

ARC: How random is the grant system ?

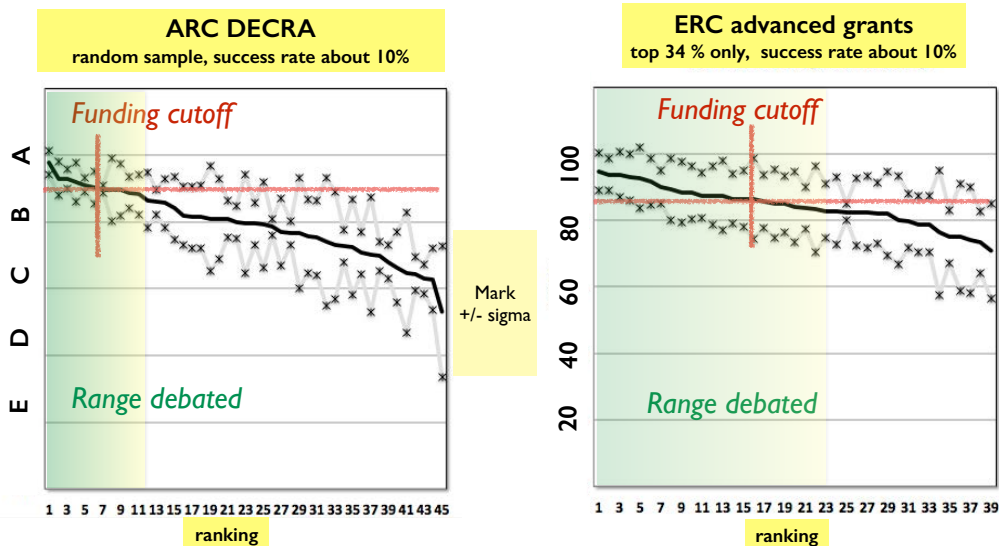
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The 2014 ARC round is in full swing again, DP and Linkage grants and DECRA Fellowships are all being evaluated and selected in the next few months. The future plans of many and the careers of some depend on the outcome. Some cynics would claim that the process is largely random - and also too time consuming for applicants and assessors. Is this correct - are we seeing a lottery? How can this game be won ?

A good first step is to look at the selection process. This involves a combination of experts chosen by the ARC, the college, and external assessor, that is people like the applicants mainly form within Australia, occasionally from overseas. The process is identical for all parts of the ARC, science, engineering, humanities etc. with similar success rates. The experts read a large number of proposals, this can be up to 100 or more for a given scheme, and they allocate marks A-E for each of the selection criteria. The top mark of A should only be given to the top 10% of all proposals in one round, B is for the next 15% etc. Typically two college members read the proposals. In addition three to five external reviewers are sought, who read typically 2-6 proposals and write reports to each selection criterium, as feedback to the applicants.

This process results in a ranking of the proposals, according to their marks, and this determines the order in which they are discussed at the meeting. Only very few would achieve all As - there will be an uncertainty coming from the variation of the marks - and a simple standard deviation is a reasonable indicator. The cut off value is determined by the amount of funding available - and since each mark has some uncertainty there is some randomness or luck involved when your grants get close to the cutoff point.

In the last 4 years the ARC has asked the college experts to moderate the marks given by the assessors. This is to ensure that the view and wisdom of the research wider community is taken into account. Given that the success rate of the schemes is about 22% for DP, higher and lower for various fellowships. It is clear that only proposals with a majority of As and Bs from all assessors and experts can win the coveted prize. Being on the ARC panel is more like being a referee ensuring decisions are made wisely and without bias. This is a proper peer review scheme and similar to many others used across the globe, for example by the European Research Council (ERC) .



Marks from both an ARC and an ERC selection, both with a success rate close to 10%. The marks are shown in their final ranking after the selection has been completed. For the ARC a random sample of 45 applications from the entire set is shown. For the ERC 39 applications are shown from the top group 34%, after culling 66% in the first round. The cutoff point is determined by the available funds. In both cases the marks drop only slowly near cutoff point, with a wide uncertainty represented by +/- one standard deviation. Typically another 10% of cases has comparable raw scores and the active panel debate extends further than the cutoff.

The figure shows two samples of data for final rankings from from ARC 2013 DECRA and ERC 2014 advanced grants. This is a completely anonymous data set - simply showing the trends and degree of uncertainty. Clearly both schemes produce very similar results - both relying on typically four to six assessments per application. In both cases the raw marks drop slowly and steadily. The uncertainty is considerable - due to a variation in opinion amongst the assessors. The scale in ARC is a little inflated: about 12% within A and 35% in B. The cutoff point for applications to be funded, set by the financial constraint, is at about 10%. In both cases, there are about twice as many applications with comparable raw marks that can be funded.

Which grant near the cutoff should be funded? Which one is out? That is longest part of the debate amongst the panel members. The overarching principle is: which application would be the best investment in science? Since these two particular funding schemes are exclusively for curiosity driven research the panels are instructed to look for the best science - and not the biggest short term benefit to the country. The most important factors are: How big would be the progress in science? How likely is it that this can actually be achieved? And increasingly in Australia: how big is the return of progress in science for the money spent, the cost effectiveness?

Detailed discussions are held during the panel meetings and grants - what matters are the vision of the project, the clarity of the description of the goals and tools to be used, and how this compares to the state of the art nationally and internationally. The track record is an important indicator of the ability of the applicant to achieve the goals, and this depends on the stage in their careers and the opportunity they have been given. How much could they have achieved? How did they use the available resources and funding? Finally, the budget justification enters the discussion: are all the items necessary? Is there any padding with items that already exist or can be covered by the University? In the last year ARC applications that were deemed to be excessive in their demand could be taken out of the ranking completely, or budgets can be cut after the selection has been made.

How to win this game? Obviously by convincing the expert panel and the assessors that yours is the best application. Here are some key points:

Have a clear vision stated in your title, summary and front page of what you want to achieve. Explain how your particular part of science may progress. Why would this attract international interest and have impact? Many applications fail in this respect, they just seem incremental and dull.

Demonstrate a clear long term view - for example 10 years into the future - and show exactly what you could do in the next 3 -5 years. Be bold in your statements, but always realistic and backed up by facts.

Why should you be chosen? How have you demonstrated that you can fulfil such ambitious goals? Use examples from what you have achieved and how you did this.

What is it that you have got already, including expertise, equipment, access to labs or samples, collaborations, ... , and what is it that you absolutely need.

You are addressing two audiences:

(1) assessors who are like yourself - experts in the field, colleagues, competitors, all driven by doing great science. They will read all of the applications, they will comment in detail and compare your application with their own work and what they know from the latest journals and conferences.

(2) The panel members, who have had many applications to read. They have a great overview but can be fairly removed from the exact research you are describing. They will act like investment bankers: which is the best science they can choose. They will read the first page or two in detail, and want to be drawn in and get fascinated. They read the budget justification carefully and try to figure out what resources you already have and they will form an opinion about what you could have achieved with your personal research opportunities.

Finally, be active as an assessor. Get involved in creating and writing fair realistic feedback that matches the marks which you are providing. This will make the peer system better, give you an insight in what others are doing and ensure that more high quality assessments are used in the ARC system - making it less random.