# It is not all about performance: Importance of the funding formula in the allocation of performance-based research funding in England

**Mehmet Pinar ***
Business School, Edge Hill University, St Helens Road, Ormskirk, L39 4QP, Lancashire, UK
* Corresponding author. Email: mehmet.pinar@edgehill.ac.uk

## Abstract

Performance-based research funding systems have become popular over the last decades. One of the main reasons for these funding systems is to allow funding bodies to allocate public research funds more effectively based on the assessed quality. However, the performance-based research funding received by higher education institutes (HEIs) not only depends on the quality of research activity carried out but also on the funding formula used by funding bodies. This paper examines the funding formula used by Research England (RE) and assesses the effect of this formula on quality-related research (QR) funding allocation using data of mainstream QR funding allocation for the 2017-2018 period. RE's funding formula includes some value judgements by policymakers such as allocation of fourfold QR funding to "world-leading" research compared to "internationally-excellent" research, and the use of different subject cost weights. These value judgements play an important role in the allocation of QR funding beyond the assessed quality of research. This paper finds that changes in some of these value judgments such as allocation of threefold (rather than fourfold) QR funding to world-leading research compared to internationally-excellent research, or the use of alternative subject cost weights lead to major changes in the allocation of QR funding to different subject areas and HEIs. Results suggest that these value judgments are also important beyond the assessed quality of research, and that consultation of different subject areas and HEIs about these decisions and re-evaluation of some of these value judgements are needed for a more accountable distribution of QR funding.

*Keywords*: Performance-based research funding systems; Research assessment systems; Research excellence Framework; Research Funding; Quality-related research funding; England

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## 1. Introduction

Performance-based research funding systems (PRFSs) have become more and more popular over the last decades (see e.g. Hicks 2012; Rebora and Turri 2013; Dougherty et al. 2016; Sivertsen 2017), with up to 17 European Union member states currently using PRFSs to evaluate the quality of research (Jonkers and Zacharewicz 2016). The main reasons for introducing the PRFSs are to provide accountability for public investment, allocate research funding selectively to the best performers, and create performance incentive for higher education institutes (HEIs) and researchers (Hicks 2012; Jonkers and Zacharewicz 2016; HEFCE 2017a).

The research performances of HEIs in different subject areas are evaluated based on quantitative bibliometric metrics (e.g. journal impact factors, citations received, and so on) or informed peer-review assessments. Either approach has its pros and cons (Jonkers and Zacharewicz 2016). Bertocchi et al. (2015) find that there is good agreement between bibliometric and informed peer-review assessments in Economics, Management, Statistics, and History fields in Italian research evaluation, suggesting that bibliometric evaluation could be used to monitor the research output of a nation on a more frequent basis as peer-review assessments have a considerable time interval between two evaluations (see also Ancaiani et al. 2015). Bibliometric evaluation can also decrease the costs of review (De Boer et al. 2015; Geuna and Piollato 2016) because carrying out peer-review assessments are expensive. Take, for example, the cost of conducting the Research Excellence Framework (REF) in 2014 (REF2014) in the UK, calculated to be £246 million (Stern 2016). On the other hand, Wang, Veugelers, Stephan (2017) argue that 'novelty' and 'significance' of research activity may not be identified by bibliometric information as 'novel' research can be published in so-called 'low impact factor journals' and recognition can be delayed. Hence peer-review assessments have more chances to identify 'novel' research. Given that both approaches have pros and cons, Hicks et al. (2015) suggest a combination of two evaluation processes.

Whichever way the research activity is evaluated (peer-review assessment or bibliometric indicators, or a combination of both), PRFSs affect the behaviour of HEIs, departments, and researchers. For instance, HEIs appoint researchers based on their eligibility for the inclusion to the next research assessment exercise (Broadbent 2010) and they prioritize these exercises not only to obtain higher levels of performance-based research funding but also to improve their ranking positions as performance outcomes in these exercises are also part of indicators lists in the university rankings (Moed 2008; Hicks 2009).

Furthermore, HEIs can also decide not to return some subject areas to the assessment exercises if the relative performance of this subject within the institute and across the HEIs is weaker (Johnston and Reeves 2017). Research assessment exercises also put pressure on researchers to be more productive and limit their autonomy (Hicks 2009; Martin 2011; Smith, Ward, and House 2011; Watermeyer 2016), and affected their publication patterns and strategies (Butler 2003; Anderson and Tressler 2014; Hammarfelt and de Rijcke 2015; Sile and Vanderstraeten 2019), which has led to increased academic misconduct to keep up with these high expectations (Qiu 2010; van Dalen and Henkens 2012; Martin 2013; Hall and Martin 2018).

There is an extensive body of literature dealing with the effects that research assessment exercises and PRFSs have on the behaviour of HEIs, departments, and researchers. However, there has been no research to date that explicitly examines the effect of the funding formula used by policymakers on the allocation of performance-based research funding across subjects and HEIs. Recent studies have examined different aspects of the evaluation criteria used in performance evaluation. Sivertsen (2018) reviewed that a different set of weights is used to evaluate a different type of publications and quality of outputs in Norway to incentivize production of a higher quality of research. Verleysen and Engels (2018) and Engels and Guns (2018) also discussed how weights attached to the different type of publications may affect funding allocations in Flanders. Related to this, Abramo, D'Angelo, and Rosati (2013) highlighted the importance of accounting for the number of co-authors of a given research outcome, and Harzing (2012) suggested the use of author-adjusted age-weighted citation rates when evaluating the individual performance of researchers. University rankings have also been found to be volatile and dependent on normative decisions made by ranking providers (Saisana, d'Hombres, and Saltelli 2011; Pinar, Milla, and Stengos 2019). Despite recent literature examining the normative weights assigned to a different type of publications, assessment and ranking criteria, and the importance of publication characteristics (e.g. publication age and number of authors), there are no investigations of the effect of policymakers' value judgments on the allocation of performance-based funding. The aim of this article is to address this gap using 2017-18 quality-related research (QR) funding allocation by Research England (RE). This allows exploration of the effect that different components of a funding allocation formula have on the distribution of performance-based research funds, and the consequences for one of the largest research evaluation exercises in Europe (the REF).

RE currently allocates QR funding across four main panels, subject areas, and HEIs following a four-stage formula (criteria). In Stage 1, they divide total QR funding into three pots (i.e. research outputs, environment, and impact) based on their respective weights in the REF2014. In Stage 2, QR funding in each pot is distributed across four main panels based on cost-weighted eligible research items. These depend on the total amount of research activity evaluated as world-leading and internationally excellent, with weights based on the cost of conducting research in each discipline. In Stages 3 and 4, QR funding in each panel is shared across 36 unit of assessments (UoAs) and HEIs based on the cost- and quality-weighted (i.e. the world-leading research receiving fourfold QR funding compared to internationally-excellent research activity) eligible volume of research.

Although the evaluated performance (i.e. quality of research) is an essential factor in the allocation of QR funding, the distribution of funds is also dependent on some decisions made by RE in their funding allocation formula. This article examines the effect of three of these decisions or value judgements. First, the formula driving the distribution of funds accros four main panels in Stage 2 is different from that in Stages 3 and 4 (when QR funds are allocated to UoAs and HEIs). In particular, quality weights attached to world-leading and internationally excellent research activities are not considered in Stage 2, but play a key role in Stages 3 and 4. Second, world-leading research activities are allocated fourfold of QR funding compared to the internationally excellent research activities in Stages 3 and 4. Third, each subject area (UoA) is given a cost weight based on the cost of conducting research in each UoA (e.g. RE assumes that costs of conducting research in Mathematical Sciences and Clinical Medicine are 60% more compared to costs of conducting research in social sciences such as Economics and Econometrics, Business and Management Studies, Law, Politics, and International Studies, with the former and latter groups of subject areas given weights of 1.6 and 1, respectively). To evaluate the implications of some of the normative decisions made by RE while allocating QR funding, this article explores the following research questions:

1) What are the consequences of allocating QR funding to four panels based on cost-weighted eligible volumes of research without considering the quality weights? How would QR funding allocation be affected if policymakers include quality weights in Stage 2?
2) Is research activity that is assessed as world-leading four times more important than internationally excellent research activity, following the rationale implicitly used by

RE in Stages 3 and 4? How would QR funding allocation be affected if a different weight ratio between world-leading and internationally-excellent research is used?

3) How well do cost weights assigned by policymakers to each subject reflect the actual cost of conducting research in these subject areas? If there exists a proxy to measure the relative cost of conducting research in different subjects, then how is QR funding allocation among different subjects and HEIs affected by the use of such proxy?

This article includes a detailed review of how RE distributes mainstream QR funding (section 2) and assesses the effect of the three normative decisions described above (Section 3. Section 4 concludes and discusses future research.

## 2. Distribution of mainstream QR funding by Research England after REF2014

The REF2014 evaluated the quality of the research produced in 36 UoAs by panels of academic experts, research users, and specialist advisors. UoAs were classified into four panels (Panel A: Medicine, Health, and Life Sciences; Panel B: Physical sciences, Engineering, and Mathematics; Panel C: Social Sciences; and Panel D: Arts and Humanities). Overall quality profile was obtained based on the quality of research in three elements: research outputs (outputs hereafter), impact of this research beyond academia (impact hereafter), and the research environment (environment hereafter), where each element was given 65%, 20%, and 15% weight, respectively. Submissions under each research element were evaluated through a peer review process by subpanel members, and awarded quality profiles based on the following five-point scale: world-leading (4-star), internationally excellent (3-star), internationally recognized (2-star), nationally recognized (1-star), and unclassified (items that fall below the standard of nationally recognized work).[1] The resulting quality profiles were then used to allocate QR funding by RE.

A total of £1,606 million research funds was distributed in 2017-18 by RE, with £1,098 million out of this allocated based on the performances of HEIs in the REF2014 (also known as the mainstream QR funding). Various factors were used in this process including the volume of research, quality profiles of submitted UoAs by HEIs, subject cost weights, and quality weights. The stages followed by RE to allocate mainstream QR funding to four main panels, UoAs, and HEIs are detailed in paragraphs 120-136 in HEFCE (2017b).

[1] See https://www.ref.ac.uk/2014/ for the results and documents related to the REF2014.

The volume of research was calculated from the number of full-time equivalent researchers submitted to the REF2014. The eligible volume of research for QR funding was determined based on the assessed research quality, with only world-leading and internationally excellent research activities qualifying for funds. To separate fields based on how expensive is it to conduct research, RE used three cost-bands for different UoAs: band A (High-cost laboratory and clinical subjects), band B (Intermediate-cost subjects), and band C (Other subjects), with costs weights of 1.6, 1.3, and 1, respectively (see paragraph 127 of HEFCE 2017b for further details).[2] Roughly speaking, this means that high-cost laboratory and clinical subjects would receive almost 60% more mainstream QR funding compared to social sciences subjects, even when two subjects in different bands produced the same quality and volume of research (see HEFCE 2017c for subject cost weights).

To sum up, each UoA and HEI were allocated QR funding based on their volume of research activity reaching 3-star and 4-star quality levels in the REF2014, multiplied by cost and quality weights. Finally, it should be noted that HEIs within inner and outer London area receive 12% and 8% (respectively) additional QR funding on top of their allocated mainstream QR funding.[3]

## 3. Value judgments of Research England and their effect on QR funding distribution

The funding allocation formula used by RE had some value judgements with the potential to affect QR funding allocation to panels, UoAs, and HEIs. The next subsections examine the effect of three of these value judgements, namely the formula used to distribute mainstream QR funding across the four main panels, the relative quality weights attached to world-leading and internationally excellent research activities, and the subject-cost weights given to each UoA.

[2] It should be noted that the Psychology, Psychiatry, and Neuroscience UoA was allocated a cost weight of 1.42 (different than the cost weights allocated in each band) to recognise that about 40 per cent of research in this unit is high-cost and the other 60 per cent intermediate-cost. Similarly, for the Geography, Environmental Studies, and Archaeology UoA, Research England recognizes that around half of all the research activity submitted in this unit could reasonably be regarded as more closely analogous to science (see paragraph 135 of HEFCE, 2017b).

[3] In this article, to compare the effect of normative decisions made by RE on the allocation of mainstream QR funding, we avoid this additional funding allocation that is based on the location of HEI.

### 3.1. Allocation of QR funding across four main panels based on cost-weighted eligible volume

In Stage 2 of RE's QR funding formula (section 1), the total funds for each pot (i.e. output, impact, and environment) were distributed to the four panels (A-D) proportional to the cost-weighted eligible volume. However, RE did not consider the quality of research produced by each panel at this stage (i.e. both 3-star and 4-star research contributed equally). The decision to not consider quality weights may be seen as a conscious choice to support science, technology, engineering and mathematics (STEM) subjects because of their world-wide importance (see e.g. Kim, Chu, and Lim 2015, for a detailed discussion on the importance of STEM subjects in East Asia). However, this was not the case. First, the reasons for the lack of quality weights in Stage 2 of the funding formula were not discussed in the relevant policy document (see HEFCE 2017b for the details). Second, most STEM subjects were already given relatively higher cost weights (i.e. most of the subject cost weights of STEM fields were 1.6, the highest subject cost weight). In other words, STEM subjects were already favoured by policymakers because of their relatively high subject cost weights (see paragraphs 94 and 95 of HEFCE, 2017b for a discussion of further allocation of additional 'targeted allocation' of £24 million to STEM subjects). Third, considering cost-weighted volume only in Stage 2 (but not quality weights) benefits panel A subjects where some of STEM subjects are located, and decreases QR funding to some of the science subjects in panel B, including chemistry, physics, mathematics, computer science and informatics, and engineering subjects (see Subsection 3.2 for the detailed changes in QR funding allocation among subjects when quality weights are considered in Stage 2). Hence, the lack of quality weights in Stage 2 is not directly linked with prioritizing STEM subjects.

With the aim of illustrating how a different formula to distribute funds at various stages (Stage 2 vs. Stages 3 and 4) affects QR funding allocation, Table 1 shows the total allocation of funds to the four main panels based on aggregate performances of each panel in three elements of research (output, impact, and environment). Table 1 also includes the total cost-weighted and total cost- and quality-weighted eligible volumes of research produced in each panel. It can be seen that the total QR funding distributed across panels in each assessed research element is proportional to the total cost-weighted eligible volumes where, for each cost-weighted eligible volume, each panel is allocated £16,479.68, £4,405.64, and £3,280.64

from the output, impact and environment pots, respectively.[4] So far, the distribution of QR funds across panels may seem reasonable as each panel receives funding proportional to the cost-weighed eligible volume as suggested by the formula in Stage 2. For instance, Panel B gets the highest total QR funding (£232,038,285.5) from the output pot since this panel produced the highest total cost-weighted eligible volume (14,080.27). However, when the total cost- and quality-weighted volume of output generated by each panel is examined, panel A actually produced better quality research outputs compared to panel B based on the quality weights attached to 4- and 3-star research in Stages 3 and 4 of the funding allocation formula. Even though panel A's aggregate quality performance in research outputs was better than panel B based on the quality weights given to 4- and 3-star research by RE, panel A was allocated less QR funding than panel B. Similar patterns were observed with other research elements. For instance, panel A produced better quality research impact and environment compared to panel B; however, the funding received by both panels was not proportional to the cost- and quality-weighted volume but proportional to the cost-weighted eligible volume.

Table 1. Total QR funding received by four main panels, total cost-weighted and total cost- and quality-weighted eligible volumes of research activity in four main panels

| Panels | Research element | Total QR funding (£) | Total cost-weighted eligible volume | Total cost- and quality-weighted eligible volume |
|---|---|---|---|---|
| A | Output | 211,522,893.6 | 12,835.38 | 25,184.69 |
| B | Output | 232,038,285.5 | 14,080.27 | 24,795.09 |
| C | Output | 136,941,492.8 | 8,309.72 | 16,708.21 |
| D | Output | 104,149,498.2 | 6,319.87 | 13,568.10 |
| A | Impact | 68,518,134.19 | 15,552.38 | 46,322.84 |
| B | Impact | 63,342,362.63 | 14,377.57 | 34,391.65 |
| C | Impact | 45,010,867.65 | 10,216.65 | 25,230.88 |
| D | Impact | 33,790,841.54 | 7,669.91 | 17,977.53 |
| A | Environment | 51,325,896.97 | 15,645.08 | 45,786.75 |
| B | Environment | 48,562,428.29 | 14,802.72 | 35,473.46 |
| C | Environment | 32,972,895.52 | 10,050.74 | 25,526.24 |
| D | Environment | 25,135,434.28 | 7,661.74 | 19,226.11 |

One should expect Panel A to receive relatively more QR funding than panel B based on the quality weights attached to world-leading and internationally excellent research

[4] Per cost-weighed volume values can be obtained by dividing the total QR funding column with the total cost-weighted eligible volume column.

activities.[5] However, this was not the case. Therefore, it can be concluded that that using different criteria at different stages of the funding allocation process leads to misallocation of QR funding across main panels. An additional example of this issue is shown in Table 2, which includes the assessed research profiles of different UoAs in Panels A and B. The cost- and quality-weighted eligible volumes in different research elements (output, impact, and environment) of these submissions was roughly similar[6] but the funding they received was different. For example, despite similar cost- and quality-weighted research output performances by Allied Health Professions, Dentistry, Nursing, and Pharmacy UoA of King's College London and Aeronautical, Mechanical, Chemical, and Manufacturing Engineering UoA of Loughborough University (247.52 and 246.85, respectively), King's College London was allocated £231,158 less QR funding than Loughborough University because of the allocation criteria used in Stage 2. Table 2 also lists similar scenarios for impact and environment aggregate performances of different institutions in two UoAs, with the University of Bristol receiving £146,610 more than Imperial College London despite similar cost- and quality-weighted impact profiles, and the University of Leeds receiving £101,778 more than the University of Lancaster despite similar cost- and quality-weighted environment profiles. Allocation of different funds to UoAs that performed similarly is not a desirable feature of QR funding distribution. Instead, QR funding should be allocated consistently to HEIs based on their UoAs' performances (i.e. cost- and quality-weighted eligible volumes) and irrespectively of which panel they belong to.

Table 2. Research profiles of different UoAs in Panels A and B and mainstream QR funding allocations

| Institution | Panel | Unit of assessment | Research element | % of research activity rated 4-star | % of research activity rated 3-star | FTE | Cost weight | Cost- and quality-weighted volume | Mainstream QR funding allocation (£) |
|---|---|---|---|---|---|---|---|---|---|
| King's College London | A | Allied Health Professions, Dentistry, Nursing and Pharmacy | Output | 26 | 60.7 | 93.93 | 1.6 | 247.52 | 2,078,925 |
| Loughborough University | B | Aeronautical, Mechanical, Chemical and Manufacturing Engineering | Output | 14.7 | 62.3 | 127.4 | 1.6 | 246.85 | 2,310,083 |
| Imperial College London | A | Biological Sciences | Impact | 53.6 | 39.1 | 99.55 | 1.6 | 403.77 | 597,241 |
| University of Bristol | B | Mathematical Sciences | Impact | 68.9 | 26.7 | 83.5 | 1.6 | 403.87 | 743,851 |

[5] Even though the quality weights attached to world-leading and internationally-excellent research activity are also questionable, which we will have an analysis in the next subsection, we take the quality weights as given to show the effect of different formula followed in the Stages 2 and 3 (4) on the allocation of QR funding.

[6] Note that the cost- and quality-weighted volume for respective scenario is calculated as follows: [((Percentage of 4-star activity /100)×FTE)×4+((Percentage of 3-star activity /100)×FTE)]×Cost-weight

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| University of Lancaster | A | Allied Health Professions, Dentistry, Nursing and Pharmacy | Environment | 100 | 0 | 64.4 | 1.6 | 412.16 | 462,022 |
| University of Leeds | B | Earth Systems and Environmental Sciences | Environment | 75 | 25 | 79.2 | 1.6 | 411.84 | 563,800 |

### 3.2. Case 1: Allocation of QR funding across four main panels based on cost- and quality-weighted eligible volume

To avoid the scenarios mentioned above, RE should have considered the quality weights attached to 4- and 3-star research activities when they allocate the mainstream QR funding to panels. In other words, the criteria used in Stage 2 should have been similar to that used in Stages 3 and 4. This subsection details how the distribution of funds to panels, UoAs and HEIs would have changed if quality weights were considered in Stage 2 of the QR funding allocation formula.

Table 3 shows the changes in mainstream QR funding allocations to panels and UoAs. A positive (negative) change indicates that the panel or UoA would have received more (less) funds if quality weights would have been considered in Stage 2 of the mainstream QR funding allocation formula[7]. Results suggest that Panels A, C, and D would have been allocated roughly £19.6 million, £2.5 million, and £7.3 million more mainstream QR funding compared to that awarded. On the other hand, Panel B would have received £29.5 million less. In short, 2.8% of the total mainstream QR funding (i.e. £29.5 million) would have been reallocated across the four main panels if quality weights would have been used in Stage 2. Changes in funds allocation to panels have knock-on effects on UoAs and HEIs. For example, research activity in Clinical Medicine (General Engineering) would have generated roughly £6 million more (£5 million less) mainstream QR funding if the quality weights would have been considered (Table 3).

**Table 3**. Changes in mainstream QR funding in panels and UoAs when funds across panels are distributed based on cost- and quality-weighted volume compared to current QR funding allocation

| Unit of assessment / Panel | Unit of assessment / Panel | Change in mainstream QR funding (£) |
|---|---|---|
| 1 | Clinical Medicine | 6,057,672 |
| 2 | Public Health, Health Services and Primary Care | 2,454,824 |
| 3 | Allied Health Professions, Dentistry, Nursing and Pharmacy | 3,414,229 |

[7] Note that Table 3 offers the total changes in QR funding when the quality weights are considered in the allocation of QR funding in Stage 2. However, these changes are obtained by summing the changes in QR funding allocations in output, impact and environment pots.

| | | |
|---|---|---|
| 4 | Psychology, Psychiatry, and Neuroscience | 3,354,316 |
| 5 | Biological Sciences | 3,255,827 |
| 6 | Agriculture, Veterinary and Food Science | 1,097,362 |
| **A** | **Medicine, Health, and Life Sciences** | **19,634,230** |
| 7 | Earth Systems and Environmental Sciences | -2,681,321 |
| 8 | Chemistry | -2,936,434 |
| 9 | Physics | -4,022,172 |
| 10 | Mathematical Sciences | -4,741,992 |
| 11 | Computer Science and Informatics | -4,052,129 |
| 12 | Aeronautical, Mechanical, Chemical, and Manufacturing Engineering | -2,706,541 |
| 13 | Electrical and Electronic Engineering, Metallurgy and Materials | -2,551,872 |
| 14 | Civil and Construction Engineering | -756,207 |
| 15 | General Engineering | -5,030,217 |
| **B** | **Physical Sciences, Engineering, and Mathematics** | **-29,478,884** |
| 16 | Architecture, Built Environment, and Planning | 200,005 |
| 17 | Geography, Environmental Studies, and Archaeology | 431,398 |
| 18 | Economics and Econometrics | 203,112 |
| 19 | Business and Management Studies | 538,833 |
| 20 | Law | 251,918 |
| 21 | Politics and International Studies | 176,826 |
| 22 | Social Work and Social Policy | 174,958 |
| 23 | Sociology | 103,124 |
| 24 | Anthropology and Development Studies | 67,591 |
| 25 | Education | 216,490 |
| 26 | Sport and Exercise Sciences, Leisure and Tourism | 141,966 |
| **C** | **Social Sciences** | **2,506,222** |
| 27 | Area Studies | 308,264 |
| 28 | Modern Languages and Linguistics | 844,958 |
| 29 | English Language and Literature | 1,419,138 |
| 30 | History | 1,299,247 |
| 31 | Classics | 283,536 |
| 32 | Philosophy | 403,092 |
| 33 | Theology and Religious Studies | 236,443 |
| 34 | Art and Design: History, Practice, and Theory | 1,044,570 |
| 35 | Music, Drama, Dance and Performing Arts | 923,883 |
| 36 | Communication, Cultural and Media Studies, Library, and Information Man. | 575,301 |
| **D** | **Arts and Humanities** | **7,338,432** |
| *Notes*: Panels A, B, C, and D consist of units of assessments between 1 and 6, 7 and 15, 16 and 26, and 27 and 36, respectively. | | |

In terms of HEI's, up to 0.7% of the total mainstream QR funding (i.e. £7.7 million) would have been reallocated if Stage 2 criteria were similar to those in Stages 3 and 4. Table 4 includes examples of this for 10 HEIs, with 5 generating more mainstream QR funding compared to the existing allocation of funds, and the other 5 receiving less funds (see Table A1 in Appendix A for the changes in mainstream QR funding for the full list of the HEIs when QR funding across four panels is distributed differently). Examples of positive changes range from +£0.2 million (University of Newcastle upon Tyne) to +£1.2 million (University College London) vs. negative changes ranging from -£0.4 million (Loughborough University) to -£1.1million (Imperial College London).

| Table 4. Five HEIs that would have generated more (less) QR funding when QR funding across four panels is distributed based on cost- and quality-weighted eligible volume compared to the existing allocation | |
|---|---|
| Higher Education Institute | Change in mainstream QR funding (£) |
| University College London | 1,194,106 |
| King's College London | 1,133,950 |
| London School of Hygiene and Tropical Medicine | 700,392 |
| Institute of Cancer Research | 238,881 |
| University of Newcastle upon Tyne | 238,479 |
| Imperial College London | -1,141,184 |
| University of Southampton | -1,006,445 |
| University of Cambridge | -901,711 |
| University of Warwick | -530,689 |
| Loughborough University | -435,384 |

Overall, 92 (30) HEIs would have generated more (less) QR funding if quality weights were considered in Stage 2 of the QR funding distribution (Figure 1). A total of 18 (17) HEIs would have experienced significant increases (decreases) in their QR funding above £100k in the 2017-18 funding period. The effect on 65 (i.e. 54+11) HEIs would have been less marked as they would have experienced changes less than £50k.

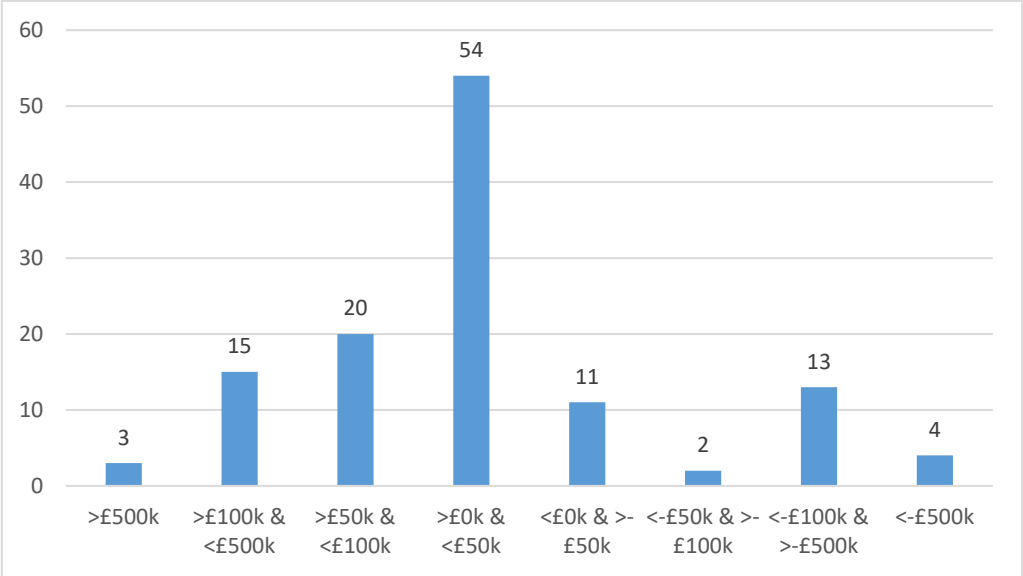


**Figure 1**. Number of HEIs with QR funding changes within different ranges based on the alternative allocation of QR funds in Stage 2

### 3.3. Case 2: Distribution of QR funding based on alternative quality weights

Another important normative judgment made by RE is the relative weights attached to the quality of research activity that is considered world-leading and internationally excellent.

This subsection discusses changes to these weights over time, what they mean, and how they affect the QR funding distribution.

The weights attached to the assessed quality profiles in the UK have changed over time (see, e.g. Table 6 of Geuna and Piolatto 2016). Following results from the 2008 Research Assessment Exercise (RAE), 2-star, 3-star, and 4-star research activities were given weights of 1, 3, and 7, respectively, during the 2009-10 QR funding period. These changed to no weight (2-star), 1 (3-star), and 3 (4 star) on 2012-13 and 2014-15. While the expectation was that a ratio of 3:1 (4-star:3-star) would be maintained, RE decided to increase the weight given to 4-star research activities following results from REF2014,[8] with the current 4:1 ratio given to 4-star and 3-star research activities subsequently used to distribute QR funding since 2015-16.

The decision to give four times more weight to 4-star research activity relative to 3-star research activity *implicitly* suggests that the former is 4 times more important and hence should attract fourfold QR funding compared to the latter one. This means that four research activities rated as 3-star generate the same QR funding that one 4-star rated research activity. This raises questions such as why a 4-star research paper (for example) would be four times more important than a 3-star paper (the same question applying to impact or environment), or how can the 'true' value of 4-star vs. 3-star research be evaluated. Evidence suggests that quality profiles can be perceived differently by decision makers. Manville et al. (2015) found that REF2014 evaluators in panels B and D clearly separated 4-star from 1-star impact case studies but struggled to distinguish between 2-star and 3-star and, most importantly, between 3-star and 4-star. Pidd and Broadbent (2015) compared the journal rankings by the Association of Business Schools (ABS) with the REF2014 ratings of 1,000 outputs submitted to Business and Management subpanel. Their results showed that many 3-star ABS journal articles were rated as 4-star in the REF2014 (i.e. 80 out of 190) and many 4-star rated ABS journal articles were rated as 3-star in the REF2014 (i.e. 95 out of 433), hence suggesting that the perceived quality of 3-star and 4-star articles is roughly similar. Following on this, 3-star impact case studies in some fields such as biomedical and health subjects can be perceived by both the public and researchers as 4-star (Pollitt et al. 2016). Finally, detailed analyses by

[8] This change has attracted some media attention highlighting the fact that this change in QR funding allocation is made after the completion of REF exercise. For further details, see https://www.timeshighereducation.com/news/research-funding-formula-tweaked-after-ref-2014-results/2018685.article

HEFCE (2015) suggest that bibliometric and altmetric indicators are not good predictors of REF peer-reviewed quality assessments, with results varying across UoAs (see Table A3 of HEFCE 2015). HEFCE (2015) additionally examined citation counts for a different quality of REF outputs. Their analyses indicated although 4-star outputs were three times more likely to be cited than 3-star outputs (see Table A1 of HEFCE 2015), citation counts varied dramatically both within 4-star and within 3-star rated outcomes (see Figure A1 of HEFCE 2015). To sum up, the existing literature points to methodological challenges to differentiate 4-star research activities from 3-star ones, and suggests that the perceived quality difference between these is not fourfold. The following analyses explore the effect of reverting quality weights to those used from 2012 to 2015 (3:1 for 4:3-star) on the allocation of QR funds, and compare results with the current funding distribution.

The change in quality weights from 4:1 to 3:1 does not affect the allocation of QR funding among the four main panels because Stage 2 of QR funding allocation by RE does not consider quality weights.[9] The change is mainly felt across UoAs and HEIs, because of the different weight given to 4-star research activities (Table 5). In general, the change in funding allocation due to a change in quality ratio is relatively small across UoAs due to the fact that QR funding to the four main panels remains the same (i.e. panels continue to receive the same funding irrespective of weight allocations to 4-star and 3-star research activities). There are, however, some noticeable changes, with UoAs 3, 14, and 34 attracting £941k, £455k, and £409k more QR funds, and UoAs 11, 10, and 4 generating £832k, £440k, and £435k less QR funding when the 3:1 ratio is considered (vs. the current 4:1). Overall, 0.3 % of the total mainstream QR funding (i.e., £3.4 million) is reallocated from some UoAs to others when the weight ratio between 4-star and 3-star research activities changed from 4:1 to 3:1.

Table 5. Distribution of QR funding across different UoAs based on alternative quality weight ratios given to 4-star and 3-star research activities

| (UoA) - no | Unit of assessment (UoA) | QR funding (4:1) (£) | QR funding (3:1) (£) | QR (3:1) - QR (4:1) (£) |
|---|---|---|---|---|
| 1 | Clinical Medicine | 95,606,822 | 95,496,299 | -110,523 |
| 2 | Public Health, Health Services and Primary Care | 37,988,249 | 37,764,111 | -224,138 |
| 3 | Allied Health Professions, Dentistry, Nursing and Pharmacy | 61,360,341 | 62,300,944 | +940,604 |
| 4 | Psychology, Psychiatry and Neuroscience | 57,057,856 | 56,622,616 | -435,240 |
| 5 | Biological Sciences | 62,031,270 | 61,681,561 | -349,709 |
| 6 | Agriculture, Veterinary and Food Science | 17,322,387 | 17,501,394 | +179,007 |
| 7 | Earth Systems and Environmental Sciences | 31,341,266 | 31,556,792 | +215,526 |

[9] To evaluate the effect of each alternative scenario, changes in each scenario are carried out one at a time (not simultaneously).

| | | | | |
|---|---|---|---|---|
| 8 | Chemistry | 34,228,282 | 34,191,086 | -37,196 |
| 9 | Physics | 46,862,422 | 47,023,183 | +160,761 |
| 10 | Mathematical Sciences | 55,248,384 | 54,758,579 | -489,805 |
| 11 | Computer Science and Informatics | 47,250,104 | 46,418,200 | -831,903 |
| 12 | Aeronautical, Mechanical, Chemical and Manufacturing Engineering | 31,645,606 | 31,835,722 | +190,116 |
| 13 | Electrical and Electronic Engineering, Metallurgy and Materials | 29,743,306 | 30,003,662 | +260,356 |
| 14 | Civil and Construction Engineering | 8,829,812 | 8,906,874 | +77,062 |
| 15 | General Engineering | 58,793,894 | 59,248,979 | +455,084 |
| 16 | Architecture, Built Environment and Planning | 16,688,133 | 16,600,831 | -87,302 |
| 17 | Geography, Environmental Studies and Archaeology | 33,889,459 | 33,829,116 | -60,342 |
| 18 | Economics and Econometrics | 13,125,748 | 13,061,771 | -63,977 |
| 19 | Business and Management Studies | 44,329,666 | 44,464,615 | +134,948 |
| 20 | Law | 21,485,114 | 21,649,703 | +164,589 |
| 21 | Politics and International Studies | 17,357,240 | 17,315,021 | -42,219 |
| 22 | Social Work and Social Policy | 16,752,651 | 16,835,061 | +82,410 |
| 23 | Sociology | 9,426,740 | 9,513,601 | +86,861 |
| 24 | Anthropology and Development Studies | 7,761,772 | 7,783,332 | +21,560 |
| 25 | Education | 20,704,840 | 20,441,814 | -263,025 |
| 26 | Sport and Exercise Sciences, Leisure and Tourism | 13,403,894 | 13,430,391 | +26,497 |
| 27 | Area Studies | 7,298,915 | 7,305,963 | +7,048 |
| 28 | Modern Languages and Linguistics | 18,547,765 | 18,570,301 | +22,537 |
| 29 | English Language and Literature | 29,822,044 | 29,675,906 | -146,138 |
| 30 | History | 26,349,427 | 26,270,935 | -78,492 |
| 31 | Classics | 6,478,459 | 6,420,927 | -57,532 |
| 32 | Philosophy | 8,654,451 | 8,631,198 | -23,253 |
| 33 | Theology and Religious Studies | 5,306,450 | 5,300,342 | -6,108 |
| 34 | Art and Design: History, Practice and Theory | 26,569,810 | 26,978,947 | +409,138 |
| 35 | Music, Drama, Dance and Performing Arts | 20,879,314 | 20,767,367 | -111,947 |
| 36 | Communication, Cultural and Media Studies, Library & Info. Man. | 13,169,139 | 13,153,887 | -15,253 |

Notes: QR funding (4:1) and QR funding (3:1) offer the mainstream QR funding across different UoAs when quality weight ratios of 4:1 and 3:1 between 4-star and 3-star research activities are used in the allocation of mainstream QR funding, respectively. QR (3:1) - QR (4:1) offer the differences between QR funding (3:1) and QR funding (4:1).

Despite limited changes for UoAs, the impact of changing quality weights attached to 4-star and 3-star research activities was significant for some HEIs (Table 6). Examples of this include more funds allocated to the University of Leicester, Liverpool, and Manchester Metropolitan University (+£456k, +£297k, and +£289k) vs. less funds allocated to the University of Oxford, Cambridge, and London School of Economics (-£2.8million, -£2.5million, and -£1.3million) if a 3:1 ratio would have been adopted. Simply put, the latter set of universities have benefitted from the increased weight attached to 4-star research activities by RE.

Table 6. Distribution of QR funding to HEIs based on alternative quality weight ratios given to 4-star and 3-star research activities

| Higher Education Institute | QR funding (4:1) (£) | QR funding (3:1) (£) | QR (3:1) – QR (4:1) (£) |
|---|---|---|---|
| University of Leicester | 13,787,977 | 14,244,097 | +456,119 |
| Brunel University London | 9,162,659 | 9,564,282 | +401,623 |
| University of Birmingham | 26,795,665 | 27,133,937 | +338,272 |
| University of Liverpool | 19,496,596 | 19,793,271 | +296,675 |

| | | | |
|---|---|---|---|
| Manchester Metropolitan University | 4,746,925 | 5,036,126 | +289,202 |
| University of Oxford | 81,745,022 | 78,968,754 | -2,776,268 |
| University of Cambridge | 73,936,806 | 71,483,195 | -2,453,611 |
| University College London | 79,835,672 | 78,384,013 | -1,451,658 |
| Imperial College London | 49,870,637 | 48,591,889 | -1,278,748 |
| London School of Economics and Political Science | 14,405,333 | 13,933,731 | -471,602 |
| Notes: QR funding (4:1) and QR funding (3:1) offer the mainstream QR funding to HEIs when quality weight ratios of 4:1 and 3:1 between 4-star and 3-star research activities are used in the allocation of mainstream QR funding, respectively. QR (3:1) - QR (4:1) offer the difference between QR funding (3:1) and QR funding (4:1). | | | |

Overall, an aggregate of £10 million mainstream QR funding (1% of the total) would have moved from some HEIs to others when the ratio of quality weights given to 4-star and 3-star research activities changes from 4:1 to 3:1. A total of 99 (23) HEIs would have generated more (less) QR funding with the alternative quality weights compared to the existing ones suggesting that the change in quality weight ratio only benefitted few on the expesense of many HEIs (see Table A2 in Appendix A for a full list of QR funding allocations to HEIs with the quality weight ratio of 3:1). Figure 2 includes the number of HEIs with QR funding changes within different ranges with alternative quality weights compared to existing quality weights, suggesting that most of the institutions would have benefitted from a 3:1 quality weight ratio.

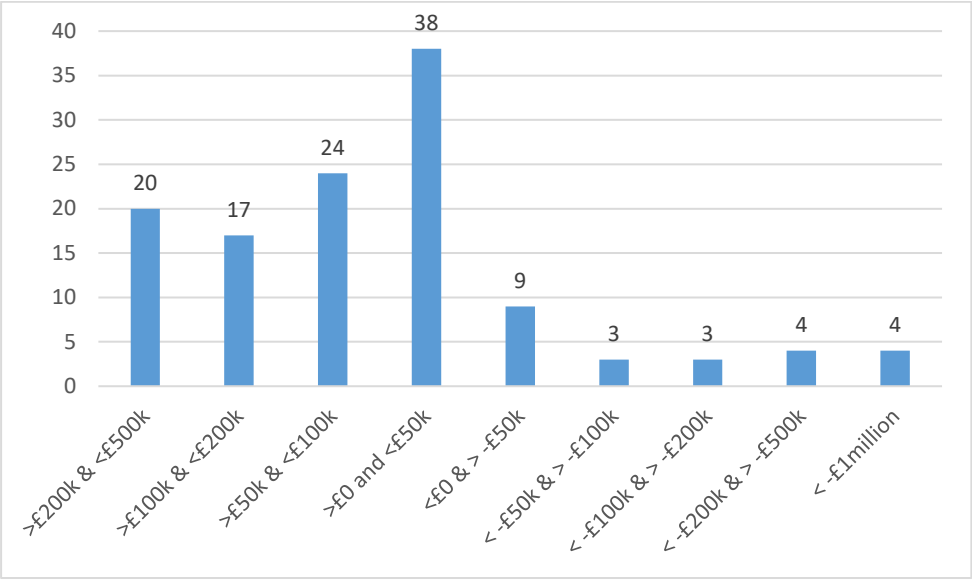


**Figure 2**. Distribution of number of HEIs with QR funding changes within different ranges based on alternative quality weights

### 3.4. Case 3: Distribution of QR funding based on alternative subject cost weights

Additional to aspects analysed above, QR funding allocation also considers cost weights assigned to UoAs (see section 2 and HEFCE 2017b for further details). The argument for this is that laboratory-based research is more expensive than library-based research (see paragraphs 25 and 117 of HEFCE 2017b) and that cost weights given to different subjects reflect the relative monetary value of carrying research in different fields. Rather than using individual cost weights for each UoA, RE cluster subjects into the three bands described in section 2. The cost weights for each band are based on expenditure data from the Higher Education Statistics Agency (HESA) where alignment of each UoA with HESA cost centres is available from HEFCE (2017c).

Except for Psychology, Psychiatry, and Neuroscience, all UoAs in Panels A and B were allocated to Band A and given a cost weight of 1.6. Five UoAs were clustered into Band B and given a cost weight of 1.3, except Geography, Environmental Studies, and Archaeology, because RE argues that around half of all their research activity could be considered closely analogous to science (see paragraph 135 of HEFCE 2017b). Finally, most of the UoA in social sciences (Panel C) and arts and humanities (panel D) were given a cost weight of 1.

The expenditures reported by English HEIs in different subject areas (i.e. HESA cost centres) were analysed for the 2014-15, 2015-16, 2016-17, and 2017-18 academic years[10] in order to examine whether the cost weights assigned to each band reflected actual costs. Expenditure data from HESA for each cost centre consists of costs associated with four different activities: academic staff costs (the total amount paid for academic staff members), other academic costs (e.g. pension contributions and so on), other operating costs (e.g. amortization, cost of non-capitalized equipment, and maintenance contracts), and depreciation costs (of capitalized equipment, building, and machinery).[11] Since the number of academic staff varies across cost centres and costs are higher in fields with more academic

[10] Expenditure breakdown by activity and HESA cost centres are obtained from https://www.hesa.ac.uk/data-and-analysis/finances/expenditure for the 2015/2016, 2016/2017 and 2017/2018 academic years and obtained from https://www.hesa.ac.uk/data-and-analysis/publications#finances-higher-education-providers for the 2014/2015 academic year.

[11] Detailed explanation of different cost activities can be found from https://www.hesa.ac.uk/collection/c17031/table_8

staff members, different cost activities were normalized by the total full time equivalent staff employed under different cost centres in respective academic years.[12]

RE policy document (HEFCE 2017b) does not indicate what type of cost activities (i.e. academic staff costs, other staff costs, etc.) is used for assigning weights in different cost bands. However, their motivation for using cost weights mainly relates to the differences in capital expenses (i.e. machinery, building, equipment, and so on) across subjects. Among the four cost activities, other operating costs and depreciation costs could be considered as capital costs associated with each HESA cost centre, with academic and other staff costs regarded as labour costs. Despite the lack of information about how activities are used for assigning cost weights to different bands, two scenarios have been developed here for comparison: the first scenario considers costs reported under other operating expenses and depreciation; the second considers all cost activities.

Based on RE's approach and cost bands classification tables (HEFCE 2017c), HESA cost centres were clustered into cost bands (A, B, and C). The average capital cost and average total costs per FTE staff members for each cost band were derived from HESA expenditure data. Total capital costs were calculated from adding other operating costs and the total asset costs. The latter were subject to depreciation rates of 10% based on the worldwide capital and fixed assets guide of the Ernst & Young (2018) since different types of assets are not distinguished in the HESA cost centres (see e.g. Oulton and Wallis 2016 where the depreciation rates vary depending on asset types). Average total costs were obtained by summing the total capital and labour costs, where the latter is the sum of the academic staff costs and other staff costs. Table 7 shows REF UoAs classified by cost bands, their corresponding HESA cost centres, the average capital and total costs per FTE staff member, and the respective cost weights based on capital and total costs per FTE. When all cost centres and UoAs are clustered into three cost bands, the actual capital costs per FTE are roughly £36k, £30k and £23k for bands A, B, and C, respectively. Standardized capital costs lead to cost weights (i.e. 1.55, 1.29, and 1 for cost bands A, B, and C, respectively) that are relatively close to those of assigned by policymakers (i.e. 1.6, 1.3, and 1 for cost bands A, B, and C, respectively). The average total cost per FTE in each band is roughly the same after labour costs are considered.

[12] Total numbers of staff members in each cost centres for the 2015/2016, 2016/2017 and 2017/2018 academic years are obtained from https://www.hesa.ac.uk/data-and-analysis/staff.

Table 7. Research cost centres for each cost band and average capital and total costs in each band

| Cost band | REF UoAs | HESA cost centres | Capital cost per FTE (£) | Cost weights (Capital) | Total cost per FTE (£) | Cost weights (Total) |
|---|---|---|---|---|---|---|
| A | 1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 | 101, 102, 103, 105, 106, 107, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 127 | 36,368 | 1.55 | 87,973 | 1.00 |
| B | 16, 17, 26, 34 and 35 | 108, 111, 123, 124, 126, 143, 144 | 30,228 | 1.29 | 89,652 | 1.02 |
| C | 18, 19, 20, 21, 22, 23, 24, 25, 27, 28, 29, 30, 31, 32, 33 and 36 | 125, 127, 128, 129, 130, 131, 132, 133, 135, 137, 138, 139, 140, 141, 142, 145 | 23,443 | 1.00 | 89,938 | 1.02 |

*Notes*: HESA cost centre of 111 (Earth, marine & environmental sciences) is aligned both with cost bands of A and B. HESA cost centre of 127 (Anthropology & development studies) is aligned both with cost bands of A and C. Both cost centres are used in the calculations of the cost weights of each band. Cost weights (Capital) are obtained by dividing capital cost per FTE column with the lowest capital cost per FTE. Cost weights (Total) are obtained by dividing total cost per FTE column with the lowest total cost per FTE.

It should be noted the approach to calculate costs weights for different bands was similar to that by RE. However, the actual costs for each subject differ markedly among UoAs that are clustered in different bands (see Appendix Table A3 for average costs per FTE in four activities, average capital and total costs per FTE in each cost band and HESA cost centres). For example, Mathematical Sciences and Chemistry are put into cost band A and allocated a cost weight of 1.6. However, if one were to use the HESA cost centres specified for these subjects (122 and 113, respectively), capital costs and total costs per FTE amount to £27k and £86k for Mathematics, and to £58k and £105k for Chemistry, respectively. The same rationale applies to other disciplines, which have distinctively different research costs despite being clustered into the same band. Therefore, it is recommended that existing cost weights used by RE are updated before the next REF, and that each subject is considered separately instead of grouping disciplines into pre-determined bands. Furthermore, a clearer definition of how the cost weights are calculated would increase the transparency of how QR funding is allocated.

The effect of using cost band weights different from those proposed by RE was also analyzed. The following two alternative scenarios were considered: (1) weights of 1.55, 1.29,

and 1 for cost bands A, B, and C, respectively[13]; and (2) a weight of 1 for all cost bands, which eliminates the subject costs from the QR funding allocation criteria.

Table 8 shows the changes in mainstream QR funding received by different panels and UoAs, where positive (negative) changes suggest that a given panel or UoA would have received higher (lower) QR funding if the alternative cost weights were applied. The first scenario could be considered as the most conservative one, with subject costs being distinctively different from one another (see Appendix, Table A3). Results for this scenario show that Panels A and B (Panels C and D) would have received roughly £2.9 million and £3.8 million less (£3.6 million and £3 million more) QR funding, respectively. Results from the second scenario, where the subject costs were removed from the allocation criteria, panels A and B (panels C and D) would have received roughly £44.5 million and £52.2 million less (£53.9 million and £42.8 million more) QR funding, respectively. Clinical Medicine (Business and Management) would have been the main loser (winner) with both alternative scenarios (Table 8). Overall, with the first scenario, only 0.6% of the total mainstream QR funding (i.e. £6.7 million) would have been reallocated across panels and UoAs. This is in sharp contract with the second scenario, where 9.2% of the total mainstream QR funding (i.e. £96.7 million) would have been reallocated across panels and UoAs.

Table 8. Changes in mainstream QR funding with alternative cost weight scenarios compared to the existing scenario

| Unit of assessment / Panel | Unit of assessment / Panel | Scenario 1 (£) | Scenario 2 (£) |
|---|---|---|---|
| 1 | Clinical Medicine | -1,058,172 | -14,623,612 |
| 2 | Public Health, Health Services and Primary Care | -420,886 | -5,814,773 |
| 3 | Allied Health Professions, Dentistry, Nursing and Pharmacy | -677,470 | -9,364,120 |
| 4 | Psychology, Psychiatry and Neuroscience | 123,031 | -2,588,605 |
| 5 | Biological Sciences | -684,491 | -9,460,094 |
| 6 | Agriculture, Veterinary and Food Science | -191,873 | -2,650,737 |
| **A** | **Medicine, Health, and Life Sciences** | **-2,909,860** | **-44,501,941** |
| 7 | Earth Systems and Environmental Sciences | -343,336 | -4,761,991 |
| 8 | Chemistry | -374,400 | -5,194,175 |
| 9 | Physics | -512,945 | -7,114,555 |
| 10 | Mathematical Sciences | -604,797 | -8,388,274 |
| 11 | Computer Science and Informatics | -516,447 | -7,166,678 |
| 12 | Aeronautical, Mechanical, Chemical and Manufacturing Engineering | -346,731 | -4,808,932 |
| 13 | Electrical and Electronic Engineering, Metallurgy and Materials | -325,239 | -4,512,555 |
| 14 | Civil and Construction Engineering | -96,742 | -1,341,635 |

[13] The cost weights for the Psychology, Psychiatry and Neuroscience and the Geography, Environmental Studies and Archaeology units of assessment are calculated as suggested by RE.

| | | | |
|---|---|---|---|
| 15 | General Engineering | -644,406 | -8,936,330 |
| **B** | **Physical Sciences, Engineering, and Mathematics** | **-3,765,043** | **-52,225,124** |
| 16 | Architecture, Built Environment and Planning | 218,360 | 740,592 |
| 17 | Geography, Environmental Studies and Archaeology | 90,314 | -1,395,099 |
| 18 | Economics and Econometrics | 275,011 | 4,701,586 |
| 19 | Business and Management Studies | 928,579 | 15,857,927 |
| 20 | Law | 449,659 | 7,684,017 |
| 21 | Politics and International Studies | 363,600 | 6,204,422 |
| 22 | Social Work and Social Policy | 351,068 | 5,989,078 |
| 23 | Sociology | 197,597 | 3,370,779 |
| 24 | Anthropology and Development Studies | 162,506 | 2,772,766 |
| 25 | Education | 433,558 | 7,401,593 |
| 26 | Sport and Exercise Sciences, Leisure and Tourism | 175,573 | 593,029 |
| **C** | **Social Sciences** | **3,645,824** | **53,920,691** |
| 27 | Area Studies | 152,209 | 2,578,577 |
| 28 | Modern Languages and Linguistics | 386,873 | 6,553,476 |
| 29 | English Language and Literature | 622,191 | 10,539,264 |
| 30 | History | 549,930 | 9,315,083 |
| 31 | Classics | 135,129 | 2,289,163 |
| 32 | Philosophy | 180,529 | 3,058,012 |
| 33 | Theology and Religious Studies | 110,700 | 1,875,311 |
| 34 | Art and Design: History, Practice and Theory | 345,200 | 1,086,293 |
| 35 | Music, Drama, Dance and Performing Arts | 271,678 | 858,700 |
| 36 | Communication, Cultural and Media Studies, Library and Info. Man. | 274,640 | 4,652,495 |
| **D** | **Art and Humanities** | **3,029,079** | **42,806,375** |
| *Notes*: Panels A, B, C, and D consist of units of assessments between 1 and 6, 7 and 15, 16 and 26, and 27 and 36, respectively. | | | |

A total of 89 and 87 HEIs would have received more QR funding with the first and second scenarios, respectively, vs. a total of 33 and 35 HEIs receiving less funds compared to the current cost weights (see Appendix Table A4 for the detailed changes in QR funding received by all the HEIs with alternative cost weight scenarios). With scenario 1, Imperial College London, the University of Cambridge, and University of Southampton are the main losers with £480k, £210k, and £162k less QR funding than their current allocation. The University of Essex, University of Kent, and London School of Economics and Political Science are the main winners with increases in QR funds of £90k, £103k, and £255k. Finally, when subject costs are removed (scenario 2), Imperial College London, University College London, and University of Cambridge (the University of Essex, University of Kent, and the London School of Economics and Political Science) would lose (win) £6.6 million, £2.7 million, and £2.6 million (£1.5 million, £1.6 million, and £4.3 million) with respect to their current QR funding allocation, respectively. Overall, only 0.2% of QR funds were reallocated among HEIs in scenario 1, vs. 2.5 % in scenario 2.

## 4. Conclusions and future research

The last decade has seen an increased emphasis on PRFSs, with a majority of the European countries adopting an approach to distribute research funds based on the assessed performance of HEIs. However, this article demonstrates that it is not only the assessed performance that matters, but also the funding formula used to calculate and allocate research funds. This study examined the effect that a funding allocation formula has on the distribution of performance-related research funding. Sensitivity analyses were conducted to investigate changes to mainstream QR funding distributed by RE to panels, UoAs, and HEIs during the 2017-18 period, as a result of adopting alternative criteria. Results indicated major changes to QR funding allocation when considering alternative normative judgements in different stages of the mainstream QR funding allocation formula. These included changes to funding allocation when using (1) cost- and quality-weighted eligible volume vs. cost-weighted eligible volume only in Stage 2; (2) quality weight ratio of 3:1 vs. 4:1 for world-leading and internationally excellent research activities; (3) alternative cost weights. The analyses presented here showed that there are large variations in funding received by the panels, UoAs, and HEIs if alternative normative judgements in different stages of the mainstream QR funding allocation formula are used compared to the existing ones. This suggests that QR funding received by HEIs not only depends on their assessed research performance but also decisions made by funding bodies about how this funding is distributed.

Even though funding bodies consult HEIs about various aspects of the next REF exercise (HEFCE, 2016), there is no detailed discussion about or consultation on the funding formula (criteria) followed by RE. Results in this article demonstrate the importance of this formula (criteria) in the allocation of QR funding, pointing to the need for further detailed discussion. Consultation on criteria followed by funding bodies would increase the transparency, reliability, and accountability of the allocation of QR funding in the future.

Although the focus of this study is QR funding allocation by RE and its effect on HEIs in England, performance-based research funding allocations are increasingly used in many countries. Hence, a more comprehensive review of funding formulas followed by different international funding bodies and the effect of these on allocating performance-based research funds would benefit research in this area.

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| **Table A1**. Changes in the QR funding received by the HEIs when QR funding across four panels is distributed based on cost- and quality-weighted eligible volume *versus* cost-weighted eligible volume | |
|---|---|
| Higher Education Institute | Change in mainstream QR funding (£) |
| University College London | 1,194,106 |
| King's College London | 1,133,950 |
| London School of Hygiene and Tropical Medicine | 700,392 |
| Institute of Cancer Research | 238,881 |
| University of Newcastle upon Tyne | 238,479 |
| Royal Veterinary College | 199,801 |
| University of Nottingham | 180,414 |
| Birkbeck College | 165,765 |
| London School of Economics and Political Science | 158,886 |
| University of Northumbria at Newcastle | 158,372 |
| School of Oriental and African Studies | 143,743 |
| University of Sussex | 133,412 |
| Queen Mary University of London | 121,665 |
| Roehampton University | 119,746 |
| University of the Arts, London | 114,292 |
| Goldsmiths' College | 113,343 |
| University of Westminster | 108,901 |
| University of Reading | 102,136 |
| University of the West of England, Bristol | 86,034 |
| Manchester Metropolitan University | 85,968 |
| St. George's, University of London | 82,267 |
| Nottingham Trent University | 80,893 |
| Oxford Brookes University | 78,256 |
| Sheffield Hallam University | 68,900 |
| University of East London | 66,136 |
| University of Wolverhampton | 61,718 |
| Courtauld Institute of Art | 61,685 |
| University of Lincoln | 61,499 |
| Liverpool School of Tropical Medicine | 61,380 |
| The University of Essex | 57,310 |
| Anglia Ruskin University | 57,097 |
| University of Brighton | 56,312 |
| University of Chester | 54,960 |
| London Business School | 52,164 |
| Bath Spa University | 52,021 |
| Canterbury Christ Church University | 51,650 |
| University of Leicester | 50,243 |
| University of Hull | 50,236 |
| University of Central Lancashire | 48,230 |
| Birmingham City University | 45,122 |
| University of Salford | 44,917 |
| University of Liverpool | 43,110 |

| | |
|---|---|
| Liverpool Hope University | 41,704 |
| Leeds Beckett University | 41,286 |
| Edge Hill University | 39,744 |
| University of Keele | 39,121 |
| University of Sunderland | 37,103 |
| Royal College of Art | 35,498 |
| University of Kent | 35,415 |
| University of Winchester | 34,311 |
| De Montfort University | 34,025 |
| University of Bedfordshire | 32,041 |
| Kingston University | 30,882 |
| University of Bradford | 30,848 |
| University of Worcester | 29,924 |
| Bournemouth University | 25,693 |
| York St John University | 24,792 |
| London Metropolitan University | 24,221 |
| St Mary's University, Twickenham | 24,090 |
| University of Birmingham | 20,264 |
| University of Chichester | 19,567 |
| University of Northampton | 17,773 |
| Falmouth University | 17,671 |
| University of Gloucestershire | 17,563 |
| Royal Academy of Music | 14,645 |
| University of Derby | 14,626 |
| Harper Adams University | 13,212 |
| Staffordshire University | 12,437 |
| Royal Central School of Speech and Drama | 12,176 |
| University for the Creative Arts | 11,408 |
| City, University of London | 11,099 |
| Arts University Bournemouth | 10,402 |
| University of West London | 10,395 |
| Trinity Laban Conservatoire of Music and Dance | 10,097 |
| Middlesex University | 9,053 |
| Southampton Solent University | 9,031 |
| Newman University | 8,964 |
| Royal College of Music | 8,868 |
| Leeds Trinity University | 8,621 |
| Buckinghamshire New University | 7,775 |
| Aston University | 7,549 |
| University of Cumbria | 6,919 |
| Royal Northern College of Music | 5,287 |
| Rose Bruford College of Theatre and Performance | 4,806 |
| Norwich University of the Arts | 4,477 |
| Bishop Grosseteste University | 3,418 |
| Heythrop College | 3,242 |
| Guildhall School of Music & Drama | 1,912 |
| Writtle University College | 1,163 |

| | |
|---|---|
| University of London Institute in Paris | 854 |
| Teesside University | 702 |
| Royal Agricultural University | 595 |
| University of Exeter | -2,036 |
| University of Bolton | -14,533 |
| University of Huddersfield | -14,583 |
| Royal Holloway, University of London | -15,571 |
| University of Greenwich | -17,997 |
| London South Bank University | -18,176 |
| Liverpool John Moores University | -19,313 |
| University of Plymouth | -21,864 |
| University of Hertfordshire | -27,640 |
| Coventry University | -31,685 |
| University of Portsmouth | -42,863 |
| University of East Anglia | -53,519 |
| University of York | -55,149 |
| Open University | -122,434 |
| University of Manchester | -146,453 |
| University of Sheffield | -158,718 |
| Brunel University London | -173,882 |
| University of Lancaster | -254,345 |
| University of Surrey | -268,914 |
| University of Leeds | -303,257 |
| University of Bath | -330,617 |
| University of Oxford | -340,698 |
| Cranfield University | -378,347 |
| University of Durham | -392,915 |
| University of Bristol | -430,735 |
| Loughborough University | -435,384 |
| The University of Warwick | -530,689 |
| University of Cambridge | -901,711 |
| University of Southampton | -1,006,445 |
| Imperial College London | -1,141,184 |
| *Notes*: Positive (negative) change in mainstream QR funding suggest that a given HEI generates more (less) QR funding when QR funding across four panels is distributed based on cost- and quality-weighted eligible volume *versus* cost-weighted eligible volume. QR funding generated by the Allied Health Professions, Dentistry, Nursing and Pharmacy UoA of Sussex University is allocated to University of Brighton in both scenarios as agreed by two institutions. | |

**Table A2**. Distribution of QR funding to HEIs based on alternative quality weight ratios given to 4-star and 3-star research activities

| Institution | QR funding (4:1) (£) | QR funding (3:1) (£) | QR (3:1) – QR (4:1) (£) |
|---|---|---|---|
| University of Leicester | 13,787,977 | 14,244,097 | 456,119 |
| Brunel University London | 9,162,659 | 9,564,282 | 401,623 |
| University of Birmingham | 26,795,665 | 27,133,937 | 338,272 |
| University of Liverpool | 19,496,596 | 19,793,271 | 296,675 |
| Manchester Metropolitan University | 4,746,925 | 5,036,126 | 289,202 |
| Loughborough University | 14,216,965 | 14,502,391 | 285,425 |
| University of Surrey | 10,958,014 | 11,234,391 | 276,377 |
| University of Plymouth | 6,523,110 | 6,796,367 | 273,257 |
| University of Nottingham | 36,253,211 | 36,526,123 | 272,912 |
| University of Hull | 5,318,274 | 5,580,815 | 262,541 |
| University of Reading | 13,860,768 | 14,100,798 | 240,030 |
| Open University | 7,515,764 | 7,755,491 | 239,727 |
| University of Central Lancashire | 2,843,975 | 3,071,307 | 227,332 |
| University of the West of England, Bristol | 4,436,304 | 4,653,124 | 216,821 |
| City, University of London | 7,848,232 | 8,062,884 | 214,652 |
| University of Salford | 2,991,088 | 3,202,801 | 211,714 |
| University of Portsmouth | 4,584,238 | 4,794,544 | 210,306 |
| University of Kent | 11,519,479 | 11,729,122 | 209,643 |
| University of Northumbria at Newcastle | 5,326,586 | 5,533,177 | 206,591 |
| Middlesex University | 3,485,563 | 3,689,930 | 204,367 |
| University of Hertfordshire | 2,860,025 | 3,043,554 | 183,529 |
| Oxford Brookes University | 3,951,461 | 4,126,417 | 174,955 |
| University of Huddersfield | 3,325,852 | 3,485,903 | 160,051 |
| University of Keele | 5,384,240 | 5,541,408 | 157,168 |
| Liverpool John Moores University | 4,378,839 | 4,535,373 | 156,534 |
| University of Exeter | 17,827,068 | 17,982,425 | 155,357 |
| Sheffield Hallam University | 3,748,341 | 3,892,835 | 144,494 |
| University of Leeds | 30,738,717 | 30,880,661 | 141,944 |
| Anglia Ruskin University | 1,595,880 | 1,730,067 | 134,187 |
| Coventry University | 2,432,142 | 2,562,985 | 130,843 |
| University of Greenwich | 2,196,653 | 2,323,457 | 126,805 |
| Nottingham Trent University | 3,451,852 | 3,576,556 | 124,704 |
| London South Bank University | 1,184,951 | 1,305,074 | 120,123 |
| De Montfort University | 3,179,720 | 3,297,380 | 117,660 |
| Bournemouth University | 2,441,996 | 2,550,257 | 108,261 |
| University of Brighton | 4,001,163 | 4,108,390 | 107,227 |
| Canterbury Christ Church University | 1,216,576 | 1,320,294 | 103,718 |
| Teesside University | 1,085,692 | 1,183,904 | 98,211 |
| University of Wolverhampton | 1,605,098 | 1,700,352 | 95,255 |
| Kingston University | 2,088,896 | 2,176,937 | 88,041 |
| University of Sheffield | 29,983,204 | 30,070,263 | 87,059 |
| University of Bath | 13,246,891 | 13,333,697 | 86,805 |
| University of Lincoln | 2,562,090 | 2,647,468 | 85,379 |
| University of Westminster | 3,376,996 | 3,458,957 | 81,961 |

| | | | |
|---|---|---|---|
| Edge Hill University | 1,116,608 | 1,198,466 | 81,857 |
| University of Sunderland | 1,054,579 | 1,136,305 | 81,726 |
| Birmingham City University | 1,704,781 | 1,783,915 | 79,134 |
| University of East London | 1,914,369 | 1,992,067 | 77,697 |
| Goldsmiths' College | 4,284,613 | 4,361,227 | 76,614 |
| Leeds Beckett University | 1,640,908 | 1,716,248 | 75,340 |
| University of Newcastle upon Tyne | 23,231,671 | 23,306,811 | 75,141 |
| University of Chester | 943,608 | 1,018,069 | 74,460 |
| Cranfield University | 6,180,882 | 6,248,196 | 67,314 |
| University of Worcester | 721,847 | 787,829 | 65,982 |
| University of Sussex | 10,859,215 | 10,920,029 | 60,815 |
| Liverpool Hope University | 822,967 | 882,787 | 59,820 |
| University of Derby | 695,938 | 750,598 | 54,660 |
| University of Bedfordshire | 2,069,679 | 2,123,345 | 53,666 |
| London Metropolitan University | 890,475 | 943,503 | 53,029 |
| Staffordshire University | 611,913 | 664,323 | 52,410 |
| University of Northampton | 542,172 | 592,493 | 50,320 |
| University of Bradford | 2,818,027 | 2,866,374 | 48,348 |
| School of Oriental and African Studies | 3,537,627 | 3,584,260 | 46,633 |
| University of Winchester | 604,940 | 648,351 | 43,411 |
| University of Durham | 19,375,673 | 19,417,421 | 41,749 |
| Royal Holloway, University of London | 9,122,463 | 9,162,279 | 39,817 |
| Roehampton University | 2,487,171 | 2,525,677 | 38,505 |
| Aston University | 4,981,945 | 5,020,377 | 38,432 |
| Bath Spa University | 857,334 | 892,736 | 35,402 |
| Royal Veterinary College | 3,016,980 | 3,050,724 | 33,744 |
| University of Gloucestershire | 584,345 | 615,300 | 30,956 |
| University of the Arts, London | 2,681,420 | 2,708,778 | 27,358 |
| University of Essex | 6,917,992 | 6,945,209 | 27,218 |
| York St John University | 452,074 | 479,204 | 27,130 |
| University of East Anglia | 11,895,926 | 11,920,965 | 25,039 |
| University of Bolton | 393,145 | 417,353 | 24,208 |
| Harper Adams University | 246,319 | 268,426 | 22,107 |
| Liverpool School of Tropical Medicine | 976,761 | 995,998 | 19,237 |
| Southampton Solent University | 145,439 | 161,915 | 16,476 |
| University of Chichester | 637,195 | 653,241 | 16,046 |
| Buckinghamshire New University | 205,630 | 221,592 | 15,962 |
| Falmouth University | 358,228 | 374,105 | 15,877 |
| University for the Creative Arts | 334,082 | 348,043 | 13,961 |
| University of West London | 241,385 | 254,917 | 13,532 |
| Newman University | 135,345 | 146,313 | 10,969 |
| Birkbeck College | 6,591,303 | 6,602,162 | 10,859 |
| Arts University Bournemouth | 118,206 | 127,224 | 9,018 |
| University of Cumbria | 197,568 | 206,274 | 8,705 |
| Trinity Laban Conservatoire of Music and Dance | 199,223 | 207,506 | 8,284 |
| Writtle University College | 41,220 | 49,389 | 8,168 |
| Leeds Trinity University | 93,104 | 100,501 | 7,396 |

| | | | |
|---|---|---|---|
| Rose Bruford College of Theatre and Performance | 60,673 | 66,397 | 5,724 |
| Heythrop College | 209,863 | 213,889 | 4,026 |
| Royal Academy of Music | 245,578 | 249,024 | 3,446 |
| Norwich University of the Arts | 116,444 | 118,444 | 2,000 |
| Guildhall School of Music & Drama | 242,217 | 244,177 | 1,959 |
| University of London Institute in Paris | 7,668 | 9,330 | 1,661 |
| Bishop Grosseteste University | 57,816 | 59,359 | 1,543 |
| St. George's, University of London | 1,504,629 | 1,504,687 | 59 |
| St Mary's University, Twickenham | 350,295 | 349,767 | -528 |
| Royal Agricultural University | 37,896 | 37,011 | -885 |
| Royal Northern College of Music | 270,847 | 267,586 | -3,262 |
| Queen Mary University of London | 19,304,897 | 19,300,868 | -4,029 |
| Royal College of Music | 348,356 | 344,194 | -4,162 |
| Royal College of Art | 1,500,361 | 1,486,656 | -13,705 |
| Royal Central School of Speech and Drama | 540,795 | 525,632 | -15,163 |
| University of York | 17,382,883 | 17,346,788 | -36,095 |
| Courtauld Institute of Art | 1,180,817 | 1,141,963 | -38,854 |
| London School of Hygiene and Tropical Medicine | 9,959,776 | 9,905,357 | -54,419 |
| University of Lancaster | 15,227,694 | 15,143,582 | -84,111 |
| Institute of Cancer Research | 4,107,551 | 4,022,285 | -85,265 |
| University of Southampton | 33,432,121 | 33,330,398 | -101,723 |
| London Business School | 2,787,838 | 2,627,305 | -160,533 |
| University of Manchester | 44,047,523 | 43,880,358 | -167,165 |
| University of Bristol | 34,028,123 | 33,749,926 | -278,198 |
| University of Warwick | 27,123,965 | 26,774,989 | -348,977 |
| King's College London | 40,370,905 | 40,011,061 | -359,844 |
| London School of Economics and Political Science | 14,405,333 | 13,933,731 | -471,602 |
| Imperial College London | 49,870,637 | 48,591,889 | -1,278,748 |
| University College London | 79,835,672 | 78,384,013 | -1,451,658 |
| University of Cambridge | 73,936,806 | 71,483,195 | -2,453,611 |
| University of Oxford | 81,745,022 | 78,968,754 | -2,776,268 |

*Notes*: QR funding (4:1) and QR funding (3:1) offer the mainstream QR funding to HEIs when quality weight ratios of 4:1 and 3:1 between 4-star and 3-star research activities are used in the allocation of mainstream QR funding to HEIs, respectively. QR (3:1) - QR (4:1) offer the difference between QR funding (3:1) and QR funding (4:1). QR funding generated by the Allied Health Professions, Dentistry, Nursing and Pharmacy UoA of Sussex University is allocated to University of Brighton in both scenarios as agreed by two institutions.

| Table A3. Costs per FTE of different activities for cost bands and HESA cost centres | | | | | | |
|---|---|---|---|---|---|---|
| Cost band | Depreciation per FTE (£) | Other operating costs per FTE (£) | Academic staff costs per FTE (£) | Other staff costs per FTE (£) | Total capital costs per FTE (£) | Total expenditure per FTE (£) |
| Band A | 2,171 | 14,657 | 39,334 | 12,271 | 36,368 | 87,973 |
| Band B | 1,500 | 15,232 | 46,026 | 13,398 | 30,228 | 89,652 |
| Band C | 695 | 16,491 | 55,079 | 11,417 | 23,443 | 89,938 |
| HESA cost centre | Depreciation per FTE (£) | Other operating costs per FTE (£) | Academic staff costs per FTE (£) | Other staff costs per FTE (£) | Capital cost per FTE (£) | Total cost per FTE (£) |
| 101 Clinical medicine | 1,775 | 13,101 | 35,167 | 11,790 | 30,853 | 77,811 |
| 102 Clinical dentistry | 2,234 | 17,035 | 71,473 | 20,650 | 39,373 | 131,497 |
| 103 Nursing & allied health professions | 1,105 | 13,128 | 53,526 | 10,551 | 24,175 | 88,252 |
| 104 Psychology & behavioural sciences | 1,168 | 10,024 | 49,172 | 9,097 | 21,706 | 79,975 |
| 105 Health & community studies | 579 | 10,858 | 42,153 | 9,908 | 16,644 | 68,705 |
| 106 Anatomy & physiology | 2,447 | 14,915 | 41,509 | 13,300 | 39,384 | 94,192 |
| 107 Pharmacy & pharmacology | 2,365 | 20,181 | 46,434 | 16,988 | 43,832 | 107,255 |
| 108 Sports science & leisure studies | 2,102 | 12,743 | 52,449 | 10,349 | 33,764 | 96,562 |
| 109 Veterinary science | 1,663 | 25,366 | 48,089 | 17,619 | 42,001 | 107,708 |
| 110 Agriculture, forestry & food science | 3,961 | 21,902 | 44,716 | 15,581 | 61,509 | 121,806 |
| 111 Earth, marine & environmental sciences | 2,412 | 17,599 | 39,872 | 13,207 | 41,722 | 94,801 |
| 112 Biosciences | 2,531 | 13,661 | 35,647 | 12,392 | 38,974 | 87,013 |
| 113 Chemistry | 3,992 | 17,967 | 33,779 | 13,110 | 57,890 | 104,779 |
| 114 Physics | 3,079 | 14,801 | 33,352 | 11,217 | 45,587 | 90,156 |
| 115 General engineering | 2,225 | 20,126 | 32,301 | 12,898 | 42,381 | 87,579 |
| 116 Chemical engineering | 3,799 | 22,405 | 36,911 | 15,079 | 60,397 | 112,387 |
| 117 Mineral, metallurgy & materials engineering | 3,759 | 21,146 | 30,718 | 14,376 | 58,736 | 103,829 |
| 118 Civil engineering | 2,126 | 16,932 | 48,885 | 14,843 | 38,195 | 101,923 |
| 119 Electrical, electronic & computer engineering | 2,460 | 15,478 | 38,328 | 12,385 | 40,076 | 90,789 |
| 120 Mechanical, aero & production engineering | 3,632 | 18,556 | 37,678 | 16,023 | 54,875 | 108,576 |
| 121 IT, systems sciences & computer software engineering | 1,580 | 13,561 | 45,251 | 11,962 | 29,363 | 86,576 |
| 122 Mathematics | 1,372 | 13,153 | 50,822 | 8,246 | 26,872 | 85,939 |
| 123 Architecture, built environment & planning | 1,012 | 14,126 | 49,902 | 11,834 | 24,250 | 85,986 |
| 124 Geography & environmental studies | 1,223 | 14,084 | 48,542 | 10,427 | 26,319 | 85,288 |
| 125 Area studies | 408 | 13,205 | 50,092 | 9,871 | 17,283 | 77,246 |
| 126 Archaeology | 831 | 9,474 | 39,297 | 9,120 | 17,782 | 66,199 |
| 127 Anthropology & development studies | 890 | 12,753 | 46,835 | 10,163 | 21,657 | 78,655 |
| 128 Politics & international studies | 808 | 11,698 | 55,834 | 10,549 | 19,781 | 86,164 |
| 129 Economics & econometrics | 141 | 14,328 | 66,769 | 9,936 | 15,734 | 92,439 |
| 130 Law | 589 | 14,046 | 61,645 | 10,042 | 19,931 | 91,618 |
| 131 Social work & social policy | 534 | 14,259 | 48,172 | 9,599 | 19,601 | 77,372 |
| 132 Sociology | 498 | 10,269 | 53,801 | 9,018 | 15,251 | 78,070 |
| 133 Business & management studies | 955 | 27,975 | 64,287 | 16,893 | 37,528 | 118,708 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 134 Catering & hospitality management | 1,171 | 16,905 | 54,414 | 9,371 | 28,610 | 92,396 |
| 135 Education | 763 | 17,602 | 49,678 | 11,059 | 25,235 | 85,971 |
| 136 Continuing education | 508 | 39,740 | 39,594 | 56,557 | 44,819 | 140,970 |
| 137 Modern languages | 283 | 8,640 | 47,577 | 8,935 | 11,465 | 67,977 |
| 138 English language & literature | 327 | 9,788 | 51,743 | 7,687 | 13,060 | 72,489 |
| 139 History | 275 | 11,213 | 54,844 | 7,975 | 13,960 | 76,778 |
| 140 Classics | 657 | 16,630 | 53,771 | 7,849 | 23,201 | 84,821 |
| 141 Philosophy | 109 | 11,575 | 53,437 | 7,355 | 12,664 | 73,457 |
| 142 Theology & religious studies | 270 | 11,112 | 52,937 | 6,318 | 13,813 | 73,068 |
| 143 Art & design | 1,287 | 13,549 | 44,000 | 18,173 | 26,421 | 88,594 |
| 144 Music, dance, drama & performing arts | 1,456 | 19,866 | 49,833 | 11,424 | 34,425 | 95,681 |
| 145 Media studies | 1,819 | 11,980 | 49,733 | 12,710 | 30,166 | 92,609 |

*Notes*: Capital costs per FTE calculated by summing the other operating costs and asset costs where the latter is obtained by multiplying the depreciation costs per FTE with 10. Total costs per FTE column is calculated by summing the capital costs per FTE, academic staff costs per FTE and other staff costs per FTE. All costs are rounded to the next Sterling pound figures.

| **Table A4**. Changes in QR funding received by HEIs with alternative cost weights compared to the existing allocation | | |
|---|---|---|
| Institution | Scenario 1 (£) | Scenario 2 (£) |
| Anglia Ruskin University | 12,915 | 135,301 |
| Aston University | -13,478 | -100,127 |
| Bath Spa University | 14,830 | 180,161 |
| Birkbeck College | 61,276 | 935,884 |
| Birmingham City University | 20,332 | 174,444 |
| Bishop Grosseteste University | 1,213 | 20,776 |
| Bournemouth University | 18,744 | 168,160 |
| Brunel University London | 13,547 | 129,950 |
| Buckinghamshire New University | 1,663 | 4,374 |
| Canterbury Christ Church University | 13,462 | 163,197 |
| City, University of London | 24,583 | 479,232 |
| Courtauld Institute of Art | 15,357 | 48,371 |
| Coventry University | 1,100 | -88,263 |
| Cranfield University | -45,365 | -582,154 |
| De Montfort University | 23,846 | 264,152 |
| Edge Hill University | 12,921 | 168,632 |
| Falmouth University | 4,680 | 14,985 |
| Goldsmiths' College | 53,880 | 670,715 |
| Guildhall School of Music & Drama | 3,143 | 9,916 |
| Harper Adams University | -2,714 | -37,536 |
| Heythrop College | 4,361 | 73,917 |
| Imperial College London | -479,460 | -6,646,425 |
| King's College London | 11,378 | -19,361 |
| Kingston University | 15,983 | 190,698 |
| Leeds Beckett University | 21,284 | 160,088 |
| Leeds Trinity University | 1,901 | 30,942 |
| Liverpool Hope University | 13,574 | 202,292 |
| Liverpool John Moores University | 19,587 | 84,580 |
| Liverpool School of Tropical Medicine | -10,807 | -149,365 |
| London Business School | 58,333 | 999,748 |
| London Metropolitan University | 9,128 | 129,451 |
| London School of Hygiene and Tropical Medicine | -110,628 | -1,527,710 |
| London South Bank University | -80 | -12,277 |
| Loughborough University | 44,664 | 179,699 |
| Manchester Metropolitan University | 23,582 | 309,068 |
| Middlesex University | 29,485 | 372,877 |
| Newman University | 2,639 | 42,733 |
| Norwich University of the Arts | 1,519 | 4,858 |
| Nottingham Trent University | 17,126 | 206,324 |
| Oxford Brookes University | 25,975 | 289,724 |
| Queen Mary University of London | -40,674 | -433,406 |
| Roehampton University | 35,013 | 455,037 |

| | | |
|---|---|---|
| Rose Bruford College of Theatre and Performance | 796 | 2,570 |
| Royal College of Music | 4,534 | 14,397 |
| Royal Holloway, University of London | 48,329 | 623,542 |
| Royal Northern College of Music | 3,520 | 11,132 |
| Sheffield Hallam University | 32,212 | 271,706 |
| Southampton Solent University | 1,388 | 8,775 |
| St Mary's University, Twickenham | 6,637 | 96,844 |
| St. George's, University of London | -16,543 | -229,045 |
| Staffordshire University | 5,955 | 56,060 |
| Teesside University | 2,341 | 46,838 |
| The Arts University Bournemouth | 1,554 | 5,050 |
| The Institute of Cancer Research | -45,370 | -627,176 |
| The London School of Economics and Political Science | 255,142 | 4,268,128 |
| The Open University | 43,248 | 654,379 |
| The Royal Academy of Music | 3,211 | 10,300 |
| The Royal Agricultural University | -412 | -5,708 |
| The Royal Central School of Speech and Drama | 7,021 | 22,119 |
| The Royal College of Art | 19,405 | 60,266 |
| The Royal Veterinary College | -33,465 | -462,190 |
| The School of Oriental and African Studies | 70,001 | 1,098,260 |
| The University of Bath | -21,697 | -356,842 |
| The University of Birmingham | -11,594 | -128,828 |
| The University of Bolton | 343 | 7,908 |
| The University of Bradford | -7,205 | -81,826 |
| The University of Chichester | 9,022 | 64,726 |
| The University of Cumbria | 1,851 | 12,599 |
| The University of East Anglia | -2,955 | 124,633 |
| The University of Essex | 89,814 | 1,479,628 |
| The University of Huddersfield | 21,912 | 289,491 |
| The University of Hull | 15,779 | 209,923 |
| The University of Kent | 103,166 | 1,562,669 |
| The University of Lancaster | 44,714 | 861,439 |
| The University of Leeds | -22,901 | -298,216 |
| The University of Leicester | 1,970 | 141,370 |
| The University of Liverpool | -78,352 | -1,157,261 |
| The University of Manchester | -92,167 | -1,035,266 |
| The University of Northampton | 5,310 | 76,042 |
| The University of Nottingham | -64,504 | -640,988 |
| The University of Reading | 9,607 | -37,890 |
| The University of Salford | 12,671 | 76,904 |
| The University of Sheffield | -88,599 | -1,206,947 |
| The University of Surrey | -42,245 | -610,443 |
| The University of Warwick | 39,472 | 955,870 |
| The University of West London | -184 | -3,531 |
| The University of Westminster | 37,705 | 431,572 |
| Trinity Laban Conservatoire of Music and Dance | 2,599 | 8,283 |
| University College London | -142,283 | -2,682,162 |
| University for the Creative Arts | 4,351 | 13,822 |

| | | |
|---|---|---|
| University of Bedfordshire | 8,086 | 126,839 |
| University of Brighton | 26,452 | 171,213 |
| University of Bristol | -123,382 | -1,758,151 |
| University of Cambridge | -210,306 | -2,607,056 |
| University of Central Lancashire | 6,699 | 71,818 |
| University of Chester | 6,637 | 69,406 |
| University of Derby | 4,893 | 64,884 |
| University of Durham | 46,832 | 736,787 |
| University of East London | 16,390 | 211,510 |
| University of Exeter | 56,865 | 836,031 |
| University of Gloucestershire | 7,432 | 46,572 |
| University of Greenwich | -6,887 | -89,567 |
| University of Hertfordshire | -8,896 | -117,921 |
| University of Keele | -7,291 | -42,841 |
| University of Lincoln | 2,246 | 10,092 |
| University of London Institute in Paris | 161 | 2,732 |
| University of Newcastle upon Tyne | -38,899 | -679,575 |
| University of Northumbria at Newcastle | 25,358 | 265,449 |
| University of Oxford | 2,399 | 980,045 |
| University of Plymouth | -10,180 | -235,157 |
| University of Portsmouth | 9,151 | 181,307 |
| University of Southampton | -162,328 | -2,288,563 |
| University of Sunderland | 6,567 | 85,653 |
| University of Sussex | 57,860 | 937,051 |
| University of the Arts, London | 34,900 | 110,454 |
| University of the West of England, Bristol | 18,447 | 236,883 |
| University of Winchester | 10,256 | 142,899 |
| University of Wolverhampton | 11,271 | 140,672 |
| University of Worcester | 4,536 | 40,327 |
| University of York | 34,613 | 587,916 |
| Writtle University College | -319 | -5,164 |
| York St John University | 5,509 | 60,870 |

*Notes*: Changes in mainstream QR funding with the scenarios 1 and 2 obtained by subtracting the existing QR funding of HEIs from the alternative QR funding distribution with cost weights in Scenarios 1 and 2, respectively. QR funding generated by the Allied Health Professions, Dentistry, Nursing and Pharmacy UoA of Sussex University is allocated to University of Brighton in both scenarios as agreed by two institutions.