

Review of the assignment of academic cost centres to price groups

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Introduction

1. HEFCE 2003/42, 'Developing the funding method for teaching from 2004-05: consultation', seeks views on proposals to develop our methods for funding teaching and widening access and improving retention for 2004-05 and beyond. One of the intended changes to the main funding method for teaching is to the subject-related factors: price groups and their weightings.

2. This report describes the analysis that we undertook that underpins the proposals we present in HEFCE 2003/42. Here we assess the relative cost of different subjects, and propose new cost centre to price group mappings and price group weightings. We also show how changes in assignments and weightings will affect the distribution of weighted FTE across cost centres and price groups.

Background

3. The assignment of cost centres to price groups was introduced in the current funding method for teaching, which was first implemented for higher education institutions in 1998-99. Development of the funding method followed an extended period of consultation that began in July 1996 with the publication of HEFCE consultation paper CP 1/96 'Funding Method for Teaching', which introduced the idea of mapping academic subjects to four price groups and outlined how the funding model would operate. The responses to the consultation supported the move to broader subject groupings, and further work led to the publication of HEFCE circular C 21/96 'Funding Method for Teaching from 1998-99' published in November 1996.

4. Annex A of C 21/96 provided the first detailed description of the price groups and showed preliminary assignments of cost centres to price groups based on departmental expenditures and student full-time equivalents (FTEs) reported on the 1994-95 Higher Education Statistics Agency (HESA) finance and student returns. Previously, most of the discussion with the higher education sector had been with central administrations through the heads of institutions. However, as the proposals regarding the detailed composition of the price groups emerged, consultation with the sector began to focus on the interests of individual subjects. We received numerous representations from subject associations and professional bodies urging us to reconsider their provisional assignments, and we engaged in a process of further consultation and gathering of evidence which led to a number of reassignments. Annex A of C 10/97 'Funding Method for Teaching from 1998-99: Additional Decisions' published the outcome of these discussions, and a number of cost centres were reassigned to higher price groups while others were held pending further investigations. In the meantime, five new cost centres were introduced in order to capture the relevant information in future data returns.

5. The original assignment of subjects to price groups combined information from the 1994-95 HESA finance and student records. This was the first year that consistent data were available at the level of cost centres spanning the higher education sector. As such, it was subject to some uncertainty and variation as institutions were in the process of acquainting themselves with the new definitions and data requirements. Furthermore, 1994-95 followed a period of unprecedented growth in student numbers that was not evenly distributed between academic subjects, and this may have introduced some short-term distortion of the expenditure per FTE student in those subjects with the most rapid growth. With each successive HESA finance return, we have recalculated the expenditures per FTE in order to track

changes in the relative costs of subjects and price groups.

6. This paper revisits the assignments of cost centres to price groups using the latest available data and identifies areas for further consultation.

Methodology

7. The data underlying this analysis are drawn from the 1997-98, 1998-99, 1999-2000, 2000-01 and 2001-02 HESA student record, the HESA finance record and HEFCE research funding allocations. The data were collated as follows:

a. Total FTE student load, including overseas students by cost centre, was derived from the HESA individualised student record.

b. Departmental expenditure from general funds was taken from table 6 of the HESA finance record, which excludes expenditure on specific research grants and contracts, but includes expenditure derived from HEFCE recurrent funding for research (HEFCE_R). Since we no longer collect accountability data for research funding, expenditure derived from HEFCE_R has been approximated by the traditional quality-related research (QR) element of institutions' allocated funding for research. This was deducted from the departmental expenditure from general funds to leave departmental expenditure associated with teaching resource (the sum of HEFCE recurrent funding for teaching (HEFCE_T) and fee income). In some instances institutions had not reported expenditure in particular cost centres (usually where the number of students returned was very small) or the reported expenditure was less than the allocated HEFCE_R. This gave rise to a significant number of observations with zero or negative values of expenditure (854 out of a total of 10,618); however they account for less than 1 per cent of the total FTE. These observations represent anomalies in the data and have not been included in the analysis.

c. The proportion of non-departmental expenditure (academic services, administration and central services, premises) associated with teaching resource was calculated by multiplying the total non-departmental expenditure by the factor $\frac{\text{HEFCE_T} + \text{fee income}}{\text{HEFCE_T} + \text{fee income} + \text{TOTAL_R}}$, where TOTAL_R is the sum of HEFCE_R and income from research grants and contracts. The adjusted expenditure on academic services, administration and central services has been attributed to departments according to FTEs, as we believe these types of cost are not generally affected by subject of study. The adjusted expenditure on premises has been attributed according to departmental expenditure associated with teaching resource, as premises for clinical and laboratory based subjects are likely to be more costly.

d. The data have been 'cleaned' by removing outliers and institutions with unusual cost structures. Any observations with fewer than 20 FTEs, or with expenditure per FTE of less than £1,500 or more than £20,000 (except in the medical cost centres), have been removed. Specialist institutions (those having 60 per cent or more of their provision in two or fewer cost centres) were excluded, together with the Open University as it has a somewhat different cost structure from the rest of the sector. This meant that a further 1,075 observations were not included in the analysis.

8. There remained a total of 8,689 separate observations spanning five years of data. Initially, time series of mean expenditure per FTE for each cost centre were plotted. The general trend was a year on

year (inflationary) rise in expenditure, with some cost centres exhibiting a certain amount of fluctuation. In the light of this, it was decided that an average of the last three years (1999-2000, 2000-01 and 2001-02) of data (totalling 5,327 observations) would give a robust and up to date figure for comparing the relative expenditure in different cost centres.

9. The plots in Annex A show expenditure against student FTE for each cost centre. The data have been presented in this way to provide the maximum amount of information as clearly and succinctly as possible. The plotted line is the least squares regression of expenditure against student FTE, and the coefficient therefore represents the least squares estimate of the expenditure per FTE student. Also shown for comparison between cost centres are the mean (total expenditure divided by total FTE), and both the median and standard deviation of the individual rates associated with each observation. The mean gives a greater influence to larger institutions that may exhibit unusually high or low rates of expenditure for a particular cost centre. Similarly, the least squares regression coefficient gives a greater influence to any institutions (large or small) exhibiting unusually high or low rates of expenditure. For example the mean rate for Business and Management Studies (cost centre 27) is influenced by two or three institutions showing relatively high expenditure, as are both the mean and least squares regression coefficient for Other Modern Languages (36). For Continuing Education (41), it is clear that the line of best fit has been heavily skewed by the one observation to the right of the plot. It was therefore decided that the median would be the most appropriate average to use when comparing the relative expenditure in different cost centres, as it gives a value which is characteristic of the majority of institutions.

10. When considering which price group each cost centre should be placed in, there are two considerations:

- the median expenditure per FTE in cost centres should be consistent across the price group
- where appropriate, academically cognate subjects should be in the same price group.

11. The estimated expenditure per FTE student in each of the price groups is calculated using the medians for each cost centre multiplied by the student FTE, which is then summed over the price group and divided by the total FTE in each price group. This produces a weighted average of the cost centre expenditure rates. When calculating the price group expenditure rates, the following cost centres have been excluded so that they do not skew the results: Nursing and Paramedical Studies (5), Business and Management Studies (27), Education (34) and Continuing Education (41). Departments within the Nursing and Education cost centres receive significant funding from the NHS and Teacher Training Agency respectively, and the average expenditure seen will have been influenced by the level of this funding. Our study 'Survey of fees for postgraduate taught and part-time undergraduate students' (available on our web-site alongside this report) shows that for Business and Management programmes, the fees charged are significantly higher than the level that we currently assume, hence the reported expenditure in this cost centre will be overstated in relation to the resource model we use for funding purposes. The Continuing Education cost centre includes expenditure from non-credit bearing courses for which the students have not been counted. For this reason we believe the observed expenditure rate per FTE is an overestimate of the true value.

Results

12. Annex B shows the results using the current assignment of cost centres to price groups. The average rate of expenditure per FTE has been calculated as described in paragraph 11, and the normalised rate relative to the average for price group D is also shown. The main issues that arise are as

follows:

- a. The data suggest a narrowing of the cost differential between price groups B and D and between price groups C and D. One of the determining factors responsible for this narrowing may be the growing use of IT in all subjects.
- b. There is a wide range of expenditure in price group B, with the four most expensive cost centres exhibiting expenditure per FTE that is significantly above the average for that price group. If the overall weighting for B is to be reduced (see above), it follows that there is a strong case for splitting this price group so that the more expensive cost centres do not have too low a weighting.
- c. Some cost centres appear to be in an inappropriate price group, based on the evidence of their relative expenditures. Information Technology and Systems Sciences (25) would fit more aptly in price group D, and Computer Software Engineering (39) is closer to the average of price group C than B. A natural solution is to put both these cost centres in price group C, since they are academically cognate, and their combined expenditure is close to the average of that price group. There would then be no incentive for institutions to return students in Computer Software Engineering rather than IT.
- d. There is no evidence for splitting Psychology and Behavioural Sciences (7) between price groups B and D, or for splitting Librarianship, Communications and Media Studies (30) between price groups B, C and D. Annex C gives more detailed plots for these cost centres, showing how institutions are currently funded for this activity. Institutions have been divided into categories depending on whether their price group splits contain more than 80 percent in B, C or D, or are a mixture (not more than 80 per cent in any one price group). The plots show no noticeable groupings of institutions in the different categories, and in some cases the provision being funded at price group D rates exhibits higher expenditure than that being funded at price group B or C. Overall, each of the categories for Psychology and Behavioural Sciences is closer to the average of price group C than that of B or D, and each of the categories for Librarianship, Communications and Media Studies is closer to the average of price group D than that of price group B or C. It is also the case that the spread of the data in these cost centres is no greater than that in the majority of the others; therefore, in the context of the block grant principle, there is no justification for treating them in a different way to any other cost centre.
- e. Almost all higher education institutions record their Sports Science and Leisure Studies (38) provision in price group C, but the evidence suggests that this cost centre fits more appropriately in price group D.

13. The proposed new cost centre to price group mappings and price group weightings are detailed at Annex D. The weightings for price groups B1, B2 and C are the normalised rates rounded up to the nearest decimal place. The weighting for price group A has been adjusted so that it more accurately reflects the rates for Clinical Dentistry (2) and Veterinary Science (3). Some of the expenditure reported in the Clinical Medicine (1) cost centre is reimbursed by the NHS; therefore the average value that has been calculated is an overestimate of the expenditure associated with teaching resource.

Modelling the proposed changes

14. Annex E shows how the changes in assignments and weightings will affect the distribution of weighted FTE across cost centres and price groups. The figures in the FTE column come from institutions' Higher Education Students Early Statistics 2002 (HESES02) returns, and have been distributed over cost centres using HESA 2001-02 data. FTEs weighted by old and new price group are then computed, and the FTE weighted by new price group is up-rated such that the sector total weighted FTE remains unchanged. The percentage increase is then calculated as the increase in weighted FTE divided by the FTE weighted by old price group. The percentage increase in FTE will be very close to the percentage increase in standard resource when the new assignments and weightings are incorporated into the funding method for teaching.

15. Observations are as follows:

- a. Looking at the summaries by old and new price group at the bottom of the table, it is clear that there is a shift from B2 and Media to B1 and D. Cost centres that remain in price group C and A are largely unaffected by the proposed changes.
- b. Some cost centres have been reassigned to lower price groups (aside of those in B2), and therefore see a significant drop in their associated resource:
 - i. Librarianship, Communication and Media Studies (30) has moved from a B/C/D split to be wholly assigned to price group D.
 - ii. Sports Science and Leisure Studies (38), which was split between price groups C and D, will be wholly assigned to price group D.
 - iii. Computer Software Engineering (39) has been reassigned from price group B to price group C.
- c. Despite the fact that the pre-clinical element of the Clinical Medicine and Clinical Dentistry cost centres has been assigned to B2, the weighting for the clinical (price group A) element is sufficient that these cost centres will see a slight gain in resource overall.

16. For the old Media and Psychology price groups, the effect on institutions' standard resource level will depend on their current split for this provision. Psychology and Behavioural Sciences currently funded at price group B rates, and Librarianship, Communication and Media Studies currently funded at price group B or C rates, will see a drop in associated resource, while any provision currently funded at price group D rates will see a rise in associated resource.

17. The proposed changes will only influence institutions' standard resource level if they have significantly differing levels (compared to the sector average) of provision in the more affected cost centres or price groups. These institutions will commonly be specialist institutions for which we have a variable premium in the funding method for teaching to compensate for unusual cost structures. However, inevitably there will be some multi-disciplinary institutions whose standard resource will be affected in a positive or negative way, possibly causing them to fall outside the tolerance band depending on their current level of resource. HEFCE 2003/42 'Developing the funding method for teaching from 2004-05: consultation' describes the other changes we are proposing to make to the funding method for teaching for implementation from 2004-05. In order for institutions to assess the impact of all the changes on their own funding, we will shortly provide a summary of simulated outcomes by institution on our web-

site under Learning & teaching.

18. The proposed assignment of cost centres to price groups and price group weightings are based on median expenditure rates for cost centres, in other words the rate that best represents most institutions, but not all. Some institutions will always spend more in certain cost centres than others, for various reasons. The block grant principle allows institutions to divide their grant internally as they wish, which may or may not be in accordance with our subject weightings, depending on how well or poorly our weightings reflect the resource required by particular departments.

Annexes

19. The plots and tables referred to in this report are contained in annexes A to E:

- Annex A Plots of expenditure against FTE for each cost centre
- Annex B Results of the study with cost centres classified by the current price group assignments
- Annex C More detailed plots for the Psychology and Behavioural Sciences and Librarianship, Communication and Media Studies cost centres
- Annex D Results of the study with cost centres classified by the proposed new price group assignments - the proposed price group weightings are also shown
- Annex E Modelling the effects of the new assignments and weightings