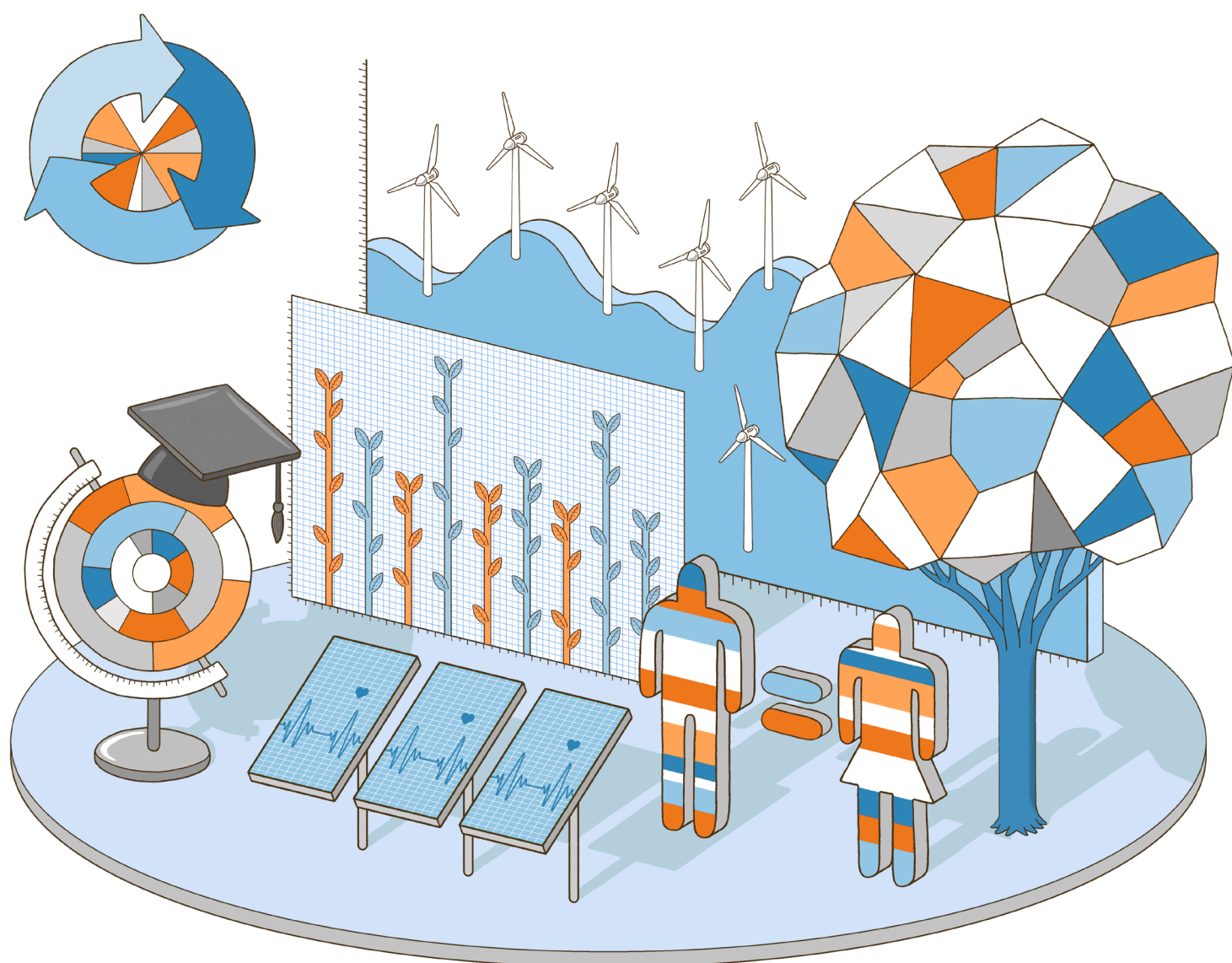


# Calibrating economic and societal impact

Best practices to inform ex-post evaluation of funded research



Reporting from a workshop with participants from the following organizations:



ELSEVIER



הקרן הלאומית למדע  
المؤسسة الإسرائيلية للعلوم  
Israel Science Foundation



MINISTRY OF BUSINESS,  
INNOVATION & EMPLOYMENT  
HĪKINA WHAKATUTUKI



Fondúireacht Eolaíochta Éireann  
Dá bhfuil romhainn  
Science Foundation Ireland  
For what's next

Scientific knowledge is the bedrock of societal and economic progress. This is especially true at a time when society and governments are looking to research to inform how to best tackle grand challenges such as the COVID pandemic or climate change. And yet, drawing a direct line between research and its ultimate impact remains difficult.

Research funding organizations have a long experience selecting proposals and following their results. This experience is incorporated in their processes, many times in the form of improved practice or implicit ways to identify the look and feel of research proposals that have a high potential for impact. Still, in most instances it is hard to codify the determinants of success, the characteristics that identify ‘the spark in the eyes’ of the best and brightest. And many research funders agree that there is room for improvement.<sup>1</sup>

Throughout October and November 2021, Elsevier convened a series of workshops on “Calibrating Economic and Societal Impact: Best Practices to Inform Ex-post Evaluation” with a group of similarly sized funders working within research intensive economies. The sessions discussed and identified approaches and actions that might be taken into the research ecosystem to improve the ability to demonstrate impact.

This report summarizes the discussions that took place in those workshops: from the assumptions that participants recognized that they are working under, to the challenges that need to be addressed, and the desire for further understanding and research. The workshops were small, invitation-only and held under the [Chatham House Rule](#). As such, this summary is anonymized and aggregated where relevant.

The Academy of Finland, Science Foundation Ireland, Israel Science Foundation, and New Zealand’s Ministry of Business, Innovation and Employment were represented in this workshop series.

The participants recognized a need to broaden the evidence base around the societal and economic impact of research and to develop the common language for communication around that impact. In doing so, all those in the research community with a role to play in tackling global and regional challenges would benefit, alongside the general public. Elsevier invites funders and research institutions to talk with us about the themes and challenges laid out in this report.

*Max Voegler, Vice President for Global Strategic Networks, DACH region, Elsevier*  
*Carlos Henrique de Brito Cruz, Senior Vice President, Research Networks, Elsevier*  
November 2021



<sup>1</sup> [https://www.globalresearchcouncil.org/fileadmin/documents/GRC\\_Publications/GRC\\_2019\\_Statement\\_of\\_Principles\\_Expectations\\_of\\_Societal\\_and\\_Economic\\_Impact.pdf](https://www.globalresearchcouncil.org/fileadmin/documents/GRC_Publications/GRC_2019_Statement_of_Principles_Expectations_of_Societal_and_Economic_Impact.pdf)

# Research benefits society, so:

Why are we struggling to define and demonstrate this?

What are we not measuring that we would like to measure?

These workshops led to discussions around four interrelated themes:



## The power of excellent research to enable societal impact

Research excellence and impact are distinct concepts, yet approaches to research evaluation often link them through simultaneous assessment.

What is the nature of the relationship between research quality and societal impact?



## Communicating relevant research to societal actors

Researchers are not solely responsible for delivering the societal and economic impact of their work. Identifying the supplementary aspects of research would benefit all.

To what extent is the relevance of research reliant on intervening actions and the wider context?



## Societal impact of research-based education and training

It is often thought that the most effective vehicle for delivering impact is through people, i.e., researchers, and their actions.

What more can we learn about the contributions to societal impact made by people who have received a research-based education?



## Costs and benefits of research excellence and impact assessment

Research evaluation often comes at great cost to research institutions and researchers.

To what extent is this work effective, and what formative role does assessment play in our understanding of the concepts measured?

Which led us to two potential research projects to test our assumptions and add to the evidence base informing decision-making:

### Identifying success factors for impact

#### Testing the assumption:

Societal impact of research is more likely to occur where research excellence is coupled with societal relevance, and alongside contextual factors that contribute to the realization of impact.

### Societal impact of research-based education and training

#### Testing the assumption:

Societal impact of research can be created by people who leave research and pursue careers that make use of their research-based education and training.

## Shared perspectives and challenges

The crises of COVID-19 and climate change demonstrate the need for science to inform public policy, health, and societal and economic innovation. Science does not just ‘push’ knowledge into the world, rather, there is an interactive and integrative cycle of push and pull between society and the research community leading to new ideas and actions that help solve global challenges.

Research funding organizations are called upon not just to fund high quality research, but also to demonstrate that the outcome of that research has a positive impact. And with public funds stretched across many different sectors and needs, there is an increasing emphasis on generating and demonstrating economic value. Additionally, funding organizations benefit from strategic intelligence: they need to understand which projects and programmes most effectively help with their strategy and mission.

This all demonstrates a clear need for better evidence of the impact of research. But to get to that point, foundational work still needs to be done.

In a perfect world, there might be a single definition of societal impact to guide us, but variations in the definition and thus the measures of impact dependent on context seem a more realistic approach. One achievable advancement would be greater recognition for negative impact, known by some as ‘grimpact’;<sup>2</sup> that is, impact that has a negative effect or consequence on society or the environment — perhaps an unintentional by-product. Another would be a more comprehensive set of metrics in measuring societal impact. In part because metrics don’t account well for the complexities in attributing impact to an individual researcher or research team. A societal development may come many years, even decades after the original research, influenced by many factors, and helped by serendipitous moments or discoveries along the way. Metrics and indicators rarely manage to account for this complexity; many in use today are contested as to what they really demonstrate. Furthermore, there is a risk with any assessment system solely reliant on metrics that gamification becomes prevalent among those whose careers are dependent on them.

For now, research assessment does still partly rely on metrics to inform and support expert assessment, although there are styles of research assessment that make greater use of narrative descriptions of impact. Metrics can help, but it is hard to see metrics substituting expert advice. The Leiden Manifesto states “Metrics have proliferated: usually well intentioned, not always well informed, often ill applied. We risk damaging the system with the very tools designed to improve it... Quantitative metrics can challenge bias tendencies in peer review and facilitate deliberation. This should strengthen peer review... However, assessors must not be tempted to cede decision-making to the numbers.”<sup>3</sup>

This approach, used in the performance-based research funding systems in New Zealand<sup>4</sup> and the UK<sup>5</sup>, coupled with peer review approaches to assessment, are often considered to represent best practice, yet come with their own challenges — not least around resourcing and cost.

Perhaps then, it is these unsolved challenges that drive funding organizations to continually improve the ways in which societal and economic impact is captured and demonstrated. Supported by scientometricians, professionals focused on impact, knowledge brokers, research institutions, and information and analytics providers such as Elsevier, the research community is making every effort to bring out positive change to society.

### Common ground

Questions around societal and economic impact are being grappled with by those in the research system globally. The workshop series participants were represented one of the major public funding agencies for research and innovation in small, advanced economies. All countries represented look to science and innovation systems to drive economic growth and their relatively small size offers the advantages of agility and of a less complex funding ecosystem (i.e., with one or a few major national public funders).

These funding organizations are challenged to one degree or another to deliver societal and economic impact. They are accountable for developing and demonstrating the societal impact of funded research for reasons of accountability and advocacy, allocation of funding, as well as for creating a research system that considers impact from research idea to delivery. And the current position of these organisations on its impact agenda is considered quite advanced in its thinking.<sup>6</sup>

The hope was that these contextual similarities would increase the chance of finding common ground among the workshop participants. Indeed, common ground was discovered and, throughout the workshops, the discussions began to narrow in on a select few topics and questions.



<sup>2</sup> Towards characterising negative impact: Introducing Grimimpact (2018) STI 2018 Conference Proceedings, 1199-1213)

<sup>3</sup> Hicks, D. et al., (2013) Bibliometrics: The Leiden Manifesto for research metrics, *Nature*, 520, 429-431

<sup>4</sup> <https://www.tec.govt.nz/funding/funding-and-performance/funding/fund-finder/performance-based-research-fund/>

<sup>5</sup> <https://www.ref.ac.uk/>

<sup>6</sup> Broadening the Scope of Impact, 2015, Small Advanced Economies Initiative, [https://www.sfi.ie/resources/SAEI\\_Impact-Framework\\_Feb\\_2015\\_Issue2.pdf](https://www.sfi.ie/resources/SAEI_Impact-Framework_Feb_2015_Issue2.pdf)

## Themes for further discussion

Through the course of the first workshop, participants discussed which elements of societal and economic impact are most important to their organisations and identified questions and problems they face in demonstrating that impact. From those discussions, four themes emerged:

### **The power of excellent research to enable societal impact**

Excellence is considered a precondition of impact, but do we fully comprehend the relationship between research quality and societal impact?

### **Communicating relevant research to societal actors**

To realize potential societal impact of research, effective communication among stakeholders is critical. Where does this responsibility lay, and which other interventions help drive societal impact?

### **Societal impact of research-based education and training**

Are people who train in academia and then move into industry a conduit for societal impact? Conversely, do they push the societal relevance of academic research when they continue to collaborate with their former colleagues and advisors?

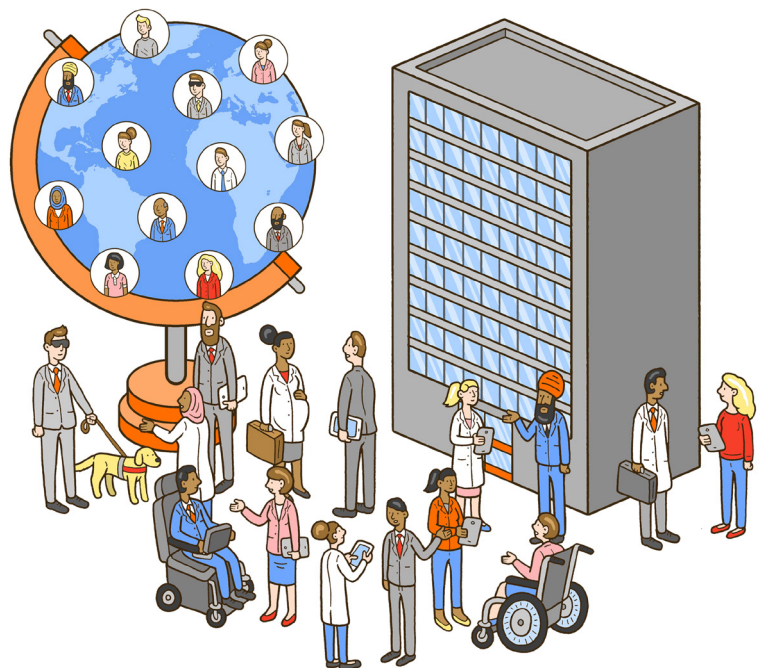
### **Costs and benefits of research excellence and impact assessment**

As the pressure to deliver societal and economic impact increases, how effective is the assessment of research and to what extent are researchers bearing its cost?

In the second and third workshops, participants explored these themes in considerable detail. The participants reviewed the existing evidence base within published research and more general discourse. They identified questions that could form the basis of future research projects and contribute to how the research community understands and performs impact evaluation. The next section of this report expands on these themes and presents the actions that the group determined would be most appropriate.

## PROGRESS, NOT SOLUTIONS

The questions and areas for further research present real challenges. Clear-cut conclusions to some of the questions raised may be out of reach. Given the complexity and timelines, perhaps there will always be some element of intuition, no matter how uncomfortably that sits for those living and breathing evidence-based approaches to their work. In recognition of this, the workshop discussions leaned towards tackling important but answerable questions that would further our collective understanding and advance the existing evidence base.







## Theme 1: The power of excellent research to enable societal impact

### Challenges faced

By its definition, excellent research would seem worthy of our ambition: that is, internationally recognised research, performed with a rigorous and ethical approach, and leading to an increased or improved understanding of problems. Many in the research community believe that if excellent research is funded and conducted, impact will follow. Indeed, calls for proposals and research evaluation exercises, especially at a national level, often couple the concepts through their structure and approach.

Though distinct, excellence is broadly considered a necessary precondition of societal impact. Combined, they determine policy and funding decisions: a deeper understanding of what role excellence plays in delivering societal impact would seem critical. Yet the understanding of these fundamental aspects of research performance is limited.

### Progress in this area

There is evidence of a positive correlation between research proposal quality and research results impact;<sup>7</sup> that is, impact in the advancement of knowledge, thus within the research community. While there is a positive correlation between excellence and societal impact, it is very weak and is based on data from only a single country.<sup>8</sup> Due to the relatively recent focus on impact and a dearth of objective measures of impact itself, the evidence base is limited. Studies around this concept often use data from assessment exercises such as the UK's REF or New Zealand's PBRF, which provide rich but limited datasets which creates parameters for subsequent research.

### Proposed questions

The evidence surrounding the correlation between research excellence and impact is limited. Identifying a causal relationship may be out of reach, yet as more data becomes available, can the community develop its understanding of the long-term benefits of funding research excellence? To what extent is that effected by the chosen field of study?

An omission from the evidence base, perhaps an artefact of the way research assessment is structured, is an understanding of the impact of research that is not classified as excellent. If research excellence helps drive societal impact, does that preclude non-excellent research from the same results? Exploring that would broaden our understanding of the link between quality and impact.

<sup>7</sup> Teräsmä E. et al, (2016) Beyond Academia – Interrogating Research Impact in the Research Excellence Framework. PLOS ONE 11(12): e0168533. <https://doi.org/10.1371/journal.pone.0168533>

<sup>8</sup> LSE (2017) The 2014 REF results show only a very weak relationship between excellence in research and achieving societal impact, LSE Blog, <https://blogs.lse.ac.uk/impactofsocialsciences/2017/07/19/what-do-the-2014-ref-results-tell-us-about-the-relationship-between-excellent-research-and-societal-impact/>



## Theme 2: Communicating relevant research to societal actors

### Challenges faced

Research that is focused on real-world challenges (i.e., that addresses societal relevance) is considered most likely to deliver societal impact. Yet there are many examples of research that led to remarkable, sometimes ground-breaking yet unintentional impact. Critically then, relevant research relies on strong communication channels to form a — sometimes very long — path through dissemination to uptake and then outcomes.

Even where there was no original connection between research and the problem it solved, communicating this progress to society is important. And there can be significant challenges around that communication when impact relies on those not directly within the research community. For example, government stakeholders may be quite far removed from a researcher's area of expertise, yet there will be times when it is critical that findings are shared in such a way that they can be understood and utilised in policy deliberations.

With the distinction made by funding organizations between research excellence and impact, some also consider a line of sight to impact from the outset a critical step. Researchers must connect early in their work with those affected by the problems they're working to solve and with those in industry who might transform knowledge into real-world action. Then delivering and communicating research to the wider world might require action from other roles within research institutions and intermediaries, from technology transfer officers to impact professionals and knowledge brokers.

### Progress in this area

Our collective understanding of the complexity of the connections between research results and their use and their societal impact has evolved. What was once considered to be linear is now treated as cyclical or embedded within wider contexts.<sup>9</sup> The importance of relevance is well-acknowledged, and activities with a focus on relevance have been shown to contribute to societal impact.<sup>10</sup> Increasingly though, the need for relevance brings with it a burden for researchers who must integrate research expertise with policy expertise.<sup>11</sup>

### Proposed questions

The top priority identified in the workshops was to bring greater understanding to the contextual factors that drive societal impact or relevance. Which interventions are most effective? What can funding organizations, research institutions and researchers do to ensure the impact is realized? Learning more was determined to be an opportunity for taking positive steps forward.

This could be extended to a broader look at how the growth and increased professionalisation of research-adjacent activities in research-intensive universities and systems has enabled or driven greater societal impact. Essentially, has the focus on societal challenges made a difference in the form of an acceleration of impact?

<sup>9</sup> Newman K. et al (2019) Rethinking research impact through principles for fair and equitable partnerships, IDS Bulletin, 50(1) <https://bulletin.ids.ac.uk/index.php/idsbo/article/view/3019> Online%20article

<sup>10</sup> D'Este, P et al (2019) Aligning scientific impact and societal relevance: the roles of academic engagement and interdisciplinary research, DRUID19, [https://conference.druid.dk/acc\\_papers/q9tvngaj72m97v4x5ix8rew8hl7qxb.pdf](https://conference.druid.dk/acc_papers/q9tvngaj72m97v4x5ix8rew8hl7qxb.pdf)

<sup>11</sup> Bandola-Gill J. (2019) Between relevance and excellence? Research impact agenda and the production of policy knowledge, Science and Public Policy, 46(6), 895-905, <https://doi.org/10.1093/scipol/scz037>



## Theme 3: Societal impact of research-based education and training

### Challenges faced

The people who conduct research are understood by many to be the key to research excellence. However, there are risks with assessing individual researchers on societal impact. ‘Measuring’ individual researchers is fraught with risks and instead portfolios, programmes, and institutions offer a more favourable level of aggregation. However, given the critical role of people, it is important to understand where they go when they leave academia and their impact is no longer captured through research evaluation.

Indeed, people are often considered a conduit for knowledge by most funding organizations. Therefore, more information is required on where those who receive a funded research-based education through a doctorate go throughout their careers and what impact they deliver if they leave academia for roles in industry.

### Progress in this area

This theme from the workshops touched on arguably well-trodden ground: funding organizations and research institutions follow-up to see where the people funded through their doctoral studentship or their post-doctoral scholarships go. By tracking individuals, the rate at which people move into the private or governmental sector can be captured. Results vary considerably depending on the scope of the cohort. In recent studies from institutions in Canada, 26% of doctoral graduates were identified to work in the private sector 2–10 years after graduation.<sup>12</sup> Another study asked the same question but found 18% of them worked in the private sector 1–16 years after graduation.<sup>13</sup>

Several studies classify private sector roles as research based or otherwise (e.g., executive). For example, a recent study from the United Kingdom showed that 24–66% of doctoral graduates went on to research roles, depending on the research field.<sup>14</sup> Use of third-party platforms such as LinkedIn is adding a powerful method of gathering this data.

### Proposed questions

The workshop participants felt that the most insightful studies tracking doctoral graduates were those that were able to identify job titles or roles, whether new companies were founded, and physical location. Could the best data sources, partners and methodologies be identified to ensure more of these studies reach those goals?

There were a few ways in which current approaches could evolve. While challenging to deliver, comparative studies across funding organizations or countries enabling greater understanding of the different models of research-based education. There was also a consensus that the studies would benefit from delivering more detail on how people are contributing to societal impact, going beyond economic value. And, given the varied natures of different sectors of industry, there’s a need for more granularity in the results to find insights for different disciplines and fields of study. What are the best approaches to capturing the full extent of societal impact of those with a research-based education?

There was also a strong desire to be able to move beyond one-off snapshots and move to a continuous monitoring approach: is that possible?

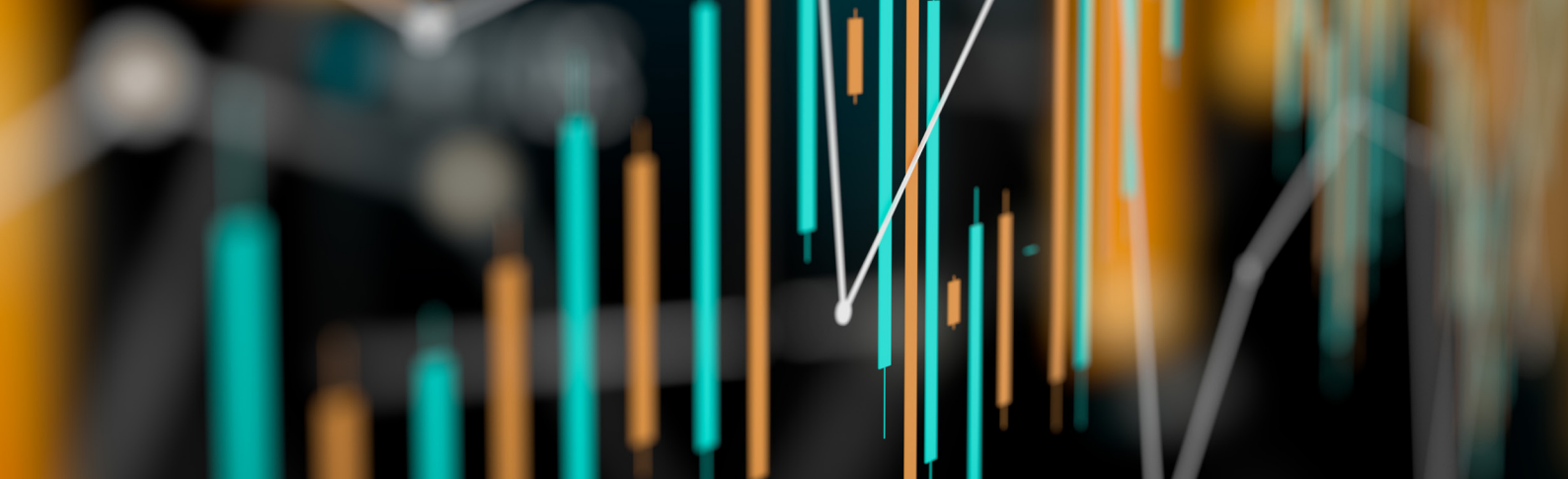
Lastly, what impact results from the connections built through the movement of people? Do those that move into industry maintain partnerships with those from their former research institution and do those relationships inform their work and societal impact?

<sup>12</sup> Porter S. (2017) UBC PhD Career Outcomes, University of British Columbia, [https://outcomes.grad.ubc.ca/docs/UBC\\_PhD\\_Career\\_Outcomes\\_April2017.pdf](https://outcomes.grad.ubc.ca/docs/UBC_PhD_Career_Outcomes_April2017.pdf)

<sup>13</sup> Reithmeier R. (2019) The 10,000 PhDs project at the University of Toronto: Using employment outcome data to inform graduate education, PLOS ONE, <https://doi.org/10.1371/journal.pone.0209898>

<sup>14</sup> Hancock S. (2021) What is known about doctoral employment? Reflections from a UK study and directions for future research, Journal of Higher Education Policy and Management, 43:5, 520–536, DOI: 10.1080/1360080X.2020.1870027





## Theme 4: Costs and benefits of research excellence and impact assessment

### Challenges faced

Many countries now have performance-based research funding systems (PRFS), although the structure and measurements differ. Within these exercises, narrative case studies depicting impact and peer review approaches to gauging excellence and impact tend to be highly regarded. Further, the outputs of those assessments are considered valuable — and not just regarding their original purpose. For example, those performing research on research have been able to explore the datasets and garner powerful insights.

Yet there are well-documented criticisms of these assessments. Some question the approaches and structure, and a common challenge is the financial and time cost for those participating. There is also a growing concern that impact statements are less helpful than they used to be, as our fluency around impact develops and stakeholders demand more detail on the return on investment. Individual assessments often include a cost-benefit analysis, but more knowledge sharing around this might benefit everyone — from those structuring the assessments to the researchers feeling the burden.

### Progress in this area

Assessments such as the Research Excellence Framework in the UK attract a great deal of attention from those thinking about research evaluation and, as might be expected for an exercise of its scale, a formal cost-benefit analysis was performed. Higher education institutions indicated that they benefited from greater impact insight and the development of a culture of holistic thinking.<sup>15</sup> There are concerns about gathering intelligence from a process that also determines future funding and therefore necessitates putting forward the best possible version of events<sup>16</sup> and that game playing tactics will play a greater role in time given how much is at stake.<sup>17</sup>

### Proposed questions

Researchers feel the pressure of the impact agenda keenly. Not getting evaluation right can increase that pressure, especially where the structure or approach inadvertently delivers the message that their outputs and metrics are the ‘answer’ to impact. Therefore, there is a need to keep reviewing the effectiveness of the various assessment exercises, not forgetting the ad hoc reporting required by funding organizations or research institutions for purposes of measuring impact, comparing topical performance and identifying candidates. Which approaches are most effective? If resourcing and financial costs prevent measuring the excellence and impact of all research, what is getting missed?

Furthermore, what of the reporting load on researchers? A comprehensive understanding of what burden assessment places on the research community might also benefit the research community.

<sup>15</sup> Farla K. et al (2015) REF 2014 Accountability Review: Costs, benefits and burden, Technopolis Group, <https://www.technopolis-group.com/wp-content/uploads/2020/02/REF-Accountability-Review-Costs-benefits-and-burden.pdf>

<sup>16</sup> Jump P. (2015) Is the REF worth a quarter of a billion pounds? Times Higher Education. <https://www.timeshighereducation.com/blog/news-blog-ref-worth-quarter-billion-pounds>

<sup>17</sup> Reed M et al (2017) How much was an impact case study worth in the UK Research Excellence Framework? Fast Track Impact. <https://www.fasttrackimpact.com/post/2017/02/01/how-much-was-an-impact-case-study-worth-in-the-uk-research-excellence-framework>

## Conclusion

For funding organizations, there are many different and often very complex approaches and questions that go into calibrating societal and economic impact. While there are challenges around impact evaluation, it is essential for the research ecosystem to continue finding new potential ways forward. Through the workshop discussions, participants quickly established common ground, even with the different context and specifics each brought to the table. In looking for these opportunities, there was a clear preference for tackling tangible questions that the whole research community is facing: ones that will directly inform how funding organizations think

about impact. There was also recognition that, no matter what we question or learn about research excellence and societal impact, neither should be deprioritized.

With that in mind and through the course of the discussion, the participants identified two potential research projects. They reflect the highest priority questions and — of all the challenges identified — progress would offer the most impact. The projects would test assumptions and add to the evidence base, thereby informing decision-making.

---

**The first project weaves together the first and second themes of research excellence and relevance:**

### Identifying success factors for impact

#### Testing the assumption:

Societal impact of research is more likely to occur where research excellence is coupled with societal relevance, and alongside contextual factors that contribute to the realization of impact.

**The second project develops ideas and the existing evidence base related to the third theme of capturing societal impact brought out by the movement of people:**

### Societal impact of research-based education and training

#### Testing the assumption:

Societal impact of research can be created by people who leave research and pursue careers that make use of their research-based education and training.



## Next steps

Through 2022, work will begin to explore these research projects. Elsevier's International Center for the Study of Research (ICSR<sup>18</sup>) will regroup with interested workshop participants to begin framing the research questions. This is in line with ICSR's mission to further the study of research and thus to contribute to the evidence base supporting the practice of research strategy, evaluation and policy; its vision is a world in which decisions informed by such evidence benefit research and society.

ICSR will develop either or both of the two research project ideas together with those best placed in the research community to work on such proof-of concept studies (not limited to those who participated in these workshops). As with all such studies conducted via ICSR, the aim would be to publish the results for the benefit of all who rely on evidence to support their decision-making.

<sup>18</sup> <https://www.elsevier.com/icsr>



For more information visit  
[elsevier.com](https://elsevier.com)

### **Elsevier offices**

ASIA AND AUSTRALIA

Tel: + 65 6349 0222

JAPAN

Tel: + 81 3 5561 5034

KOREA AND TAIWAN

Tel: +82 2 6714 3000

EUROPE, MIDDLE EAST AND AFRICA

Tel: +31 20 485 3767

NORTH AMERICA, CENTRAL AMERICA AND CANADA

Tel: +1 888 615 4500

SOUTH AMERICA

Tel: +55 21 3970 9300

CHINA

Tel: +86 1085 2087 65

For a complete list of Elsevier offices,  
please visit [elsevier.com/about/locations](https://elsevier.com/about/locations).



**ELSEVIER**

Copyright © 2022 Elsevier B.V.  
June 2022