

# Seeing the bigger picture

## The future of UK research and development – a UCU policy statement

Author: Rob Copeland

December 2014

*Unlike the funding for teaching in higher education, government policy on research has been dominated by a conservative, piecemeal approach. This was exemplified by the low-key *Innovation and Research Strategy for Growth* document, published in 2011.*

### INTRODUCTION

Earlier in the year the UCU published a policy paper on teaching quality and student learning in higher education.<sup>1</sup> The aim of the paper was to put forward a positive alternative to the consumerist agenda in higher education. The following paper seeks to develop the union's position on research policy and funding.

Unlike the funding for teaching in higher education, government policy on research has been dominated by a conservative, piecemeal approach. This was exemplified by the low-key *Innovation and Research Strategy for Growth* document, published back in 2011.<sup>2</sup> Since then we have had the Witty review of the role of universities in generating economic growth, which examined the whole 'third mission' of universities (eg knowledge transfer, relationships with small-to-medium enterprises [SMEs])<sup>3</sup> while, on research infrastructure, we have seen savage cuts in capital spending followed by ad hoc, discretionary increases via the new UK Research Partnership Investment Fund.<sup>4</sup> Further incremental changes to the 'dual support' system have also occurred, in particular the growth of the 'impact' agenda and renewed interest in the use of metrics in research assessment.

The impact of devolution has been much less dramatic on research than in other areas of higher education (eg fees). The Research Council arm of dual support, for example, remains a UK responsibility and funds are allocated competitively to institutions in the four nations. And while the responsibility for allocating research funds via the block grant remains a devolved responsibility, the funding stems from a UK-wide research assessment exercise. Administrations in the four nations have also adopted similar policies on research, including increased concentration of funding and a greater alignment with national priorities.

What has been missing is a white paper-style document on the future of UK research. UCU believes that the time is right for a long-term review of research policy and we call on the next Westminster government to undertake this at the earliest opportunity. We believe that it should be a wide-ranging inquiry along the lines of the 1997 Dearing review, with a broad membership base and opportunities for genuine consultation with staff, students and employers.

*Universities play a significant role in the economic life of the UK, for example, through direct employment and export earnings. But, as in other countries, publicly-funded research in the UK is important in generating economic growth through licences and spin-out companies and through specific research and consultancy for businesses.*

Given that we are in the run-up to a Westminster election it is timely to pull together the main elements of UCU's approach to research funding and assessment. The first section examines why research matters, and in particular the contribution of publicly-funded research to the economy, society and culture. Section two explores the current levels of funding for research, both public sector and private sector mechanisms. These sections draw heavily on the work that we have been undertaking as part of the *Knowledge Economy* campaign.<sup>5</sup>

Section three outlines the main critiques of the current UK framework, while the final section outlines the union's key priorities for research in the next UK Parliament. The position paper reflects longstanding Congress/higher education sector conference (HESC) policy on research assessment and funding,<sup>6</sup> particularly on issues such as the 2014 research excellence framework (REF),<sup>7</sup> open access publishing<sup>8</sup> and the policies of individual research councils.<sup>9</sup> It is also underpinned by existing UCU policy on issues such as fixed-term contracts<sup>10</sup> and equality and diversity in research careers.<sup>11</sup>

Finally, this education policy paper needs to be viewed alongside the work that the higher education committee has been doing on the 2014 REF.<sup>12</sup> When the REF results are published on 18 December, UCU will seek to monitor developments at both the local and national level, particularly the effect on employment and equality issues.

## **SECTION 1: WHY RESEARCH MATTERS**

Universities play a significant role in the economic life of the UK, for example, through direct employment and export earnings.<sup>13</sup> But, as in other countries,<sup>14</sup> publicly-funded research in the UK is important in generating economic growth through licences and spin-out companies and through specific research and consultancy for businesses.<sup>15</sup> By providing advanced research training for thousands of doctoral candidates, universities also ensure a steady supply of highly skilled scientists, engineers and technologists for the wider economy.<sup>16</sup>

The benefits of research, however, are not confined to economic matters or science, engineering and technology-based disciplines. University research in the humanities and social sciences has a significant social and cultural impact on UK life, for example, through improved health and wellbeing and a more open democracy.<sup>17</sup>

Some of this research has been funded via charities and private businesses. However, government funding for research is crucial in ensuring that long-term experimental inquiry – which underpins a knowledge economy – takes place. Block grant funding is particularly important as it allows universities and academics to focus on curiosity-driven research that would not be funded by the private sector. For example, a 2009 report from Universities UK and the UK higher education funding councils – reveals how breakthroughs have been made in areas such as confronting Alzheimer's disease and treating diseases such as cancer, heart disease and diabetes as a result of block grant research funding.<sup>18</sup>

A strong research base is important in fostering a prosperous economy and a healthy society but it requires government to take a long-term strategic approach to investment.

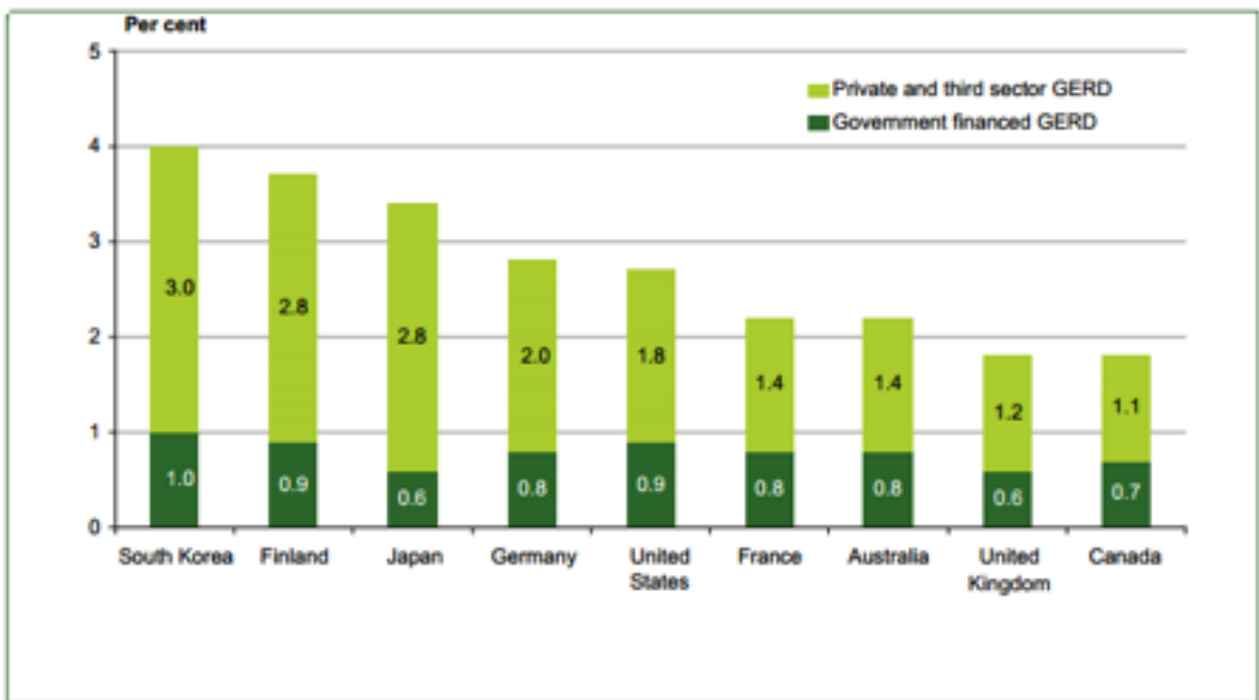
**SECTION 2: UK SPENDING ON RESEARCH AND DEVELOPMENT**

There is a growing consensus that one of the key challenges the UK needs to address is the lack of public and private investment in research and development (R&D).<sup>19</sup>

The UK's total spending on R&D has remained largely static at 1.8% of gross domestic product (GDP) since the early 1990s. Total R&D expenditure in the UK in 2012 represented 1.72% of GDP, a decrease from 1.77% in 2011. This level of UK investment in R&D remains below the Organisation for Economic Co-operation and Development (OECD) and European Union (EU) averages. For example, the EU-28 provisional estimate was 2.06% of GDP in 2012 whereas the 2012<sup>20</sup> OECD average was 2.4%.<sup>21</sup>

To give some specific examples, the US spends around £250 billion (2.8% of GDP) on R&D per year and South Korea doubled its expenditure between 2003 and 2011 to around £35 billion (4.0% of GDP). Countries such as Germany and France have consistently invested more than 2% of their GDP in R&D and aim to increase this to 3% or more in the future.<sup>22</sup>

**Table 1: Total gross expenditure on research and development (GERD) as percentage of GDP in 2011**



**Note:** \* Private and third sector GERD = Total R&D expenditure (GERD) minus government financed GERD  
**Source:** OECD; BIS analysis

Source: BIS (2014) p31

*Research and technological innovation is an internationally competitive activity and during this period a number of other countries, such as Germany, China and the USA, have increased rather than cut public funding for research. The UK government should take the lead in supporting a vibrant publicly-funded research system.*

### Public sector investment

In 2012 public investment in UK research and development stood at 0.59% of GDP. In contrast, the similar percentages for the US and Germany stood at 1.01% and 0.84% of GDP respectively.<sup>23</sup>

In recent years it has been difficult to convince successive UK governments of the need for increased public investment in research. One of their justifications for this has been that, comparatively speaking, the UK is a highly productive research nation in terms of articles and citations per researcher or per unit of R&D expenditure. For example, while the UK represents just 0.9% of global population, 3.2% of R&D expenditure, and 4.1% of researchers, it accounts for 9.5% of downloads, 11.6% of citations and 15.9% of the world's most highly-cited articles.<sup>24</sup> However, without continued investment in the research base, this situation is unlikely to last. We, therefore, support the conclusion of a recent Department for Business, Innovation & Skills (BIS) paper that *'a commitment to a long-term step change in the UK's science and public sector innovation investment is needed if the UK wants to remain a global leader'*.<sup>25</sup>

Since 2010 the so-called 'science ring fence', which includes funding for the seven UK research councils and core research funding allocated by the Higher Education Funding Council for England (HEFCE), has been frozen at approximately £4.6 billion. We recognise that this is a more positive scenario compared to other parts of the post-school education budget in England. At the same time, UK universities experienced a £467 million real-terms cut in public research funding between 2009-10 and 2012-13. Universities UK have calculated that by the end of the spending review period (2014-15) the real-terms cut to universities is likely to be in the region of £600 million.<sup>26</sup> In addition, the total income for the seven research councils has also gone down by about 10% since 2009/10 to £3.47 billion,<sup>27</sup> although the picture varies considerably between the different research councils.<sup>28</sup>

Research and technological innovation is an internationally competitive activity and during this period a number of other countries, such as Germany, China and the USA, have increased rather than cut public funding for research. The UK government should take the lead in supporting a vibrant publicly-funded research system, particularly as evidence shows that this can, in turn, support greater private sector investment.<sup>29</sup>

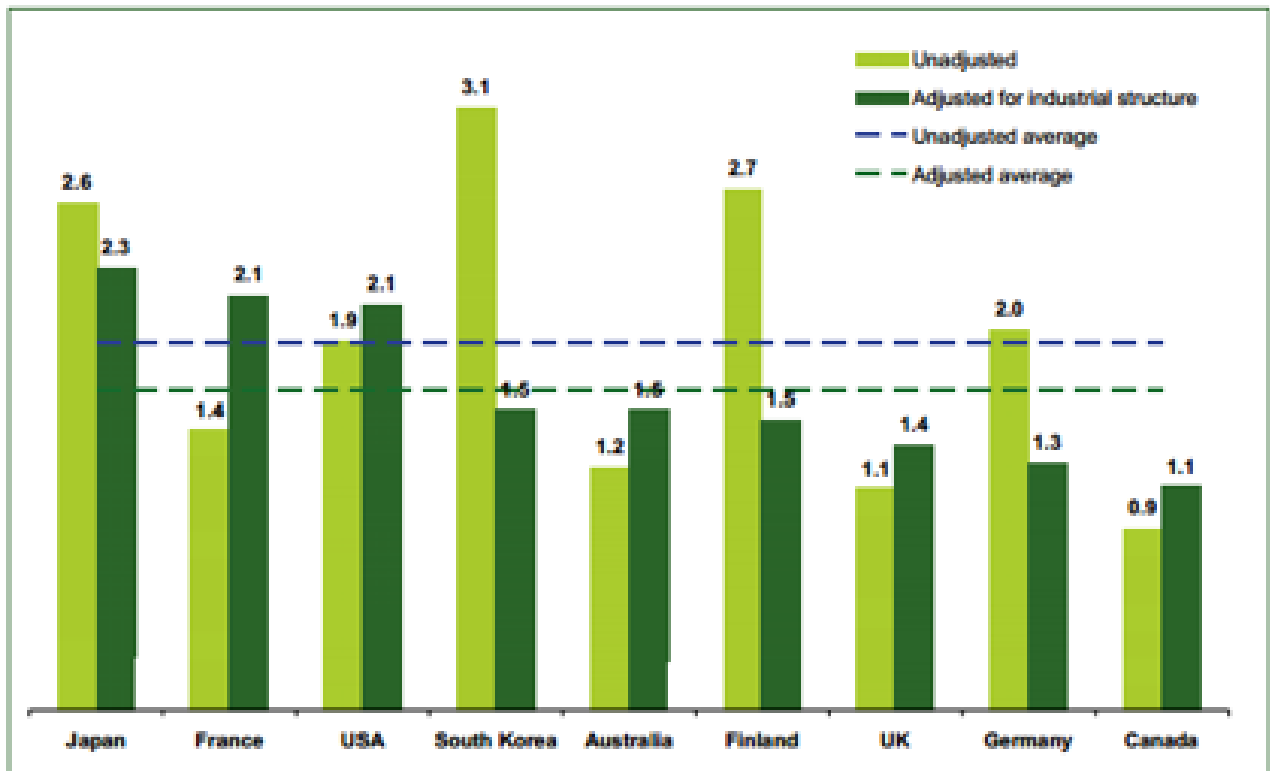
**Through the Knowledge Economy campaign we continue to call on the UK government to ensure that spending on R&D catches up with the average for OECD countries.<sup>30</sup>**

Working with groups such as *Science is Vital*<sup>31</sup> and the *Campaign for Science and Engineering*<sup>32</sup> remains an important part of the *Knowledge Economy* campaign, although the demand for greater research funding should also cover disciplines in the arts, humanities and social sciences.<sup>33</sup>

### Private sector investment

Of course, part of the problem in the UK is the unusually low level of private sector investment in R&D. For example, the UK's private sector R&D investment, measured by Business Enterprise R&D (BERD) was 1.1% of GDP in 2011. This is significantly lower than key comparator nations. For example, South Korea invests 3.1% of GDP; Finland 2.7% of GDP; Japan 2.6% of GDP; USA 1.9% and Germany 2.0%.<sup>34</sup>

**Table 2: Business Enterprise R&D (BERD) as percentage of GDP in 2011, unadjusted and adjusted for underlying sector composition of GDP**



Source: BIS (2014) p33

Over the last decade or so the UK government has introduced a series of innovation policy initiatives to try to tackle the dearth of business investment in R&D. The latest manifestation is the Catapult network for technology and innovation, which are ‘*new centres of excellence where UK businesses, scientists and engineers work together on late-stage research and development – transforming “high potential” ideas into new products and services*’.<sup>35</sup> This activity is often called translational research.

It is too early to assess the impact of the Catapults on translational research, although the new centres rely on comparatively modest public funding. For example, while the Catapult centres have been given £200m to spend over five years, the annual research budget of the German Fraunhofer institutes is £1.4 billion, including a network of 20,000 staff across 60 centres.<sup>36</sup>

R&D tax credits have been another method by which UK governments have sought to stimulate business investment in R&D. However, tax credits and other incentives such as innovation vouchers have, so far, failed to generate a significant increase in business R&D and investment in human capital. In part this may stem from the fact that UK R&D tax credits are less generous than in many other countries.<sup>37</sup> A bigger problem is that tax-based policies fail to address the structural problems inherent in the UK economy, such as the lack of long-term private finance and the vulnerability of UK companies to takeovers by private equity firms.<sup>38</sup>

It is time to consider a more radical approach to investment in UK research and technology. Professor Mariana Mazzucato has outlined the case for an ‘entrepreneurial

*The demand for increased public investment in research is a key element in the UCU's Knowledge Economy campaign. In addition, we believe that there are problems with the way in which research funding is assessed and distributed in UK higher education.*

state' which seeks to use instruments such as a state investment bank to direct public resources into technological innovation (for example, as occurs with the KfW in Germany or the Brazilian development bank – BNDES). A new approach also requires government to think creatively about how best to recoup some of their major investments in basic and applied research (for example, in key areas such as biotechnology and ICT). For example, SITRA, the Finnish government's public innovation fund, provided the early stage funding for Nokia. By retaining some equity in the company, SITRA were able to reinvest these returns in future innovation.<sup>39</sup>

**In the UK we need to explore how we can get a better return on our public investment in research and innovation.**

### **SECTION 3: CRITIQUE OF THE UK FRAMEWORK**

#### **Introduction**

The demand for increased public investment in research is a key element in UCU's *Knowledge Economy* campaign. In addition, we believe that there are problems with the way in which research funding is assessed and distributed in UK higher education. Before outlining these it is useful to sketch out the main features of the UK framework.

Under the UK dual support system the funding councils provide block grant funding for institutions to support the research infrastructure, fund permanent academic salaries and enable universities to produce self-directed research. This funding is allocated on a competitive basis, currently via the 2008 Research Assessment Exercise (RAE) and from 2015-16 via the Research Excellence Framework (REF). This is known as quality-related (QR) funding and in 2012-13 universities received £1.94 billion in QR funding.<sup>40</sup>

The UK research councils, charities, the EU and government departments provide grants for specific research projects and programmes. This is the second key element in the dual support system and for 2013-14 the budget for the research councils was £2.77 billion, including support for the specialist research council institutes.<sup>41</sup> Charities are a particularly important part of the higher education landscape and account for 20% of UK universities' research grants and contracts.<sup>42</sup> A separate Charity Research Support Fund (CRSF) exists to provide increased public resources for universities to cover the costs of research overheads (for example, in 2014-15 the CRSF will amount to approximately £198 million in England alone).<sup>43</sup>

Finally, there is an element of public funding for 'knowledge exchange and transfer', in particular the Higher Education Innovation Fund (HEIF) in England and Knowledge Partnership Grants in Scotland. For example, in 2014-15 the overall HEIF budget will be £160 million.<sup>44</sup>

#### **What are the key problems with the UK dual support system?**

##### ***Dominance of the RAE and now the REF***

The successful distribution of public funding for higher education research involves striking a balance between the need, on the one hand, to ensure accountability and 'value for money' in the use of public funds, and, on the other, to encourage creative enquiry and flexibility. We believe that the balance has gone too far in the direction of centralised assessment and intrusive evaluation over the last two decades.

*Part of the problem with the UK assessment system stems from the fact that 100% of core research funds are attached to the REF results.*

Arguably the key problem stems from the dominance of UK national research assessment exercises. The 2014 REF, for example, is probably unique in terms of its size, complexity and the proportion of core funding that is attached to the results. The consequence is that the REF is seen as ‘the only game in town’. And while other countries have also gone down the research evaluation route, no-one has done so on the scale of the UK.<sup>45</sup> For that reason we are sceptical about recent proposals to extend the REF model to countries such as Australia, New Zealand and Hong Kong.<sup>46</sup>

For many years we have pointed out that the REF and the RAE before it have had a largely detrimental impact on the higher education sector and on staff in particular: for example, increasing workload pressures, creating unreasonable performance expectations on staff and exacerbating inequalities between different groups of staff (for example, men and women).<sup>47</sup> Similar trends have been reported in the academic literature on UK research assessment,<sup>48</sup> including wider educational policy concerns. For example, studies suggest that the RAE has weakened rather than strengthened the links between research and teaching.<sup>49</sup>

Academics have also highlighted the ways in which the RAE/REF have limited intellectual freedom and restricted the character, breadth and inter-disciplinarity of research.<sup>50</sup> The assessment criteria have meant articles in mainstream journals are favoured at the expense of monographs or interdisciplinary publications,<sup>51</sup> while conventional approaches within the discipline are prioritised over the unfashionable or heterodox, for example, in economics.<sup>52</sup>

Part of the problem with the UK assessment system stems from the fact that 100% of core research funds are attached to the REF results. Another issue is the high degree of selectivity in relation to the REF star levels, eg ‘world-leading’ (four star), ‘internationally excellent’ (three star), ‘recognised internationally’ (two star). For example, as with the current RAE it seems likely that firstly, a two-star REF output will receive no public funding and that secondly, there will be a significant gap in the funding ratios between four-star and three-star research. Panel judgements, therefore, will have a significant effect on departmental funding levels and the career prospects of individual academics.

**In short, we believe that the UK’s uniquely high-stakes, winner-takes-all research assessment system needs major reform.**

### ***Decline in the proportion of core funding***

While the RAE/REF have dominated research activity for nearly 30 years, the block grant for research now provides a dwindling proportion of public research funds. This is because project-based funding, particularly from charities and international sources of funding, has grown at a much higher rate than funding council grants.

Back in 2004, Jonathan Adams identified the distorted nature of the current dual support system:

*‘The greatest problem... is that over time there has developed an increasing imbalance between the money provided as core research funding by the Funding Councils and the amount provided as project grants, with the consequence that universities are unable properly to support the amount of research that they are carrying out. The key issue is not one of changing the way funds are allocated, but substantially restoring the core*

*The reality is that research potential is distributed very widely throughout our higher education institutions, but it is increasingly frustrated by a core funding model that operates as if it were to be found only in a dozen or so universities.*

*funding stream and building back the characteristics that have enabled the UK research base to be so effective and so efficient for so long.<sup>53</sup>*

Since 2004, the gap between QR funding and project funding has grown wider, partly as a result of the full economic costing of research.<sup>54</sup> Despite the drawbacks with the current system, block grant funding enables universities and academic staff greater opportunities to undertake curiosity-driven research and to sustain research strengths during temporary changes in political or academic fashion.<sup>55</sup>

**We, therefore, call on future governments to prioritise investment in block grant funding for research.**

### **Over-concentration of funding**

Another key objective of research policy is to strike a balance between, on the one hand, supporting research excellence, and, on the other, encouraging dynamism in the sector, allowing new subjects and centres to develop. We are concerned that the recent policy of increasing the concentration of funding in a small number of ‘leading’ institutions risks undermining the health and dynamism of the research base as whole, and reducing the capacity of some regions to undertake necessary research.<sup>56</sup>

In 2012-13, 25% of the UK’s total recurrent research funding was allocated to five universities, 50% to 12 universities and 75% to 31; the remaining 130 universities shared 25% of QR funding. Funding allocated by the research councils is even more concentrated. For example, in 2012-13 75% of research council funding was shared by only 22 higher education institutions.<sup>57</sup>

Heavy concentration of QR funding has deprived many talented researchers, especially relatively new entrants to the profession, of access to research support. The reality is that research potential is distributed very widely throughout our higher education institutions, but it is increasingly frustrated by a core funding model that operates as if it were to be found only in a dozen or so universities.

Research concentration is not simply a problem with RAE/REF style funding as similar policies are being enacted by the UK research councils. For example, the Economic and Social Research Council (ESRC) has restricted doctoral training support to pre-1992 institutions. The exclusion of all post-1992 universities from the new ESRC framework underestimates the research capacity of these institutions and fails to recognise their strengths and contributions within the social sciences. Such policies also lead to greater differences in experiences for students, including the majority of students from black and minority ethnic backgrounds who are disproportionately found in institutions with low levels of research funding.

**For all of these reasons we call for a reduction in the concentration of research funding and for the development of a funding model that helps to sustain the diverse network of research activity across all levels and disciplines.**

### **A preoccupation with scale and STEM**

The problem of ‘hyper-concentration’ of research funding is bound up with a preoccupation with scale. There is an assumption that ‘excellent’ research must necessarily take place in large research units (or those with a sufficient ‘critical mass’). This is



*We believe that subject-based peer review remains an essential, if imperfect, means of judging the quality of academic research and that technocratic alternatives such as citation counts are no substitute for the difficult and time-consuming process of academic judgement.*

unhelpful as concentrating resources on the basis of scale could destroy the high-quality small research units that form a key part of the UK research base.

This situation has arisen partly as a result of successful lobbying by particular university mission groups. But it also stems from a 'big science' model of research funding which is often inappropriate for non-STEM subjects. For example, a highly selective funding model may be appropriate for research in particle physics but makes no sense for research in moral philosophy. A STEM-dominated policy is also apparent with many of the schemes funded by the Technology Strategy Board (for example, the various Catalyst funds.)<sup>58</sup> This approach underestimates the value that the arts and humanities can play in our creative industries and in wider contributions to culture and society.

**STEM research is vital to our future economic and social wellbeing, but we also need to make sure that the arts, humanities and social sciences receive their fair share of research funding.**

**In addition, we call on the research councils to recognise and reward high-quality research wherever it exists (ie regardless of the size of the 'research unit').**

#### **Research assessment: the preference for technocratic tinkering**

In the last few years we have seen a preoccupation with new technocratic initiatives in UK research assessment. One of these has been the introduction of metrics-based assessment, particularly citation counts, as a possible alternative and/or supplement to subject-based peer review.

Our biggest concern with citation counts is the assumption that they are a proxy for measuring the quality of research. There are a range of problems with this type of assumption, including subject bias and a tendency to under-count specialist sub-fields or heterodox positions within the discipline.<sup>59</sup>

Of course, peer review is not without its own drawbacks. Elements of subjectivity are never entirely absent from a process based on academic judgement. We accept that more could be done to improve the transparency and representativeness of review processes. In addition, peer review activities such as editing journals and participation in REF and Research Council panels need to be better recognised at an institutional level (for example, promotion procedures should consider such work a contribution to the 'academic public good' to be valued alongside teaching and research work).

However, we believe that subject-based peer review remains an essential, if imperfect, means of judging the quality of academic research and that technocratic alternatives such as citation counts are no substitute for the difficult and time-consuming process of academic judgement.

Another politician-led innovation has been the development of the research 'impact' agenda, firstly within the research councils and then as a crucial element within the 2014 REF. While UCU members are keen to ensure that publicly-funded research benefits our economy and society, they have serious concerns about how 'impact' is conceptualised and measured in the research assessment process. Many academics view the 'impact' agenda as a government-led attack on core academic values and the ethos of university research. For example, in 2009 nearly 18,000 academics,

*The relationship between the research councils and the Department for Business Innovation and Skills (BIS) needs to be more open and transparent so that it is clearer about the degree to which BIS is directing research council decisions, especially with regards to their delivery strategies.*

higher education professionals and researchers signed a UCU petition calling for the UK funding councils to withdraw the original 'impact' proposals for the REF.<sup>60</sup>

We were disappointed that impact criteria retained a 20% weighting in the 2014 REF and are concerned that there has been a rush to judgement regarding the apparent success of the new impact criteria.<sup>61</sup>

**As with the current review of metrics,<sup>62</sup> we call for a proper independent review of the effects of the 'impact' agenda on UK research activity.**

#### ***Increasing micro-management of the research councils***

In recent years concerns have been raised about increasing government interference in determining the priorities of the research councils. Of course, the idea that research councils are free to set their own priorities ceased to be true in practice some years ago.<sup>63</sup> However, there is some evidence to suggest that the current administration has gone further than previous ones in using its control of the finances to ensure greater compliance with a government-led agenda. Perhaps the most notorious example was the decision of the Arts and Humanities Research Council (AHRC) to include a contribution to the 'Big Society' in its delivery plans. And while there was little evidence of direct political interference, many academics perceived this to be a craven attempt by the AHRC to curry favour with the new coalition government.<sup>64</sup>

It is important for the research councils to balance the requirement to respond to government priorities with an ability to maintain their academic independence. This requires the research councils to be more proactive in challenging the government over the issue of research priorities. The relationship between the research councils and BIS needs to be more open and transparent so that it is clearer about the degree to which BIS is directing research council decisions, especially with regards to their delivery strategies.

**In addition, we call for a proper discussion about the pros and cons of different types of research council grants.** In recent years there has been a shift away from responsive mode funding in favour of directed mode funding.<sup>65</sup> The latter covers proposals in defined, cross-sectoral programmes which are seen as strategic priorities by the government (the current themes are digital economy, nanotechnology, energy, living with environmental change; global security; an ageing population).

Similarly, a number of research councils have abolished their smaller grants in favour of larger awards. Small grants, however, can be an excellent way for early career researchers to get a foothold on the funding ladder. Alongside various subject associations,<sup>66</sup> we are unconvinced that putting more and more funding into large 'strategic' grants is necessarily the best way to fund all forms of high-quality research, particularly in the arts, humanities and social sciences.

#### ***Lack of long-term infrastructure funding***

In general, UK research funding suffers from an overly short-term approach. Perhaps the classic example is public spending on research infrastructure, whereby massive cuts in capital expenditure between 2009- 2011 have been followed by ad hoc, discretionary increases. Such stop-start policies on capital spending make it hard for universities to plan their research effectively.

*Recent infrastructure initiatives have failed to pay sufficient attention to the importance of ensuring a suitably skilled workforce, including funding for training and professional development and the facilitation of viable career paths. These elements need to be built into the requirements of future infrastructure schemes.*

UCU believes that long-term stability in capital funding for universities and research councils is vital to improve UK research capacity. It is also important to get the balance right between high-profile capital projects, for example, the Graphene Engineering Innovation Centre<sup>67</sup> or the Alan Turing Institute,<sup>68</sup> and day-to-day investment in research infrastructure across the higher education sector.

Public funding is required to maintain and upgrade equipment in all universities and research institutes as well as to purchase new equipment for projects funded by research councils. We also need to ensure there is proper national infrastructure support for open access research repositories.<sup>69</sup>

**We, therefore, support the call made by the Royal Society of Chemistry for more ‘bread and butter investment’ in research infrastructure.**<sup>70</sup> Non-STEM disciplines should also be included in UK-funded infrastructure projects (which is effectively not the case with the current UKRPIF).

Recent infrastructure initiatives have also failed to pay sufficient attention to the importance of ensuring a suitably skilled workforce, including funding for training and professional development and the facilitation of viable career paths. These elements need to be built into the requirements of future infrastructure schemes.

#### ***Uncertainty regarding ‘knowledge transfer’ activities***

In many higher education institutions ‘third-mission’ work, such as collaborating with SMEs, has become an important part of their activities. Over the last decade there has been a significant increase in the level of university-business and community interaction, particularly through consultancy and collaborative and contract research. For example, a recent report for HEFCE found that the total knowledge exchange investment has risen from £3.4 billion in 2011-12 to £3.6 billion in 2012-13, an increase of 5%.<sup>71</sup>

In England the government’s Higher Education Innovation Fund (HEIF) has played a key role in facilitating greater knowledge transfer between universities and business. At the same time, more could be done to improve incentives for universities to engage with innovative SMEs and community organisations. **In particular, we support the recommendation in the Witty review calling for the Westminster Government to make an explicit long-term commitment to HEIF and to increase the HEIF budget to £250 million a year. In line with the Scottish approach to knowledge transfer, we welcome the principle of a baseline level of support for all higher education institutions.**

Further development of this agenda, however, is dependent on stronger guidelines governing university-business collaborations, including commercially-sponsored research. For example, the use of commercial confidentiality agreements to restrict the publication of research results can be a particular problem with pharmaceutical industry funded research.<sup>72</sup> **We, therefore, call for stricter academic freedom protections over the content and publication of research results and the establishment of clear conflicts of interest policies.**

#### ***Problems with the recruitment and development of researchers***

A recent report for BIS argued that the ‘recruitment, development and motivation of researchers’ was the key factor in ensuring high-quality academic research. The BIS report identified two major impediments to achieving these goals: first, the time and

*Alongside Universities UK and the National Union of Students we have called for major reforms to the UK visa system, including removing international students from the migration cap and greater opportunities for the reintroduction of a post-study work visa.*

effort associated with recruiting individuals that require a visa to work in the UK and second, a lack of recognition for carrying out mentoring and appraisal activities.<sup>74</sup>

Alongside Universities UK and the National Union of Students we have called for major reforms to the UK visa system, including removing international students from the migration cap and greater opportunities for the reintroduction of a post-study work visa. It is also important to acknowledge the difficulties that international staff face in negotiating the UK visa system.<sup>75</sup> **We need to make sure that the UK is a welcoming place for both international students and staff in higher education.**

In addition, there is a need to ensure equality and diversity in research careers, particularly in STEM subjects. A new Campaign for Science and Engineering (CaSE) report – *Improving diversity in STEM* – shows that women, disabled people and those from ethnic-minorities or socially-disadvantaged groups are consistently under-represented, particularly at senior levels, in science and engineering. The report proposes a series of ‘quick’ wins such as mandatory unconscious bias training for all research council panels and ‘big’ wins such as making diversity a central plank in the development of all government policy making on STEM.<sup>76</sup>

Another policy imperative is to ensure a sufficient supply of UK-domiciled researchers, particularly postgraduate researchers. A HEFCE study from 2011 found that the number of PhD starters from a UK domicile increased by over 50% between 1996-97 and 2009-10, whereas the number of starters from an EU or international domicile more than doubled.<sup>77</sup> However, in 2012-13 the number of postgraduate research students started to fall (-0.5%) and since 2010-11 we have seen a decline in the number of research council PhD studentships.<sup>78</sup> In addition, a recent report commissioned by BIS shows that UK HEIs are expecting reduced demand for PhD study as a result of the impact of undergraduate loans and diminished funding for taught postgraduate programmes.<sup>79</sup>

A related issue is the relatively high number of PhD holders who are working outside the UK higher education sector. For example, three and a half years after completion over 60% of PhDs are working outside the sector<sup>80</sup> and the Royal Society estimates that only 3.5% of science PhDs stay in academia for the rest of their careers.<sup>81</sup> While we welcome the need for better support for research staff to explore research careers outside of higher education and to encourage a positive and natural turnover of research staff, no other profession appears to be willing to sacrifice its experienced and able workforce on such a regular basis on the flimsy argument that we need to make ‘space’ for ‘fresh blood’.

One of the reasons why a large proportion of PhD holders do not end up working in the sector is the lack of a proper career pathway and job security. In 2012/13, the latest period for which Higher Education Statistics Agency (HESA) data is available, the higher education research community in the UK was numbered at a total of just over 40,000 people, of whom the vast majority worked full time but were on fixed term contracts. As is highlighted in *table 3*, 67% of all full-time research-only staff counted by HESA are on fixed-term contracts. This will heavily underestimate the level of actual casualisation since many researchers are now employed on open-ended contracts, which HESA bundles up with permanent contracts but many of which are in fact dependent on the continued existence of short-term funding grants for continued employment.

**Table 3: Research staff according to terms and mode of employment**

RESEARCHERS – 2012/13 (HESA 2014)						
FULL-TIME			PART-TIME			
	Open-ended/ permanent	Fixed-term contract	Total	Open-ended/ permanent	Fixed-term contract	Total
Research only						
Female	4715	10220	14935	1880	3130	5010
Male	6530	13340	19875	755	1775	2530
<b>Total research only</b>	<b>11245</b>	<b>23565</b>	<b>34810</b>	<b>2635</b>	<b>4905</b>	<b>7540</b>

Compared to other highly-skilled professions, higher education research is a highly precarious career. The predominance of fixed-term posts can make a university research career an unattractive one and hard to pursue in the long term (eg the difficulty in settling in one location and the impact of that on family life).<sup>82</sup> Working practices within a fixed-term context can also cause inefficiencies within the research system as a whole (e.g. researchers focusing on new funding bids rather than being able to complete existing projects, HR departments spending considerable amounts of time on the renewal of contracts etc.)<sup>83</sup>

**We believe that there is a better way to organise the employment of researchers in UK higher education. The following section outlines our proposals in more detail.**

#### **SECTION 4: UCU'S PRIORITIES FOR RESEARCH**

##### **Long-term investment strategy**

There is growing consensus that the UK needs to close the investment gap on research and innovation. Alongside a range of sector bodies, the UCU calls for long-term certainty on public investment and real terms increases to the research budget to bring the UK's investment in line with international R&D averages.

##### **Fundamental review of research funding and assessment**

In 2015 the funding councils will undertake an operational review of the 2014 REF. While this is welcome we call for a much wider review of the current funding model. It should explore research funding on both sides of the dual support system and address key aspects of research policy, including workforce issues, capital funding and the relationship between research and 'third mission' activities.

A fundamental review of research assessment and funding should examine all policy options, including:

- considering a minimum level funding for HEIs to offer some form of research environment, within which the resources exist for research and scholarship to take place both to support and inspire students<sup>84</sup>

*The increased commercialisation of research policy and funding, including new 'strategic partnerships' between research councils and individual corporations suggests that we need new measures to protect and strengthen academic freedom.*

- encouraging the maximum participation of all research staff in the assessment process
- reconsidering current levels of selectivity between 4\*, 3\* and 2\* REF outputs<sup>85</sup>
- exploring the potential of differential funding ratios by subject (ie the differences between particle physics and moral philosophy)
- considering how research, scholarship and teaching can become properly integrated and mutually supportive processes in both REF and research council assessment criteria
- exploring how best to reward departments and research units that have developed 'good practice' on staffing issues (eg on equality, support for 'early career' staff etc)
- considering ways to increase the transparency of peer review processes, and
- exploring how best to ensure genuine open access of research publications.

### **Strengthening institutional autonomy and academic freedom**

Given the continuing uncertainty about the relationship between the research councils and government, UCU recommends new legislation to protect the independence of research councils.

Moreover, the increased commercialisation of research policy and funding, including new 'strategic partnerships' between research councils and individual corporations<sup>86</sup> suggests that we need new measures to protect and strengthen academic freedom, including:

- legal protection of academic freedom be extended to cover staff in all universities and colleges across the UK, building on the 1997 UNESCO Recommendation on the Status of University Teaching Personnel;
- academic freedom is conceived not just as a defence of the right to express controversial or unpopular opinions, but also positively as the freedom of academic and related staff to pursue their own lines of research, rather than being constrained by the funding or ideological agendas of government or business;
- alleged breaches of academic freedom should be investigated and adjudicated by a body similar to the Office of the Independent Adjudicator for students.<sup>87</sup>

### **Making the UK an attractive place for research staff**

In general, we agree with the analysis of the learned societies that:

*'Ongoing investment must be made in the skills and training of staff to populate and continually develop the UK's research facilities. Clear stable career paths are needed to attract, develop and retain these research and technical staff vital to research facilities, and their contribution should be properly evaluated in the evaluation and funding processes'.<sup>88</sup>*

On postgraduate training we call for an increase in the number of research council funded studentships and an independent review of funding for taught postgraduate courses.

The research councils also have a role to play in fostering an employment environment that supports more attractive and sustainable research careers. As we noted above, there are serious inefficiencies that arise from the short-term, project based funding model: wasted time and effort associated with grant applications, lost projects and intellectual lines of inquiry and the continuous churn of talented researchers out of the sector. UCU's view is that universities have, with some notable exceptions, generally failed to grasp the opportunity to engage in collective bargaining that could mitigate these inefficient effects.

While we continue to press universities to take their role as employers of researchers seriously, UCU encourages the research councils to examine ways in which they could take action to facilitate rather than hinder the permanent employment of research staff on the appropriate academic grade. The Research Councils UK (RCUK) Academic Fellowship Scheme<sup>89</sup> shows that there is potential to build on existing practice, but changing the short-termist culture prevalent in university research will take more far-reaching change. Possible measures would be:

- extending the duration of grant funding
- making it a condition of grant that institutions reduce reliance on fixed-term contracts and establish bridging funds and redeployment policies for their research staff
- facilitating and funding the development of national and regional talent pools to assist researchers in securing ongoing work
- committing to funding research posts at higher grades with reference to the national academic role profiles.

In terms of equality and diversity we call for the funding bodies and education institutions to take on board the recommendations in the CaSE report.<sup>90</sup>

The UCU will continue to press universities to support improved career structures for research staff. In addition to our national and local collective bargaining, we have sought to develop a range of supportive tools for research staff, such as the *Researchers' Survival Guide*<sup>91</sup> and the UCU researchers' email network, and we have begun to expand the range of UCU continuing professional development<sup>92</sup> courses that are available for early-career researchers. These types of small-scale interventions can lead to day-to-day improvements in the lives of individual researchers. However, they must be combined with wider campaigns for alternative policies on research and higher education. That is why that, in this paper, we are calling for major changes to research funding and assessment in UK higher education.

## NOTES

- <sup>1</sup>UCU (2014) Beyond the consumerist agenda: teaching quality and the 'student experience' in higher education, February: [http://www.ucu.org.uk/media/pdf/j/q/ucu\\_teachinginhe\\_policy\\_feb14.pdf](http://www.ucu.org.uk/media/pdf/j/q/ucu_teachinginhe_policy_feb14.pdf)
- <sup>2</sup>BIS (2011) Innovation and Research Strategy for Growth, December  
<https://www.gov.uk/government/news/multi-million-package-announced-to-boost-innovation-and-research-in-the-uk>
- <sup>3</sup>BIS (2013) Encouraging a British Invention Revolution: Sir Andrew Witty's Review of Universities and Growth, October  
[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/249720/bis-13-1241-encouraging-a-british-invention-revolution-andrew-witty-review-R1.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/249720/bis-13-1241-encouraging-a-british-invention-revolution-andrew-witty-review-R1.pdf)
- <sup>4</sup>For details of the UKPRIF, see <http://www.hefce.ac.uk/whatwedo/rsrch/howfunder/ukprif/>
- <sup>5</sup><http://www.knowledgeeconomy.org.uk/>
- <sup>6</sup>UCU (2010) HESC motion 'Research funding', HE31 <http://www.ucu.org.uk/4652>
- <sup>7</sup>The HESC has passed numerous motions on the REF since 2010, covering a range of employment, equality and education policy issues.
- <sup>8</sup>UCU (2013) HESC motion 'Open access', HE20  
<http://www.ucu.org.uk/index.cfm?articleid=6613#HE20>
- 'Open access publishing', HE21 <http://www.ucu.org.uk/index.cfm?articleid=6613#HE21>
- 'The Finch report', HE22 <http://www.ucu.org.uk/index.cfm?articleid=6613#HE22>
- <sup>9</sup>UCU (2012) HESC motion 'The Economic and Social Research Council's Doctoral Training Centres', HE23 <http://www.ucu.org.uk/index.cfm?articleid=6119#HE23>
- UCU (2011) HESC motion 'The 'Big Society' and political interference in Research Council priorities', UCU (2009) HESC motion 'Engineering and Physics Research Council (EPSRC) Funding Applications', L7 <http://www.ucu.org.uk/3892>
- <sup>10</sup>For details of UCU's work to challenge casualisation, including researchers, see <http://www.ucu.org.uk/stampout>
- <sup>11</sup>UCU (2014) HESC motion 'The Research Excellence Framework and gender discrimination', HE18  
<http://www.ucu.org.uk/index.cfm?articleid=7082#he18>
- UCU (2013) HESC motion 'REF 2014: ensuring equality' HE13  
<http://www.ucu.org.uk/index.cfm?articleid=6613#HE13>
- <sup>12</sup><http://www.ucu.org.uk/ref>
- <sup>13</sup>Universities UK (2014) The impact of universities on the UK economy, April  
<http://www.universitiesuk.ac.uk/highereducation/Documents/2014/TheImpactOfUniversitiesOnTheUKEconomy.pdf>
- <sup>14</sup>For the US, see for example, The Science Coalition (2013) Sparking Economic Growth 2.0 – Companies Created from Federally Funded University Research, Fueling American Innovation and Economic Growth, October  
<http://www.sciencecoalition.org/reports/Sparking%20Economic%20Growth%20FINAL%202010-21-13.pdf>
- <sup>15</sup>The Russell Group (2010) The economic impact of research conducted in Russell Group universities,  
[http://russellgroup.ac.uk/uploads/RG\\_ImpactOfResearch2.pdf](http://russellgroup.ac.uk/uploads/RG_ImpactOfResearch2.pdf)
- Million+ (2014) The economic and social benefits of research funding in universities, 25 September  
<http://www.millionplus.ac.uk/news-views/latest-news-views/growth-by-research-case-studies-test>
- <sup>16</sup>Evidence Ltd (2010) The future of the UK university research base. A report for Universities UK, July, pp.55-56 <http://www.universitiesuk.ac.uk/highereducation/Documents/2010/FutureOfResearchLiteratureReview.pdf>
- <sup>17</sup>British Academy (2014) Prospering wisely. How the humanities and social sciences enrich our lives, February <http://www.britac.ac.uk/prosperingwisely/pub/pdf/prospering-wisely.pdf>



Russell Group (2010) The social impact of research in Russell Group universities, <http://russellgroup.ac.uk/uploads/SocialImpactOfResearch.pdf>

<sup>18</sup>Universities UK et al (2009) Securing world-class research in UK universities: exploring the impact of block grant funding  
<http://www.universitiesuk.ac.uk/highereducation/Documents/2009/WorldClassResearch.pdf>

<sup>19</sup>Million+ (2014) The Innovation Challenge: a new approach to research funding, September  
<http://www.millionplus.ac.uk/research-policy/reports/latest-reports/research-report-the-innovation-challenge-a-new-approach-to-research-funding>

University Alliance (2014) Science and Innovation: future-proofing the eco-system  
<http://www.unialliance.ac.uk/blog/2014/09/12/science-and-innovation-future-proofing-the-ecosystem/>

Russell Group (2013) OECD Education at a Glance report, 25 June, <http://www.russellgroup.ac.uk/russell-group-latest-news/154-2013/5514-oecd-education-at-a-glance-report/>

Universities UK (2014) UUK President to outline pre-election priorities for universities, 9 September, <http://www.universitiesuk.ac.uk/highereducation/Pages/AnnualConferenceUUKPresidentSpeech2014.aspx#.VC1xVPIdWWU>

<sup>20</sup>Office for National Statistics (2014) UK Gross Domestic Expenditure on Research and Development, 2012, 12 March [http://www.ons.gov.uk/ons/dcp171778\\_355583.pdf](http://www.ons.gov.uk/ons/dcp171778_355583.pdf)

<sup>21</sup>OECD (2014) OECD Factbook - Economic, Environmental and Social Statistics, p152

<sup>22</sup>Figures taken from Vince Cable's speech at The Mission-Oriented Finance for Innovation (MOFI) conference, 23 July 2014  
<https://www.gov.uk/government/speeches/innovation-and-the-uks-knowledge-economy>

<sup>23</sup>Million+ (2014) The Innovation Challenge: a new approach to research funding, p6

<sup>24</sup>BIS (2013) International Comparative Performance of the UK Research Base – 2013, A report prepared by Elsevier for BIS, p2 [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/263729/bis-13-1297-international-comparative-performance-of-the-UK-research-base-2013.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/263729/bis-13-1297-international-comparative-performance-of-the-UK-research-base-2013.pdf)

<sup>25</sup>BIS (2014) Insights from international benchmarking of the UK science and innovation system, BIS analysis paper number 03, p6  
[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/277090/bis-14-544-insights-from-international-benchmarking-of-the-UK-science-and-innovation-system-bis-analysis-paper-03.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/277090/bis-14-544-insights-from-international-benchmarking-of-the-UK-science-and-innovation-system-bis-analysis-paper-03.pdf)

<sup>26</sup>Universities UK (2014) Research and postgraduate research funding, p2  
<http://www.universitiesuk.ac.uk/highereducation/Documents/2014/ResearchAndPGRtraining.pdf>

<sup>27</sup>BIS (2014) Research Council impact reports 2013, May  
[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/301473/bis-14-654-research-council-impact-reports-2013-trends-in-inputs-outputs-and-outcomes\\_formatedit.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/301473/bis-14-654-research-council-impact-reports-2013-trends-in-inputs-outputs-and-outcomes_formatedit.pdf)

<sup>28</sup>While the social sciences have seen a 23% cut, earth sciences have received a 13% increase, see Universities UK (2014) Research and postgraduate research funding, p15

<sup>29</sup>Campaign for Science & Engineering (2014) The Economic Significance of the UK Science Base, Briefing Note, April [http://sciencecampaign.org.uk/?page\\_id=14040](http://sciencecampaign.org.uk/?page_id=14040)

<sup>30</sup>UCU (2013) Spending review submission, May  
[http://www.ucu.org.uk/media/pdf/h/g/ucu\\_2013\\_spendingreviewsubmission\\_v2.pdf](http://www.ucu.org.uk/media/pdf/h/g/ucu_2013_spendingreviewsubmission_v2.pdf)

<sup>31</sup><http://scienceisvital.org.uk/>

<sup>32</sup><http://sciencecampaign.org.uk/>

<sup>33</sup>Paul Whiteley (2013) 'Investing in higher education, including the social sciences, would promote growth in Britain', LSE British Politics and Policy blog, 15 May  
<http://blogs.lse.ac.uk/politicsandpolicy/does-britain-under-invest-in-social-science/>

<sup>34</sup>BIS (2014) Insights from international benchmarking of the UK science and innovation system, IS analysis paper number, p 33

<sup>35</sup><https://www.innovateuk.org/-/catapult-centres>

- <sup>36</sup>Figures taken from Stephen Harris (2014) 'Catapult Centres', *Ingenia*, issue 58, March  
<http://www.ingenia.org.uk/ingenia/articles.aspx?index=882>
- <sup>37</sup>Miriam Frankel (2012), 'UK in bottom half of global R&D tax credit ranking', *Research Fortnight*, 6 August  
[http://www.researchresearch.com/index.php?option=com\\_news&template=rr\\_2col&view=article&articleId=1218845](http://www.researchresearch.com/index.php?option=com_news&template=rr_2col&view=article&articleId=1218845)
- <sup>38</sup>House of Commons Science and Technology Committee (2013) Bridging the valley of death: improving the commercialisation of research  
<http://www.parliament.uk/business/committees/committees-a-z/commons-select/science-and-technology-committee/news/130313-valley-report-published/>
- <sup>39</sup>Mariana Mazzucato (2013) 'Lighting the innovation spark' in Andrew Harrop (ed) *The Great Balancing – how to fix a broken economy*, Fabian Society, pp42-53  
[http://marianamazzucato.com/file\\_upload/00000000074.pdf](http://marianamazzucato.com/file_upload/00000000074.pdf)
- Mariana Mazzucato (2014) Startup myths and obsessions, *The Economist*, Feb 3  
<http://www.economist.com/blogs/schumpeter/2014/02/invitation-mariana-mazzucato>
- Mariana Mazzucato (2012) 'Without state spending there'd be no Google or GlaxoSmithKline', *The Guardian*, 22 April  
<http://www.theguardian.com/commentisfree/2012/apr/22/without-state-spending-no-google-glaxosmithkline>
- <sup>40</sup>Universities UK (2014) Research and postgraduate research funding, June, p11
- <sup>41</sup>For a list of RC-funded institutes, see <http://www.rcuk.ac.uk/funding/noparentrcs/>
- <sup>42</sup>Universities UK (2014) Research and postgraduate research training, p21
- <sup>43</sup>While the Charity Research Support Fund has helped to make charity funded research more sustainable, it attracts a lower level of financial support compared to research council funding. In addition, although there has been a significant increase in the amount of charity funded research over the last few years, funding for the CRSF has remained flat.
- <sup>44</sup>HEFCE (2013) Funding for universities and colleges for 2012-13 and 2013-14: Board decisions, February  
<http://www.hefce.ac.uk/pubs/year/2013/ci042013/name,76487,en.html>
- <sup>45</sup>Diana Hicks (2011) 'Performance-based university research funding systems', *Research Policy*, doi:10.1016/j.respol.2011.09.007 ; Aldo Geuna and Ben R. Martin (2003), University research evaluation and funding: an international comparison, *Minerva* 41: 277-304,  
[http://www.sussex.ac.uk/Users/prff0/Publications/Geuna%20and%20Martin%20Univ%20research%20evaluation\\_2003.pdf](http://www.sussex.ac.uk/Users/prff0/Publications/Geuna%20and%20Martin%20Univ%20research%20evaluation_2003.pdf)
- <sup>46</sup>David Matthews (2014) 'HEFCE looks at overseas links for research excellence', *Times Higher Education*, 10 April  
<http://www.timeshighereducation.co.uk/news/hefce-looks-at-overseas-links-for-research-excellence/2012572.article>.
- See also the current HEFCE consultation on an 'international REF':  
<http://www.hefce.ac.uk/news/newsarchive/2014/news94764.html>
- <sup>47</sup>For example, see the results of the 2013 UCU survey on the REF  
<http://www.ucu.org.uk/media/pdf/0/q/REF-survey-report-September-2013.pdf>
- <sup>48</sup>Lisa Lucas (2006) *The Research Game in Academic Life*, Maidenhead: SRHE and Open University; Louise Morley (2003) *Quality and Power in Higher Education*, Maidenhead, SRHE & Open University
- <sup>49</sup>Alan Jenkins (1995), 'The Impact of the Research Assessment Exercise on Teaching in Selected Geography Departments in England and Wales', *Geography*, Vol 80 part 4 (349), pp 367-374; Ian McNay (1999) 'The Paradoxes of Research Assessment Funding', in *Changing relationship between higher education and the state*, ed Mary Henkel and Brenda Little, London: Jessica Kingsley Publishers, pp 191-203
- <sup>50</sup>For a good summary, see Ben Martin and Richard Whitley (2010) 'The UK Research Assessment Exercise. A case of regulatory capture?' in *Reconfiguring knowledge production: changing authority relationships in the sciences and their consequences for intellectual innovation*. OUP Uncorrected proof – first proof, 22/3/2010, pp.69-71  
<https://www.sussex.ac.uk/webteam/gateway/file.php?name=Fac-BRM-OUP-RAE&site=25>
- <sup>51</sup>See Paolo Palladino (2013) 'Why the REF is bad for the very idea of the university', *UCU REF Watch*, 10 December  
<http://ref.web.ucu.org.uk/2013/12/10/why-the-ref-is-bad-for-the-very-idea-of-the-university/>

- <sup>52</sup>Frederic S Lee (2007) 'The Research Assessment Exercise, the State and the Dominance of Mainstream Economics in British Universities', Cambridge Journal of Economics, 3(2): 309-25. PDF available here: <http://www.hetecon.net/documents/ResearchAssessment/RAE-CJE.pdf>
- <sup>53</sup>Jonathan Adams (2004) What future for dual support?, HEPI, February <http://www.hepi.ac.uk/wp-content/uploads/2014/02/6-Dual-Support.pdf>
- <sup>54</sup>Alan Hughes et al (2013) The Dual Funding Structure for Research in the UK: Research Council and Funding Council Allocation Methods and the Pathways to Impact of UK Academics, A report from the Centre for Business Research and the UK Innovation Research Centre to the Department for Business, Innovation and Skills, February, p3 [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/181652/bis-13-545-dual-funding-structure-for-research-in-the-uk-research-council-and-funding-council-allocation-methods-and-the\\_pathways-to-impact-of-uk-academics.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/181652/bis-13-545-dual-funding-structure-for-research-in-the-uk-research-council-and-funding-council-allocation-methods-and-the_pathways-to-impact-of-uk-academics.pdf)
- <sup>55</sup>Universities UK et al (2009) Securing world-class research in UK universities: exploring the impact of block grant funding; Evidence Ltd (2005) Impact of selective funding of research in England, and the specific outcomes of HEFCE research funding. A desk-based review for HEFCE and the Department for Education and Skills, September <http://webarchive.nationalarchives.gov.uk/20130401151715/http://www.education.gov.uk/publications/eOrderingDownload/RW47.pdf>
- <sup>56</sup>Evidence Ltd (2003) Funding research diversity – the impact of further concentration on university research performance and regional research capacity. A report for Universities UK <http://www.universitiesuk.ac.uk/highereducation/Documents/2003/FundingResearch.pdf>
- Evidence Ltd (2007) Monitoring research diversity: changes between 2000 and 2005. A report for Universities UK, [http://www.universitiesuk.ac.uk/highereducation/Documents/2007/MonitoringResearchDiversity2000\\_2005.pdf](http://www.universitiesuk.ac.uk/highereducation/Documents/2007/MonitoringResearchDiversity2000_2005.pdf)
- Evidence Ltd (2009) Monitoring research concentration and diversity: changes between 1994 and 2007. A report for Universities UK [http://www.universitiesuk.ac.uk/highereducation/Documents/2009/MonitoringResearchDiversity1994\\_2007.pdf](http://www.universitiesuk.ac.uk/highereducation/Documents/2009/MonitoringResearchDiversity1994_2007.pdf)
- <sup>57</sup>Million+ (2014) The Innovation Challenge: a new approach to research funding, p18
- <sup>58</sup><https://www.innovateuk.org/-/catalysts>
- <sup>59</sup>For a good critique of metrics, see Meera Sabaratnam and Paul Kirby (2014) Response to the Independent Review of the Role of Metrics in Research Assessment, June <http://thedisorderofthings.com/2014/06/16/why-metrics-cannot-measure-research-quality-a-response-to-the-hefce-consultation/>
- <sup>60</sup>[http://www.ucu.org.uk/media/pdf/n/q/ucu\\_REFstatement\\_finalsignatures.pdf](http://www.ucu.org.uk/media/pdf/n/q/ucu_REFstatement_finalsignatures.pdf)
- <sup>61</sup>For example, the Witty review called for an increase in the weighting attached to impact criteria from 20% to 25%.
- <sup>62</sup>Chaired by Professor James Wilsdon 'The Independent review of the role of metrics in research assessment' was launched in May 2014, <http://www.hefce.ac.uk/whatwedo/rsrch/howfundr/metrics/>
- <sup>63</sup>Paul Jump (2011), 'Haldane myth prevents a 'grown-up approach' to setting of research policy', Times Higher Education, 23 June: <http://www.timeshighereducation.co.uk/416585.article>
- Nick Hillman (2014) 'Why Labour's attack on government science policy is misplaced', The Guardian, 24 September <http://www.theguardian.com/higher-education-network/blog/2014/sep/24/nick-hillman-labour-science-policy-funding>
- <sup>64</sup>Miriam Frankel (2011) 'AHRC Peer Review College members launch petition to end Big Society funding', Research Fortnight, 30 March [http://www.researchresearch.com/index.php?option=com\\_news&template=rr\\_2col&view=article&articleid=1046461](http://www.researchresearch.com/index.php?option=com_news&template=rr_2col&view=article&articleid=1046461)
- <sup>65</sup>The latest report from BIS suggests that the proportion of the research councils' spend on directed mode funding will increase from 19% to 22%, see BIS (2014) Triennial review of the research councils: final report, April 2014, p37 [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/303327/bis-14-746-triennial-review-of-the-research-councils.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/303327/bis-14-746-triennial-review-of-the-research-councils.pdf)

- <sup>66</sup>Paul Jump (2011), 'PSA protests to Willetts over demise of grants', Times Higher Education, 26 May 2011, <http://www.timeshighereducation.co.uk/news/psa-protests-to-willetts-over-demise-of-grants/416282.article>
- <sup>67</sup>HEFCE (2014), '£60 million of public and private investment for new leading-edge graphene research facility', 10 September: <http://www.hefce.ac.uk/news/newsarchive/2014/news88239.html>
- <sup>68</sup><https://www.gov.uk/government/news/plans-for-world-class-research-centre-in-the-uk>
- <sup>69</sup>UCU (2013) Open access: campaign briefing, November  
[http://www.ucu.org.uk/media/pdf/5/2/ucu\\_openaccess\\_campaignbriefing\\_nov13.pdf](http://www.ucu.org.uk/media/pdf/5/2/ucu_openaccess_campaignbriefing_nov13.pdf)
- <sup>70</sup>Clare Viney (2014), 'UK science needs more bread-and-butter investment', The Guardian, 12 June  
<http://www.theguardian.com/science/blog/2014/jun/12/uk-science-bis-consultation-capital-investment>
- <sup>71</sup>HEFCE (2014) Universities drive growth across the UK, 12 June  
<http://www.hefce.ac.uk/news/newsarchive/2014/news87376.html>
- <sup>72</sup>Scientists for Global Responsibility (2009) Science and the corporate agenda, p23-32  
[http://www.sgr.org.uk/SciencePolicy/SGR\\_corp\\_science\\_full.pdf](http://www.sgr.org.uk/SciencePolicy/SGR_corp_science_full.pdf)
- <sup>73</sup>For some of the difficulties arising from university-business collaborations in Canada, see Canadian Association of University Teachers (2013) Open for business – on what terms? An analysis of 12 collaborations between Canadian Universities and Corporations, Donors and Governments, November  
[http://www.caut.ca/docs/default-source/academic-freedom/open-for-business-\(nov-2013\).pdf](http://www.caut.ca/docs/default-source/academic-freedom/open-for-business-(nov-2013).pdf)
- <sup>74</sup>Economic Insight (2014) Growing the best and brightest: the drivers of research excellence. A report for the Department for Business, Innovation and Skills, March: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/298507/Growing\\_the\\_Best\\_and\\_Brightest\\_The\\_Drivers\\_of\\_Research\\_Excellence.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/298507/Growing_the_Best_and_Brightest_The_Drivers_of_Research_Excellence.pdf)
- <sup>75</sup>Times Higher Education (2014) 'Non-EU scholars struggling with the UK's visa policy', 2 January, <http://www.timeshighereducation.co.uk/features/non-eu-scholars-struggling-with-the-uks-visa-policy/2010106.fullarticle>; Harriet Swain (2013) 'Is Britain closing its doors to foreign academics?', The Guardian, 28 October  
<http://www.theguardian.com/education/2013/oct/28/overseas-academics-refused-uk-visas>
- <sup>76</sup>Campaign for Science and Engineering (2014) Improving diversity in STEM, May  
<http://sciencecampaign.org.uk/CaSEDiversityinSTEMreport2014.pdf>
- <sup>77</sup>HEFCE (2011) PhD study – trends and profiles 1996-97 to 2009-10, October, p8  
[http://www.hefce.ac.uk/media/hefce/content/pubs/2011/201133/11\\_33.pdf](http://www.hefce.ac.uk/media/hefce/content/pubs/2011/201133/11_33.pdf)
- <sup>78</sup>Universities UK (2014) Research and postgraduate research funding, p32
- <sup>79</sup>Robin Mellors-Bourne et al (2014) Understanding the recruitment and selection of postgraduate researchers by English higher education institutions. A report to HEFCE by CRAC/Vitae and iCeGS, September, pp 26-7  
[http://www.hefce.ac.uk/media/hefce/content/pubs/indirreports/2014/understandingtherecruitmentandselectionofpgrsbyenglishheis/2014\\_pgrrecruitment.pdf](http://www.hefce.ac.uk/media/hefce/content/pubs/indirreports/2014/understandingtherecruitmentandselectionofpgrsbyenglishheis/2014_pgrrecruitment.pdf)
- <sup>80</sup>BIS (2014) Insights from international benchmarking of the UK science and innovation system, p42
- <sup>81</sup>Royal Society (2010) The Scientific Century – securing our prosperity, March, p14  
[https://royalsociety.org/~media/Royal\\_Society\\_Content/policy/publications/2010/4294970126.pdf](https://royalsociety.org/~media/Royal_Society_Content/policy/publications/2010/4294970126.pdf)
- <sup>82</sup>Science is Vital (2011) Careering Out of Control: A Crisis in the UK Science Profession? A report prepared by Science is Vital at the request of the Rt Hon David Willetts MP, Minister of State for Universities and Science, 5 October  
<http://scienceisvital.org.uk/wp-content/uploads/2013/01/ScienceCareers-report-WEB.pdf>
- <sup>83</sup>Liz Oliver and Louise Ackers (2005) Fixed Term Positions in the Academic Career Trajectory, CSLPE Working Paper, No 3, pp19-21  
<file:///C:/Users/rcopeland/Downloads/Paper%203%20Final%2026%20April%202005.pdf>
- <sup>84</sup>For example, this has been proposed by the Welsh Assembly's Finance Committee, see David Matthews (2014) 'All Welsh universities 'deserve' share of research cash', Times Higher Education, 22 May, <http://www.timeshighereducation.co.uk/news/all-welsh-universities-deserve-share-of-research-cash/2013463.article>

<sup>85</sup>In their latest policy statement Million+ is calling for the restoration of funding for 2\* research, see The Innovation Challenge, p20

<sup>86</sup>For example, between the Natural Environment Research Council (NERC) and Shell. See Kieron Flanagan (2014) 'Research Councils should steer clear of partnerships with individual firms', The Guardian, 11 February <http://www.theguardian.com/science/political-science/2014/feb/11/research-councils-should-steer-clear-of-strategic-partnerships-with-individual-firms>

<sup>87</sup>UCU (2010) Education for the future: UCU's manifesto for post-school education, February, p15 [http://www.ucu.org.uk/media/pdf/e/r/ucu\\_postschoolmanifesto\\_feb10.pdf](http://www.ucu.org.uk/media/pdf/e/r/ucu_postschoolmanifesto_feb10.pdf)

<sup>88</sup>Royal Society, British Academy, Royal Academy of Engineering and the Academy of Medical Sciences (2014) Response to the consultation on proposals for long-term capital investment in science and research, July, p4 <https://royalsociety.org/~media/policy/Publications/2014/040714-joint-academies-response-to-capital-consultation.pdf>

<sup>89</sup>RCUK <http://www.rcuk.ac.uk/Publications/archive/AcademicReport/>

<sup>90</sup>Campaign for Science and Engineering (2014) Improving diversity in STEM

<sup>91</sup><http://www.ucu.org.uk/researchstaff>

<sup>92</sup>[http://cpd.web.ucu.org.uk/files/2014/07/Course\\_Outline.pdf](http://cpd.web.ucu.org.uk/files/2014/07/Course_Outline.pdf)