



Report by the  
Comptroller and  
Auditor General

# Department of Education and Science: Postgraduate Awards

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Gordon Downey  
Comptroller and Auditor General

National Audit Office  
7 May 1987

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# Department of Education and Science: Postgraduate Awards

## Report

1. This Report records the results of a National Audit Office (NAO) examination of postgraduate awards made by the Department of Education and Science (DES), the Economic and Social Research Council (ESRC), the Science and Engineering Research Council (SERC), the Natural Environment Research Council (NERC) and the Medical Research Council (MRC). The Report does not consider arrangements within the Agricultural and Food Research Council (AFRC) whose annual spend on awards is not significant.

2. Postgraduate training varies widely in both length and attainable qualifications. The NAO examination concentrated on research studentships lasting up to three years and culminating in the preparation of a thesis and the award of a PhD or similar qualification. The examination reviewed developments over the last few years in:

- the assessment of postgraduate manpower needs and benefits;
- monitoring of student progress;
- submission rates for theses; and
- the application of sanctions.

### Expenditure on awards

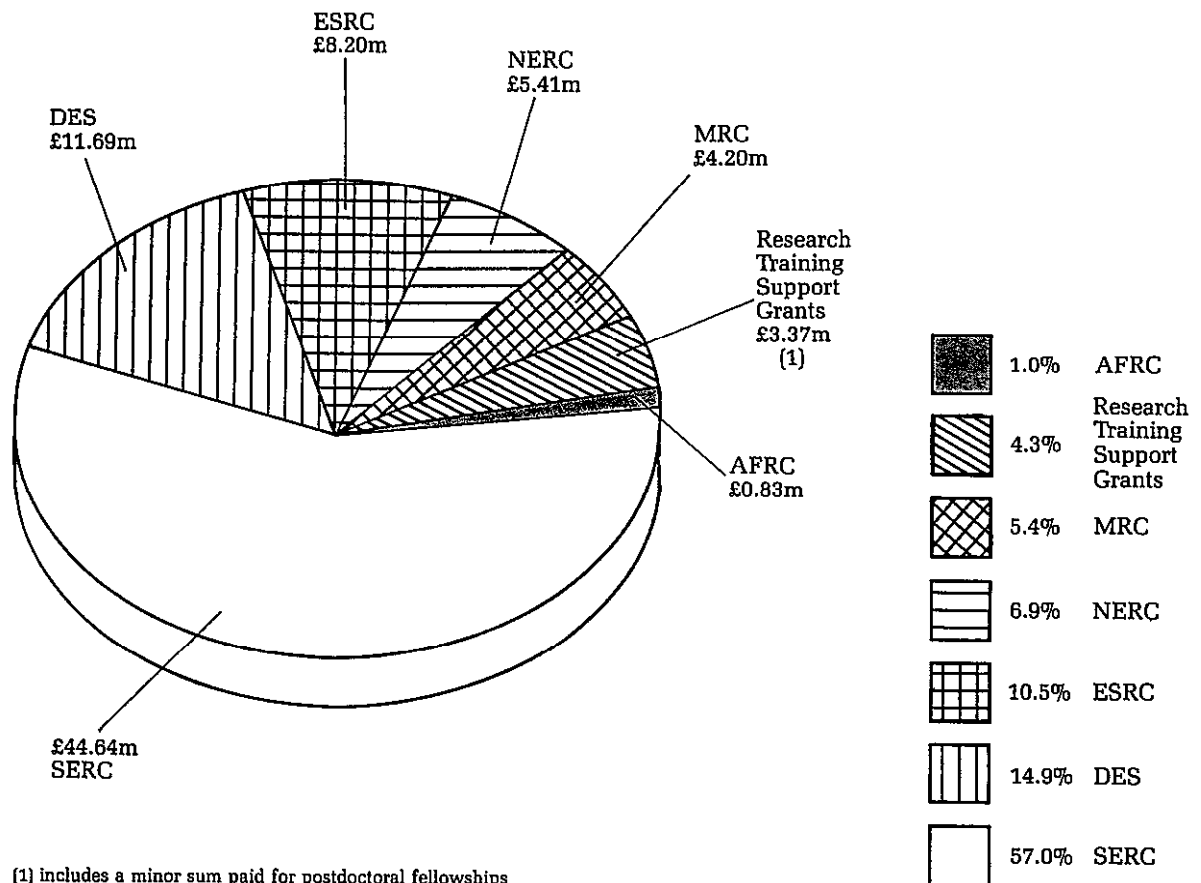
3. In 1985–86 expenditure on postgraduate awards by DES and the five Research Councils in engineering, the humanities and the sciences (including the social sciences) totalled some £78 million of which SERC spent some £45 million (see Table 1 overleaf).

4. These figures refer to direct expenditure on awards only and thus take no account of the associated costs of using university facilities, etc. No figures are available of the overall cost of postgraduate research education, by subject or by Council. DES analyses of overall costs of higher education are based on unit cost per student which do not distinguish between postgraduates and undergraduates. DES estimate, however, that new research studentships represent about half of the costs of new postgraduate awards each year.

### Number and distribution of awards

5. Just over 8,000 new awards were made in the academic year 1985–86, over half by SERC. Extant awards totalled some 15,600 (see Table 2, page 3).

**Table 1**  
**1985-86 Postgraduate training awards**



**Postgraduate manpower needs and benefits**

6. Government observations on the Third Report of the Expenditure Committee, 1973-74, summarised the broad objectives of postgraduate education as being:

- to meet the nation's future manpower needs;
- to provide further training for qualified, suitable and keen students;
- and
- to contribute to the advancement of knowledge.

Government accepted that the primary aim of the postgraduate award arrangements was to meet the country's needs for trained manpower. This seemed to be the most comprehensive principle within which it should be possible to go a long way, if not the whole way, towards meeting the other objectives. Government recognised, however, that it was unlikely that a close match between manpower supply and demand could ever be achieved and it would be important to resist the temptation to forecast and plan with spurious precision. A certain looseness of fit was necessary not only because the knowledge and techniques for bringing about a close match were lacking, but also to allow for the fact that some of the best postgraduates put their education and training to good use in ways which it was impossible to predict or to relate to any mere extrapolation of the existing job market.

**Table 2****Postgraduate awards**

	Research studentships	Other postgraduate awards	Total
<b>A: Number of new awards, academic year 1985 - 86</b>			
SERC	2,549	2,116	4,665
DES	523	1,176	1,699
ESRC	384	439	823
NERC	303	214	517
MRC	184	74	258
AFRC	35	15	50
	<b>3,978</b>	<b>4,034</b>	<b>8,012</b>
<b>B: Extant awards</b>			
SERC	7,054	2,145	9,199
DES	1,214	1,594	2,808
ESRC	999	569	1,568
NERC	887	214	1,101
MRC	725	95	820
AFRC	114	15	129
	<b>10,993</b>	<b>4,632</b>	<b>15,625</b>

7. In practice, it has always been very difficult to predict relevant manpower needs. A report in 1982 from a working party on postgraduate education (Cmnd 8537) identified various difficulties:

- it is not possible to foresee clearly the implications of scientific developments or changes in economic and social circumstances;
- account cannot be easily taken of the switches between capital and labour, between highly trained and less trained manpower and between subject disciplines; and
- student response to employers' demands is uncertain.

8. The working party concluded that attempts in the past had shown that these difficulties were too great to allow future manpower needs to be reliably predicted and that even though relevant material was inadequate, it would not be readily improved by collecting more data. Instead the working party recommended an approach under which each Research Council would periodically make thorough reviews of its grant allocations and postgraduate policies and in the short term would take into account the current unemployment rate amongst former students.

9. In responding to the NAO examination the Councils were clearly of the view that meeting the nation's future manpower needs, though important, should not be regarded as the primary objective of postgraduate training. There was strong support for the wider educational view that the purpose of

postgraduate studentships was to give training in techniques and disciplines of research, to develop attitudes and approaches to problem solving, and to foster personal and management qualities and skills; DES also cautioned against exaggerating the importance of the aim of meeting manpower needs as against the other two objectives. There were no agreed manpower needs in the different disciplines nor was it possible to quantify them.

10. The complexity of trying to link postgraduate work directly with manpower needs was also emphasised by SERC, who stated that:

“The Council does not believe that it is feasible to fix research student numbers for each discipline by reference to manpower needs alone, even if these were available. When surveys of manpower needs have been made, responses appear to have been either extremely optimistic or pessimistic, and have invariably not been borne out. Much broader criteria must be used such as technological changes in the economy, employment trends, the position in other advanced industrial countries, perceptions about the percentage of undergraduates who should become postgraduates, and institutional and student demand. It is very difficult to use these criteria to arrive at actual numbers, but the view of the Council is that present postgraduate numbers should at least be maintained. Because of demographic trends a smaller working population will in future support a larger community. This will need higher skills more widely acquired and, as one consequence, a higher level of postgraduate training.”

11. As regards the national manpower benefits accruing from postgraduate training, DES stated they had always taken the view that these were best assessed (insofar as this was possible) by the award-making bodies in consultation with the academic institutions. Although DES had no detailed information about any such specific assessments made by the Councils, they were aware that in allocating resources to postgraduate awards the Councils sought to reach a broad judgment on manpower benefits, taking into account the available data and advice from subject committees. Thus it was for each Council to decide how much to spend on postgraduate education in the light of the total funds they had to spend and their other responsibilities. Clearly a broad assessment of future needs for trained research workers would be one factor that they ought to take into account in reaching their decisions. And, as noted in paragraph 38 the Government has asked the Research Councils, the UGC and the institutions generally to give special weight to such considerations.

12. DES and the Councils shared the view of the 1982 working party (paragraph 7 above) that assessment of employer demands by manpower planning techniques was not an adequate basis for determining policy or support for research students. DES observed that in recent years numbers of awards had been primarily determined by financial constraints and had fallen well short of student demand. They added that in the sciences there were no grounds for believing that student numbers had exceeded what manpower planning (if available) would have called for.

13. NAO noted that attempts were nevertheless being made by ESRC, NERC and SERC to assess the national manpower benefits derived from their postgraduate awards. ESRC had recently questioned the contribution

its advanced courses made to the provision of trained manpower and intended to undertake a study of the careers of those with social science doctorates. In NERC returns on employment take-up were analysed and the one year advanced courses were reviewed on a regular rolling basis. These reviews take into account the demand by employers for the training provided by the courses. SERC had commissioned a study into the contribution that PhDs make to the industrial economy. The survey report concluded that:

- universities should encourage students to follow courses giving an insight into industry and commerce as well as those aimed at developing communication skills;
- some industries need PhDs with specific subject knowledge; and
- SERC, universities and companies should continually assess and monitor needs and ensure postgraduate research is undertaken in important areas where industry requires the particular knowledge concerned.

14. At the time of the NAO examination this report had not been endorsed by SERC. But the Council told the NAO that it agreed a PhD was a necessary qualification for certain occupations and that recently it had deliberately increased the number of research studentships in areas of perceived national need such as physics, biotechnology and information technology.

15. For those humanities awards, which are administered by the British Academy acting as agents of the DES, DES confirmed that neither they nor the Academy had sought to assess the national manpower benefits. They pointed out that, in contrast to the sciences, advanced degrees in the humanities are not often required for employment outside academic institutions, and that in assessing the value of humanities awards more weight needs to be given to the other two objectives of postgraduate training mentioned in paragraph 6 above, namely providing further training for qualified, suitable and keen students and contributing to the advancement of knowledge. DES considered that the benefits from research training in the humanities were exceptionally difficult to quantify on any objective measure, though nonetheless real.

## **Postgraduate student employment**

16. Following the report of the 1982 working party referred to in paragraph 7 above, all Research Councils introduced procedures to ascertain during the year after the end of training details of the students' first employment. NAO examined this information and compared it with the statistical analyses of employment of first degree graduates used by the Department of Employment. This examination showed that the Councils did not collect or analyse their data in the same way. Across the Councils it was not possible in every case:

- to examine figures by subject area;
- to identify the number of students finding permanent or temporary work, or who were unemployed;
- to assess the extent to which postgraduate training had been relevant to the career chosen; and
- to examine trends, e.g. in unemployment, in particular disciplines over the years.



17. As a result there was insufficient information as a basis for meaningful comparisons within and between Councils or for attempting any general assessment of the national manpower benefits accruing for the training given and expenditure incurred.

18. DES told NAO they had not thought it appropriate to impose upon the Councils a common basis for collecting employment information. Although SERC expressed the view that a central collection agency might have advantages, DES believed that it was for each Council to gather such data in its own way according to its subject responsibilities and any special factors in the employment fields covered. They acknowledged that the present timetable for collecting employment data after 12 months was not entirely satisfactory as many research students might still be at work on their theses and might not have actively sought employment. To provide better information at least one Council (NERC) was now collecting employment data two years after termination of a course.

19. DES drew attention to two reasons why in their view employment statistics could be no more than one indication of the value of postgraduate awards. First, research which led to a significant and original contribution to knowledge, which would normally be published in book or journal form as well as in the PhD thesis, would in itself justify the expenditure on the award. Second, a qualified postgraduate might find employment other than in his specialist field — and indeed it is argued that general management in this country would be strengthened if more senior and general managers possessed higher degrees in science and technology. In DES' view the decisive consideration should be quality and the ability of the award recipient to profit from the training received. For example, an excellent thesis that added to human knowledge and advanced a subject justified taxpayer support even if the PhD did not go on to work in that field.

20. DES themselves had undertaken no regular surveys of first employment of their PhD students, although the Department's awards in 1985 – 86, paid mainly by the British Academy on their behalf, represented by number the second largest proportion of all new awards.

#### **Monitoring of student progress**

21. Since 1982 each Council has reviewed its student supervision and monitoring procedures. Three Councils (ESRC, SERC and NERC) had issued guidance booklets on good supervisory practice; and a code of practice had been issued by the Committee of Vice Chancellors and Principals. The guidance emphasised the importance of the programme of supervision leading to the student submitting a thesis within a reasonable time. In NERC's opinion this guidance has been important in leading to improvements in supervisory procedures in university departments. NAO noted however that the guidance did not specify the arrangements for monitoring progress after the end of the award period although it appeared to NAO that this was the most vulnerable period when the timetable for a student's submission of his or her thesis was likely to slip.

22. Monitoring procedures designed to assess whether a student should continue with his or her training varied among the bodies. ESRC in particular had improved the administration of its awards by requiring reports on students at the end of each course year, by interviewing students where this was felt desirable, and by tightening its procedures for approving the extension of awards into a third year. Procedures at the other awarding bodies varied in content and timing and were less comprehensive.

## Submission of theses

23. As each of the awarding bodies has a common purpose in monitoring student progress NAO found it difficult to establish the rationale for the varying procedures and timings adopted. But while tighter or more frequent monitoring should in principle encourage a better submission rate for theses, there seemed in practice no obvious correlation between the procedures adopted by each body and its submission results (see paragraphs 25 – 26 below). It should be noted, however, that the full effects of improvements in monitoring such as those introduced by ESRC will inevitably take time to work through the system.

24. My predecessor's 1978 – 79 Report on research and training in the social sciences questioned the low submission rates for PhDs in the then Social Science Research Council, now the ESRC. A 1977 – 78 survey had shown that only 15 per cent of students obtained their qualification during the three year grant period; and a previous survey had suggested only 21 per cent of PhD students obtained their doctorate within four years. The Committee of Public Accounts observed that it was unsatisfactory that large amounts of public money should be spent without achieving the purposes for which they were granted within the timescale envisaged (34th Report, Session 1979 – 80). The subsequent Treasury Minute referred to the fact that the Advisory Board for the Research Councils (ABRC) had commissioned a special study of postgraduate education. (This was the 1982 study whose conclusions are summarised in paragraph 7 above.)

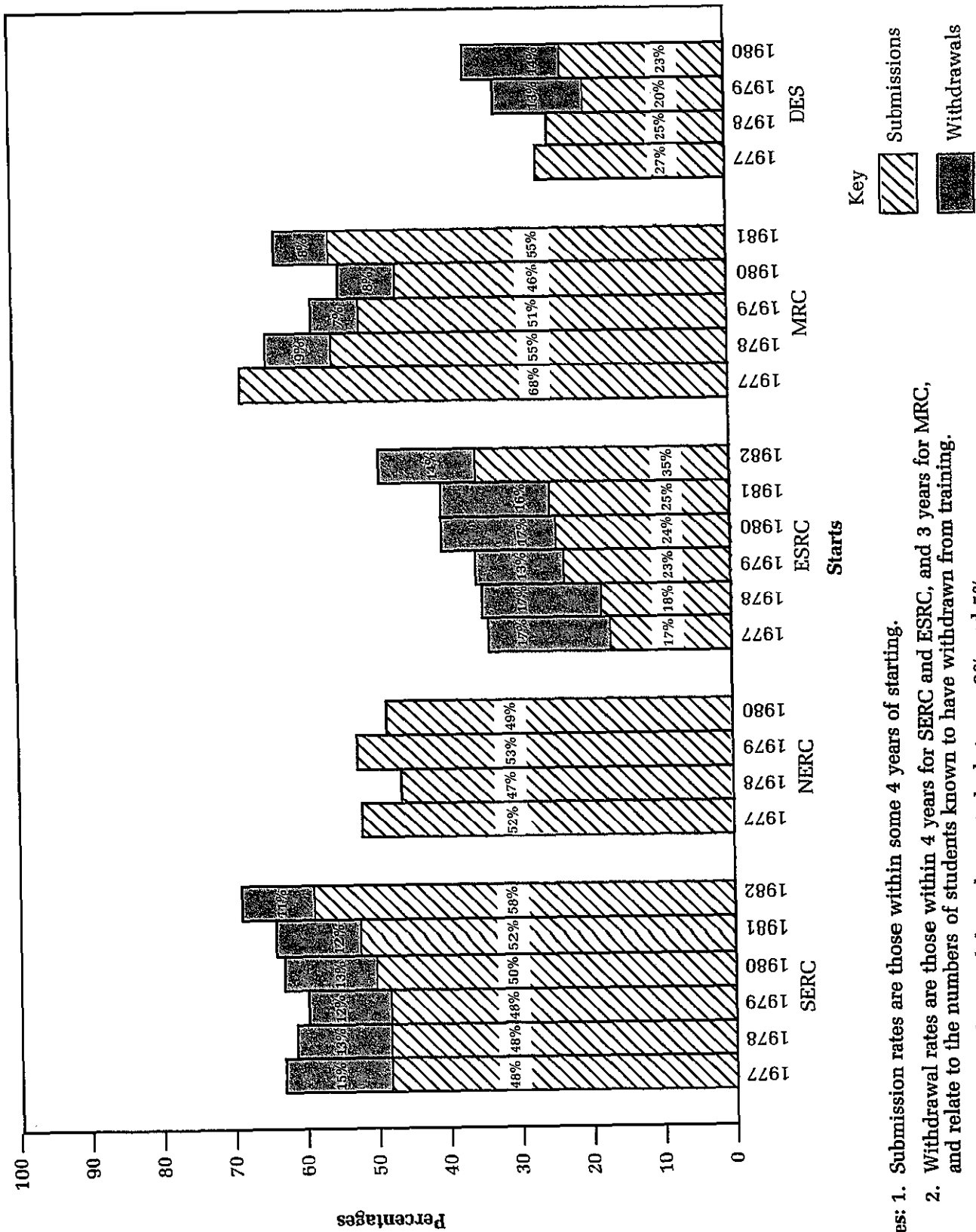
25. DES and the Councils prepare statistics for theses submitted within approximately four years of students starting courses. Submission rates varied widely between the bodies (see Table 3 overleaf) though comparisons made should be treated with caution.

26. The main points to emerge are:

- the gaps in information about courses started in 1981 and 1982 mean that comparable figures for all bodies were available only for training which started in 1980 or earlier;
- with two exceptions (SERC and MRC) none of the bodies had achieved in any year a submission rate of more than 55 per cent;
- the pattern for three bodies (SERC, NERC, DES) appeared broadly stable with some indication of an upward trend in SERC;
- MRC's submission rate had fallen from 68 per cent to 55 per cent, with a low of 46 per cent for courses starting in 1980 (but see paragraph 31 about doubts on the consistency of available information);
- although ESRC's submission rate had risen from 17 per cent to 35 per cent (with a significant rise in the latest available figures) it was in general still well below the rates of around 50 per cent regularly achieved by SERC, NERC and MRC. The upward trend of ESRC submission rates must however be seen as encouraging, no doubt reflecting the special efforts now being made to tighten up arrangements (see paragraphs 22 above and 34 below); and
- Submission rates in the humanities had fallen from 27 per cent to 23 per cent.

27. NAO examination of other available statistics showed that even after a further six years, i.e. ten years after the students began their training, the

Annual submission and withdrawal rates for research studentships



- Notes:
1. Submission rates are those within some 4 years of starting.
  2. Withdrawal rates are those within 4 years for SERC and ESRC, and 3 years for MRC, and relate to the numbers of students known to have withdrawn from training.
  3. NERC estimated its withdrawal rates to be between 2% and 5%.

Table 3

ESRC submission rate had risen to only 54 per cent against the NERC rate of at least 89 per cent; no similar information was available for the other bodies.

28. NAO enquired as to the reasons for the low submission rates in ESRC and DES and the apparent deterioration of those at MRC.

29. At ESRC an internal study team had been appointed to enquire into and recommend action to improve poor submission rates. The team had identified varied and complex reasons for this situation. These included:

- confusion about the nature, form and purpose of the postgraduate degree;
- differences between the social sciences and other fields;
- weaknesses in selection and guidance of students;
- insufficient supervisory influence on choice of topic;
- lack of guidance on length and content of theses; and
- students' problems of stress and isolation.

30. DES acknowledged that it was difficult to explain completely why submission rates in the humanities were so much lower than those in the pure and environmental sciences and in engineering. They considered the variance might be due to several factors:

- the field of study for the physical sciences and engineering is typically more narrowly defined and subject to closer supervision;
- the sort of PhD thesis required in the humanities and the social sciences tends to be considerably longer than that required for pure science and technology;
- students in physical science and similar disciplines tend to complete the main part of their research while still at college because only there do they have access to necessary laboratory facilities; and
- humanities theses might often be delayed or abandoned if students found full-time employment whereas in scientific fields a postgraduate qualification is much more often a requirement for employment.

31. In MRC's view minor variations in the timing of requests to university departments for information, differences in the approach taken to obtain the information and the amounts of resources that could be devoted to chasing up returns — coupled with the relatively low number of awards made by MRC — rendered comparisons of percentage submission rates between individual years almost meaningless. A special exercise on awards made in 1980 had indicated a submission rate of 85 per cent after five years, as against the rate of 46 per cent after four years referred to in Table 3 above.

## **Sanctions**

32. The Councils have from time to time considered applying sanctions against university departments with low submission rates. Possible sanctions identified by the 1982 working party were:

- to insist that prior to payment of any award a student should have both a designated supervisor and an approved research topic;
- to take account of a university's low submission rate in determining awards quotas; and
- to deprive a persistent offender of its quotas altogether.

However, by mid-1985 action by the Councils on the last two types of sanctions had in practice apparently been limited to SERC warnings to universities that it would bring low submission rates to the attention of its allocation committees when award quotas were being decided, with the strong suggestion that they take direct action against any departments whose record of completion rates was seen as unsatisfactory. SERC issued similar but stronger warnings in 1986, and in allocating awards to be taken up in 1987 - 88 they will apply sanctions against certain departments with especially poor submission rates. NERC informed NAO that in making the awards they take into account submission rates and, following a recent careful examination, it considers further sanctions are not necessary.

33. In May 1985 the Government's Green Paper on the Development of Higher Education into the 1990's (Cmnd 9524) voiced concern at the time taken to submit doctoral theses and indicated that the Government expected progress in this area to be closely monitored. Subsequently, and under financial pressure from the ABRC which advises DES on the allocation of the science budget, ESRC introduced sanctions against institutions with low submission levels. In a package of measures ESRC determined that in 1986 no funds for new studentships would be allocated to institutions whose current submission rates were less than 10 per cent. It also imposed sanctions on nine institutions whose 77 student registrations in 1979 and 1980 had produced only three theses. The 10 per cent submission threshold was increased to 25 per cent in 1987 with sanctions being imposed on 20 institutions whose rates for 1980 - 1982 registrations had been below this level. ESRC intends to raise the threshold for sanctions to 40 per cent by 1989, by which time it expects the overall submission rate to be well above 50 per cent. It is also proposing to redirect funds from postgraduate awards into direct research grants.

34. DES told NAO that it seemed sensible for the Councils to adopt their own approaches in seeking improved submission rates and applying available sanctions. It was consonant with the Government's Financial Management Initiative to allow the Councils greater discretion and responsibility for taking what measures they chose to improve their rates in the light of their subject responsibilities, special needs and circumstances, and the recommendations of the ABRC. DES agreed that they needed to ask the funding institutions to improve the data about submission rates and take effective action where they found evidence of inadequate supervision.

35. As regards DES's own awards in the humanities, which on the evidence so far available have still not yet produced a submission rate higher than 27 per cent, there was no allocation to institutions on the pattern widely operated by the Research Councils. The British Academy made awards direct to students who were free to choose their own areas of research and the institutions at which to study. Consequently, most research students in the humanities were widely dispersed in small numbers. DES had therefore taken the view that completion rates could not reliably be used as an index of performance of institutions. In 1983 DES impressed on the universities the need to improve submission rates: but subsequent monitoring had not yet shown evidence of the improvement hoped for. Following the ESRC initiative referred to in paragraph 33 above, DES were discussing with the British Academy what further action should be taken, what criteria should be adopted for judging value for money in

respect of postgraduate awards in the humanities, and how it might be improved.

## **Overall DES responsibilities**

36. As well as their own awards in the humanities, DES are responsible for the overall direction of science education policy and, with the benefit of the advice of the ABRC, for the funding of the Research Councils. It appeared to the NAO that these responsibilities made DES well placed to oversee, and as necessary coordinate, the efforts made by the Councils to secure the objectives and benefits of postgraduate awards and to provide maximum value for money for the substantial resources involved. DES explained that they had not sought to dictate policy to the Research Councils in matters of scientific or academic judgment. The Research Council system was designed to permit decisions about the allocation of resources to be taken at arm's length from Ministers and the Department. General guidance for the Research Councils was provided from time to time, usually on the advice of the ABRC which, like the Research Councils, included in its membership independent scientists and businessmen. This non interventionist tradition dated back to the earliest years of the Research Councils and had been repeatedly endorsed. DES informed NAO that because of this tradition they were not equipped to exercise detailed control over the decisions of the Research Councils.

## **Main findings and conclusions**

37. (a) There are very real difficulties in assessing the requirements and priorities of the objectives of postgraduate education, in particular in predicting manpower needs, and in devising satisfactory measures of performance which can be related to the substantial annual spends and use of resources in this field (paragraphs 6 - 10).

(b) These difficulties were the main reason for the apparent uncertainty about how far the volume and allocation of postgraduate awards should be directed (insofar as this is possible) towards meeting national manpower needs and the weight to be given to the other two objectives of such training. There was also considerable uncertainty as to the extent and quantification of the national manpower benefits actually achieved (paragraphs 11 - 15). In NAO's view, without some clearer agreement as to the importance of each objective and a better and more quantified assessment of the contribution made towards them by the current programme of awards, it is difficult to see how value for money — and particularly effectiveness — can properly be determined and demonstrated.

(c) In recent years the number of postgraduate awards has been primarily determined by financial constraints and has fallen well short of student demand; and in DES's view there were no grounds for believing that in the sciences student numbers had exceeded what manpower planning (if available) would have called for (paragraph 12). In NAO's view it is at least as important to establish how far the programme of awards may fall short of what is required, in aggregate or in different fields. Little reliable information is available on the insufficiency, sufficiency or excess of the present levels of resources in meeting the declared objectives of the programme or the country's needs. Establishing this position is even more important in a period of financial constraint so as to target limited resources to best effect.

(d) However the difficult questions of manpower needs and benefits from awards are to be tackled, success will depend on reliable information and analysis, including information on postgraduate employment. Despite the efforts made in recent years, there remain significant

gaps and a lack of consistency in the available data (paragraphs 16 – 20).

(e) Action has been taken in recent years to improve monitoring arrangements, particularly by ESRC. There seemed however to be no obvious correlation between the different extent of the varying monitoring procedures and the submission rates of theses; and it remains to be seen whether and when the improvements introduced will work their way through the system and significantly raise the submission rates (paragraphs 21 – 22).

(f) Submission rates for theses represent only a broad measure of the benefits obtained. Nevertheless, submission rates remain the main yardstick used by DES and the Councils to measure the successful completion of postgraduate research studentships. There were therefore grounds for concern over apparent reservations about the reliability of some of the data collected on submission rates, and how far different bases and timing for collecting information made it difficult to compare results and trends within and between the award making bodies (paragraphs 26 – 27, and 31).

(g) The available data on submission rates indicated that even at the higher end of the range performance generally was not much better than a 50 per cent submission rate some four years after the students began their courses, with only a gradual improvement over the next six years (according to the limited information available for such later years) (paragraphs 25 – 27).

(h) ESRC had identified a number of reasons for the very low submission rates on its awards (paragraph 29) and has begun to apply increasing sanctions against institutions with the poorest results, with the longer term aim of raising its submission rate from 25 per cent to 40 per cent (paragraph 33).

(i) Submission rates in the humanities awards made by DES and the British Academy remained consistently low at around 25 per cent, and DES accepted that this was difficult to explain completely (paragraphs 25 – 26, and 30). DES were following up steps they had taken with the universities in 1983, and, given the continuance of low submission rates in the humanities and in the light of the ESRC's initiative, were discussing with the British Academy what further action should be taken to improve submission rates in the humanities (paragraph 35).

(j) There was some little information on sanctions taken by the other Councils, and there had been no public statement as to the extent they regarded a submission rate of around 50 per cent after four years as representing a satisfactory situation.

(k) DES are responsible for the overall direction of science education policy and, with the advice of the ABRC, for the funding of the Research Councils. Thereafter responsibility for individual programmes of awards, and accountability for their costs and achievement, devolves to the individual Councils. DES do not seek to dictate policy on such matters to the Councils which involve questions of scientific or academic judgment; and this arm's length and non-interventionist approach had been repeatedly endorsed (paragraph 36). This raises the question as to who other than DES is in a position to exercise the overall direction and oversight which the NAO believe is needed to tackle the

issues referred to in this Report, and to stimulate and coordinate the efforts of the various bodies involved. Such action should, however, stop short of close central control, detailed manpower planning and a separate budget for postgraduate education.

38. As this Report was being finalised for presentation to Parliament, the Government published its White Paper on Higher Education (Cmnd 114 of April 1987). The White Paper emphasised that higher education should serve the economy more effectively and that this need, though not the sole purpose of higher education, must be vigorously pursued. In planning for the future a major determinant must be the nation's requirements for highly qualified manpower to meet employers' needs, across a range of disciplines. Research at universities and other institutions would be a major source of trained people at all levels. By emphasising in these and similar terms the importance of the nation's manpower needs, the White Paper — though directed primarily towards undergraduate education — appeared to the NAO to give renewed significance to the issues raised in paragraphs 6 - 20 of this Report.



## **Glossary of abbreviations**

DES	Department of Education and Science
ESRC	Economic and Social Research Council
SERC	Science and Engineering Research Council
NERC	Natural Environment Research Council
MRC	Medical Research Council
AFRC	Agricultural and Food Research Council
ABRC	Advisory Board for the Research Councils