

The Effect of Public Funding on Research Output: The New Zealand Marsden Fund (Gush, Jaffe, Larsen, and Laws (2015))

The Question: What is the impact of public grant funding on scientific teams? Do grant committees identify the teams that will go on to be most productive?

The Setting: This paper examines applications to New Zealand's major public science fund from 2003-2008. Administered by the Royal Society of New Zealand, the Marsden Fund awards grants of around NZD 300,000 (190,000 USD) per year to research teams whose proposals are approved by committees of 5-10 evaluators.

The Results: Winning a Marsden Fund grant produces a modest increase in both papers published and citations received by the winning teams and scientists. Surprisingly, holding constant other factors, the committees' ranking of the proposals was not positively correlated with future success.

The study examines research output (as indicated by publications and citations to those publications) of teams of researchers in the years just subsequent to their Marsden grant application. To control for the intrinsic quality of the research teams, post-application research output is measured relative to the team's research output in the years just prior to the grant application. Examining all 1263 proposals that reached the final stage of committee review, the authors found that the total publication output (the sum of all members' publications) of grant-winning teams was 6-15% higher than that of non-winning teams. Citations of post-grant work (a measure of high-impact research) were 22-26% higher for grant winning teams than non-winning teams in the years after the grant was awarded.

At the individual level, the authors examine the approximately 9,800 researchers who submitted second-round grant proposals. They find that each additional Marsden grant received increased a researcher's publication rates by about 3-5% per year and citations by 5-8% per year.

Are these increases the result of a few "superstar" proposals funded by the committee? When the authors try to adjust for this, they find that higher-ranked teams do not have more publications and citations than lower-ranked teams (again, measured relative to pre-application performance). Holding constant a team's past performance and Marsden funding, the proposal teams that were highly ranked by the selection committee performed no better than lower ranked teams.

The Lessons:

Funding appears to have a modest positive impact on the number of scientific publications. It is unclear whether the output boost from the Marsden Fund is a result of the Marsden money itself, or indirect effects whereby the signal of Marsden success facilitates greater access to other resources.

Importantly, teams ranked highly by Marsden selection committees actually performed no better than lower ranked teams (controlling for funding and past performance). This may be due to specific features of the Marsden process, such as the difficulty of making fine comparisons within the broad subject areas (e.g. "Biomedical Sciences") covered by each panel. It could also be because second-round proposals are already of such high quality that distinguishing the very top is difficult. Or it could simply be due to the inherent uncertainty of the research process.