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Too Big to Innovate?

The Sense and Nonsense of Big Programmatic Research

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In our contribution to this volume, we argue that Dutch science-funding practices should be recalibrated because the status quo fails to meet its own stated objectives and is causing non-trivial harm along the way. We challenge, in particular, the existing bias toward identifying and awarding scholarly niches and national champions with large grants to ever tinier shares of the submitted proposals. We argue that this is wasteful spending and, when scrutinized, based on unrealistic assumptions about the nature of scientific research and the composition of the scientific community. The bias also skews the incentives for young researchers: by creating a culture of winners and losers, it demoralises promising young scholars and ends up mistakenly treating research and research impact as fundamentally opposed to teaching (rather than complementary activities). The result is that the existing system of funding may have the perverse, if unintended, effect of discouraging originality and innovation. The risk is that it undermines the 'culture of curiosity' that is essential to academic research.

We argue instead for a system of funding in which the existing pie is divided in a less bureaucratic fashion and among many more smaller grants, distributed among more researchers, so as to allow work in smaller, more fluid research combinations. We argue that this can also facilitate a more creative research culture in which different kinds of research approaches can be socially relevant, and in which research curiosity can flourish. Many of the arguments we offer here echo those made by others in various venues. But they are important to take seriously at this juncture in the development and scholarly soul-searching provoked by the National Research Agenda ('Nationale Wetenschapsagenda').

1 All four authors are professors of Political Science at the University of Amsterdam, and have collectively raised grants from Dutch Scientific Council (NWO), European Research Council (ERC), Research Foundation Flanders (FWO), amongst others, worth more than 10 million euros. They have participated in many grant award committees.

Recent trends: centralized competition, declining success rates, increasing corporate orientation

The point of departure for our arguments are several observations about the trends and character of financing scholarship in the Netherlands and Europe, particularly of academic research in the social sciences and humanities. An important issue involves the actual level of financial support for research in the context of scarce research time, alongside teaching and administration. There is some debate as to whether, and in what realms, such financing has become less generous in recent years and decades if one looks at what various types of funding have been made available for actual research time and investment as opposed to various overheads (NRC/Rathenau articles and responses). It is, however, beyond dispute that research monies in Dutch academia have become substantially more subject to competition, as larger proportions of total funding have been shifted away from 'first flow of funds' investment (blocked and un-earmarked monies for research units and universities) and towards 'second ' (NWO) and 'third flow of funds' (EU and other sources) subject to individual or group, thematic or open, grant competitions.

While we would certainly join calls for more substantial investment in scholarly research, our concerns here are additional, involving three well-known features of this competitive financing. The first is that, particularly for the social sciences, acquiring research monies has become increasingly, and fiercely, competitive – in a way that leaves unfunded many researchers and projects deemed to be of high and fundable quality. This is certainly true with respect to the major funding sources for social science scholarship, the NWO, and the European Research Council. In the period 2009 to 2013, for which we have data, the average success rate for all science realms (NWO-Centraal, CW, STW, ALW, EW, Wotro, MaGW, GW, ZonMW, NORO, etc.) and all Dutch universities and institutes is 24%; for the humanities (GW) this figure is about 23%, but for the social sciences (MaGW) it is a mere 16% (NWO documentation 2015, via UvA Universitaire Onderzoekscommissie).

University administrators and Ministry of Education officials often point to the European Union as the promising funding source to take up the slack of national financing. Yet the competition for EU/ERC sources is even more intense, with financing and funding chances actually getting smaller – the average success rate for all funding lines (including sciences, medicine and humanities) has dropped from 20% to 14% in the recent *Horizon 2020* calls, compared to FP7 years. Also, financing in the EU's social-science realms has consistently seen the lowest funding rates, and hence been subject to

the fiercest competition. In the previous FP7 structure, the 'Social Science and Humanities (SSH)', and 'Security' realms for all of Europe in the period up to 2013 amounted to 9% and 16.5%, respectively. In the new Horizon 2020 structure since 2013, 'Society' and 'Security' dropped even further to 8% and 11%, respectively, in 2014. Although Dutch universities have done somewhat better than average, our drop in success rates has in fact been greater, from 13% to 10% for 'Society', and from 23% to 12% for 'Security' in the same period. Although these figures reveal fierce competition the most recent trends are truly worrying, with the Horizon 2020 success rates for the social sciences dropping to a mere 4.2% (!) in 2015. While these figures are in and of themselves very worrying, they mask the fact that a great many (often older) researchers are only eligible for a small minority of grant lines, where the success rates are even worse (e.g. ERC Synergy grants had a success rate of 2.1% in 2014).

A second key characteristic in the implementation of research financing involves the focus on awarding winners and niches with a few large grants and 'consortia'. This is usually justified as recognizing the best research programmes, fostering national champions of excellence and taking advantage of economies of scale in research. The trends towards such champions involve not only individual multi-million-euro grants (e.g. VICI, ERC starter/consolidator/advanced) but also relatively new NWO instruments like the tens of millions of euros spent on single projects in the 'Gravitation' (*Zwaartekracht*) programme. To be sure, there is always a need to tie the financing of research to actual needs of projects, something that can require millions for ambitious research programmes – also in the social sciences and humanities. And there is a need to identify and encourage niches of research excellence within and between universities – something that NWO instruments may well be doing by inspiring productivity and some measures of quality among Veni, Vidi, Vici recipients (Gerritsen et al., 2013). Large grants might provide incentives to prepare and submit projects to compensate for the meagre chances of success. But this is a tendency that should be judged in light of the diminishing success rates and funding trends, meaning that there is a movement towards 'winner-take-all' dynamics where (growing) research demands and capacities are going unsupported.

Third, research financing includes increasing emphasis on more earmarked, thematically focused lines of research, where the themes are increasingly tied to manifesting or ensuring visible social and particularly economic relevance. This dynamic has long been true in the NWO and EU instruments. But it has become particularly clear in the transition from

FP7 to Horizon 2020 – where the latter puts greater weight on impact beyond the fundamental scholarly impact and where many research lines explicitly (and in practice) demand active collaboration with non-research-oriented entities in industry and civil society organisations.

In addition, and closer to home, the entire discussion of the Dutch National Research Agenda (NWA) and reform of the Netherlands Organisation for Scientific Research (NWO) has focused on reorganising funding lines into thematic areas, including the active promotion of 'top sectors' in the Dutch socio-economy. These trends have been reinforced by particular universities and research institutes within universities, such as the priority areas (with supplemental financing) identified by individual universities and faculties. This focus on themes is an important development to judge in and of itself, relative to the more open-ended focus of individual research grant lines; and it is important also to judge given the particular themes and kinds of partnerships that the NWA and top-sector policies envision.

Is the increase in competitive financing, clustering of research into major priority areas that pool facilities in large teams, and focusing on major themes of relevance leading to the innovative and internationally competitive scientific environment that many policymakers seem to dream of? Below we argue that the answer is 'no', for reasons that we divide into a discussion of the pitfalls of clustering into winner-take-all competitions and a discussion of the attempt to tie such clustering to particular themes of social and economic relevance.

The drawbacks of concentrating on big winners: small is beautiful

In this section, we first discuss some drawbacks of the current policy regime with its orientation toward awarding large research grants. We then offer an alternative vision in which we argue for a system that includes more and smaller research grants, selected and awarded through less cumbersome bureaucratic procedures.

In recent years, science policy and universities have championed changes to counter the model of individual, free, and unconstrained research in order to foster clustering and bundling. There is plenty to be said for this: perhaps the model of the lone genius, struggling to complete his (for the lone genius is nearly always gendered male) *magnum opus* in the proverbial attic room might no longer be the right model for young PhDs wishing to embark on a university career. As Stefan Collini (2012, p. 140) points out, 'scholarship is [...] an inherently *cooperative* enterprise' (emphasis in original).

However, we argue that the consolidation of research funding into big grants, 'Gravitation' initiatives, and centres of excellence has reached its limits (Butterworth, 2015). It is both economically inefficient and demoralising to individual researchers. Explaining why this is so entails setting out three arguments. First, the costs of grant writing and reviews exceed the benefits with low success rates. Second, as grant size increases, it becomes less likely that research can afford to be genuinely risky and innovative. Third, the present system demoralises a new generation of excellent researchers before their careers even get off the ground.

First, the costs of grant writing and reviewing are reaching a limit where they are disproportionate to the payoff.[2] In our own experience, this has become particularly acute as a problem given the *opportunity costs* of grant work, the weeks and months (and accompanying stress) that could otherwise be spent on one's actual scholarship and output. And such opportunity costs are higher particularly where one must tailor new proposed lines of research and collaborative organisation to suit the vagaries of particular calls for proposal in a thematic grant line. These are more obviously wasted efforts should a proposal not be granted. Additionally, a host of referees and grant committee members are spending *their* time reviewing mostly unsuccessful grant proposals instead of doing their own research.

These are perennial worries about competitive review in a winner-take-all setting, but evidence from outside of Europe make this problem even greater. In their study of the costs of the grant peer review system in Canada, Gordon and Poulin (2009) found that the cost of preparing and reviewing grant applications now exceeds the gains of selection. They argue that it would be cheaper and more effective to distribute small, direct grants without peer review to all qualified researchers. They consider the grant competition system to be skewed, not just because grant-giving bodies often have near 'monopoly status' (ibid., p. 21), but also because they need to compare 'competing worthiness of distinct goals', rather than adjudicating between 'people trying to attain the same specific goal' (ibid., p. 16).

In addition, there is solid empirical evidence of diminishing returns of grant size. A recent study shows that '[r]esearchers who received additional funds from a second federal granting council, the Canadian Institutes for Health Research, were not more productive than those who received only

2 For a useful, styled arithmetic exercise of the waste in the current Dutch grants system, see De Cruz (2014); for published research on opportunity costs in grant writing with data from the US, see Von Hippel & Von Hippel (2015). Australian researchers have also found non-trivial impact on emotional wellbeing of researchers, see Herbert et al. (2014).

National Science and Engineering Research Council (NSERC) funding. Impact was generally a decelerating function of funding. Impact per dollar was therefore lower for large grant-holders' (Fortan and Currie, 2013). There is an intuitive reason behind this result: as funding increases, excellent researchers are turned into bureaucrats who must manage other people and spend increasing time on reporting rather than on research.

Gordon and Poulin argue that it might be better to distribute grant money randomly or to spread it equally. The outcomes of grant evaluation procedures are often compared to the outcomes of a lottery, and judged to be 'random and arbitrary' (2009, p. 21). But this metaphor does not do justice to the hard work and serious effort by all participants in the grant review procedure. Research councils take great care in designing procedures that are clear and fair, given serious constraints on their budgets.[3] Based on our own experiences with participating in grant awarding and grant review work, we posit that the outcomes of grant review are less like a lottery and more like a carefully polished funnel. Often, grant competitions – despite all their goals of excellence – support compromise and middle ground. A layered collation of assessments underpins any grant decision: for example, in a typical NWO Vidi competition, at least two pre-reviewers (members of the committee) will assess the proposal; then (if the applicant is lucky not to be rejected at pre-review stage) at least four external reviewers (sometimes six or seven) assess the proposal; then the whole committee of twelve to fifteen or more members assess and rank the applicants' interview performance; finally, the NWO domain chair has to formally approve the nominations. At all these stages – except perhaps the last – it is important that the proposal receives support and instils enthusiasm with reviewers and committee members. But it is equally important that, at all these stages, the proposal does not challenge or alienate its readers, or provoke strong negative reactions. All other things being equal, unconventional and controversial approaches within a discipline fare less well than standard and safe approaches. The multilayered and reiterative review system adds up to support mainstream and incremental proposals, not necessarily originality and excellence.

Second, then, we argue that the large grant competitions are inherently conservative in the outcome patterns they generate. This is partly due to the way innovation in research, perhaps particularly in social sciences and humanities, emerges not so much or only from economies of scale but from

3 Whether grant review procedures are clear and fair is beyond the scope of this chapter. Much work is done, for example, in NWO's so-called 'pre-advice' forms, which remain entirely obscure to applicants.

'economies of scope' (see Teese, 1980). These can be understood as informal, intellectual 'trading zones' where theoretical and empirical insights developed with respect to one research line spilling over to others (see Galison, 1997, writing about physics). Institutions or research communities encompassing scholars from very different theoretical and methodological traditions – and, indeed, different disciplines – can trade insights in competitive or collaborative dialogue, even while each is working alone on his or her own boutique research programme. This can inspire innovation and creativity much more than does the pursuit of scale economies. Harnessing such gains from diversity argues against the identification of large-scale clusters or niches.

In any event, the privileging of big priority winners can be conservative and may fail to support innovation given the evaluation procedures governing the picking of winners (and losers). An important example is that feasibility is often an explicit, non-trivial evaluative criterion. To write a grant proposal able to survive the rigorous review procedures that are – necessarily – designed for the largest of grants, the applicant needs to be fully immersed in the subject matter: s/he needs to be thoroughly familiar with the literatures and debates, know exactly what s/he wants to examine, why and how. Successful proposals have to articulate what PhD candidates will be doing in three to four years' time, where they will go, who (for example) they will interview, and what they will ask. The expected outcome of the proposed project and what major breakthroughs it is likely to deliver need to be specified in advance. It is entirely understandable that grant-giving bodies, handing out millions of public money, should desire this level of detail. But if all uncertainty and possibility of surprise is eliminated, why would this process lead to innovative and creative projects?

Moreover, the emphasis on big grants has an anti-innovative effect on the development of young scholars doing their PhDs. Whereas the doctorate was originally considered to be a young scholar's 'master proof', demonstrating his or her ability to conceive, carry out, and write his or her own research from start to finish, we are now training a generation of scholars whose first extensive research experience is in carrying out a research project formulated by someone else. The innovative potential of research questions formulated by graduates in their twenties is largely getting lost.

Large individual grants are the main funding instruments through which creative, independent and curiosity-driven research is supported. However, their evaluation procedures create incentives for applicants to continue with research that has a status quo bias built into it. In addition, existing track records within a given research area will be a major evaluation criterion.

This raises barriers to innovation for even the most successful researcher. Thus, while the NWO experience might entail large grant competitions promoting productivity (Gerritsen et al., 2014), large grant competitions can be expected to 'lock scientists into narrow paths […] reducing the adventure, innovation and scope of their discovery' (Gordon and Poulin, 2009, p. 20).

Within a grant review system in which outliers are systematically disadvantaged, what happens to surprise, to curiosity, to adventure? As Patricia Pisters (2015) has asked, are big grant competitions sufficiently able to support 'unexpected connections [and] unpredictable discoveries'? Do they succeed in stimulating 'the human avidity to know', described by Foucault (1989, p. 305) as an ethos of curiosity that has 'a readiness to find strange and singular what surrounds us; a certain relentlessness to break up our familiarities and to regard otherwise the same things'? Not all good research might know its outcomes in advance.

Third, and perhaps most importantly, we now risk creating a generation of very good and very disappointed young scholars. In the social sciences, direct funding for PhDs has largely dried up. That means that aspiring PhD students are faced with a choice: either they apply to do a PhD within a senior scholar's funded project, which means they can pursue their individual intellectual curiosity only in limited ways, or they pin their hopes on the NWO Talent scheme with a less than 10% success rate and a process that takes nine months, or they commit to doing an unfunded PhD, whilst making a living with teaching or other work.

Once in possession of a PhD, academics are once again confronted with the two-tier system. In many universities, at least in the social sciences and humanities, a full teaching load leaves too little time to maintain an internationally visible research career, however much one loves teaching (and many successful researchers are also passionate teachers). Most Dutch universities lack a system of regular research sabbaticals. This means that young lecturers strongly feel a need to bring in grant income, not just to achieve tenure, but also to shield their research time from the pressures of teaching and management. Now that success rates in the most important grant competitions have fallen so low, young researchers have to get accustomed to being rejected before their careers even get off the ground properly. Clearly, dealing with rejection is part of academic life, and in some cases it leads to better proposals and more determined researchers. However, our research funding system stimulates profound competitiveness with very small chances of winning the competition. Promising young researchers face increasingly pressurised environments, because while grant success rates are going down, the sense of the importance of grant success to their

career prospects is going up. And the problem is compounded for older researchers who survive in such environments – as for them there are very few funding lines to even compete for, making the fundraising standard of success and quality all the more difficult to meet. There is little justification for this state of affairs; people with roughly equal educations and productivity levels are treated as if they have extremely different research skills.

Our proposal

There is no doubt that the future success of grant competitions and the legitimacy of the research councils requires a significant increase in success rates. We do not deny that there *is* a future for grant competitions and research councils. Letting universities distribute all the monies (as Gordon and Poulin suggest) is not a solution: it would increase internal competition, and possibly lead to obscure decision-making (by university managers rather than academic peers). Basically, success rates can be improved in two complementary ways. The first is a very substantial increase in and diversification of government funding for research across the board, including PhD projects, small grants, and funding for large collaborative project. We certainly support such an increase. But the second way is crucial to the current climate where more generous funding appears politically unlikely: success rates can be increased by developing more varied competitions for many, smaller grants and smaller consortia with less burdensome application and review criteria, including periodic small-scale grants for researchers in good academic standing to support, say, modest periods of leave or research assistance. This simultaneously broadens eligibility criteria, because it would open competitions to many more ages and categories of researchers in academia. And it could include more funding for individual PhD projects, allowing future PhD candidates to write their own original proposals (currently, the NWO PhD grant competition *Onderzoekstalent* is one of the worst when it comes to success rates).

Research funding should do more to stimulate independent research and smaller-scale projects (Pisters, 2015). In many research lines in social sciences and humanities, valuable research can be carried out with grants that run into the thousands and ten thousands, rather than millions, of euros, funding some months of teaching buy-out and some travel, research assistance, or data purchase.

Finally, the current funding system only recognizes individual 'principal investigators' who are expected to hire PhDs and post-doctoral researchers,

and large consortia with multiple teams working together. But social scientists and humanists typically collaborate in very small, often horizontal teams of 2-4 people, sometimes based at the same university but often not. Funding these kinds of collaboration, again with small funds and low-intensity procedures, would better connect funding opportunities to actual research practices, instead of getting the practices to contort themselves to be in conformity with eligibility criteria.

Better success rates at research grant competitions entail a better balance between the investments in grant writing and reviewing and the payoffs; it means more room for adventurous, curiosity-driven research (in addition to large projects); and it provides more stimulus and chances to a wider group of young researches.

'Knowledge utilization' in the service of business and government

In this section, we chart how Dutch science policies have come to translate the need for science to be socially relevant into a demand that it should directly serve the corporate sector or the government's knowledge needs. We then outline our own vision of scientific research as networked into, feeding on, and serving a knowledge society, and the kind of funding strategy that would befit and benefit this vision.

More than sixty years ago, the Dutch government founded the Netherlands Organisation for Pure Scientific Research (ZWO). Its remit was to exclusively fund non-applied research. In 1988, the organisation dropped the term 'pure' and began to fund 'both curiosity-driven research and research into issues that occupy [sic] the world.'[4] Social relevance has been an – initially optional – criterion for assessing its research proposals ever since, one that has animated social scientists, since social trends and problems are their object of research, making it inherently relevant to society.

Recently, this element of assessment has been relabelled 'knowledge utilization', reflecting the insight that it is not enough for research just to be relevant to society in principle, but that efforts need to be made for social actors to be able to understand and utilize research findings. In itself, this shift is to be commended: scientists should not be content to publish only in specialist journals and leave a special class of knowledge entrepreneurs to take up their findings – or not. Funded by the taxpayer's money, they should make an effort to explain what they do and why it matters to social actors

4 See NWO's mission statement: www.nwo.nl/en/about-nwo/mission+and+vision

who may learn and profit from their findings. But in NWO competitions, the ways in which knowledge utilization is identified and assessed is sometimes unclear: should researchers blog, tweet, and write op-eds, should they offer direct policy advice, should they contribute to economic growth? Or all of the above? In addition, there is a risk that valorisation prioritizes economic utility and downplays cooperation with the social sector, including NGOs and civic groups.

This upgrading of the old 'social relevance' criterion is part of a broader international trend. In the United Kingdom, the latest national research assessment, Research Excellence Framework, now includes a criterion on impact, which requires institutions to submit case studies documenting how research has had an 'impact', defined as 'change or benefit to the economy, society, culture, public policy or services, health, the environment or quality of life, beyond academia' (REF, 2014, p. 6). The emphasis on impact is problematic on various levels, but at least the referent of the impact is very broadly defined.

In the Netherlands, by contrast, we have recently witnessed a much narrower interpretation of what constitutes appropriate social impact. Ten years ago, policymakers introduced the idea of 'valorisation' as an aim that universities ought to pursue, meaning 'turning research results into economic value'. More recently, in 2011 former Economic Affairs Minister Maxime Verhagen launched the catchphrase 'kennis – kunde –kassa' (knowledge = skills = cash) to express his vision of the contribution of science to society. Investments in science, in other words, were to be translated directly into an increase in the profit margins of the corporate sector. In practical terms, this vision was translated into generous support for the above-mentioned 'top sectors': collaboration between academia and Dutch corporations in nine specific sectors.[5]

While Verhagen's vision may have been extreme in the candidness with which it reduced the purpose of scientific endeavour to the fattening of corporate calves, it is again part of a broader European trend in seeing science as an engine for innovations with economic benefit. The European Research Council, one of the EU's primary funding instruments, appears at first sight very different, with an emphasis on 'investigator-driven frontier research' and a recognition 'that research at and beyond the frontiers of understanding is an intrinsically risky venture'. Yet it also insists that such

5 See Wetenschappelijke Raad voor de Regering [Netherlands Scientific Council for Government Policy], *Naar een lerende economie*, Report No. 90, November 2013, for a critical assessment of the top sector policy even from the perspective of its stated aim of serving the Dutch economy.

research must be 'of critical importance to economic and social welfare'. The economic element is clearly privileged, as illustrated by the ERC Proof of Concept grant available to existing ERC grant recipients for 'bridging the gap between research and a marketable innovation'.[6] There is no equivalent grant for translating one's research findings into social benefits.

The current Minister of Education has walked away from the knowledge-skills-cash catchphrase (characterizing it as 'revolting'), but the tendency to equate social actors with corporate actors remains unchanged. The knowledge coalition behind the Dutch National Research Agenda that is the subject of this volume consists of a wide variety of research institutions, and just two social actors: the Confederation of Netherlands Industry and Employers (VNO-NCW) and the Netherlands organisation for small and medium enterprises (MKB). It is as if the knowledge needs of society are wholly reduced to being factors of economic production.

Funding opportunities for other types of partnership tend to be very narrow and directed. To give one example, a current call for applications by NWO on Security & Rule of Law in Fragile and Conflict-Affected Settings initially appeared relevant to the research of some colleagues. However, it turned out that the research could only relate to specifically named countries where the Netherlands is active as a donor. Hence, one colleague who works closely with Médecins Sans Frontières (MSF) on the influx of refugees from the Mediterranean could not apply because the refugees have fled the named countries, while another colleague who works on precisely the right issues in Latin America could not apply because the region, no longer funded by Dutch development aid, fell outside the call's remit.

Knowledge utilization in the service of a knowledge society

It is appropriate that government funders should encourage scholars to make their work directly relevant and available to social actors. But the variety of ways in which social scientists are already engaging with 'societal stakeholders' is greater than funding agencies can possibly imagine. In our direct environment, we witness extreme variety in the type of actors scholars engage with and the depth, length, and scale of engagement. In terms of the type of actors, some of us advise central bankers and European policymakers, whereas others advise disadvantaged schools, people living with HIV Aids or environmental activists. The depth and length of our

6 See ERC website: https://erc.europa.eu/proof-concept

engagement varies from research projects co-designed from beginning to end with a social actor, such as the Knowledge Programmes initiated by development organisation HIVOS, or a public mediation programme where research and practice are intertwined, to five-minute radio interviews interpreting the latest election polls. The scale of our engagement varies from very targeted interventions such as expert testimony before specific national or European committees, to media performances, columns, or blogs intended for the general public.

We propose that, in addition to the existing practice of asking grant-seekers to describe their plans for knowledge utilization, a set percentage of national and supranational funding should be set aside for research involving in-depth collaboration between researchers and social partners. The forms this may take and the type of societal stakeholder that could be involved should remain largely open. NWO and other funding bodies could build on the NWA exercise in fostering engagement between academics and society at large by creating a pool of volunteer lay reviewers from all sections of society to review such collaborative proposals alongside academic peers. As with the other forms of funding we propose, grants should be small and multipurpose, and procedures should be light. An emphasis on small grants, for example up to €50,000, will not only have the advantages sketched above, but also prevent capture of the scheme by big corporate interests.[7]

Such a scheme would exemplify a funding policy that prioritizes knowledge utilization *without* steering it towards particular (corporate) actors, particular (government policy) agendas, or particular notions of productivity, whilst neglecting or stifling many others. It is in line with what Schnabel et al. have characterized as the 'network university' that serves not just a knowledge economy, but a knowledge society (Sociale Wetenschappen, 2014, pp. 55-56).

Finally, funding bodies should explicitly recognize the most obvious and natural way in which scholars translate their research work into broader social knowledge: via the classroom. Year in, year out, social scientists teach new generations of future societal leaders and citizens what they have learned through their own research and that of others. Once science policymakers recognize this, we can stop treating research and education as opposed to each other.

7 From an economic perspective, this situation resembles a form of rent seeking by richly endowed and well-connected corporate agents, who should, in fact, be able to fund profitable research without government aid. It is by no means obvious that the existing funding policies are the best way to increase social goods.

Conclusion

We have argued against the existing bias toward awarding large research grants, which, given the size of the current research pie, generates extremely low success rates, cumbersome bureaucratic procedures, and considerable opportunity costs. In addition, the bias toward large research grants encourages less innovative research and thereby fails to produce the intended policy goal. We believe that the available grant mix should be diversified with increased availability of smaller grants that can be awarded to more members of the research community. In addition, we have argued that research impact and utilization should be oriented not just toward well-connected corporate agents, but toward a wide diversity of societal stakeholders, including those found in classrooms.

References

Bollen and Scheffer https://omslag.de/onderzoeksfinanciering/de-wijze-massa/

De Cruz, H., 'Gedijt wetenschap het beste bij competitie? Reflecties op de wetenschapsvisie', 12 december, 2014, *Bijnaderinzien,* http://bijnaderinzien.org/2014/12/14/gedijt-wetenschap-het-beste-bij-competitie-reflecties-op-de-wetenschapsvisie/

Fortin, J.-M., and D.J. Currie, 'Big Science vs. Little Science: How Scientific Impact Scales with Funding', *PLoS ONE* 8(6), 2013, e65263. doi:10.1371/journal.pone.0065263

Foucault, Michel, 'The Masked Philosopher' in *Foucault Live: Collected Interviews 1961-1984*, edited by Sylvère Lotringer (New York: Semiotext(e), 1989 [1980])

Galison, P., 'Image & logic: A material culture of microphysics' (Chicago: The University of Chicago Press, 1997)

Gerritsen, S., E. Plug, and K. van der Waal, 'Up or Out?: How individual research grants affect academic careers in the Netherlands', *CPB Working Paper No. 249*, 2013, pp. 1-33

Gordon, R., and B. Poulin, 'Cost of the NSERC Science Grant Peer Review System Exceeds the Cost of Giving Every Qualified Researcher a Baseline Grant', *Accountability in Research: Policy and Quality Assurance* 16 (1), 2009, pp. 13-40

Herbert, Danielle L, et al., 'Public health – Research: The impact of funding deadlines on personal workloads, stress and family relationships: a qualitative study of Australian researchers' *BMJ Open*, 4:3, 2014, e004462. doi:10.1136/bmjopen-2013-004462

Pisters, Patricia (2015) http://rethinkuva.org/blog/2015/03/16/jams-loops-and-downward-spirals-in-the-academic-system/

Research Excellence Framework (REF): *The results*, Higher Education Funding Council for England (HEFCE), 2014

Sociale Wetenschappen: 'Verantwoord en Verantwoordelijk, Sectorplan Sociale Wetenschappen 2014', Commissie Sectorplan Sociale Wetenschappen, 2014

Teece, D.J., 'Economies of scope and the scope of the enterprise', *Journal of economic behavior & organization*, 1(3), 1980, pp. 223-247

von Hippel T., and C. von Hippel, 'To Apply or Not to Apply: A Survey Analysis of Grant Writing Costs and Benefits', *PLoS ONE* 10(3), 2015, e0118494. doi:10.1371/journal.pone.0118494

Werfhorst, van der, Herman, 'NWO benadeelt de sociale wetenschappen', 15 March, 2015 www.hermanvandewerfhorst.socsci.uva.nl/blog/science/nwo/