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Document Analysis of Peer Review Criteria and Process in Science Foundation Ireland¹

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Introduction

Peer review is widely regarded as the most trusted and used mechanism available to select grant proposals with the highest potential for contributing to scientific and technological progress and innovation. However, many aspects of grant application review processes have been criticised by researchers and policy makers due to its lack of reliability, potential for bias, lack of transparency, and heavy reliance on overworked researchers (Abdoul et al., 2012). This project is to examine criteria and processes of grant funding peer review and decision-making in SFI (Science Foundation Ireland) involving multiple stakeholders, by analysing the Investigators Programme and Industry Fellowship Programme. Our goal is to improve the efficiency, transparency, and equity of grants application, evaluation and allocation in Irish science. The study addresses related topics, such as transparency of process, equity for gender and early career researchers, the role of interdisciplinarity in peer review, the evaluation of economic and social impacts of grant proposals, and overall, what constitutes research excellence and impact in Irish science. Specific objectives include the following:

- To understand the experiences and perceptions of key stakeholders (recipients, non-recipients, reviewers, industry partners, and staff) in peer review process at SFI
- To examine consideration and process of SFI's funding decision making based on review results and the impact towards the peer review criteria and process dynamically
- To integrate findings into specific policy recommendations for the peer review process at SFI, including evaluation criteria, workflow processes, and equity and transparency

Literature Review

While universally practiced, peer review is not a process without controversies. Scientific studies have shown that inter-reviewer reliability has not been consistent (e.g., Graves et al., 2011; Fogelholm, et al., 2012; Marsh, et al., 2008). There are also issues pertaining to conservatism and various kinds of biases, including, but not limited to, career stage, sex, language, nationality, and so on (see, for example, Lee et al., 2013; Marsh et al., 2008;

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Newton, 2017). Selection of the best possible proposals must also consider many other factors. These criteria for selecting grant proposals, however, could lead to risk-averse behavior, including “deferring to expertise and deferring to disciplinary sovereignty” (Luukkonen, 2012). Discussions have also indicated the side-effects of conservatism including biases of gender, nationality, native languages, and so on. Lastly, there is also a dearth of studies concerning the impact of peer review on grantees and non-grantees and academic-industry collaboration. A growing interest and increasing move towards academic-industry collaborations within Ireland (e.g. the Lero Irish Software Research Centre, and the Insight Centre for Data Analytics and the Innovation Value Institute) and internationally poses challenges for research (Boardman and Ponomarev, 2009) and for the peer review process of allocating funding grants. Given that the emergence and proliferation of research centres with particular industrial focus are relatively recent but increasing phenomenon, there lies a gap in academic knowledge and understanding of what is the best practice for different types of academic-industry collaborations, including their role in the formulation and allocation of research grants and the associated peer review process.

Methodology

The project involves quantitative and qualitative analyses of existing SFI data, including statistical analysis of grantees and anonymised reviewers, modelling review process, documentary analysis of guidelines and decision letters, as well as focus groups and interviews with various stakeholders. Based on that, an agent-based model will be designed and implemented to identify and externalise some critical conditions of SFI peer review processes and to test scenarios of interest to provide further insights such as alternative peer review strategies and/or workflows.

Preliminary Findings

This poster will focus on analysing the background and requirements of the two SFI programmes using publicly available reports, grantee data, and other materials provided by SFI. Preliminary findings include: (a) There is a strong emphasis on impact as a criterion: Although impact is broadly defined, economic and societal impacts are most emphasised; (b) Criteria are set as high-level concepts including quality, significance, and relevance: It is unclear as to what constitutes these criteria, meaning that reviewers could interpret the requirements differently and inconsistently; and (c) International reviewers are recruited for all applications: It is unclear as to how these international reviewers are informed about the potential economic and societal impacts, including relevant beneficiaries and needs in the Irish context. These findings will form the basis of qualitative studies and will inform a preliminary framework for designing and implementing Agent-Based Models (see, for example, Roebber & Schult, 2011) in subsequent stages of this research project.

Selected Bibliography

Abdoul, H., Perrey, C., Amiel, P., Tubach, F., Gottot, S., Durand-Zaleski, I., & Alberti, C. (2012). Peer review of grant applications: Criteria used and qualitative study of reviewer practices. *PLoS One*, 7(9), e46054.

Almquist, M., von Allmen, R. S., Carradice, D., Oosterling, S. J., McFarlane, K., & Wijnhoven, B. (2017). A prospective study on an innovative online forum for peer reviewing of surgical science. *PLoS One*, 12(6), e0179031. <http://doi.org/10.1371/journal.pone.0179031>

Bornmann, L. (2011). Scientific peer review. *Annual review of information science and technology*, 45(1), 197-245.

Bornmann L., Leydesdorff, L., & van den Besselaar, P. (2010) A meta-evaluation of scientific research proposals: Different ways of comparing rejected to awarded applications. *Journal of Informetrics*, 4, 211–220.

Fogelholm, M., Leppinen, S., Auvinen, A., Raitanen, J., Nuutinen, A., & Väänänen, K. (2012). Panel discussion does not improve reliability of peer review for medical research grant proposals. *Journal of Clinical Epidemiology*, 65(1), 47-52.

Graves, N., Barnett, A. G., & Clarke, P. (2011). Funding grant proposals for scientific research: retrospective analysis of scores by members of grant review panel. *BMJ*, 343, d4797.

Lamont, M., & Huutoniemi, K. (2011). Opening the black box of evaluation: How quality is recognized by peer review panels. *Bulletin SAGW*, 47-49.

Li, D., & Agha, L. (2015). Big names or big ideas: Do peer-review panels select the best science proposals?. *Science*, 348(6233), 434-438.

Lucas, P. (2014). An adaptation of the ethnographic decision tree modeling methodology for developing evidence-driven agent-based models. In Kamiński, B. and Koloch, G., editors, *Advances in Social Simulation*, volume 229 of *Advances in Intelligent Systems and Computing*, pages 343–350. Springer.

Luukkonen, T. (2012). Conservatism and risk-taking in peer review: Emerging ERC practices. *Research Evaluation*, 21(1), 48-60.

Marsh, H. W., Jayasinghe, U. W., & Bond, N. W. (2008). Improving the peer-review process for grant applications: reliability, validity, bias, and generalizability. *American psychologist*, 63(3), 160.

Marsh, H. W., Bornmann, L., Mutz, R., Daniel, H. D., & O'Mara, A. (2009). Gender effects in the peer reviews of grant proposals: A comprehensive meta-analysis comparing traditional and multilevel approaches. *Review of Educational Research*, 79(3), 1290-1326.

McCullough, J. (1994). The role and influence of the US National Science Foundation's program officers in reviewing and awarding grants. *Higher Education*, 28, 85–94.

Roebber, P. J., & Schultz, D. M. (2011). Peer review, program officers and science funding. *PLoS ONE*, 6(4). <https://doi.org/10.1371/journal.pone.0018680>