

# **A CHASS response to the Productivity Commission's Draft Report on *Public Support for Science and Innovation.***

## **1. Overview of the CHASS response**

CHASS is in agreement with much of the Productivity Commission's *Draft Report*, and supports many of the draft findings that have relevance to the Humanities, Arts and Social Sciences (HASS).

At the same time, the *Draft Report* could enhance its value by giving more consideration to the role HASS play in the innovation process. It could, for instance, broaden its interpretation of the term 'science', by adopting the standard European definition which refers to the methodical pursuit of knowledge in all fields. The European Science Foundation uses such an all-embracing definition: '[*The ESF*] represents all scientific disciplines: physical and engineering sciences, life, earth and environmental sciences, medical sciences, humanities and social sciences.'

This inclusive definition would allow a place at the table for HASS. As it stands, HASS researchers are hardly encouraged to be innovative when the systems and settings in Australia either overlook their contributions or apparently deny them any role in the innovative process. HASS representatives are almost completely absent from the Prime Minister's Science, Engineering and Innovation Council; excluded by the R&D Tax Concession; largely ignored when it comes to appointing Departmental Committees to consider matters of research policy; accorded only weak recognition by the National Research Priorities; and reduced to bit players by the name of the principal Commonwealth Department governing their activities — why not Education, RESEARCH and Training, rather than Education, Science and Training? Does the Chief Scientist have any responsibilities to represent the HASS sector or to engage with them? If not, where are the equivalent officers in HASS?

It is worth noting that in not giving greater recognition to the HASS, the *Draft Report* is reporting on only part of the national system. About 75% of Australia's outlays in R&D go to science and technology, but that still leaves 25% which this report could also acknowledge<sup>1</sup>

CHASS stands by the statements we made in our original submission, that the HASS sector has a crucial role to play in the innovation process, both as an innovator in its own right, and also in conjunction with science, technology, engineering and medicine (STEM). We note that the *Draft Report* recognises this on occasions. In Figure 1.3, for instance, typical HASS functions lie at the very centre of the diagram the PC uses to describe the Innovation System.

In response to the specific Draft Findings of the Report, we would suggest the following changes:

### *Finding 5.1*

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<sup>1</sup> Stuart Cunningham, *The humanities, creative arts and the innovation agenda, in Innovation in Australian arts, media and design: Fresh Challenges for the Tertiary Sector*, eds Brad Haseman, Sue-Anne Wallace, & Rod Wissler, Post Pressed, 2004, p.224

An additional point would call for the addressing and removal of those impediments which confront researchers wishing to engage with colleagues from other disciplines. These impediments are set out in detail in the CHASS report *Collaborating across the sectors*,<sup>2</sup> launched on Wednesday 6 December. A copy is enclosed with this response.

#### *Finding 8.1*

We agree that 'there are concerns if the trend towards publicly funding applied science and innovation, at the expense of basic and strategic science and innovation, goes too far.' The *Draft Report* couches this point too politely, if anything. On the other hand, the *Draft Report* has tendered no convincing empirical argument for its finding that the overall quantum and mix of public support for science and innovation are satisfactory at present levels (notwithstanding pipeline decline in several major federal budget programs). To claim there is no 'evidence' of a need to change the overall quantum or mix is quite remarkable, if not downright preposterous, given that numerous authoritative sources have tendered evidence of that precise need over the last decade and more. This finding needs major substantiation, if it is to be taken seriously across the research community.

#### *Finding 9.1*

Research in the HASS sector is specifically excluded from eligibility under the Income Tax Act. There seems to be no reason for this, other than precedent. Options the *Draft Report* could put forward include removing that impediment, or suggesting the establishment of a new scheme that would encourage and reward appropriate activities no matter the discipline. The UK's National Endowment for Science, Technology and the Arts (NESTA)<sup>3</sup> might provide a suitable model, and was mentioned in a recent submission to the Prime Minister's Science Council<sup>4</sup> as such.

#### *Finding 9.4, 9.5*

We support Finding 9.4, calling for a reinstatement of the original definitions of the CRC program, and see considerable value in a complementary program to encourage collaborative activities. Ways to achieve this are discussed at length in the CHASS report on *Collaboration between the sectors*.<sup>5</sup> This could take the nature of a program to support the best of the university-based centres of research and

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<sup>2</sup> Jenni Metcalfe, Michelle Riedlinger, Anne Pisarski, and John Gardner, *Collaborating across the sectors: the relationships between the humanities, arts and social sciences (HASS) and science, technology, engineering and medicine (STEM) sectors*, CHASS, Canberra, 2006:

<http://www.chass.org.au> (accessed 12 December 2006).

It is worth noting this new report finds that major improvements in collaboration between the HASS and STEM sectors can be generated without any additional funding, by removing unintended obstructions that clutter the current research and innovation systems. In concert with many of the PC draft report's points, it shows that many aspects of the current system can be improved relatively simply, by the removal of much unnecessary red tape, quite aside from the (heavily politicised) debates about investment quantum.

<sup>3</sup> "NESTA is the National Endowment for Science, Technology and the Arts. We are the largest single endowment devoted exclusively to supporting talent, innovation and creativity in the UK. Our mission is to transform the UK's capacity for innovation. We invest in early stage companies, inform innovation policy and encourage a culture that helps innovation to flourish." <http://www.nesta.org.uk/>

<sup>4</sup> *The Role of Creativity in the Innovation Economy*  
[http://www.dest.gov.au/sectors/science\\_innovation/science\\_agencies\\_committees/prime\\_ministers\\_science\\_engineering\\_innovation\\_council/meetings/fourteenth.htm](http://www.dest.gov.au/sectors/science_innovation/science_agencies_committees/prime_ministers_science_engineering_innovation_council/meetings/fourteenth.htm)

<sup>5</sup> *Op. cit.*

education, those focused on particular issues (eg obesity); collaborative in nature; and working in partnership with business and industry.

Another option would be to extend funding for the ARC Linkage program. This Program brokers research partnerships within the Australian innovation system, undertaken to acquire new knowledge and involving risk or innovation. They are collaborations between higher education researchers and industry. In the last year, the success rate for Linkage proposals fell significantly.

A third option would be a funding program modeled on the UK's Economic and Social Research Council (ESRC) and the Arts and Humanities Research Council (AHRC). They recently issued a joint statement with): *ESRC has agreed to collaborate with the other Research Councils on the peer review and funding of research projects that extend beyond the social sciences. The new arrangements will enhance the opportunities for research that brings social sciences methods and approaches together with those of other research communities. Examples include research into energy, ageing, genomics, nanotechnology and the creative industries.*<sup>6</sup>

#### *Finding 11.1*

We agree that introducing the RQF in the stated timeframe will be challenging. While we see there are potential advantages in the new system, it will need to be managed very skillfully in order to avoid major disruptions. At the very least, the tertiary sector does need to be compensated for the additional costs of its introduction.

What follows in this response document is a fuller explanation of these points and recommendations.

## **2. CHASS's areas of interest in the Productivity Commission's draft report**

CHASS exists to ensure that Australians recognise and understand both the contribution and the potential of humanities, creative arts, and social sciences (HASS) education, research, and scholarship. To that end, CHASS commissions numerous research projects that investigate the real and potential contribution of work conducted in these fields of knowledge.

CHASS was eager to meet with the authors of the *Draft Report* and develop this perspective in a more exploratory fashion than the formal submission allows. In our view, the *Draft Report* has overlooked many important aspects of both scientific inquiry and practical innovation where the contribution of HASS research is of clear (and even measurable) significance. A classic international case is the High/Scope Perry Preschool study, which demonstrated a return of a program to intervene in the early educational experiences of at-risk children. "*The age-27 analysis found that every public dollar spent on the program saved \$7.16 in tax dollars.*"<sup>7</sup>

*Pathways to Prevention* is an Australian project similar to the Perry Project, and its final report was launched earlier this month at Parliament House by the Prime Minister. It too has been subject to cost-benefit analysis, and shows strong returns to the community.<sup>8</sup>

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<sup>6</sup> <http://www.esrcsocietytoday.ac.uk/ESRCInfoCentre/opportunities/ahrc%5Fesrc/>

<sup>7</sup> <http://www.highscope.org/Research/PerryProject/tale.htm>

<sup>8</sup> <http://www.mission.com.au/cm/p.aspx?n=MGOOI-BVUTR-DCVBX-GTJLP-SNOXF&SID=TNNWY-MDRLE-KHUVY-CZFNK-YXBWF>

The *Draft Report* is light-on for discussion about the social sciences, and almost completely devoid of discussion about the creative arts and the humanities.

The HASS disciplines are demonstrably crucial in the formation of basic knowledge, and in the application to human life of many inventions arising from STEM research. CHASS sees both these angles coming through its research again and again. The humanities are bundled up with every stage of scientific inquiry and application. The social sciences constantly inform business, government, and others in their decisions about the interface between scientific innovation and human behaviour. The creative arts, likewise, are frequently cited as inspirational in inquiry processes, as well as a critical tool in disseminating scientific knowledge. Indeed, research recently published has shown that creative arts industries are generating an unprecedented level of wealth among younger entrepreneurs worldwide.<sup>9</sup>

If the PC inquiry's intention is to meet its terms of reference comprehensively, these oversights mark an area requiring significant improvement. The final report should either redress these oversights by including that 25% of the country's outlays in R&D that goes to the HASS sector; or (perhaps more realistically) develop a method for evaluating publicly supported inquiry and innovation in HASS fields of knowledge that can be integrated into the work already performed under this inquiry.

### **3. Recapitulating and reinterpreting the Productivity Commission's *terms of reference***

One constructive aspect of the *Draft Report* is the explicitness with which it defines many of its basic concepts and key terms. The PC has endeavoured to respect its terms of reference, which is commendable, but the *Draft Report* has confused its definitions of several key terms, to the extent that it has committed several errors in its discussion. These confusions also lead the report away from several important features of the publicly supported science and innovation system in Australia, meaning it appears not to grasp the potential for a renewed innovation framework fully. These definitional issues are discussed in the following sections.

#### **i. The Productivity Commission's definitions of 'science' and 'innovation'**

The terms of reference direct the PC towards a consideration of publicly supported science and innovation. They do not direct the PC in its interpretation of those terms. The draft report, understandably, rules out directly considering aspects of Australia's knowledge and research systems that do not qualify as scientific or make a contribution to innovation. It does not define 'science' with enough clarity and understanding to reap the full rewards from that focus, however.

Science is often understood in two ways, with important differences between them. The original usage is the more inclusive, meaning all kinds of knowledge and the methodical pursuit of knowledge. This usage is still preferred in many international contexts. It is reflected in a CHASS-commissioned report on *Collaborating across the sectors*,<sup>10</sup> published since the PC released its draft report. *Collaborating across the sectors* recommends 'adopting the European use of the term "science" to include the social sciences and the humanities (as the European Science Foundation

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<sup>9</sup> Potts, Jason. *Agenda*, Vol 13, Number 4, 2006, pp 339-350

<sup>10</sup> *Op. cit.*

does).<sup>11</sup> To this, CHASS would add that research pursued within the creative arts is a logical candidate for the same treatment.

Although that inclusive sense of ‘science’ is familiar to Australians, this doesn’t support the proposition the more common usage in this country holds ‘science’ as referring specifically to the natural sciences. That this common understanding flows through into learned discourse is clear from the name and role of the Australian Academy of Science, or from the contents of any secondary school science curriculum in Australia. If this usage is to be preferred (a choice CHASS does not recommend), then the word ‘science’ needs to be replaced in many cases by less discipline-narrow terminology. Public support for *research* and innovation captures this distinction, without diffusing the inquiry’s focus. Similarly, the federal government should consider changing DEST to a Department of Education, *Research*, and Training.

There are reasons for defining the term both ways, of course. CHASS remarks on the definitional question here because the *Draft Report* is not clear about which sense of the term it has adopted. At several points, it seems that social sciences research has been included in the term, and possibly humanities research as well. Yet there are other sections where the emphasis is clearly on science, technology, engineering, and mathematics (STEM) research.

In the context of this inquiry, the test for either definition is how well it contributes to a discussion of innovation. Like many parties that lodged submissions to this inquiry, CHASS urges the PC to recognise that knowledge work in the creative arts, the humanities, and the social sciences is scientific in and of itself, or else it is a contributor to Australia’s innovation system alongside the sciences — and inextricably bound up with them. This definitional issue needs to be front-ended in the final report, because all subsequent discussions are affected by it.

For example, there is no investigation of whether the R&D tax concession *should* be available to research and innovation drawing on HASS approaches. Yet this disincentive is instrumental in marginalising the role of HASS research in the for-profit sector. Our report on *Collaboration between the sectors*<sup>12</sup> shows that, in many cases, the most productive strategy to improve the relative performance of HASS research and innovation in Australia is to remove such structural disincentives.

A striking example of the sorts of intellectual breakthroughs that HASS can offer, this one from outside Australia, is Nicholas Stern’s *Review on the Economics of Climate Change*.<sup>13</sup> Stern brings a social science discipline – economics – to bear on a problem that has usually been regarded as a question of the natural sciences. In the process, his report has reframed that problem in ways that resonate internationally, and which have inspired rapid policy and business innovation worldwide.

According to the *Draft Report*’s own definitions, it is clear that any equivalent Australian report would deserve public support as an important case of innovation. A good example is the successful *Pathways to Prevention* project under the auspices of Mission Australia and Griffith University, which will generate significant cost-savings for all levels of Australian government through reductions in family

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<sup>11</sup> *Ibid.*, p. 44.

<sup>12</sup> *Ibid.*

<sup>13</sup> Nicholas Stern, Final Report of the Review on the Economics of Climate Change, Her Majesty’s Treasury, London, 2006: [http://www.hm-treasury.gov.uk/independent\\_reviews/stern\\_review\\_economics\\_climate\\_change/sternreview\\_index.cfm](http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/sternreview_index.cfm) (accessed 5 December 2006).

breakdown, childhood health problems, and criminal and antisocial behaviour. And yet the PC's *Draft Report* contains no detailed consideration of how such important innovations come to be produced and adopted when (as in Stern's case) they come from a non-STEM field of knowledge. The data the PC report uses reflect research and innovation from outside STEM fields very weakly, where they reflect them at all.

Another way the *Draft Report* might have viewed the question is to recognise that significant inputs, including public inputs, go into HASS research and innovation in Australia. HASS research and innovation produce significant outputs, and in many cases generate important outcomes, which are often of a public benefit nature. For these reasons, HASS research and innovation merit specific evaluation under the PC inquiry's terms of reference, simply because they make up 25% of national outlays on R&D.

## ii. Using marginal spillovers as the driving rationale for public support

The *Draft Report* argues for the importance of explicit rationale in determining questions of public support. It goes on to list four such rationales, but gives priority to the spillover rationale:

The study has found that the strongest reasons for public support of R&D are the returns that cannot be captured by the innovator (*spillovers*) — whether in the public, private or not-for-profit sectors.<sup>14</sup>

Implicit in this rationale is a sense of public or generalised benefit, so that a given innovation is of benefit to the society in which it occurs. This aspect of the benefit is prioritised through the notion of 'marginal spillovers.' In other discourses around education, research, and scholarship, there is a comparable emphasis on 'public goods' — and a consensus that HASS sector workers are very efficient generators of them.

CHASS is happy to go along with the *Draft Report's* rationale, so long as it is consistently applied. Innovations of public or generalised benefit are very often the result of research activity in the HASS fields. Indeed, these three areas of knowledge are most heavily penalised by systems of public support that overlook the marginal spillover imperative, such as public funding systems that favour applied research. Along these lines, CHASS endorses the *Draft Report's* emphasis on the relative importance of basic and strategic research as priorities for Australia's system of public support. CHASS believes the PC's rationales for this argument could even be spelled out in greater detail.

Several examples of R&D from the social sciences are cited in the draft report, but none are clearly from the humanities or the creative arts. CHASS hopes this does not indicate a failure to differentiate between the three, or to treat only social sciences research as suitable for the PC's terms of reference. Innovation in the creative arts leads directly to innovation in industry, while humanities research underpins and renews the interpretative reasoning essential to advancing the moral, cultural, historical, and epistemological basis of all knowledge. These benefits which accrue to the nation through HASS are not captured in an exclusive focus on R&D spend, as they occur within the far wider envelope of the innovation

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<sup>14</sup> *Draft Report, Overview, p. xx.*

system/environment (see, for instance, Keith Smith's address *The Productivity Commission's work on the Australian innovation system*.)<sup>15</sup>

### **iii. Comparing the Productivity Commission's report with the Business Council of Australia's recent report on innovation**

The Business Council of Australia's recently published *New Pathways to Prosperity – A National Innovation Framework for Australia*<sup>16</sup> makes interesting reading alongside the PC's draft report. The BCA report calls for a radical expansion of Australia's innovation capacity, which would occur under the auspices of a nationally coherent innovation framework. This appears to be in some tension with the PC *Draft Report's* emphasis on Australia's industry sector mix as a determinant of investment in R&D.

While in many respects the *Draft Report* emphasises changes to Australian policy and practice, as dictated by the rationales that guide public support for science and innovation, in this respect it seems to endorse business as usual. The *Draft Reports* seems hesitant to use public support for science and innovation as a vehicle for strategically repositioning Australia's industry outlook. By contrast, the *New Pathways* report is enthusiastic about research and innovation as drivers of industry overhaul. If the PC had interpreted its terms of reference in a wider sense suggested by Smith, this would have come into focus more clearly.

CHASS wishes to see the PC's final report engage with this apparent tension directly. If BERD is a consequence of industry sector mix, for example, is it desirable that GOVERD be used as a vehicle to transform that mix? CHASS believes the *New Pathways* report is correct to argue for this case, but all interested parties can benefit from reading a clear exposition of the PC's response to it, however that may be framed. Again, the PC may benefit from a close reading of the enclosed report on *Collaboration between the sectors*,<sup>17</sup> which examines this relationship through a number of case studies, and suggests several recommendations for better harnessing the contributory potential of HASS sector work.

## **4. Picking up on particular points about the Productivity Commission's draft report**

The *Draft Report* passes detailed comment on a wide range of points, much of which is outside the direct interest or expertise of CHASS, however we note several points that would benefit from further development in the final report.

### **i. The Productivity Commission's mixed treatment of peer review**

CHASS notes the *Draft Report's* treatment of peer review as a regulatory force underpinning the quality of scholarly research in Australia and elsewhere. We applaud this discussion's even-handedness, which merits further development in the PC's final report. Now that the federal government has signalled its intention to press

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<sup>15</sup> Smith, Keith Presentation to Melbourne Innovation Leadership Summit, Wednesday 6 December 2006, Melbourne Town Hall

<sup>16</sup> Business Council of Australia and the Society for Knowledge Economics, *New Pathways to Prosperity – A National Innovation Framework for Australia*, BCA, Melbourne, 2006,

<sup>17</sup> *Op. Cit.*

ahead and introduce its preferred model of Research Quality Framework in time to affect university funding from 2009, the PC's discussion has become particularly timely. CHASS has cautiously welcomed the RQF announcement, but member organisations are acutely aware of the dangers that an unbalanced system could pose for Australian universities.

Peer review is manifestly a fundamental scholarly practice. It is integral to most decision-making processes at the coalface of university research and teaching; it is the basis of most decisions about quality and esteem within the disciplines nationally and internationally; and it has a place in numerous non-university R&D processes as well. No research and innovation framework for Australia can be complete unless it features a recognition of peer review's role in underpinning the intellectual quality of much institutional practice.

At the same time, there are limits to the capacity and the responsiveness of peer review processes. The *Draft Report* alludes to some of these in Chapter 11. Peer review must draw information from appropriate objective indicators if it is to escape various forms of closed-mindedness in decision-making. CHASS recently convened expert panels to pilot a new approach to counting citations as an indicator of research quality in political science and history at Australian universities. This dilemma was directly addressed by the panellists involved. It would be constructive for the PC's final report to spell it out in greater detail, and CHASS would be happy to advise further on this point if that is helpful. Peer review is shown in the CHASS Collaboration report to be essential but conservative in that it favours silo disciplinary review; and thus needs to be supplemented to embrace the challenges of really significant cross-sectoral activity

## **ii. The problematic attempt to confine curiosity-driven research**

At several points, the *Draft Report* questions whether the breadth of Australia's research effort is sustainable. This has clearly been a concern for several contributors to the debate, including the federal Department of Education, Science and Training. CHASS is aware that several parties would endorse the *Draft Report's* caution, when it wonders aloud:

If scientific curiosity is the trait to be valued, and budgets are limited, why not stick to curiosity about a less broad range of scientific fields?<sup>18</sup>

CHASS does not share this view. Partly, this is because it is at odds with the evidence. Curiosity-driven research tends to be less capital-intensive and require smaller labour costs than the more applied research that is favoured under present funding arrangements. Research and innovation in HASS fields can expand very significantly off the current capital base, given only that public support for staff time can be increased. Likewise, modest increases could fund several world-leading research centres; and the sort of collaborative arrangements in the UK (between the Arts and Humanities Research Council, and the Economic and Social Research Council, as described above) offer rich possibilities.

Equally importantly, it is illogical. A regulatory will to confine research curiosity is at odds with the nature of curiosity itself. Government can offer inducements in particular areas, but the curiosity of scholarship will invariably take that research support in some highly entropic directions. Australia's National Research Priorities are an outstanding example of the way a system that supports any degree of basic

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<sup>18</sup> *Draft Report*, Chapter 3, p. 3.20.

and strategic research into targeted priorities will wind up supporting fields of research that may be very different from what the system's authors imagined. CHASS regards this as a normal and healthy response to any such system. Barlow's recently published book on science policy makes a similar point, arguing that research funding should go to creative people, rather than to well-anticipated outcomes.<sup>19</sup>

It has been argued that too much research and innovation effort is going into the humanities, creative arts, and social sciences at the expense of STEM areas. Our view is that this is mistaken on two grounds:

- First, it would imply that research and innovation is indeed a zero-sum game. As discussed above, CHASS prefers the BCA proposition that Australia's research and innovation capacity needs expansion across the board. Across-the-board expansion can deliver growth in areas urgently required to develop national productivity, such as mathematics and Asian languages, as well as allowing an expansion of resources available to the system as a whole.
- Secondly, relating to that broader conception of the research and innovation system, the *Draft Report* itself has noted an increasing body of literature that emphasises the long term and generalised return on basic and strategic research which is curiosity-driven, as distinct from the shorter-term and more easily captured returns from applied research that is commissioned.

Finally, it is worth noting that HASS makes up a significant proportion of Australia's R&D spending by any measure. In justifying its approach to the development of National Research Priorities, for example, the government noted that 75% of national R&D spending is attributable to STEM fields.<sup>20</sup> The inverse of this argument is that 25% of national R&D spending is *not* attributable to STEM disciplines. If HASS fields contribute only the 25% excluded by that figure,<sup>21</sup> then they are still making a very significant contribution to national research and innovation. For the *Draft Report* to pay so little attention to 25% of the system seems a very large oversight.

### **iii. Reconceptualising areas of so-called oversupply in Australia's science and innovation workforce as a strategic opportunity**

It is our view that the Research Quality Framework is an opportunity to re-centre the value of outcomes over inputs.

The Government has been quite specific over its desire to extract greater value from its investment in research, and has remained attached to the notion of "impact" despite the challenges of measuring this factor in some research.

The HASS sector sees this as an opportunity. It has felt progressively 'disincentivised' by a system that prioritises high cost research higher degree completions and the quantity of research income, rather than indicators of quality and benefit to society, economy and culture.

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<sup>19</sup> Thomas Barlow, *The Australian Miracle*, Pan Macmillan, Sydney, 2006.

<sup>20</sup> Stuart Cunningham, The humanities, creative arts and the innovation agenda, in *Innovation in Australian arts, media and design: Fresh Challenges for the Tertiary Sector*, eds Brad Haseman, Sue-Anne Wallace, & Rod Wissler, Post Pressed, 2004, p.224

<sup>21</sup> The mechanics of RFCD codes and especially SEO codes, which encourage under-reporting of non-STEM research inputs, mean any such figure is more likely than not to be an underestimate.