A Measure of Excellence of Young European Research Council Grantees

Javier Arevalo
Research Services, University of Helsinki, Finland

ABSTRACT

Bibliometric benchmarking can be an aid to researchers pondering whether to apply for competitive grants. In this paper, the highly prestigious grants offered by the European Research Council to young scientists of any nationality were scrutinized. The analysis of the 2014–2015 data indicates that over 75% of life science grantees in the starting category (2–7 years after completing a Ph.D. degree program) had at least 14 papers and an H-index of 10 (28 and 16, respectively ,in the case of the consolidator category—i.e., 7–12 years after obtaining the Ph.D.). Yet other signs of excellence, expert advice, and the limitations of metric approaches need to be considered.

INTRODUCTION

Think of a scientist pondering whether to submit an application to the European Research Council (ERC). The carrot is a tasty one: joining the prestigious club of those—over 5,500 members of 66 nationalities, including over 180 U.S. nationals—who have received, since 2007, one of the 5-year 1.5–2.5 million euro grant (European Research Council, 2015). The scientist may have an excellent project idea (ground-breaking and high-gain high-risk, in ERC language), which will be put to the test during the evaluation process. However, a second criterion will have to be met: the CV and track record also must be excellent. So what sort of measure of excellence would that be? After all, even for the best scientist at a given department or institution, a track record that is not perceived as outstanding at the European level will have no chance, meaning months of preparation spent in vain. The opposite may also occur, with scientists who could

potentially succeed not submitting an application due to excessive modesty.

Benchmarking merits against previous grantees may be the next thought—in most cases these are young scientists either within the starting (2–7 years after Ph.D.) or consolidator (7–12 years after Ph.D.) categories (European Research Council, 2016). And here is where, at least within some disciplines (including the life sciences), bibliometric analyses could prove handy. So with a focus on the ERC Life Science (LS) domain and its 9 panels, key publication metrics for all 488 Starting and Consolidator grantees in the 2014 and 2015 rounds were retrieved from Scopus. Figure 1 displays quartile values, which may offer a useful reference to the pondering young scientist while controlling for outliers. The highlighted first quartile values, for example for the LS1 panel (Molecular and Structural Biology and Biochemistry), reveal that 75% of grantees in the starting category had at least 13 papers (counted as Scopus-type articles and reviews), 523 citations (not shown) and H-index of 10. The equivalent values for consolidators in the same panel are 24 papers, 949 citations, and an H-index of 16.

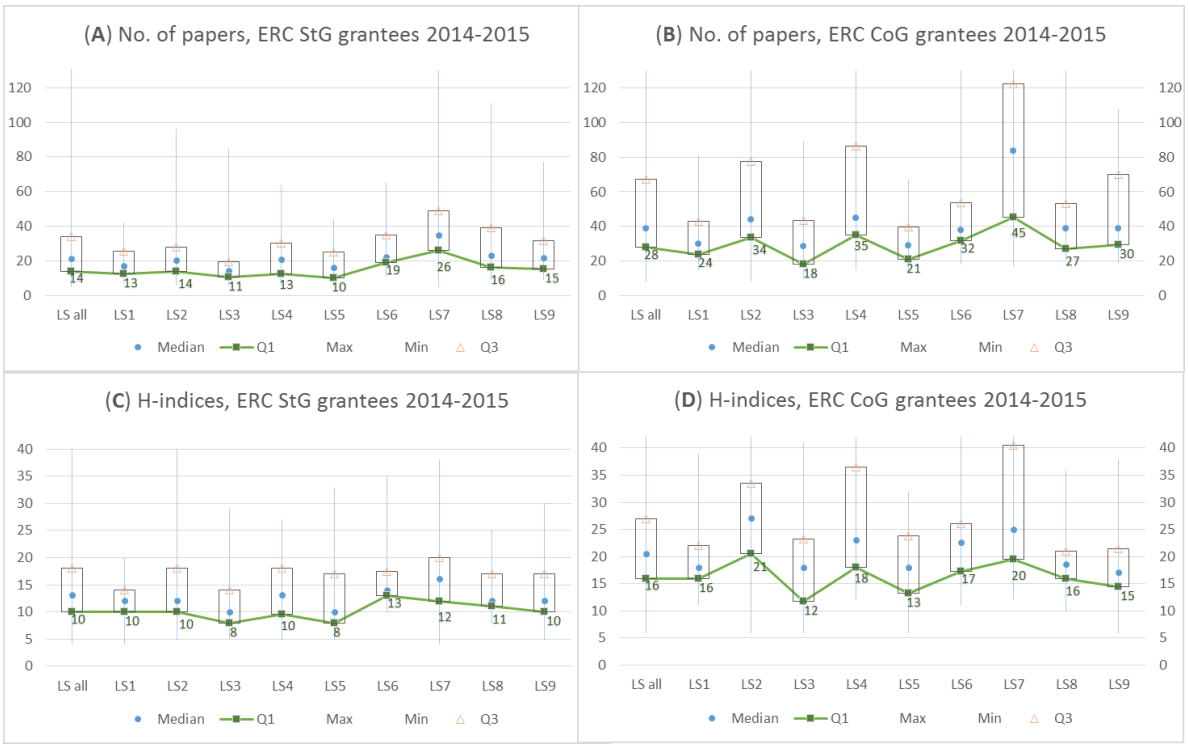

Figure 1. Bibliometrics for the 2014–2015 ERC Starting and Consolidator Grantees in the life Sciences. (**A**) and (**B**) display number of papers and (**C**) and (**D**) H-indices. Value ranges are indicated by vertical lines. Boxes delimit the first (Q1) and third (Q3) quartiles, with median values also marked. Q1 values are shown and connected by a line.

The graphs also capture differences between panels, likely reflecting variation in publication and citation practices by field. Values were somewhat lower in panels such as LS3 (Cellular and Developmental Biology) and LS5 (Neurosciences and Neural Disorders). The LS7 panel (Diagnostic Tools, Therapies and Public Health) showed some of the highest values, possibly consistent with the fact that this life science panel received the most applications. The highest interquartile range values were found in some of the consolidator panels (e.g., LS7 and LS4—Physiology, Pathophysiology and Endocrinology), indicating a higher variability in grantees' metrics.

ERC Myths and Facts

While little has been shared in the literature, there is a great deal of expertise on the ERC among European research institutions. In the words of the late Professor Ilkka Hanski (ERC Advanced grantee and former panel chair), an H-index approaching 10 could be considered a good indication when applying for ERC Starting, which seems in line with the values shown above. With respect to the often claimed "hidden" additional criteria, such as the need for prior international mobility, preliminary evidence reassuring feasibility, or a paper in *Science*, *Nature* or *Cell* (*The Guardian*, 2014), no evidence was found to support such claims. With regard to the latter, the data showed tremendous panel variations, with, for example, 80% of starting grantees in LS1 having such a paper versus just 18% in LS7. Considering the tough international competition for these grants, these and any other merits are simply likely to help—for example, it has been observed that ERC panels tend to select applicants who have published high-impact articles (Robitaille et al., 2015). Without splitting hairs about the values shown in the figure, we could derive the general conclusion that young scientists whose metrics are above first quartile values should probably stop pondering and start applying.

All things considered, this look into metrics confirms something that comes as no surprise: the ERC is highly competitive and only for the best, with the 12–15% success rates for 2015 as a reminder. Yet, metrics could be of use in planning and rationalizing efforts when targeting research funding. The fairness of the ERC process [aside from political considerations (*The Guardian*, 2014) or exasperation about ever-changing deadlines] is widely acknowledged, especially with regard to recognizing excellence. Not surprisingly, rankings of excellence nowadays include counts of ERC grants, and an increasing number of organizations are re-modelling

their schemes to imitate the ERC, with even some national programs sponsoring the best non-funded ERC applications (*Nature Cell Biology*, 2010). As institutional recruitment practices follow suit, the issue at hand will continue to attract attention.

A recent report commissioned by the ERC indicated that scores attributed by the evaluation committees match well with applicant performance as measured by bibliometric indicators (Robitaille et al., 2015, p. 69). Still, obvious caution should be exercised in the interpretation of our values given the limitations of the metrics approach [see *Science* (2016) for a discussion on metrics for young scientists]. In the case presented here, only grantees' profiles were considered, with the excellence of the project idea criterion not accounted for. While effort was put into cross-checking the accuracy of the data (e.g., checking researchers' ORCID and their own websites when necessary), the publication numbers in Scopus may not exactly match the scientists' record at the time of the evaluation. Furthermore, the metrics analyses only capture a part of the picture (e.g., overlooking merits such as awards or the scientist's contributions to multi-authored papers). Whereas substantial differences in the material and methods used impeded a comparison of results with two related studies [those of Pecha on a 2012 Starting grantees' cohort (Pecha, 2014), and of the MERCI project with 2007 and 2009 Starting applicants (MERCI project, n.d.)], the described analyses can be easily replicated with future ERC cohorts, and may be likewise relevant for other competitive research funding schemes. When interpreting values, the golden rules of metrics also need to be remembered: use more than one metric to give insights into an issue, and support conclusions with expert analysis (Colledge & Verlinde, 2014). Research advisors, ERC National Contact Points, and particularly ERC-experienced scientists will be great supports for the pondering scientist who, if still doubting, should just be encouraged to apply.

LITERATURE CITED

Colledge, L., & Verlinde, R. (2014). *SciVal metrics guidebook*, Version 1.01. New York: Elsevier. https://www.elsevier.com/__data/assets/pdf_file/0020/53327/scival-metrics-guidebook-v1_01-february2014.pdf

European Research Council. (2015). *Ideas newsletter* (December). https://erc.europa.eu/sites/default/files/publication/files/Newsletter_December_2015.pdf

European Research Council. (2016). *2016 work programme* (July). https://erc.europa.eu/sites/default/files/document/file/ERC_Work_Programme_2016.pdf

The Guardian. (2014). European research funding: It's like Robin Hood in reverse (7 November). http://www.theguardian.com/higher-education-network/2014/nov/07/european-research-funding-horizon-2020

MERCI project. (n.d.). *Monitoring European Research Council's implementation of excellence*. Final Report. http://cordis.europa.eu/result/rcn/177023_en.html

Nature Cell Biology. (2010. A maturing European Research Council (Editorial), *12*, 307. http://www.nature.com/ncb/journal/v12/n4/full/ncb0410-307.html

Pecha, O. (2014). *Results of a bibliometric analysis of successful applicants for ERC starting grants in 2012*. Prague: Technology Centre AS CR.

Robitaille, J. P., Macaluso, B., Pollitt, A., Gunashekar, S., & Lariviè, V. (2015). *Comparative scientometric assessment of the results of ERC-funded projects, bibliometric assessment report.* Report prepared for the European Commission. https://erc.europa.eu/sites/default/files/document/file/ERC_Bibliometrics_report.pdf

Science. (2016). Measure of success (Letters, NextGen Voices). *28*, 352. http://science.sciencemag.org/content/suppl/2013/10/03/342.6154.36.DC1

ABOUT THE AUTHOR

Javier Arevalo is a Senior Advisor in Research Funding at the University of Helsinki. After dedicating the last two years to advising life science researchers on international funding applications, he is now part of a newly formed team supporting strategic research projects. Prior to his work as research advisor, he worked for 7 years as a researcher and lecturer at the School of Forest Sciences, University of Eastern Finland. This included research and project work in countries such as Brazil, China, Kenya, Russia and Burkina Faso. He holds a Ph.D. in Forestry and Agriculture Sciences from the University of Eastern Finland, and a M.Sc. also in Forestry from the Technical University of Madrid (Spain).