per committee.

[2] *For more information about the detailed calculations of this aspect, see section 1.2 of the Annex 1.*

[3] *See section 2.1 Structure of the Panels*

For more information about the specific calculations of the ranking see *List of shortlisted candidates and single reserve list* in Annex 1.

*This methodology serves a **twofold purpose: to ensure excellence and representation**. It guarantees that the best candidates from each discipline are selected (70%) while also ensuring that outstanding candidates are chosen regardless of their discipline (30%).*

DRAWS

In the event of draws involving two or more applications, these will be resolved considering the final score in each individual criterion prioritised according to their weight (C1>C2>C3). Firstly, a comparison of the scores of C1 will be made. If the draw persists, the same process will be followed considering C2 and so forth.

If the draw still persists, it will be resolved by introducing the results of the additional evaluation aspects given by each evaluator[4].

2.4 Feedback on the Evaluation

To maximise transparency, the following information is released once the shortlisting stage is concluded:

- Feedback to Candidates
  Candidates receive information on their score, position within the panel and general statistics of the selection process.

  In addition, candidates obtain information on the quartile in which their application is located, for each criterion evaluated, in comparison to the rest of applications assessed by the same panel.

- Feedback to Shortlisting Evaluators
  Evaluators are provided with access to scores and comments by the rest of the experts (anonymously) on their panel.

- Feedback to Interview Committee Evaluators
  Evaluators who take part in interview committees will also have access to scores and any information provided to candidates and the comments by the shortlisting evaluators (anonymously) to be considered for the final assessment.

[4] *For more information about the detailed calculations of this aspect, see section 1.4 of the Annex 1.*

Stage 3:
Interviews

Shortlisted candidates are invited to an interview as the final stage in the selection process. The overall purpose of the interview is to select the candidates with the highest potential according to the selection criteria. This process is specifically designed to mitigate biases and ensure objectivity and efficiency.

3.1 Structure of the Committees

The number of committees will be formed according to the number of applicants called to interviews by disciplinary field. The committees will be multidisciplinary and formed by 4 to 8 university professors, researchers or professionals who are experts in the disciplines assessed. Each committee will be chaired by an officer from LCF who will moderate the session and ensure that the interviews are carried out according to the planned schedule.

Following the same structure as the shortlisting stage, committees are based on **four areas of knowledge**:

To ensure evaluations are both timely and thorough, a maximum number of candidates to be interviewed per committee is established. If needed, the committees can be split or merged to adjust their capacity. In case of a merging, close-related fields will be considered.

In the event that committees are split, candidates will be distributed among the different subcommittees in a sequential manner according to their shortlisting score. Therefore, the candidate with the highest score will be assigned to subcommittee 1, the next one to subcommittee 2, and so on until exhausting the candidates' list.

3.2 Evaluation of candidates

PREPARATION OF INTERVIEWS

Prior to the interview, evaluators will be provided access to an online platform with all necessary information about the interviewed candidates. This information includes general statistics of the selection process, scores, position and evaluation comments for each candidate from the shortlisting stage as well as specific guidelines to conduct the evaluation and general information of the call.

Expertise Level

In the same way as in the previous stage, all evaluators must indicate, for each application assessed, their level of expertise in the discipline of the application.

The definition of the expertise level is:
Level 1: The evaluator's expertise corresponds with the discipline of the application.
Level 2: The evaluator's expertise may not correspond with the discipline of the application. However, their background allows for a proper assessment.

The evaluators' expertise level weights the scores accordingly: level 1 experts have a greater impact on the candidate's final score than the level 2 experts.

By default, all evaluators are labelled as level 2. Evaluators with a higher level of expertise must select level 1.

Evaluation Criteria and Scoring

For each application, three evaluation criteria must be assessed and scored using the following scale (including decimals):

Each evaluator must score, for the same application, **three criteria**:

40% Candidate's Potential
30% Motivation and Statement of Purpose
30% Academic and Professional Background

1. CANDIDATE'S POTENTIAL (40%)

Summary: the candidate's potential will be assessed considering their "soft" skills, such as clarity, consistent discourse and articulation of ideas, ability to express complex and independent reasoning, originality, entrepreneurship, leadership and teamwork.

Specifically, the following **aspects** will be assessed:

- **Clarity of exposition**: ability to clearly and precisely express complex reasoning and very specific matters, so that the ideas introduced can be understood by the general public.
- **Originality**: ability to think outside the box making creative proposals or digging deeper into unexplored areas.
- **Innovation**: capacity to create new knowledge and new theoretical approaches to go beyond the state of the art as well as the ability to create new technologies or innovative use of existing ones. For professional careers, ability to open new routes or design new formulas, products or services to bring benefits to society.
- **Entrepreneurship, leadership and teamwork**: capacity to take new initiatives and independent decisions, to provide inspiration and guidance to others as well as work successfully in a collaborative environment.

2. MOTIVATION AND STATEMENT OF PURPOSE (30%)

Summary: the excellence of the ideas introduced in the statement of purpose will be assessed, considering their originality, innovative approach and their potential impact as well as the suitability of the host institution chosen and the studies or research to pursue.

The following **aspects** should be considered:

- **The statement's consistency and structure**.
- **To what extent the studies proposed are well justified** representing a key step to achieve the candidate's objectives towards a broader and consistent career trajectory.
- **The suitability of the host institution/s chosen and the studies or research to pursue**. Note that candidates are not required to prove prior admission to the chosen studies' programme. Therefore, the candidates who do not give proof of said admission should not be penalised. However, the candidate's interest and concern in having a deep understanding of the programmes that best align with their personal project should be valued positively.
- **The societal impact of the studies or research proposed**, understood in its broadest sense: science progress, knowledge transfer, welfare and wealth creation.
- **The statement's originality**: innovative proposals that involve elements of risk, creativity, unconventional approaches as well as entrepreneurial initiatives should be valued positively.
- Applications that entail **contact with new academic, cultural or scientific environments** as well as interdisciplinary and intersectoral approaches will be valued positively.
- For equivalent applications, candidates who have not previously benefited from similar opportunities shall be given preference.

3. ACADEMIC AND PROFESSIONAL BACKGROUND **(30%)**

Summary: academic and professional background of the candidate in relation to the career stage and the opportunities they may have had.

The following **aspects** should be considered:

- **The quality and depth of curriculum** in relation to the applicants' possibilities. In this respect, younger applicants accrediting incipient curricula cannot be penalised.
- **The scope, quality and depth of the activities accredited by the applicants** (courses, seminars attended, written and audio-visual publications, professional experience, etc.) that demonstrate their intellectual curiosity to complete their curriculum.
- **The consistency and focus of candidates' trajectory**: deviations in this sense must be justified.
- Efforts shown by the candidate to **overcome a difficult family situation**, from a socioeconomic perspective, should be expressly considered, if any.

3.3 Interview Protocols

FORMAL ASPECTS

The round of interviews will be conducted strictly following the next formal aspects:

- **Punctuality:** Utmost punctuality is expected. The interviews follow a very precise schedule and no flexibility is allowed in relation to this time schedule.
- **Duration:** Each interview will last 20 minutes and it will start with a brief presentation by the candidate (3 minutes approximately) and followed by questions asked by the evaluation committee (17 minutes approximately).
- **Language:** Interviews are conducted entirely in English.
- **No supporting materials:** audio-visual materials, presentations, documents, etc will not be allowed during the interview. Nor will the committee accept any documents that have not been included in the application.

***No show**: Failing to attend the interview entails that the candidate will not be allowed to apply to future calls, except in case of duly justified force majeure.*

INTERVIEW'S OPENING

The LCF Officer will welcome the candidate and then, the candidate will start the presentation. To ensure independence, the composition of the committee is **blinded**, which means that candidates do not know the identity of the evaluators. For this reason, committee members will not be introduced to the candidates. After the candidate's presentation, the committee members will ask the questions they deem relevant to properly assess the application.

QUESTIONS

There are no specific guidelines to conduct the selection interview. Experts are entitled to establish their own dynamics and tone, depth and scope of the questions asked to each candidate.

Questions raised in the interview aim at testing candidates' capabilities, broadening the information provided in the application and clarifying any aspects that were insufficiently addressed in the application.

3.4 Selected Candidates

RANKING

At the end of each interview, evaluators must score each candidate, according to the selection criteria established. Once all the interviews are concluded, evaluators will give each candidate three scores, one for each criterion.

The selection of candidates is not based on consensus or discussion among evaluators. It is an individual assessment. More specifically, the ranking results from the aggregation and weighting of the scores given by the evaluators to each application, sorted by highest to lowest score on each committee.

Shortlisting Score: *The score obtained in the shortlisting stage will be included in the final score weighted as an additional evaluator with expertise level 1.*

DISCREPANCIES

Evaluators will be called to revise discrepancies among the scores of candidates in the cut-off threshold, if any, and adjust them if deemed appropriate[5].

DRAWS

In an event of a draw, it will be resolved by the experts who form the selection committee.

[5] *For more information about the detailed calculations of this aspect, see section 2.4 of the Annex 1.*

FINAL LIST

Once the process is concluded, all evaluators must ratify the final ranking of the fellowships awarded and the candidates on the waiting list.

3.5 Feedback on the Evaluation

To maximise transparency, the following information is released once the shortlisting stage is concluded:

» Feedback to Candidates
The official list of fellows and wait-listed candidates will be published on the LCF website. Candidates receive information on their score, position within the panel and general statistics of the selection process.

In addition, candidates obtain information on the quartile in which their application is located, for each criterion evaluated, in comparison to the rest of applications assessed by the same panel.

LCF has no further information on the assessment than the information disclosed to each candidate. Once the evaluation processes of all fellowship programmes have finished, a complete list of the participating evaluators is published on the LCF website.

Annex 1:

Mathematical Calculations and Formulas

This section is aimed to describe the mathematical calculations and formulas behind the different stages of the selection process in order to maximize transparency and clearness.

The following mathematical procedures rule the selection process:

Scoring	Collecting the candidates' scores given by each of the experts and weighted according to the corresponding evaluation criteria.
Expertise	Weighting scores according to the expertise acknowledged by the evaluators.
Normalization	Normalizing the scores to mitigate the differences in scale and dispersion between different experts.
Discrepancies	Reviewing the candidates' scores for whom there are significative differences between expert assessments.
Draws	Resolving draws between candidates with equal scores.
Reserve list	Establish a reserve list to retrieve candidates in case of a withdrawal.
Feedback to candidates	Presenting the scores and information to make it accessible to candidates.

1. Shortlisting Stage Formulas

1.1. SCORING

Every application in a panel is reviewed by a certain number n of *evaluators*, usually between 2 and 4, who are independent experts in the discipline specific for that panel or a close - related disciplinary field. The evaluation of each expert, for a given candidate, consists of three scores between 1 and 8 (admitting decimals), corresponding to three different selection criteria. We call these the *primary scores,* and we denote them by

$$score1(\mathrm{c},\ \mathrm{e},\ \mathrm{crit})\ \in [1,8],\ \text{with}\ \ crit \in \{1,2,3\}\ ,\ e\ \in \{1,2,\dots,\ n\}$$

which designates the primary score of the candidate c, given by the evaluator e, for the criterion $crit$.

Every call may indicate specific weights for the three different criteria, and we denote them by

$$weight(crit),\ \ \text{with}\ \ \ crit \in \{1,2,3\}$$

Then, the added scores of a given candidate for a given evaluator is computed as follows:

$$\mathrm{score1.sum}(c,e) = \sum_{crit=1}^{3} score1(c,e,crit)\cdot \mathrm{weight}(crit)$$

1.2. DISCREPANCIES

The evaluation system detects significant discrepancies among experts' scores for the same application. If any, these applications are referred back to those experts to review their original scores if deemed appropriate. To detect discrepancies, the following two steps are followed:

1. The primary score $score1.sum(c,e)$ of each candidate given by each evaluator, is recalculated by subtracting the evaluator's mean. That is,

   $$newscore1.sum(c,e) = \ score1.sum(c,e) - \ mean.score1(e)$$

   where $mean.score1(e)$ denotes the average of all primary scores given by evaluator e. In this way the new average of all scores is now 0 and they can be better compared.

2. For each candidate we compute the difference between the highest and the lowest score among all those obtained from the different evaluators. That is

   $$diff(c) = max_e\ newscore1.sum(c,e) - min_e\ newscore1.sum(c,e)$$

If this difference is equal or larger than 2, the scores of this candidate are considered discrepant.

1.3. EXPERTISE

Experts have declared an expertise level with the specific discipline of the candidate assessed.

The final primary score of a candidate is the result of averaging the primary scores obtained from the evaluators, weighted by the different expertise levels of each of them. More precisely:

1. If the expertise levels of all n evaluators coincide, we compute the simple mean

$$score1.panel(c) = \frac{1}{n}\sum_{e=1}^{n} score1.sum(c,e)$$

2. If the expertise levels do not coincide, we compute a weighted mean, where an additional weight of 0.5 is divided between the experts with Level 1. In other words,

$$\text{score1.panel}(c) = \sum_{e=1}^{n} \text{score1.sum}(c,e) \cdot \text{weight}(e,c)$$

where

$weight(e,c) = \frac{1}{n+0,5}$ if the expertise of this evaluator is Level 2, and

$\text{weight}(e,c) = \frac{1+0,5/m}{n+0,5}$ if the expertise of this evaluator is Level 1, and there are m evaluators with Level 1.

Note that if all evaluators declare the same level of expertise (that is if $m = 0$ or $m = n$) then all of them have weight $1/n$ and hence the weighted mean equals the regular mean.

Example

There are 3 experts in the panel ($n = 3$). Evaluators 2 and 3 have indicated Level 2 while evaluator 1 has indicated Level 1. Then

$$\text{weight}(1,c) = \frac{1}{3,5} = 0,29, \quad \text{weight}(2,c) = weight(3,c) = \frac{1,25}{3,5} = 0,36.$$

At this stage, using the procedure described above, every candidate has a final score denoted as

$$score1.panel(c)$$

which reflects all primary scores obtained from evaluators on the candidate's panel considering their expertise level. Ordering the candidates based on this final score gives a ranking of all candidates within their panel.

1.4. DRAWS

In case two final scores coincide in the ranking above, the system uses the primary scores obtained in each of the three criteria separately, to resolve the draw. Specifically, this is done as follows:

1. Every candidate's primary score is divided into three *subscores*, one for each criterion, computed by adding the scores of all evaluators, weighted by their expertise level. In other words,

$$subscore1.panel(c,crit) = \sum_{e=1}^{n} score1(c,e,crit) \cdot \text{weight}(e,c)$$

where we recall that $score1(c, e, crit)$ is the original primary score given by evaluator e, to candidate c , for criterion $crit$.

2. The criterion with maximum weight is the one which is used to resolve the draw. If the draw persists, the criterion with the second highest weight will be used, and so on until the last criterion is reached.

3. If the draw still persists, the additional evaluation is considered. Each evaluator assesses four qualitative aspects for each candidate, that are translated into numerical values between 1 and 5:

Qualification	Poor	Acceptable	Good	Very Good	Exceptional
Numerical Value	1	2	3	4	5

For this purpose, the system computes the total sum of these values given by all evaluators of the panel to each candidate and uses this score to resolve the draw.

1.5. LIST OF SHORTLISTED CANDIDATES AND SINGLE RESERVE LIST

After proceeding as described in the sections above, a **ranking of candidates within each of the panels** is obtained.

Recall that each call establishes a predetermined number of candidates for each committee which must be promoted to the interview phase. Given a particular committee, let N be the number of candidates that need to be promoted to the face-to-face interview.

Also let

P = number of panels associated to the given committee;

$can(P)$ = number of applications (candidates) assigned to the panel P;

$C = \sum_P can(P)$ = the total number of applications in the given committee.

The N shortlisted applicants are selected in two steps considering that:

$$N = N1 + N2$$

Step 1: Selection of 70% of candidates to be shortlisted (N1)

In the first step N_1 candidates will be promoted, where N1 equals 70% of the total of *N* candidates, rounded to the nearest whole number. That is,

$$N_1 = round(0.7N)$$

The first N_1 candidates are shortlisted proportionally to the number of applications $can(P)$ compared to the total C. In this way, the first

$$fin(\mathrm{P}) = round\left(\frac{\mathrm{can(P)}}{\mathrm{C}} \cdot 0.7\mathrm{N}\right)$$

candidates ranked in the panel P are shortlisted and pass to the final stage, where this number is also rounded to the nearest whole number. In case the rounding gives 0, at least one candidate will be assigned[6].

To select the f candidates shortlisted in each panel, the scores are normalized in the following way:

- Calculate the average of the scores of all candidates assessed by each evaluator:

$$\text{mean}_e = \frac{1}{n}\sum_{c=1}^{n} \text{score}_{c,e}$$

- Compute the standard deviation of the evaluator:

$$stdev_e = \sqrt{\frac{\sum_{c=1}^{n}(score_{c,e} - mean_e)^2}{n-1}}$$

- Adjust the standard deviation to control the dispersion[7] of the scores when the *stdev << 1*:

$$stdev_e = \begin{cases} thrs & if \quad stdev_e < thrs \\ stdev_e & if \quad stdev_e \geq thrs \end{cases}$$

, where:

$$thrs = \frac{stdev_{committee}}{2}$$

- Finally, standardise the score of each candidate according to the mean and standard deviation of the evaluator. Hence, if the candidate c has been evaluated by the evaluator e, then

$$score_{c,e}^{norm} = \frac{score_{c,e} - mean_e}{stdev_e}$$

With these normalised scores, the *f* best scored applications of each panel will be the N_1 candidates shortlisted.

Step 2: Selection of the remaining 30% of candidates to be shortlisted (N2)

In the second step, the remaining 30% of candidates ($N_2 = N - N_1$) will be chosen.

To select the N_2 candidates, a single ranking will be made. This ranking is established by joining the candidates of the panels belonging to the same committee that have not been shortlisted within N1. This single ranking is made according to the *normalized primary scores* of the candidates, computed in step 1.

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[6] *If the rounding system leads to a total larger (resp. smaller) than the 70% of N, the candidate in excess (resp. defect) will be removed from (resp. assigned to) the panel with the lowest (resp. highest) value of $fin(P)$ before rounding.*

[7] *For more details about the implementation of this lower bound see Annex 1.1.*

With these normalised scores, the best scored applications on this list (N_2) are shortlisted regardless of the panel they have been self-assigned to. Likewise, non-shortlisted applications remain in a single waiting list per committee.

1.6. FEEDBACK TO CANDIDATES

To provide adequate feedback to the candidates on their assessment in the shortlisting stage, their scores for each criterion will be compared with the scores of the other candidates of their selection panel.

Normalization (for each criterion)

To provide this information, a new normalization will take place although in this occasion it will be done separately for each of the criteria used for the candidate's evaluation. Indeed, given a criterion $k \in \{1,2,3\}$, and an expert $e \in \{1, \dots, m\}$, the normalization is carried out by first calculating the average and the standard deviation in the set of *n* candidates

$$mean_{e,k} = \frac{1}{n}\sum_{c=1}^{n} score_{c,e,k}$$

$$stdev_{e,k} = \sqrt{\frac{\sum_{c=1}^{n}\left(score_{c,e,k} - mean_{e,k}\right)^2}{n-1}}$$

where $score_{c,e,k}$ denotes the score of the candidate c obtained from the expert e for the criterion k

Then, this score ($score_{c,e,k)}$ is normalized as follows:

$$score_{c,e,k}^{norm} = \frac{score_{c,e,k} - mean_{e,k}}{stdev_{e,k}}$$

Finally, the normalized score of each candidate *c* with respect to the criterion *k* is the average of all the normalized scores obtained by each of the evaluators, that is

$$score_{c,e,k}^{norm} = \frac{score_{c,e,k} - mean_{e,k}}{stdev_{e,k}}$$

In this way three normalized scores are obtained for each candidate, one for each of the criteria considered. The aim of these calculations is to be able to compare candidates' scores and allocate them in quartiles.

Quartile division

In order to provide adequate feedback to the candidates on their assessment in the shortlisting stage, their scores for each criterion will be compared with the scores of the other candidates from the same panel.

The rankings are divided into four equal parts or quartiles Q_1, Q_2, Q_3 and Q_4, where Q_1 corresponds to the top group of the $n/4$ highest normalised scores, and Q_4 to the bottom group with the $n/4$ lowest ones. **The candidate will be informed of the quartile assigned for each of the criteria.**

2. Final Selection Formulas

2.1. SCORING

Once the interviews have concluded and experts have scored all candidates, the system considers the weight of each criterion evaluated and calculate an initial score for each candidate from each expert. The final scores generated in the shortlisting stage are included as if they came from one additional expert in the committee with Level 1 of expertise:

$score_{c,e}$ =score given to candidate c by expert e.

Assuming that there are n candidates and m evaluators (including the shortlisting score), then $c \in \{1, \dots, n\}$ and $e \in \{1, \dots, m\}$.

Consequently, **every candidate has m scores: one from each expert, plus the one coming from the shortlisting stage**. These scores take values from 1 to 8.

At this stage we calculate the quantity

$$score_c = \frac{1}{m-1} \sum_{e=1}^{m-1} score_{c,e}$$

which is the average of all experts' scores obtained by candidate c, excluding the shortlisting score. This value will not be used until step *2.7. Feedback to Candidates.*

2.2. NORMALIZATION

The normalization or standardization of scores given by one expert in relation to all candidates evaluated is performed according to the following procedure. For each evaluator $e \in \{1, \dots, m\}$:

- The expert's mean score is calculated

$$\text{mean}_e = \frac{1}{n} \sum_{c=1}^{n} \text{score}_{c,e}$$

- The standard deviation of this same set of scores is also obtained from

$$stdev_e = \sqrt{\frac{\sum_{c=1}^{n} \left(score_{c,e} - mean_e\right)^2}{n-1}}$$

- Finally, the set of scores is of every evaluator (also the ones coming from the shortlist stage) are normalized by

$$score_{c,e}^{norm} = \frac{score_{c,e} - mean_e}{stdev_e}$$

Observations

With this procedure, the original scores

$$score_{c,e} \in [1,8]$$

are converted in new quantities

$$score_{c,e}^{norm} \in (-\infty, \infty)$$

The mean of the new scores of each expert is 0 and its standard deviation is 1. In this way, the possible different tendencies of the evaluators (giving higher or lower scores in general, for example) are eliminated. The new scores will be higher or lower, depending on how far they are from the average of the original scores, and how frequent this distance is. (See *Annex 1.1: Effects of normalization in the scores* for further details about the effects of normalization).

2.3. EXPERTISE

Experts have declared an expertise level with the specific discipline of the candidate assessed.

Supposing we have *m* evaluators (we are including here the shortlisting score), the weights would be distributed in the following way:

- Every expert has an ensured weight of $\frac{1}{m+1}$ and moreover
- there is an additional weight of $\frac{1}{m+1}$ to be uniformly distributed among those experts with Level 1 of expertise (*k evaluators*), among which we always find the shortlisting score.

Hence,

$$weight_{c,e} = \frac{1}{m+1} \text{ if the expertise of this evaluator is Level 2, and}$$

$$\text{weight}_{c,e} = \frac{1}{m+1} + \frac{1}{k(m+1)} \text{ if the expertise of this evaluator is Level 1}$$

Example 1:

A committee is formed by 5 experts: $e \in \{1,2,3,4,5\}$.

Experts 3 and 5 have declared Level 1 of expertise for a certain candidate *c* (hence $k = 3$). As a result, the weights are distributed as follows:

Expert *e*	Level of Expertise	$weight_{c,e}$	$weight_{c,e}$ (num)
1	2	1/7	0,1429
2	2	1/7	0,1429
3	1	1/7 + 1/21	0,19
4	1	1/7 + 1/21	0,19
5	2	1/7	0,1429
Shortlisting score	1	1/7 + 1/21	0,19
	TOTAL	6/7 + 3/ 21	1

Example 2:

A committee is formed by 5 experts: $e \in \{1,2,3,4,5\}$.
No expert has declared Level 1 of expertise for a certain candidate *c* (hence $k = 1$). As a result, the weights are distributed as follows:

Expert e	Level of Expertise	$weight_{c,e}$	$weight_{c,e}(\text{num})$
1	2	1/7	0,1429
2	2	1/7	0,1429
3	2	1/7	0,1429
4	2	1/7	0,1429
5	2	1/7	0,1429
Shortlisting score	1	1/7 + 1/7	0,2857
	TOTAL	6/7 + 1/7	1

2.4. DISCREPANCIES

The evaluation system detects significant discrepancies among experts' standardized scores for the same application. To be considered as a significant divergence, the difference between the maximum and the minimum score among all those of the same candidate must be equal or larger than 2. More precisely:

$$\max_e\left(score_{c,e}^{norm}\right) - \min_e\left(score_{c,e}^{norm}\right) \geq 2$$

The scores coming from the shortlisting stage are not considered in this part of the procedure.

The system will only highlight significant discrepancies among candidates who are at the bottom of the list with fellowship or at the top of the list without fellowship. The exact number of positions considered will be proportional to the number of fellowships to be awarded by the committee.

Only the assessment of this restricted group of candidates with significant discrepancies will be discussed by the committee. After the discussion, evaluators may either maintain or change their original scores. The revised scores will be considered definitive.

2.5. COMPUTATION OF THE FINAL SCORE

The final score of each candidate is computed adding for the first time the *m* existing scores -one from each expert and one from the shortlisting stage-, all normalized and weighted according to the expert's level of expertise. In other words,

$$final.score_c = \sum_{e=1}^{m} score_{c,e}^{norm} \times \text{weight}_{c,e}$$

This final score can range from $-\infty$ to ∞, and **it is the one being used to rank the candidates**. This ranking will not be affected by any of the subsequent steps.

2.5.1. Final score rescaled

With the goal of presenting the candidate's scores in a range from 1 to 8, the following procedure will be followed:

- All final scores are first rescaled to obtain a temporary score from 0 to 1

$$temp.score_c = \frac{final.score_c - \min_c(\text{final. score}_c)}{\max_c(\text{final. score}_c) - \min_c(\text{final. score}_c)}$$

  That is, to the candidate's final score, we subtract the minimum score among all candidates and divide by the difference between the maximum and the minimum score, again among all candidates. With this step, every score is between 0 and 1 but the ranking remains the same as it was.

- All scores are translated to the interval

$$\left[\min_c(score_c), \max_c(score_c)\right]$$

  where we recall that $score_c$ is the direct average of the expert's scores for the candidate *c* (see *Section 2.1. Scoring),* before normalizing, applying the weights according to expertise and without considering the shortlisting scores.

After this rescaling, we obtain the **definitive final score of each candidate**:

$$score_c^{def} = temp.score_c \times \left(\max_c(score_c) - \min_c(score_c)\right) + \min_c(score_c)$$

2.6. SINGLE RESERVE LIST

The reserve list of each committee will be formed by the candidates who did not obtain a fellowship.

If the subcommittees are formed[8], once the candidates to be awarded a fellowship have been determined in each subcommittee, the remaining ones will be joined in a **unique reserve list,** shared across to all subcommittees within the same committee. This list will be ordered based on each candidate's definitive score $score_c^{def}$. Then, a **new normalization is applied with the aim of comparing scores from different subcommittes**. Specifically, if *N* subcommittees were created, this second normalization and final reserve list are conducted as follows:

1. For each subcommittee *S*, let us say with *n* candidates (in total), we normalize the definitive scores $score_c^{def}$ by calculating first their average

[8] For more information of the composition of the committees see *Section 3.1 Structure of the Committees of the Selection Process Guidelines*

$$score_S = \frac{1}{n}\sum_{c=1}^{n} score_c^{def}$$

and then their standard deviation

$$stdev_S = \sqrt{\frac{\sum_{c=1}^{n}\left(score_c^{def} - mean_s\right)^2}{n-1}}$$

and finally computing the normalized score

$$score_c^{def,norm} = \frac{score_c^{def} - mean_S}{stdev_S}$$

2. A unique reserve list is created by joining all candidates who were not awarded a fellowship and ordering them by the new normalized score of step 1, $score_c^{def,norm}$.

In case of a withdrawal, the fellowship will be awarded to the best ranked candidate in the reserve list. In case of tie between reserve candidates, this will be resolved based on the shortlisting score.

2.7. FEEDBACK TO CANDIDATES

2.7.1. Quartiles

To provide adequate feedback to the candidates on their assessment in the interviews' stage, their scores for each criterion will be compared with the scores of the other candidates of their committee or subcommittee.

This feedback will not consider the shortlisting score, since interviewed candidates will have already obtained the corresponding feedback from the shortlisting process at the end of such stage.

The normalization for each criterion and the quartile division are applied in the same way as described in section *1.6 Feedback to candidates.*

In case several subcommittees had been created, the quartiles will be computed separately in each subcommittee.

Annex 1.1: Effects of normalization of scores

The goal of this annex is to comment on the process of normalization (or standardization) which will be applied to the scores given by the experts in the final selection stage, as well as the effects of this action.

The objective of normalizing each expert's scores before adding them to the others' and comparing between them is to ensure that each evaluator's grade carries similar weight in candidate's final score, mitigating the differences in scale and dispersion that might exist among evaluators.

The experts' scores in each of the evaluation criteria can take values in between 1 and 8, and so does the weighted average of these grades computed for every candidate and which we denote by $mark_{c,e}$ (where *c* is the candidate and *e* the evaluator).

To normalize the scores of the expert *e*, the average ($mean_e$) and the standard deviation ($stdev_e$) of all their scores are calculated (see Section 2.2 Normalization of the Annex 1 for more details). The original $stdev_e$ is adjusted, setting a lower bound that allows controlling the dispersion of the scores of the evaluators with $stdev_e$<<1, bringing them closer to the mean of the normalised scores (0), and adding justice to the evaluation process.

With these two quantities a new score for each candidate is obtained by

$$score_{c,e}^{norm} = \frac{score_{c,e} - mean_e}{stdev_e}$$

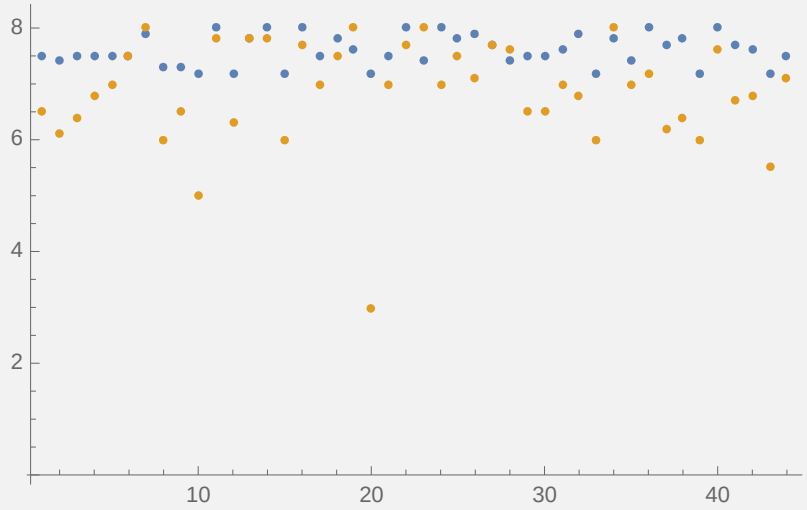
This new score is the one that will be used (after being weighted by the level of expertise of the evaluator for the given candidate) to compute the average score of all the experts' scores for the given candidate.

The performed normalization has the following effects:

- The mean of the scores of each expert is equal to 0, which neutralizes any potential tendencies of the different experts to "grade high" or "grade low".
- The standard deviation of the scores of each expert is equal to 1. This means that, in average, the distance (squared) to the new mean (0) is equal to 1. Approximately 95% of the new scores of each evaluator are between -2 and 2. Scores that were given within a very narrow range ($stdev \ll 1$) will now be more dispersed, while marks given in a large range ($stdev \gg 1$ will now become closer to the mean.
- When the number of applications assigned to an evaluator is very small, there is a risk that, if their standard deviation <<1, the normalization process may produce scores that that deviate significantly from the original scores. However, establishing a bound on the standard deviation helps mitigate this effect.
- Outliers will remain outliers and, in some cases, they may become even more pronounced. If a score was significantly further from the average than the others, the new grade will reflect that difference. Additionally, if the standard deviation of the scores from a specific evaluator is small, this effect may be amplified. However, establishing a lower bound on the standard deviation helps to reduce the impact of outliers.

Illustrative example

Suppose there are 44 candidates and, for the this example, two evaluators. The graph displays the scores from one expert (e=1) in blue, while the scores from the second expert (e=2) are shown in orange. The orange scores are more scattered than the blue scores and include a clear outlier with a grade of 3.

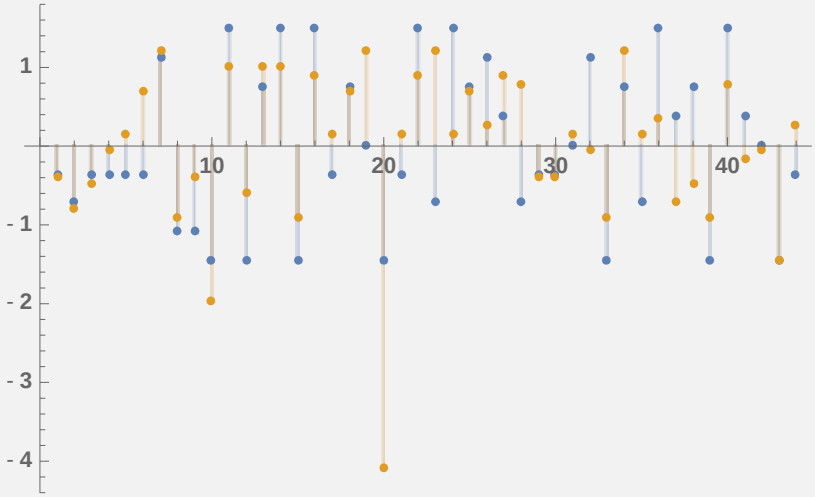


The values computed for this set of scores are:

$$mean_1 = 7{,}6; \qquad stdev_1 = 0{,}27;$$

$$mean_2 = 6{,}85; \qquad stdev_2 = 0{,}941.$$

The next figure shows the distribution of the new scores after normalization:



The yellow scores display a distribution around the mean that is similar to their original distribution, as their standard deviation was close to 1. The outlier remains present. In contrast, the blue scores are now more scattered than before -even more so than the yellow scores- due to their originally low standard deviation, which caused them to be tightly distributed around their mean.

Annex 2:
Induced balance of disciplines

In some fellowship programmes, LCF especially promotes the training of professionals and researchers in the fields of Health and Life Sciences and Physical Sciences, Mathematics and Engineering. Therefore, a corrective procedure is implemented seeking to balance the distribution of fellowships.

The formula for distributing the fellowships convened by the various committees constituted is as follows:

Firstly, the ratio of the number of applications is calculated based on the groups

(C1 + C2) and (C3 + C4)

If

$$(C1 + C2) \leq (C3 + C4)$$

The fellowships are assigned proportionally to each committee.

If

$$(C1 + C2) > (C3 + C4)$$

Then the percentage of each grouping is calculated:

$$P_{c1,c2} = \frac{(C1 + C2)}{(C1 + C2 + C3 + C4)} \times 100$$

$$P_{c3,c4} = \frac{(C3 + C4)}{(C1 + C2 + C3 + C4)} \times 100$$

If $P_{c1,c2} - P_{c3,c4} \leq 16$ then available fellowships are assigned equally (50% - 50%) between the two groups, and proportionally to each of the committees within them.

If $P_{c1,c2} - P_{c3,c4} > 16$, eight points are added to the $P_{c3,c4}$ value and another 8 are subtracted from the $P_{c1,c2}$ values, after which the fellowships available are assigned proportionally based on the new induced proportion.