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Impact of selective funding of research in England, and the specific outcomes of HEFCE research funding

**A report to HEFCE and the Department for
Education and Skills by Evidence Ltd**

Annex: annotated literature review

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Literature review

Annotations and methodology

1. Introduction

This Annex presents the review of literature on which the main report draws for its evidence base. It provides an annotated summary of all books and journal articles (Section 2), public documents and other publications (Section 3), and other forms of information (Section 4) examined in relation to the review. It also describes (Section 5) the methodological approaches used to identify and interrogate the literature reviewed. Much of the material is referenced in the main report, but some other items are also included here.

Although the topic of selective research funding is of intense interest to the higher education community there has been no previous mapping of the literature or any systematic assessment of the scope of existing work in this field. Accordingly, the review was directed at the widest possible range of both formal and informal literature relating to selective research funding in general and QR in particular. The review concentrated on two broad categories of literature.

(a) Academic publications

The primary focus in this category was academic work published during the last ten years in UK, European, American and Australian journals. The literature in this area is well defined. Inevitably, research policy is itself an issue of great interest to those who work on research activity data. As a consequence, a relatively high proportion of relevant journal articles are presented in searchable databases – because these journals have tended to be a priority for incorporation into such databases - and this gives ready and rapid access to the literature.

Literature generated in other academic contexts, notably monographs and other relevant books, was accessed via cross-checking of references in the core material. This sub-category includes serials identified in the main journal articles but not represented in the electronic databases. While some of this material might be considered minor, the aim was to make the review ‘catalogue’ as comprehensive as possible. In addition, there was some relevant material present in discipline-based academic journals, rather than core policy journals.

(b) Policy and related reports

We identified a number of areas of literature in these categories:

- Reports of policy studies commissioned and published by stakeholder organisations. Because these are in the public domain they tend to lend a particular weight to the underlying debate

- Supporting material relating to commissioned policy studies available through web-sites or as 'grey literature' in e.g. policy unit in-house series and other searchable databases
- Other in-house reports, including those from academic units, not commissioned by a specific client
- Strategy documents from institutions, e.g. reflecting their reactions to funding policy, and outcomes.

Web-based searches facilitated a systematic review of some of these categories. Where this was not feasible a simple sampling procedure was adopted to check accessibility and content. Section 5 of this Annex elaborates these and other elements in the methodology employed to identify relevant literature, with a step-by-step description of the search procedures, approaches applied and outcomes for each category of evidence.

2. Desk-based analysis (a): academic publications¹

Directly relevant and associated other work has been included in this Annex to provide a reference summary of the information sources, documents and journals that were examined.

Material included in the main report is referenced within that text as footnotes. These references also appear separately in the Annex, in most cases with annotation. However, it is important to remember that the material presented and reviewed in this Annex contains a wider range of sources than those referred to directly within the main report. Associated material is included because it is relevant to broader research funding issues, including research assessment, rather than selectivity or QR *per se*. Material has also been referenced if it provides general illumination of the historical development of selective funding of research in the UK.

Further information about the journals searched, together with procedures adopted, can be found in the final section (Section 5) of this Annex.

Annotated results

Anon (1997) Editorial: Industry Does Rely on Blue Skies Research, *South African Journal of Science*. 93 (9) 376-376.

Anon. (2003) UK research – funding focus on science elite stifles innovation: Royal Society, *Chemistry and Industry*. 10 (5).

Ayres R. (1994) The Restructuring of Higher Education in Economics. *Higher Education Quarterly*. 48 (1) 37-56

This paper examines the changing structure of economics in the light of UFC RAEs and ESRC recognition exercises. The hypothesis is that taken together, these systems of 'control' plus the declining unit of resources and moves towards mass HE will lead many departments to become primarily concerned with teaching, leaving a small number research oriented or mixed. The evidence appears to point in this direction. However, the author argues that though departmental size is linked to research output there is evidence of research excellence throughout the system. Therefore he cautions against a severe rationalisation of research funds.

Ball C. (1989) The Problem of Research. *Higher Education Quarterly*. 43 (3) 205-215

Identifying three types of research, namely scholarship, contract research and fundamental research, the paper sets out the case for selectivity of research funding in the then still binary HE system:

'The mission of the polytechnics and colleges in research is properly centred on applied research relevant to the needs of industry who pays for it. Along with this, some institutions may usefully engage in strategic research in particular fields in which they have established expertise related to their

¹ The list of publications includes articles not directly cited in the main report.

applied research. The Government does not, however, intend to supply funds in support of basic research in polytechnics and colleges.'

Ball argues that the most important implication of this policy is that the dual support system for research will not be introduced in the PCFC sector. Ball supports this decision:

'Far from believing that the system should be extended, I think we should now be thinking of withdrawing some universities from the dual support system.'

He had previously criticised these arrangements in a lecture at the Royal Society of Arts and quotes from that lecture:

'The funding of civil research needs reform. The dual support system is in decay and disarray. The balance between fundamental and development research needs to be adjusted in favour of the latter. And a more openly selective and concentrated policy of research funding is required.... The UGC has bravely embarked on a policy of selective (and concentrated) research funding by department, but I believe that this approach needs to be developed both faster and at the institutional level.... [we] may not be able to sustain as many as 45 universities fully-funded for research. Perhaps a number between 12 and 20 would be more realistic. Such a select group of universities, adequately funded through a dual support system, would provide for the construction of 'curiosity-research' and much of the fundamental research required. The remainder of the universities would join the polytechnics as 'teaching first' institutions, though all of them would be able to compete for Research Council funds as the polytechnics do now.'

Ball D F. (1997). Quality measurement as a basis for resource allocation: Research assessment exercises in United Kingdom universities. *R & D Management*. 27 (3) 281-289

Ball D F and Butler J. (2004). The Implicit Use of Business Concepts in the UK Research Assessment Exercise. *R & D Management*. 34 (1) 87-97

Barnetson R and Cutright M. (2000). Performance Indicators as Conceptual Technologies. *Higher Education*. 40 277-292.

This paper is based on evidence from Alberta. It claims to be about resource allocation. It says that performance indicators (PIs) shape what issues academics think about and how they think. There is a helpful literature review on PI theory and practice. A PI on research output would be a conceptual technology because it would focus academic attention on research and specifically on outputs. Slaughter & Leslie's view that small amounts of funding can then exert substantial influence on behaviour is cited. Research is not featured as a PI in Alberta's system.

Barthorpe F. (1995). Blue Skies Research Pays Off. *Professional Engineering*. 8 (21) 26-26

Brief commentary

Braben D W. (2002). A-Statistical Mechanics And Its Applications. *PHYSICA* 314 (1-4) 768-773

Relevance of basic and blue skies research to research development

Butler L. (2003). Explaining Australia's increased share of ISI publications- the effects of a funding formula based on publication counts. *Research Policy*. 32 (1) 143-155

Campbell D F J and Felderer B (1997). *Evaluating Academic Research in Germany: Patterns and Policies*, Political sciences series no. 48. Institute for Advanced Studies, Vienna.

Clark B.R. (1994) The Research-Teaching Nexus in Modern Systems of Higher Education. *Higher Education Policy*. 7 (1) 11-17

Universities receive diversified funding and are in a position to roll funds towards research. They tend to compete for reputation: 'the most valuable resource of all.' The author considers that the shift towards mass HE gives institutions a large undergraduate base and that they are therefore better positioned to cross-subsidise. Quoting Ross Harrold (1992):

'Research is of prime in academics' value systems... [and] university reward and value systems are premised on achievement in research. Yet the formulae by which universities are block funded are usually premised on the primacy of teaching activities.... Academics must teach but they prefer to engage in research. It would therefore be expected that the most expensive resource, the time of academics, will differ from that assumed in the formulae used to allocate resources to and within academic departments. In short, it is reasonable to expect that teaching activities will tend to subsidise research activities' (Harrold R. (1992) Resource allocation, in Clark, Burton R. and Neave, Guy (eds) *The Encyclopaedia of Higher Education*, Vol 2m Analytic Essays, Oxford, Pergamon Press, 1464-76).

Clark adds:

'Thus, whether in Germany, Britain, France, Japan or elsewhere, to the extent that universities achieve a capacity to self-steer, by old fashioned 'leave-it-on-the-stump' block funding, or by modern diversification of funding sources, they are likely to cross-subsidise in favour of research and advanced training.'

Clayton K. (1988). Trends in funding arrangements. *Higher Education Quarterly*. 42 (2) 134-143

The author describes the then norm-based method for determining the basic grant of universities.

Cunningham C M. (1972). Research funding in the social sciences. *Universities Quarterly*. 26 (3) 333-347

The author compares the UK system with the USA. In the latter, because there is no equivalent to the UGC, universities are able to charge overheads to their research grants, and grants are usually made on a full cost basis. She argues that this has some advantages. In the UK, universities receive their basic finance from the UGC leaving SSRC grants to cover only those costs not traditionally met by UGC:

'There is therefore some danger that universities will consider research to be a luxury and will therefore adopt a rather negative attitude towards it..... Of course, the opposite danger in the US may be that universities will lean on their staff to obtain grants in order to augment university revenue. However, the main advantage of the full cost funding would be that the real cost of undertaking social science research would be evident and the resources for carrying it out might all be more efficiently used.'

Curran P J. (2000). Competition in UK Higher Education: Advantage in the Research Assessment Exercise and Porter's Diamond model. *Higher Education Quarterly*. 54 386-410.

Curran P J. (2001). Competition in UK Higher Education: Applying Porter's Diamond Model to Geography Departments. *Studies in Higher Education*. 26 223-251

Curran is an experienced senior manager in HE. He notes that institutions compete for resources on the basis of research, a minority part of their total activity. Peer review (RAE) and government direction (the HEFC funding formula for a fixed pot of money) are argued as having an identical outcome to that of market forces operating through customer evaluation and product regulation.

He uses Porter's three layer diamond model to explore what gives competitive advantage at the level of department, discipline and 'nation'. Four components are identified:

- factor conditions, research orientation and institutional accumulated wealth
- demand conditions, academic demand for research measured by ability to secure external income and research students
- related departments, research strength of institution and presence of a relevant strong cluster
- departmental strategy, ability to focus attention on training and publication

Delamont S (2004). All together now? Arts and social science views of research assessment in Britain. *Higher Education Quarterly*. 58 198 –209

Whilst the paper is not on research funding, it provides an interesting resume of learned societies' views on the RAE with 17 areas of consensus, including some on metrics.

Dill D D. (2001). The regulation of public research universities: changes in academic competition and implications for university autonomy and accountability. *Higher Education Policy. The Quarterly Journal of the International association of Universities.* 14 (1) 21-35

The author examines the changing context of HE in altering the traditional means by which governments regulate their research universities and notes:

'In a number of countries, universities, which are increasingly subject to a global market, have discovered that they require greater management flexibility in order to compete effectively and are therefore seeking relief from traditional government regulations affecting both substantive and procedural matters'.

Geuna A and Martin B. (2003). University Research Evaluation and Funding: An International Comparison. *Minerva.* 41 277-304.

The paper examines the evaluation of university research in 10 countries in Europe plus Australia and Hong Kong. It examines the cost-benefits of performance-based funding in comparison with other approaches. Analysis suggests that initial benefits outweigh the costs but over time produce diminishing returns, which raise questions about continued use.

The paper also includes arguments about volume increase, rewards reinforcing the status quo and risk-averse behaviour in research publication.

Gillett R. (1989). Research performance indicators based on peer review; a critical analysis. *Higher Education Quarterly.* 43 (1) 20-38

The author criticises the UGC's 1989-90 evaluation because it did not relate output to input and therefore suggests that there is no indication of the cost effectiveness of departmental research programmes.

Glass J C, McKillop D G and O'Rourke G. (1998). A cost indirect evaluation of productivity change in UK universities. *Journal of Productivity Analysis.* 10 (2) 153-175

Glass J C, McKillop D G and O'Rourke G. (2002). Evaluating the productive performance of UK universities as cost-constrained revenue maximizers: an empirical analysis. *Applied Economics.* 34 (9) 1097-1108

Godin B (2002). The number makers: fifty years of science and technology official statistics. *Minerva.* 40 375-397

The paper traces the development of science and technology statistics and how military and science policy drove this until economics came into play.

Hoch P K. (1988). The new inter-disciplinary university research centres: avenues of expansion or road to retrenchment? *Higher Education Quarterly*. 42 (1) 38-53

The paper examines the ABRC's proposals for new university research centres. The author argues that these constituted a proposal to preserve basic research while re-orienting some of it to more long-term utilitarian ends. The analysis includes the ABRC's proposal to create a 3-tiered university research system of R, T and X universities. (The ABRC's 1987 report is noted below)

Johnes J and Taylor J. (1989). The 1989 Research Selectivity Exercise: a statistical analysis of the differences in research rating between universities at the cost centre level. *Higher Education Quarterly*. 46 (1) 67-87

The paper reviews the outcomes of 1988/9 UFC RSE. It finds disparities between subjects which may result in insufficient allocations at institutional level and analyses eight potential explanatory variables as determinants of research performance at cost centre level:

1. Staff student ratio
2. Research income per member of staff
3. Ratio of research students to total students
4. Size of assessment unit
5. Specialisation within an institution
6. Halo effects
7. Type of research undertaken
8. Location of university

Of these only the size of cost centre is consistently associated with RSE score. The only other variable influencing score in the majority of subject areas is the HEI's score in other subjects – suggesting a 'halo' effect. The author notes with surprise that research expenditure per member of staff is not strongly associated with RSE score.

Johnston R J. (1993) Formulaic follies revisited- or why geography researchers get almost twice as much money as do town planners in English universities. *Environment and Planning*. 25 (10) 1527-1534

Jones S. (1994) Modelling and muddling: resource allocation in British universities. Pp 37-54, In, Berry R H (ed) *Management accounting in British Universities*. CIMA, London

King D A. (2004). *Nature* . 430 311-316

King sets out the key evidence demonstrating the improvement in UK research performance over the last decade and the evidence supporting the idea that the UK research base is particularly efficient and effective as a research producing system.

Kogan M. (1994). Assessment and productive research. *Higher Education*. 48 (1) 57-67

The author examines the ways institutions might systematically plan for research. He argues that in research the best efforts come from individuals' own efforts rather than the proddings of assessment or quality. He criticises policies underlying assessment exercises as

'purgative rather than developmental, reductionist rather a contribution to creating a larger and more useful scientific base...'

Kogan then provides a template for how a department might cope with the demands of the selectivity exercise.

Kogan M. and Hanney S. (2000) *Reforming Higher Education*. London: Jessica Kingsley.

The section starting at page 93 sets out a detailed historical resume of the evolution of selectivity policy in the UK, with extensive quotations from the senior managers and policy leaders in the period from the 1960s onwards. It thus not only analyses the changes that took place but provides detail on the specific thinking that was associated with such change.

Lewis J. (2000). Funding social science research in academia. *Social Policy and Administration*. 34 (4) 365-376

Liefner I. (2003). Funding, Resource Allocation and Performance in Higher Education Systems. *Higher Education*. 46 469-489

Liefner argues that Anglo-American universities get more private funding for research but 'European' universities rely on state (and are more conservative, less innovative, less responsive). Many governments use competitive elements via performance measures in both formula funding and evaluated project proposals. Performance based resource allocation is also implemented within institutions. He argues that the evidence shows that performance based funding tends to bring about positive changes but has side effects. The form of allocation affects behaviour and risk taking. This impacts on the level and type of academic activity but apparently not on long-term institutional success.

The paper raises the issue of distinguishing between a funding stream (QR) and the way in which it is allocated (formula with a performance element).

Avoiding uncertain outcome may mean staying within a narrow field where expertise has been established and the likelihood of getting research funds and of publishing in prestigious journals can then be maintained, where moving to an interdisciplinary or innovative area would create uncertainties.

In conclusion, the author notes that while opinions about effects are similar, the actual systems vary yet all the HEIs are successful, so the link between allocation system and performance must be weak (compared to other factors). The overwhelming view of the interviewees across all institutions was that the main factor was the quality

(specifically they said the qualifications) of the university staff. Resource strategies can be used to exploit and drive an innovative culture but not to create it. Well-qualified people are seen as less likely to respond to incentives, working to their own well-motivated agenda and being confident to take risks. Less motivated and confident staff would be more risk averse. Performance based allocation speeds change, increases responsiveness and directs resources towards high performers.

Middlehurst, R (2004). Changing internal governance: a discussion of leadership roles and management structures in UK universities. *Higher Education Quarterly*, Vol 58, 4, pp 258-279.

Morris N. (2000). Science Policy in Action: Policy and the Researcher. *Minerva*. 38 425-451

Government policies for science increasingly influence university research management. The paper argues that policies that influence research content have a greater influence on researcher behaviour than do policies influencing overall research management. Pressure for mission compliance suggests a need for more policy-researcher dialogue. The work is based on case studies of four biological science university departments, of diverse types.

The author expresses more concern about institutional research management (or lack of competence in it, and lack of policy on long term institutional effects) and less about RC policy influence on research content.

Mundell I. (1992). UK moves closer to free market for research funding. *Nature*. 359 (6395) 470

Patrick W J and Stanley E C. (1996). Assessment of research quality. *Research In Higher Education*. 37 (1) 23-42

Payne A A. (2003). The role of politically motivated subsidies on university research activities. *Educational Policy*. 17 (1) 12-37

Perkin H. (1974). Adaptation to Change by British Universities. *Universities Quarterly*. 28 (4) 389-403 and 43 (3) 205-215

The paper stresses the importance of blue skies research and the importance of being able to 'research the urgent problems of our time' see 400-402.

Rasmussen N. (2002). Of 'small men', big science and bigger business: the Second World War and biomedical research in the United States. *Minerva*. 40

The author explains how big science and industrial collaboration was working before 1940 and many scientists were familiar with it. This paper argues that it was Federal structures that were more important than wartime experience in shaping 'big science' after 1950.

Reynolds P A. (1984). Sir Peter Swinnerton-Dyer's examination paper. *Universities Quarterly*. 38(2) 95-104

Sir Peter Swinnerton-Dyer, the then new chairman of the UGC, produced a circular to the universities, following questions raised by Sir Keith Joseph, Secretary of State for Education, regarding how far and by what means there might be greater selectivity in research funding. Reynolds provides a critique of this circular letter. Of particular relevance to the historical origins of selectivity in research funding are the following comments.

- The Leverhulme Report questioned received doctrine about the ineluctable benefit of the interweaving of teaching at the higher education level and research.
- Research benefits from exposure in a teaching context, especially at PG level,
- The optimal use of resources might be that the good teacher should do more teaching and only some research, while the good research should do more research and only some teaching.
- Since research is expensive, this implies some differentiation of funding – when resources are limited or contracting the argument for differentiation is more powerful

From this the author concludes:

‘That universities should discriminate in their provision of resources for research seems eminently reasonable.’ (102).

However, it is argued that ‘it must be the universities themselves who do it’. The author offers three reasons for leaving this to institutions to decide:

1. Differentiation may often be not between one department and another, but between one part of a department's activities and other parts. Detailed knowledge necessary for this cannot be held and managed from the centre.
2. Growing points (in research) within an institution may lie at the interface between different disciplines. The subject-directed organisation of policy at the centre ‘responds uneasily to unorthodox patterns’.
3. Data held at the centre is inevitably historical which means that flexibility, innovation and new development are less likely to attract support. ‘It follows of course from this argument that maintenance of the dual support system is essential.’

Rolfe H. (2003). University Strategy in an Age of Uncertainty: The Effect of Higher Education Funding on Old and New Universities. *Higher Education Quarterly*. 57 24-47

The paper focuses on the effects of changes in funding through the introduction of tuition fees but notes that the responses in university strategy to these changes are not easily separated from other funding changes and the general need to control costs and generate income.

Four universities were studied through interviews with senior managers. The older pre-1992 institutions were least affected. All four were concerned about quality – in recruitment of students and staff and outputs of degree results and research. Marketing and branding was seen as an important issue.

On research, the two older universities focused on quality (on which all T and R reputation was based) while the two new universities were concerned to increase the amount of research funding (and this linked relevant and curriculum based research). All four sought to recruit stars on research-only contracts. One had a scheme of incentivising research student recruitment with £10k grants to supervisors. This was part of a £15m 'virtuous cycle' strategy designed to boost research, improve RAE grades and attract better staff etc with the aim of moving up by one grade per cycle.

The new universities saw third-leg industry links as equally important and linked to their kind of research while the old universities were sceptical about links to community partners that were not founded on a strong research base.

Scott P. (1979). Expansion, and then selectivity. *Universities Quarterly*. 34 (4) 306-311

Following a discussion by three senior academics regarding the future of university autonomy, Peter Scott (then editor of the THES) argues that the discussion sent out two signals:

1. 'That the system is facing a crisis which requires a fundamental re-evaluation of its present structure.... The way out of this crisis, in their view, is a group of policies that cluster round the idea of 'selectivity'.
2. 'The second, weak and confused, is that perhaps new mechanisms will be needed to achieve this greater selectivity...'

Scott suggests that there were several obstacles to greater selectivity, not least that it

'jars with other, highly and long valued, ideas about higher education. For example, one almost inevitable outcome of any selectivity policy would be to loosen the present relationship between teaching and research..... [projects some becoming increasingly teaching oriented and some more like research institutes and units 'constitutionally but not organically linked with the teaching part of the university']. This would undermine the unity and certainly the integrity of the university. Yet the idea of a university as a liberal and comprehensive institution is deeply rooted in western society. Selectivity, if carried too far, might be a threat to this idea.'

Slaughter S and Leslie L L . (1997). Academic Capitalism: Politics, Policies and the Entrepreneurial University. Baltimore: Johns Hopkins University Press.

Startup R and Gruneberg M (1976). The rewards of research. *Universities Quarterly*. 30 (2) 227-238

The authors investigate whether the structure of rewards in the university is distorted in favour of research. They report results of a survey of research conduct in a

provincial university. This provides data on why academics do research, the pressures on them, the levels and variation in staff satisfaction with aspects of their research experience.

The paper concludes that the majority stated that the most important reason why they did research was 'because they enjoyed doing it' and it is noted, with some surprise, 'the limited extent to which respondents referred to the notion that academics have a duty to conduct research.'

However, although this survey predates by a decade the first research selectivity exercise the authors nonetheless found evidence of pressure to publish – 86% felt themselves 'under at least some pressure and included in this figure were 26 % who felt under great pressure'. Two kinds of pressure were noted: 1) the influences which impinge on the individual but which were not integral to research itself – notably pressure of promotion; 2) the 'felt drive within the individual' for example, to communicate particular ideas, or the need to publish to obtain research grants.

Stiles D R. (2002). Higher Education Funding Council (HEFC) methods in the 1990s: National and regional developments and policy implications. *Public Administration*. 80 (4) 711-731

The paper argues that HEFC methods were established to implement a devolved HE funding policy, reducing unit costs and enhancing research quality. Research funding became more influenced by RAE scores. Despite variations in allocations between regions and institutional types, the methods reinforced research-funding differences between institutions favouring those with established research track records.

Swinnerton-Dyer P.(1991) Policy on Higher Education and Research. The Rede Lecture. *Higher Education Quarterly*. 45 (3) 204-218.

This article explores the changing relationship between universities and government. It provides a personal prediction of what effects will be on universities and provides comments on the indirect costs of research.

Departments know roughly how much resource it can devote to research and have a portfolio of possible research projects. How much outside support a department needs to attract for a particular research project in order to embark on it should not depend at all on the source of that support. The question is simply whether the value of that project to the department justifies the resources that the department will have to provide... Sometimes the answer should be 'no'; indeed a Vice-Chancellor should view with considerable suspicion a laboratory-based department which never turns down outside money.'

The author also comments on the agenda for merging the UFC and PCFC, seeing as a matter for concern the effect of the merger on the funding of research:

'Even in a laboratory-based subject, a department which is seriously engaged in research needs to have at least one-third of its research money under its own control, rather than tied to particular research projects; it is only in this way that it can provide even moderately well-founded laboratories, an adequate

research library, and so on – as well as funding the research of those of its members who have not yet established a sufficient track record to attract outside funds. In non-laboratory subjects the proportion needs to be much larger... Some front-rank institutions are already finding that the research support they get from the UFC is not enough to underpin their earmarked research income, and the fact that the UFC grant is growing more slowly than other sources of research support can only make matters worse' (212).

With regard to the funding of polytechnics the author goes on to comment:

'Realistically, therefore, one is forced to advocate extending the research component of block grant to polytechnics, together with a major increase in selectivity... Such a change would be rough on the less distinguished institutions, because most of the research money that polytechnics will gain will come from them' (213).

Talib A (2001). Formula Based Allocation of Public Funds: The Case of Higher Education Research Funding. *Public Money & Management*. 21 57-64

Formula funding can be used by a principal to drive a system towards broad objectives while maintaining agent's (recipient's) autonomy on local decisions. To avoid the transfer (of funds) becoming complex and specific, a 'veil of ignorance' can be used to permit recipient (agent, institution) to vary spend compared with 'earning' pattern. This paper analyses whether use of HEFCE formula supports national objectives.

Two areas of manipulation in institutional behaviour are (1) the decisions over who to submit (filtering and biasing information provided for assessment) and (2) how to allocate received funds, either using 'earnings' formula or instead by 'cross-subsidy'.

The effect of raising the ceiling in the multiplier is noted – if this (creating 5*) had not been done then the top-end incentive would be lost due to better competition. HEFCE's policy therefore appears to be not one of supporting excellence wherever it is found (as claimed) but of sustaining centres of excellence.

The potential introduction of a policy factor for steering funds towards stated research areas is discussed. This has been resisted for the FC block grant, which means that the main steer is via the Research Councils. If government favours such a steer then that could push research funding from DfES towards OST.

Talib A and Steele A. (2000). The research assessment exercise: strategies and trade-offs. *Higher Education Quarterly*. 54 (1) 68-87

The writers portray the RAE as a budgeting exercise tool to measure past performance benchmarked against other units. Total resources available are allocated based on ex-post reporting performance. The authors focus on the submission strategy – this provides managerial choice of selective submission.

Tapper T & Salter B. (2004). Governance of Higher Education in Britain: the Significance of the Research Assessment Exercises for the Funding Council Model. *Higher Education Quarterly*. 58 4-30

The authors assert that research improvement makes the selective distribution of research funds more difficult (because everyone has moved towards the same high end of the scale). The failure to anticipate the outcome and its financial implications is described as a failure of HE management. The article explores alternative governance models 'likely to emerge' as a consequence and the (lack of) freedom of action for the FCs.

The paper concludes that the system has moved from stability to confusion, with more policy stakeholders taking an interest in HE. The RAE undermined the block grant and a university, while not compelled, would be bold – even foolish - not to follow the logic of RAE ratings in internal management of resources.

Thomas H. (2000). Power in the resource allocation process: the impact of 'rational' systems. *Journal of Higher Education Policy and Management*. 22 127-137

There are some interesting references listed here, but the thing that is most striking is that while there are several relating to funding models within Universities, they are almost all early 1980s or earlier. On the basis that the author has reviewed the available literature, this seems good confirmation of the recent deficit.

Varghese N V. (2004). Incentives and Institutional Changes in Higher Education. *Higher Education Management and Policy*. 16 27-37

In OECD countries, nearly 80% of funding comes from public sources and there are efforts to try and reduce this reliance on the state, shifting towards entrepreneurialism and autonomy. Institutional change is incentivised by 'mandates' (characterised by punishment for failure to comply) and rewards' (providing incentives for those who change).

Rewards and incentives become effective when public policy provides room for behavioural choice among institutions. Motivation depends on the [level of] performance required to reap the reward and the expectation that this can be achieved. Mandates seem to work in struggling systems while rewards work better in a developing or reviving system. Examples are given for Norway, Uganda, Malaysia and Georgia – diverse but not quite comparators for the UK.

Incentives are widely relied upon to induce change in HE, but the paper shifts between analysing this at institutional/system level and personal/institutional noting that institutional change affects individuals and groups differentially. It reviews the way in which change is made easier by incentivising individual academic staff.

Watson A. (2001). UK research funding - Universities raise their game, but the money doesn't flow. *Science*. 294 (5551) 2448-2449

Williams N. (2004). The funding shuffles begin. *Current Biology*. 14/ (9) R327-R328

Willmott H. (2003). Commercialising higher education in the UK: the state, industry and peer review. *Studies in Higher Education*. 28 (2) 129-141

3. Desk-based analysis (b): policy and related reports

This section of the Annex lists and reviews a composite set of reports and other papers. The common denominator linking this material is its connection with higher education and/or research policy. Although an eclectic mix of sources and publication types, the material has for the most part been commissioned or conducted by stakeholders in the system. Hence, we include various reports produced by Select Committees of both UK Houses of Parliament and Government Departments, as well as a more disparate grouping of publications, comment and briefings issued by organisations connected with higher education and sourced via worldwide web searches. The precise procedures used to identify and select this material are described in the final section of the Annex.

(1) Reports commissioned by stakeholders

ABRC/UGC. (1982). Report of a joint working party on the support of university scientific research. Cmnd 8567, HMSO (Merrison Report).

The report strongly argued that future research performance would require greater selectivity in the distribution of funds, an argument supported by both the University and research council parties.

ABRC. (1987). A strategy for the science base; a discussion document prepared for the Secretary of State for Education and Science by the Advisory Board for the Research Councils. HMSO.

This report argued for selectivity in research funding and suggested the R-T-X tier structure for research universities.

Adams, J and Bekhradnia B (2004). What Future for Dual Support?. HEPI, Oxford

<http://www.hepi.ac.uk/pubdetail.asp?ID=121&Doc=Reports>

The report considers the origins, effectiveness and viability of the dual support system. It also makes some suggestions for alternative arrangements for funding university research

HEFC funding originally conceived of in large part to enable blue skies research to be conducted; it is now seen largely as providing the basic research infrastructure, which underpins a university's ability to carry out research funded by others. Nevertheless, particularly in the humanities and social sciences, it continues to provide the means by which some basic research can be conducted.

The value of HEFC research funding has increased much more slowly than Research Council funding and together with the propensity for HEI's to commit to more research projects in order to secure additional resources, has resulted in more project grants being loaded onto an inadequate research base. The report suggests that the consequence is in part, a decline in the ability of academics to conduct blue skies research, and in part a running down of the research infrastructure.

Adams J Smith DN, and Ackers L. (2005). Career Development of Research Staff. A report to HEFCE

Surveys described in this report found that research staff were prepared to invest their time in pursuing a research career despite uncertainty about employment, pay or conditions. This, it is argued, is evidence of the conceptual power of the research 'idea' in academia.

Committee of Vice-Chancellors and Principals (1985). Report of the Steering Committee for Efficiency Studies in Universities. (The Jarratt Report).

CPSE (1998). Benchmarking of the International Standing of Research in England

The report provides a detailed evaluation of international standing of research (by UOA, discipline groupings), in England. The study created a series of bibliometric data sets for each of the RAE 1996 UOAs, and used these to assess output and compare English performance to international comparators.

Evidence Ltd (2002) Maintaining Research Excellence and Volume. A report to the regional HEFCs and UUK.

http://www.hefce.ac.uk/Pubs/rdreports/2002/rd08_02/

The report comments on the impact of QR on research outputs and behaviour and provides some anecdotal comment on how QR is actually spent. The report concludes that the international comparative performance of the UK research base is extremely competitive and has improved significantly over the last 15 years. Economic analysis also suggests that UK research peak provides value for money (in terms of quantity and excellence)

The report provides evidence that HEI's gear QR funding against other income streams, but suggests that research council income is more closely correlated with performance than QR.

The report comments on the use of QR income to recruit new research staff, fast-track promotions and provide investment in new lectureships and indicates that HEI's consider that QR has a critical role in providing flexibility for restructuring, enabling them to move into newer research frontiers. There is little evidence, however, of any attempt to examine or disaggregate actual use of different research funding streams.

Evidence Ltd (2003) Funding Research Diversity. A report to Universities UK.

Technical report downloadable from UUK web-site - ISBN 1 84036 103 4

<http://bookshop.universitiesuk.ac.uk/>

Virtually all-relevant commentary relates to the impact of research funding and selectivity on research outputs and behaviour

The study used a combination of data (from the RAE 2001, bibliometric indicators and HEI survey findings) to assess: the international standing of UK research; the

relationship between diversity and development in the research base; the benefits of research concentration and the potential impact of funding concentration

The report infers that a fall in RAE grading and resultant loss of QR funding would reduce capacity of the UoAs. If capacity equates to staff numbers, this suggests that fall in funding would directly affect ability to pay staff resulting in immediate staff losses (although no hard evidence provided to support this)

The report provides evidence that RAE Grade 4 units have improved in performance over the last decade, but indicates that HEI's consider that further concentration of research funding will stifle research diversity and the contribution made by Grade 4 units.

The report provides evidence that existing regional disparities in research performance would be significantly accentuated by policy changes that shift resources from Grade 4 units and increase concentration in grade 5 units

HEPU/Evidence (2000) The Role Of Selectivity and the Characteristics of Excellence. A report to HEFCE.

The report contains some detailed consideration of the impact of the RAE, research funding (in general) and selectivity on research outputs and behaviour, but no specific reference to HEFCE research funding

There is a general inference that UK research performance has improved against world average benchmarks (despite increasing international competition) and that this appears to be associated with introduction of RAE and the associated funding methodology

The report considers the problems of measuring excellence and attempts to identify different measures of attainment - but not specifically related to publicly funded research

The report also provides some institutional evidence of more effective management of research (since RAE).

PREST (2000). Impact of the Research Assessment Exercise and the Future of Quality Assurance in the Light of Changes in the Research Landscape

<http://www.hefce.ac.uk/Research/review/consult/raec.pdf>

The report describes three models for the distribution of QR funding within institutions and provides an assessment of the changing form and nature of research and the effects of the RAE on research behaviour.

It provides evidence which demonstrates a declining public sector share of funding and suggests that given current growth rates, in real terms, of UK and overseas industry funding, the HEFCs of England, Scotland and Wales are going to have less influence and leverage over what universities in the UK research and be less and less able to provide the "well found laboratory" on which project funders rely.

SPRU (2002). The economic returns to basic research and the benefits of university-industry relationships: A literature review and update of findings

<http://www.sussex.ac.uk/spru/publications/econreturnsost.pdf>

This report to the OST provides information (specifically a literature review), on academic and policy analysis of the returns to academic research. The report contains numerous references to other academic papers, which look at attempts to measure assess the outcomes of publicly funded research.

(2) Parliamentary Papers

House of Commons: Science and Technology Committee. First Report, (2 April 1998). The Implications of the Dearing Report for the Structure and Funding of University.

<http://www.publications.parliament.uk/pa/cm199798/cmselect/cmsctech/303i/st0102.htm>

The report focuses on the dual support system, explaining the three main purposes of the research component of the block grant.

Witnesses commented that 'it was those parts of the research base that relied most on HEFC funding-basic research, infrastructure and long-term, strategic management of research-that were most under-funded and that it was now almost impossible to conduct any research on HEFC funding alone.' Furthermore the Royal Society argues that, 'the result of this shift has been that the vast majority of R money from the HEFCs is consumed in providing the salaries of academic staff carrying out basic research and the facilities they require for it. Consequently, the block grant from the HEFCs is no longer sufficient to meet even those indirect costs of Research Council funded projects which are not already covered by Research Council grants.'

House of Commons: Science and Technology Committee. Fifth Report, (10th July 2003). The Future of Higher Education

<http://www.publications.parliament.uk/pa/cm200203/cmselect/cmeduski/425/42502.htm>

Interesting comments relating to the amount of QR funding include the following.

Professor Robert Burgess of the University of Leicester argued, that 'If grade 4 funding is withdrawn, charities funding [for medical research] will be put at risk, as there will be no HEFCE funding to meet the indirect costs'.

When Sir Howard Newby was asked if this meant the RAE exercise was not sufficiently discriminating. He replied that 'Part of the purpose of the money we put in is to fund, in a broad sense, research capability. It is to enable academic staff to get to the starting gate in terms of being competitive for Research Council grants.'

**House of Commons: Science and Technology Committee. Sixth Report, (24 July 2003).
UK Science and Europe: Value for Money**

<http://www.publications.parliament.uk/pa/cm200203/cmselect/cmsctech/386/38602.htm>

Much of the evidence received by the Committee raised the issue of the funding of overheads in grant awards. The Research Councils currently contribute 46% of the staff costs towards Higher Education Institution's indirect costs of research projects. Many witnesses felt that institutions were subsidising the Framework Programmes by funding the overhead costs from other sources, for example, funding council grants received by universities.

It reports that the European Court of Auditors would not increase the amount contributed by the EU towards overheads. The report also noted that:

‘The Government has an opportunity to make the UK the clear leader in European research but to realise that aim requires that the Government provide extra funding in SR2004 to meet these costs. At a time when the Government wishes to encourage universities to charge for the full costs of their research, its stance is untenable.’

**House of Commons: Science and Technology Committee. Eighth Report, (1 April 2005).
Strategic Science Provision in English Universities. Section 5, Paras. 77-78**

<http://www.publications.parliament.uk/pa/cm200405/cmselect/cmsctech/220/22008.htm#a19>

This is a very useful document in terms of current overview and context. Section 5 provides an overview of the funding system, explaining the autonomy of both the HEFCE and the framework for research funding through the RAE.

HM Treasury (2004). Science and Innovation Investment Framework 2004-14

http://www.hm-treasury.gov.uk/spending_review/spend_sr04/associated_documents/spending_sr04_science.cfm

Chapter 3, the Management of the Science Base has most relevance to this study, commenting on the use made of QR funding and explaining its inadequacy, as follows:

‘The total costs of externally funded research projects and training in universities have risen at an unsustainably faster rate than the rise in core QR funding needed to support this increased volume of activity’.

‘The bulk of increased funding from third parties provides only partial coverage of the full economic costs of research sponsored. This causes institutions to draw more heavily on limited QR resources to cover the full costs of a project from a third party, or to leave the long term cost impacts of such external projects uncovered’.

'Demands on QR resources to underpin projects from other funders have therefore increased. The effect of this on universities is that the high productivity of the science base has in many cases been achieved by cross-subsidy of research from other areas of the institution's business – such as overseas student fees and internal trading surpluses- and/or at the expense of infrastructure under –investment.'

'The Government's intention is not to increase either leg of the dual support system at the expense of the other, but to achieve balance on both sides of the system against a rising overall investment. Moving closer to 100% funding of the FEC of RC supported projects, and more accurate costing and pricing of other commissioned research will enable institutions to more easily plan the use of their QR, thus helping them deploy their own resources towards meeting their priorities, from tackling new areas of blue skies research to investing in academic staff recruitment and development.

The report goes on to discuss the drive for excellence and the need to focus on the financial sustainability of universities and suggests Government measures for assessment of outputs.

(3) Miscellaneous stakeholder literature, including web sourced materials

Adams J, Evidence Ltd. (2005). Selective Research Funding. A discussion paper.

This is available from the author at Evidence Ltd.

AUT - Response to RAE 2008: Initial decisions by the UK funding bodies

Commentary relates solely to perspective on RAE

Biosciences Federation. (2003). Review of Research funding method: A response to HEFCE.

<http://www.bsf.ac.uk/responses/resfund.htm>

British Academy – 1902 -2002 Support for Research

Summary paper on Academy's funding of research over last 100 years

CBI (1999). Initial response to HEFCE review of research assessment and funding policies

[http://www.cbi.org.uk/ndbs/positiondoc.nsf/0/7f42429dcf8612a48025687e00623e65/\\$FILE/HEFCE_Review.PDF](http://www.cbi.org.uk/ndbs/positiondoc.nsf/0/7f42429dcf8612a48025687e00623e65/$FILE/HEFCE_Review.PDF)

The comments are mostly about the structure of assessment and comments on timing, structure and planning. The response suggests that the focus of funding should be on excellence and that whilst multiple streams foster flexibility, funds should be accountable and targeted. The response also notes that game playing is a problem in the present system

Engineering Council UK

Short statement summarising ECUK's response to White Paper on 'The future of Higher Education'

Engineering Council UK – Notes on the Lambert Review

Document summarises relevance of Lambert Review to engineering

Funders Forum. (2005). Monitoring financial sustainability

Superficially the paper says nothing, but the need to move away from a ten year strategy to a ten year framework is telling, in terms of the way the sector anticipates, forecasts and plans

Funders Forum. (2005). Health of disciplines

The paper comments that there are some disciplines that are threatened by demographic issues, but 'the needs of the research base differ from those of the teaching base'. The sub-group proposes that the Funders' Forum monitors the health of disciplines by:

- Regular (annual) examining the data on numbers of researchers and age profiles in disciplines, using HESA categorisation;
- Receiving (annual) updates of the report from the Research Councils;
- Commissioning (biennial) surveys of HEIs to identify areas of recruitment difficulties;
- The process should be managed by the sub-group working with the Funding Councils

HEFCE; SHEFC; HEFCW; DELNI (2004). RAE 2008. Initial Decisions by the UK Funding Bodies, RAE 01/2004.

HEFCE (2005). Research: Funding: Dual Support Reform

<http://www.hefc.ac.uk/research/funding/dual/>

HEFCE (2005). New support element for charities research income. Circular letter16/2005.

http://www.hefc.ac.uk/pubs/ciclets/2005/c116_05/

HM Treasury (2004). Science and Innovation Investment Framework 2004-14

http://www.hm-treasury.gov.uk/spending_review/spend_sr04/associated_documents/spending_sr04_science.cfm

HEFCW – Research Funding Method 2002/3

Document provides composite statement of method applied to funding research 2002-03

HEFCW – Review of Research Policy 2000

Circular inviting comment on development of Council's research policy

Institute of Physics. (2002). Strategic Science Provision in English Universities

<http://www.policy.iop.org/Policy/Strategicscience.doc>

The paper discusses the impact of HEFCE's research funding formulae, as applied to RAE ratings, on the financial viability of university science departments, and in particular, expresses the concern of the Institute about the level of funding for 4-rated physics departments.

OST (2003, 2004). Reports and data providing international comparative performance data of UK research

http://www.ost.gov.uk/research/psa_target_metrics.htm

OST (2003). The Sustainability of UK Research: A Consultation Reforming Parts of the Dual Support System

This is a short statement on the government position on reforms to dual support system with cross-reference to guidance on full economic costing.

OST (2004): University Research Sustainability

<http://www.ost.gov.uk/research/dualsupport.htm>

Royal Society. (2000). Response to HEFCE review of research

This paper contains some interesting comment on the institutional approach to management of research income. Specifically;

'The purpose of HE Funding Councils' research funding is to allow institutions to develop their research capabilities within the context of their overall mission, and to contribute to the maintenance of high quality research facilities in the UK. There is a need to provide flexibility to local management to develop their institution's strengths, with clear understanding of how their success or failure will impact on their future funding'

Royal Society (2004) – Response to the DFID consultation on their research funding framework

<http://www.royalsoc.ac.uk/news.asp?year=&id=1622>

Relates to Department for International Development research funding framework

Russell Group – Response to Lambert Review

Short statement provides specific comment on global benchmarking & institutional management

Russell Group – Evidence to the Commons S &T Committee Inquiry into strategic science

Short statement to the Commons Science and Technology Committee Inquiry into Strategic Science Provision in English Universities – no reference to funding or selectivity

SHEFC – Consultation on the review of the research assessment

Link to SHEFC consultation paper on and copy of the RA review

UUK – New directions for Higher Education Funding

Relates to funding for teaching and learning

4. Blue skies research

In searching for literature relating to blue-skies research we encountered a number of interesting web sites and links. These are not strictly relevant to the current review but are included as they might form the starting point for a more detailed analysis that specifically tackled this area.

<http://www.frontier.co.uk/VentureResearch/>

A blue skies research web site run supported by an international group of very senior scientists who seek funding for 'deep-blue skies' research.

<http://www.arts.telegraph.co.uk/connected/main.jhtml?xml=/connected/2003/10/01/ecftop01.xml2003/10/01/ecftop01.xml&sSheet=/connected/2003/10/01/ixconn.html>

'Original thinking is being strangled by bureaucracy, say top scientists'. Link to newspaper report by Roger Highfield published 1/10/2003. The article claims that 'over the past 25 years, measures to ensure efficiency and accountability have been imposed and academics have been deluged with changes that undermine the creativity of visionary scientists and engineers'.

A group of international senior scientists have called on the Government to divert 1% of its research spending to a National Research Fund to 'scout science for exceptional people and back their ideas'.

<http://www.brtf.gov.uk/docs/pdf/scientificresearch.pdf>

The Better Regulation Task Force's, final report (2001-02) on genetic modification, embryonic stem cell research and nanotechnology. The report contains an outline, which the Task force would like to Government to use to initiate a debate within the scientific community about the regulation of research. The outline is intended to bring more transparency into the process, whilst ensuring adequate controls are maintained.

<http://www.hefce.ac.uk/research/review>

Link to HEFCE website relating to the 1999 HEFCE review of research policy and funding. The link provides terms of reference and final reports in respect of the work carried out by the five sub-groups, namely

- The role of selectivity and the characteristics of excellence
- The nature and purpose of HEFCE funding
- The role of quality assurance and evaluation
- The relationship between teaching, research and other outputs of higher education institutions
- Human resource management, equal opportunities, research training and other 'people related' issues.

<http://www.inderscience.com/offer.php?id=1389>

Website that provides access, on subscription, to academic and scientific articles published by the International Journal of Manufacturing Technology and Management

5. Search and reporting procedures

This section replicates Section 9 of the main report.

The methodology for the study was as follows:

Review the formal and informal published literature. In this we sought to identify the contexts in which previous studies have taken place and take account of consistencies and variances between existing studies. (Desk based analysis a and b)

Interrogate and reappraise source and reported material from our previous studies (Desk based analysis c)

Reanalyse principal quantitative approaches, with a workshop to explore alternative options (section 7 of the main report)

Draw the evidence together through a series of topic-based papers, presented as sections of the main report and identify areas where evidence is weak or lacking and discuss the feasibility of redressing these deficits (section 8 of the main report)

Desk-based analysis (a) – academic literature

Our starting point was work published over the last ten years by UK, European and Australian consultants. (The UK and Australian systems have some comparability, while contrasts within the European system are also informative. By contrast the USA literature is associated with a wholly different model of research funding in which there is no common core but some institutions have massive endowment resources). The academic literature in this area is well defined. Inevitably, research policy is itself an issue of great interest to those who work on research activity data and relevant journal articles are often present on searchable databases.

Here we are looking at the ‘primary’ literature on original research studies that may contain evidence relating to research management. Any reviews and books on the topic, which are clearly of potential value as an overview, should draw on such primary literature. The results of a detailed search of Thomson Scientific databases produced the following. In each case the search period ran from 1990-2005, all databases were searched for all document types (including articles, reviews and editorials), and all languages were covered.

Table 1. Counts of articles retrieved from Thomson Scientific databases, compared with keywords found only in the article title or in either the title or the article abstract

Topical keywords used in search	Search title only?	Matched articles
research funding	No	814
research funding	Yes	358
research funding AND UK	No	41
research SAME selectivity	No	225
research selectivity OR selectivity in research	No	14
research funding SAME UK	No	22
research AND funding AND selectivity	No	11
research AND fund* NOT fundamental*	Yes	1611
research AND fund* NOT fundamental*	No	8711
research AND fund* AND universit* NOT fundamental*	No	1183

Topical keywords used in search	Search title only?	Matched articles
research AND fund* AND universit* AND UK NOT fundamental*	No	94
funding councils	No	38
funding council* AND research	No	47
research income	No	7
research AND fund* AND universit* AND quality NOT fundamental*	No	149
research AND higher education AND funding	No	123
blue skies	No	61
blue skies AND research	No	6
research spend*	No	62

What this shows us is that there is a very large body of literature that refers generically to research funding. However, as we begin to specify elements within this we reduce the number of articles very rapidly to a small tally on any topic. We can then review the actual titles and abstracts for these smaller groups.

Such reviews revealed that much of the apparently valid literature did not in practice address the issues raised by HEFCE. A substantial portion of the literature was concerned only tangentially with research funding and was in fact addressing the issues of research assessment, particularly the Research Assessment Exercise (RAE) and the impact of the RAE on funding and on research culture.

We also found that while research funding was addressed at the level of the system and in terms of funding allocations to institutions there was almost no primary literature that addressed income to departments within universities or dealt with the management and allocation of core resources – such as QR - at that level. Nor was expenditure a main focus: the search for 'research spend*' in Web of Knowledge produced 62 hits (see Table) none of which looked directly relevant. The support of fundamental research, also called blue skies research, was similarly limited.

It seemed surprising that the academic community has paid so little attention to such a central aspect of its own function. We therefore also considered the material that might be covered by serials identified in the Thomson Scientific journal articles but which are not themselves in the electronic databases. This material should not be considered minor, because Thomson's coverage of the European social science literature is known to be patchy and there are some journals frequently submitted to the RAE that are not indexed electronically.

We reviewed the abstracting serial (Research into Higher Education Abstracts) published by the Society for Research into Higher Education (SRHE). This covers some 150 serial titles with a particular focus on the UK, Europe and the Commonwealth. We scanned in detail all articles referring to Research, Institutional management and Finance and physical resources.

This allowed us to identify specific articles but also to determine where the journals in which these articles were most likely to be found. We therefore looked at the following journals, which would irrespective of the SRHE abstracts' search be generally recognised as covering the bulk of mainstream UK HE policy material.

Table 2 Journal coverage of articles relating to the impact within institutions of specific research funding

Journal title	Period searched	Results and comments
Minerva	2000-2005 (Volumes 38-42)	4 relevant articles
Higher Education Quarterly	Library search 1987-2000 Volume 41 to Volume 56 On-line search 2000-2005	Checked all issues of these volumes and found 3 directly relevant articles plus some on RAE Nine of valuable background interest in the earlier period
Higher Education	2000-2005 Vols 44-49 (April)	There were a couple of papers about funding at the system level but mostly about e.g. effect of private money on autonomy etc . Only one paper was specific, but it is very useful
Public Administration		one paper
Public Money & Management	2003-2005 Vols 23-25 plus some earlier issues	2 papers
Studies in Higher Education	Covered 2000-2005.	With the exception of the next two papers, there was no article relevant to the study over this period.
Journal of Education Policy	2000-2005, Vols 15-20	Found nothing relevant.
Journal of Higher Education Policy and Management		2 papers over 5 years
Universities Quarterly	Volume 24, 1969-70 to Volume 40, 1985-86.	5 articles Note: became Higher Education Quarterly and, for a brief period before that, New Universities Quarterly.
Higher Education Policy. The Quarterly Journal of the International Association of Universities (IAU)	Library searched: 7, 1, 1994 to 14, 2, 2001	Two articles of background interest
Higher Education Digest	14, Autumn, 1992 to 40, Summer, 2001	Nothing
Public Policy Research (Formerly New Economy)	5 (2) 1998 – 12 (1), 2005	Nothing

Journal title	Period searched	Results and comments
IPPR Review of Policy Research	20 (1) 2003 – 22 (3) 2005	Nothing
Education Policy Analysis (OECD)	1997-1999, 2001-2003	Nothing

The outcome of our searches was to provide us with a limited but important set of material that did address the key topics in the HEFCE specification. At the same time these searches confirmed the relative paucity of relevant material, which we continue to regard as a surprising policy deficit.

Desk-based analysis (b) – policy and related reports

While the published journal literature may be limited we recognised that it was likely that there would be more material in policy reports, for HEFCE and others, and in the 'grey' literature of material that is nominally in the public domain but only partially visible without specific knowledge of its existence. This would include:

Reports of policy studies commissioned and published by stakeholder bodies
Supporting material relating to commissioned policy studies available through web-sites or as 'grey literature' in e.g. policy unit in-house series and other searchable databases (e.g. Education-Line²)
Other in-house reports, including those from academic units, not commissioned by a specific client
Strategy documents from institutions, e.g. reflecting their reactions to funding policy, and outcomes.

Some of this literature can be reviewed systematically and –at least documented – comprehensively. Our first step was to carry out a search on the World-Wide-Web for pages that might contain similar keywords to those used on the journal article searches. We then reduced this to the top 140 hits for each query, ranked by Google relevance. The search was constrained by the 'site:' operator to search only the website of the organisation in question. We also used the -ppt operator to exclude PowerPoint documents (assuming that policy statements will more usually be made in other formats). An example would be "research funding" policy -filetype:ppt site:.ahrb.ac.uk

Table 3 Pages retrieved from searches via Google using a 'simple' search type and restricting the search to sites within the UK

Topical keywords used in search	Total matched pages	Pages within .ac.uk domains
"research funding"	194,000	114,000
"research selectivity"	369	377
"selectivity in research"	127	552
research funding selectivity	16,700	9,420
research funding university	4,610,000	2,420,000

² University of Leeds <http://brs.leeds.ac.uk/~beiwwww/el.htm>

Topical keywords used in search	Total matched pages	Pages within .ac.uk domains
research funding universities	2,200,000	834,000
"funding councils"	127,000	98,000
"funding councils" research	105,000	84,100
"research income"	26,600	24,500
research funding universities quality	2,580,000	871,000
research "higher education" funding	825,000	605,000
"Blue skies" research	27,900	5,230

Most references to "research spending" resulting from this Google search were generic rather than specific, often occurring in news items, and most frequently referring to spending at a gross institutional (or departmental in the case of government) or even national level. This remained the case when searches were restricted to the .ac.uk, and .gov.uk domains. The searches for "research spend" produced similar results. One interesting exception (in its use of the word emphasis) was this:

"To date, the main impact of Foresight has been on the public sector. Government Departments are reflecting the Foresight findings in their development of policy and science, engineering and technology spending decisions. Research Councils are also using Foresight recommendations to inform their research spending, while maintaining the emphasis on blue skies, curiosity-driven research."³

An arbitrary visual scan of key sources suggested that the majority of the other material in the Google search was not directly relevant. We therefore reduced the total data-set to those sites with the highest density of 'hits'. This gave us 76 organisations, mostly in the public sector. We then looked at the most relevant documents on each site. This provided useful additional evidence, not available through the published literature, and this is summarised in the annexes.

The reports and background evidence of enquiries by the House of Commons and House of Lords Science and Technology Committees formed a particularly interesting and valuable source of information. There was also some relevant material in reports from the Commons' Education and Skills Committee. We have reviewed this material separately.

³ From the Foresight site: http://www.foresight.gov.uk/Previous_Rounds/Foresight_1994_1999/fsza000022.html

Table 4: Organisations identified in Google searches as having material on their web-sites that was relevant to the current enquiry, grouped by type

Organisations from Google searches	76 organisations						
Statutory Funders	University-based	Press	Government	European policy types	Trade Unions	Others	Subject-specific
AHRC (Arts and Humanities Research Council)	ARMA (Association of Research Managers and Administrators UK)	BBC	Council for Science and Technology	CEST (Centre for Science and Technology Studies)	AUT (Association of University Teachers)	CBI (Confederation of British Industry)	ABS (Association of Business Schools)
BA (British Academy)	Auril (Association for University Research and Industry Links)	Financial Times	EC (European Commission)	CWTS (Centre for Science and Technology Studies), Leiden	NATFHE (National Association for Teachers in Further and Higher Education)	IFS (Institute for Fiscal Studies)	BCS (British Computer Society)
BBSRC (Biotechnology and Biological Sciences Research Council)	HERO (Higher Education & Research Opportunities)	Guardian	House of Commons Education & Skills C	FhG Karlsruhe		BDA (British Dental Association)	
CCLRC (Council for the Central Laboratory of the Research Councils)	MURG (Modern Universities Research Group)	ResearchResearch	House of Commons Science & Technolog	OST (Observatoire des Sciences et des Techniques)		OECD (Organisation for Economic Co-operation and Development)	Biosciences Federation
EPSRC (Engineering and Physical Sciences Research Council)	National Postgraduate Committee	Times Higher Education Supplement	House of Lords Science & Technology Select Committee		BMA (British Medical Association)		
ESRC (Economic	PREST (Policy		OST (Office of		ICSU	ECUK	

and Social Research Council)	Research in Engineering, Science and Technology)		Science and Technology)		(International Council for Science)	(Engineering Council UK)	
HEFCE (Higher Education Funding Council for England)	Russell Group		Parliamentary Office of Science and Technology		Royal Society	IoB (Institute of Biology)	
HEFCW (Higher Education Funding Council for Wales)	SCOP (Standing Conference of Principals)		RA Review		The R&D Society	IoP (Institute of Physics)	
MRC (Medical Research Council)	SPRU (Science and Technology Policy Research Unit)		Scottish Executive		Law Society		
NERC (Natural Environment Research Council)	SRHE (Society for Research into Higher Education)		Welsh Assembly		CaSE (Campaign for Science & Engineering)	MeCCSA (Media, Communication & Cultural Studies Association)	
PPARC (Particle Physics and Astronomy Research Council)	UKCGE (UK Council for Graduate Education)		HEPI (Higher Education Policy Institute)	Royal Academy of Arts			
RCUK (Research Councils UK)	UUK (Universities UK)		Royal Academy of Engineering				
SHEFC (Scottish Higher Education Funding Council)		SQW (Economic Development Consultants)	Royal Astronomical Society				
	Technopolis	Royal Geographical Society					
	Royal Historical Society						
	The Wellcome	Royal Society of					

	Trust	Chemistry					
	RSA (Royal Society for the Encouragement of Arts, Manufactures & Commerce)						
	British Educational Research Association	SCASS (Standing Conference of Arts and Social Sciences)					

Table 5: Publications and other information from selected organisations identified in Table 4, ranked on index of 'most relevant' for top 7 searches

Count	22	77	32	23	19	16	11	10	7
No.	Selected?	Organisation	1	2	3	4	5	6	7
5	Yes	AUT (Association of University Teachers)	Summary of AUT's concerns with the HE White Paper	Research - concentration not growth	Response by the AUT to the Government's White Paper	The risk to research in HE in England	HE in the UK - mapping the future	2004 Spending Review submission	Response to RAE 2008: Initial decisions by the UK funding bodies
6	Yes	BA (British Academy)	Future Directions for Social Science - a response	Review of Research Assessment	That full complement of riches - chapter 3	Response to "Science and innovation: working towards a ten-year investment framework"	A Response to the EC's Communication on Europe and Basic Research	The British Academy 1902-2002: Support for Research	Support for research in the humanities and social sciences
11	Yes	Biosciences Federation	A response to the HoC Science and Technology Committee	Review of research funding method	Treasury consultation on a 10-year investment framework for Science and Innovation	HoC S&T Committee follow-up inquiry into the RAE	DFID Research Funding Framework 2005-7	Strategic Science Provision in English Universities	
14	Yes	CaSE (Campaign for Science & Engineering)	All documents published by CaSE						
15	Yes	CBI (Confederation of British Industry)	HEFCE Review of research assessment & funding policies - intital response	Research, innovation and the HE sector	HE Reach-out to Business and the Community Fund: Funding Proposals	Response to 'The Future of HE' white paper	Comments on the final report of the Lambert Review		

21	Yes	ECUK (Engineering Council UK)	Comments on 'The future of higher education'	Notes on the Lambert Review					
27	Yes	HEFCE (Higher Education Funding Council for England)	HEFCE research funding homepage						
28	Yes	HEFCW (Higher Education Funding Council for Wales)	Research Funding Method 2002/03	HEFCW's Research Funding Method	Review of Research Policy and Funding Method	Review of Research Policy	Letter from Jane Davidson WA Minister for Ed & LLL	Higher Education in Wales	Accountability For Research Funding: QR & Supplementary
29	Yes	HEPI (Higher Education Policy Institute)	What future for dual support?	Research & the regions	Government, Funding Council and Universities: How Should They Relate?	20 Years of Higher Education Policy: Looking back 10 years and Forward to the Next Decade			
31	Yes	HM Treasury	Science & innovation investment framework 2004-2014	Lambert Review of Business-University Collaboration: Final Report	Investing in Innovation: A Strategy for SET (incl. Gov't response to Roberts)	Baker report: realising the economic potential of the PSREs	Govt. response to the Baker report	Cross-cutting review of science & technology	
36	Yes	IFS (Institute for Fiscal Studies)	None found						
37	Yes	IoB (Institute of Biology)	Does every university have to teach biology?						

38	Yes	IoP (Institute of Physics)	Science and innovation: working towards a ten-year investment framework	Science and Innovation Strategy	Strategic science provision in English universities	Research assessment exercise			
48	Yes	OST (Office of Science and Technology)	The Sustainability of University Research	OST policy homepage	Higher Education Research: letter from Sainsbury & Johnson				
51	Yes	PREST (Policy Research in Engineering, Science and Technology)	Impact of the RAE & the future of QA in the light of changes in the research landscape	Science and governance	Role and Effects of Foresight in the UK				
53	Yes	RA Review	Responses from institutions	Responses from stakeholders	Responses from subject groups	Changes in research assessment practices in other countries	Analysis of responses to the 'Invitation to Contribute' to the review of RA	Report by Sir Gareth Roberts to the UK funding bodies	Summary of responses to the RA review consultation
61	Yes	Royal Society	Research Policy and funding	Response to the DFID consultation on their Research Funding Framework 2005-7	Submission to the HoC S&T Committee follow-up inquiry into the RAE	Response to the Treasury's consultation science & innovation: working towards a 10 year investment framework	Response to the Lambert Review of Business-University Collaboration and the DTI Innovation report	The place of fundamental research in the European Research Area: response to the Mayor report	Supporting basic research in science & engineering: a call for a radical review of university research funding in the UK

64	Yes	Russell Group	Lambert Review of Business - University Collaboration	Science and Innovation: Working Towards a Ten Year Investment Framework	Response to HEFCE Proposals for RAE 2008	Evidence to the Commons S&T Committee Inquiry into Strategic Science Provision in English Universities			
68	Yes	SHEFC (Scottish Higher Education Funding Council)	Consultation on the review of research assessment	Report of the task group on research and knowledge transfer	Review Of Research Policy And Funding: Second Stage Consultation	Research and the Knowledge Age	Response to the First Consultation Paper of the Scottish Higher Education Review	Response to the Second Consultation Paper of the Scottish Higher Education Review	The Garrick report
69	Yes	SPRU (Science and Technology Policy Research Unit)	The Economic Returns to Basic Research and the Benefits of University-Industry Relationships	Academic Research, Technical Change and Government Policy'	University Research Evaluation and Funding: An International Comparison	Public Policies to Support Basic Research	The Economic Benefits of Publicly Funded Basic Research: A Critical review	Identifying Research Priorities in Public-Sector Funding Agencies	
75	Yes	UUK (Universities UK)	Funding research diversity	HoC S&T Select Committee: Inquiry into the RAE	HoC S&T Select Committee inquiry: strategic science provision in English universities	Spending Review 2002: Investing for success	Spending review 2004: Achieving our vision	The internal economy of UK higher education institutions 1994-2000	New directions for higher education funding - Funding options review group final report
76	Yes	Wellcome Trust	Lambert Review of Business University-Collaboration	Review of research assessment	The sustainability of university research	Science and innovation - working towards a ten-year investment			

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