Institute of Physics Report

Study of the Finances of Physics Departments in English Universities

A summary report prepared for the Institute of Physics by Nigel Brown Associates
July 2006

Institute *of* **Physics**

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Abbreviations

EU	European Union
FEC	Full economic costing
FTE	Full-time equivalent
HE	Higher education
HEFCE	Higher Education Funding Council for England
HEI	Higher-education institution
HESA	Higher Education Statistics Agency
IOP	Institute of Physics
JCPSG	Joint Costing and Pricing Steering Group
QR	Quality-related
RAE	Research Assessment Exercise
SET	Science, engineering and technology
TRAC	Transparent approach to costing

1: Principal findings and conclusions

The data obtained in this study reveal a complex picture about the financial position of the sample of 10 physics departments in English universities. Overall in 2003–2004 all of the sample departments that were able to provide transparent approach to costing (TRAC) cost data showed deficits in gross income against full economic costs. There appears to be a weak correlation between the percentage of total income that the deficits represent and the 2001 Research Assessment Exercise (RAE) grade of the department. It is important to note that TRAC is not only a costing and pricing tool, but is at least as much a management tool for departmental and for central managers.

Of particular importance is the heavy dependence on public funding that physics departments have for their income for teaching and research. Most universities use resource-allocation models linked to earned income, so the financial position of physics departments is particularly sensitive to the metrics that underlie the funding allocations of the public funding bodies and to changes in those metrics.

The changes being made to funding methods for teaching and research so that they better reflect the full economic costs of activities are likely to be of particular benefit to physics departments, provided that the level of activity can be maintained.

The main conclusions from this study of 10 physics departments in English universities are as follows:

- In 2003–2004 all of the physics departments in the sample were in deficit on a full economic costing (FEC) basis. In part this reflected their very heavy dependence on public funding and the metrics used to allocate those public funds. The move to use the FEC for individual research projects; the increased funding of project overheads by the research councils in 2006–2007; and the decision by the Higher Education Funding Council for England (HEFCE) to use TRAC-based costing data to underpin key elements within its funding of teaching mean that there is a real prospect of an improvement in the financial position of physics departments.
- The move to increase tuition fees in England for full-time home and European Union (EU) undergraduates to a maximum of £3000 from 2006 should provide some increase in the funding available to physics departments, as long as they can sustain current levels of recruitment. However, the additional sums available from this source for making good structural deficits will at best be modest because most of the additional income will be used for student bursaries, improved academic pay and investment in teaching facilities.
- The large fixed costs involved in the delivery of the physics undergraduate programme, particularly in maintaining and servicing teaching laboratories, mean that sustained recruitment is vital to the financial health of the departments. Furthermore, the age and condition of much of the dedicated accommodation in the sample of physics departments is such that it will require major investment in the medium term. If universities are to commit the kind of capital investment required, they will need to be satisfied that physics departments will continue to be able to attract students of the right quality.
- A large proportion of the dedicated space in the sample of physics departments was 30–40 years old and in need of refurbishment. The required investment for this, if it can be justified, will offer the opportunity to review the space requirements with a view to reducing fixed costs where space is surplus to requirements and could be reallocated to other uses.
- Evidence from those departments that have specialist-taught masters programmes indicates that they can contribute significantly to the financial health of a department. Physics departments therefore need to examine their scope for running niche postgraduate-taught programmes that may be able to command high fees from both home (sponsored) and overseas students.
- There is a risk that non-publicly funded activities will be priced on a marginal cost basis because physics departments are heavily dependent on public funding even though some, at least, should be treated as wholly commercial activities.
- Relying wholly on recorded income from research grants and contracts to analyse the income and costs of publicly funded research produces an incomplete picture. This is because it necessarily excludes most of the costs of activities where research council support is mostly given in the form of allocations of time (for which there is no regularly available income equivalent measure) on centrally provided facilities in the UK and abroad. It is possible that, where such allocations of time represent a very high proportion of total research council support for a department, there may be some distortion of the financial position because there is at present little contribution to support the irreducible fixed costs of the basic research infrastructure. The FEC should help to remove such distortions.

2: Introduction

This is a summary report of a study commissioned by the Institute of Physics (IOP) from Nigel Brown Associates about the financial position of a sample of 10 physics departments in English universities. It seeks to draw some general lessons about the financial position of physics departments and how current developments in the public funding of teaching and research may impact on that position.

The study used universities' own data on gross departmental income (before any deductions for central costs) and their TRAC data to establish the FEC of the departments in the sample. Information was also collected from the universities about financial drivers, such as the full-time equivalent (FTE) student numbers of various types; the FTE of academic and other staff; and dedicated space occupied by the departments. These data were collected to provide a fuller understanding of income and costing data.

TRAC was developed by JM Consulting for the Joint Costing and Pricing Steering Group (JCPSG) of UK higher-education institutions (HEIs). It was intended to provide a more robust approach to the FEC of research projects that would be acceptable to government as a basis for the future funding of research supported by the research councils and government departments. A key element of TRAC is a survey-based allocation of academic staff time between the principal activities of teaching; research (including time spent on support through the management and administration of these activities); and "other" activities (e.g. consultancy for clients).

It must be noted that this study is an interim examination of physics department finances during a period of radical change, the eventual implications of which have yet to become clear.

3: Background

The IOP commissioned the study by Nigel Brown Associates in part to follow up a study that it undertook in 1997 about the finances of UK physics departments (*UK University Physics Departments: a Financial Survey*). There were similar concerns at that time to those that exist now about the future supply of a science, engineering and technology (SET) workforce, particularly in the light of some well publicised closures of university SET departments with financial pressures frequently cited as a major factor.

A number of recent reports have highlighted the possible impact of the closure of university physics and chemistry departments on the future supply of a SET workforce. The government's 10-year Science and Innovation Investment Framework[1] called for a step change in the numbers taking SET subjects in post-16 education and higher education (HE). In March 2005 the House of Commons Science and Technology Committee reported on strategic science provision in English universities.[2] The Secretary of State for Education and Skills also invited HEFCE to advise about "whether there are any HE subjects or courses that are of national strategic importance, where intervention might be appropriate to enable them to be available...and the types of intervention which it believes should be considered".[3]

HEFCE established an advisory group to consider the issues and published the final report of the group in June 2005.[4] The report pointed out that enrolments on physics degree programmes had been stable, unlike those for chemistry and materials science, which had experienced significant declines in recent years. Nevertheless, the advisory group did identify SET subjects as strategically important and vulnerable.

Table 1 shows the changes in the number of students for physics, chemistry, all physical sciences and all subjects from 1994/1995 to 2004/2005, as recorded in the HE student record by the Higher Education Statistics Agency (HESA). To give the full picture of the current position, the table provides figures for each of the last four years.

The table shows the significant relative decline in the number of students studying physical sciences over the past 10 years. In physics, as in the physical sciences overall, the decline in numbers has been reversed over the past four years and physics student numbers are now higher than they were 10 years ago. This rise contrasts with chemistry, where only in the most recent year, 2004/2005, is there any evidence that the decline may have halted.

Table 2 shows that expenditure within physics and chemistry cost centres in universities also declined between 1995/1996 and 2002/2003 as a proportion of total expenditure on all academic cost centres. It also shows that this decline has been matched by a decline in the number of universities with expenditure of more than £1 m within the physics and chemistry cost centres. This demonstrates that over the period 1995/1996 – 2003/2004 the decline in the number of substantive physics departments (i.e. those with more than £1 m within the cost centre) was more modest than the decline in the number of substantive chemistry departments on the same measure, although physics started from a lower base in 1995/1996.

Another significant factor in the financial pressure on academic departments has been the substantial reduction in HEFCE's support for research through its quality-related (QR) grant, following the 2001 RAE, to departments with a rating of grade 4, and the withdrawal of such funding for departments with a rating of less than grade 4 in the RAE.

Table 3 shows the performance of physics and chemistry departments in the 1996 and 2001 RAEs. This demonstrates that, even by the time of the 1996 RAE, physics had a considerably shorter "tail" than chemistry, with only 32% of departments scoring lower than grade 4, while 61% of chemistry departments scored below grade 4. By 2001 only one physics department in seven was rated less than grade 4, compared with one in four chemistry departments.

1. HM Treasury 2004 *Science and Innovation Investment Framework 2004–2014*.
2. House of Commons March 2005 *Strategic Science Provision in English Universities: Government Response to the Committee's Eighth Report of Session 2004–2005*.
3. Charles Clarke 1 December 2005 Letter from the Secretary of State for Education and Skills to the Chairman of HEFCE.
4. June 2005 *Strategically Important and Vulnerable Subjects*, final report of the advisory group HEFCE 24-05.

Table 1: Changes in student numbers* 1994/1995 to 2004/2005

Subject	1994/1995	2000/2001	2002/2003	2003/2004	2004/2005	change from 1994/1995 to 2004/2005 (%)
physics	14 040	12 905	12 830	13 360	14 610	+4.1
chemistry	23 520	19 660	19 015	18 525	18 520	–21.3
all physical sciences	72 510	69 285	71 0400	71 245	78 685	+8.5
all subjects	1 567 315	1 990 625	2 296 625	2 247 440	2 287 540	+46.0

*Includes all full- and part-time undergraduate and postgraduate students studying in the UK (i.e. home, EU and non-EU).
Source: HESA: Students in Higher Education Institutions 1994/1995, 2001/2002 to 2004/2005

Table 2: Direct expenditure in physics and chemistry cost centres 1995/1996 and 2003/2004

	Physics		Chemistry	
	1995/1996	2003/2004	1995/1996	2003/2004
expenditure in cost centre (£m)	100.5	143.7	121.6	151.0
% of total academic department expenditure	2.4	2.1	2.9	2.2
number of universities with expenditure of more than £1m in cost centre	39	37	54	44

Source: HESA: Resources of Higher Education Institutions 1995/1996 and 2003/2004

Table 3: Distribution of RAE grades: physics and chemistry departments 1996 and 2001

RAE grade	Number of institutions receiving rating			
	1996 RAE		2001 RAE	
	physics	chemistry	physics	chemistry
5*	2	2	5	6
5	11	9	22	13
4	26	13	16	15
3a	7	11	7	9
3b	3	10	0	2
1 or 2	6	16	0	0
total number of departments assessed	57	61	50	45

Source: RAE 1996 and 2001

Between 1996 and 2001, the reduction in the number of chemistry departments entered for the RAE was twice the reduction in the number of physics departments. These results may reflect the high entry costs of some kinds of physics research compared with some areas of chemistry research, leading to greater pressure earlier for increased concentration of physics research funding and the number of departments.

In addition to these pressures on physics departments, there have been increasing concerns that the funding of physics (and chemistry) teaching by HEFCE has failed to reflect the costs of providing that teaching. Although physics and chemistry are both laboratory-based subjects that have received a weighting of 2.0 in the funding formula, this was perceived by those in physics and chemistry departments to be inadequate to reflect the very strong emphasis on laboratory experience in undergraduate physics and chemistry teaching compared with other laboratory-based subjects.

The difficulty arises, however, not so much from the HEFCE formula, which has to group disciplines together, but from the use by many HEIs of the HEFCE formula to distribute teaching income to individual departments as a basis for resource allocation. In practice, HEIs do often moderate the impact of a pure income-driven approach to resource allocation through cross-subsidies to those areas that are regarded as inherently more expensive. However, where an HEI comes under general financial pressure, subjects in receipt of subsidy are inherently vulnerable.

At the start of this study in the spring of 2005, HEFCE had just started a major review of its funding method for teaching in the light of the move to variable, full-time, home undergraduate fees in 2006/2007. One element of this review has been to investigate the feasibility of using TRAC to develop a robust basis for the subject weightings and other special factors within the funding method. Following an initial period of consultation, HEFCE has now decided to pursue the possibility of using TRAC and the FEC of teaching as a basis for determining funding relativities.

These concerns about physics in universities, coupled with the work in progress to use TRAC to provide the FEC of research council-funded projects and, prospectively, to underpin the funding of teaching, made it timely to examine TRAC-derived costs against current income for the main activities of physics departments, rather than relying on departmental budgets, as in the IOP's 1997 study. Departmental budgets are derived from the resource-allocation models used by individual universities. Although these are generally similar in principle, using income earned by cost centres as the starting point for drawing up budgets, in practice there are significant variations in the way that they are applied, particularly for the treatment of central costs. TRAC is intended to provide a more consistent approach across HEIs.

4: Methodology

The study that this report summarises was undertaken through a series of face-to-face and telephone interviews with the heads of the 10 physics departments, departmental administrators, and finance and planning staff from the universities in the sample. The questionnaire used in interviews sought information about:

- cost drivers – home and EU undergraduate, and postgraduate, student numbers (FTE); overseas students (undergraduate and postgraduate) from outside the EU; academic staff (FTE); technician staff; and dedicated space (sq. m);
- gross departmental income for teaching, research and "other" activities;
- the allocation of academic staff time between the five principal activities (publicly funded teaching; non-publicly funded teaching; publicly funded research; non-publicly funded research; and "other" activities);
- the FEC of departments using the universities' individual TRAC allocation models;
- the split of total costs between the five principal activities.

The sample of departments was drawn up to include a mixture of different sizes (as measured by full-time student load) and of different RAE scores in the 2001 RAE, with 5*-, 5- and 4-rated departments. Those in the sample ranged in size from about 150 to just fewer than 500 full-time students. The departments and their universities agreed to participate on the understanding that their anonymity would be maintained in any published material and the IOP has honoured this commitment.

To illuminate the relative financial position of the physics departments, the study also sought information on a comparable basis about a sample of other departments, including, in particular, chemistry; psychology or a similar human science; and a humanities discipline (e.g. history).

The central element of the whole study was a comparison of the gross income for 2003/2004 attributable to the department (irrespective of how the allocation for the individual departments is determined in practice) with the total costs for 2003/2004 derived using the TRAC FEC methodology.[5] This includes direct costs, the department's share of indirect costs using university-wide cost drivers and the two cost adjustments for the cost of capital employed and infrastructure, which are intended to provide an estimate of the FEC of the estate used for the activity beyond what is included in the annual accounts.

There are a number of caveats in this approach that must be borne in mind when examining the findings of this study:

- Only 8 of the 10 universities in the sample were able to provide detailed FEC data based on TRAC principles for their physics departments.
- The TRAC-based FEC approach has only been applied in full up to now to the costing of publicly funded research projects. Although the work on costing research necessarily yields information about the costs of other activities, including teaching, the underpinning data will need to be made more robust if the FEC is to be used as the basis for determining subject weightings within the teaching funding method as HEFCE has now decreed, and if it is to be used by HEIs to understand and manage their costs effectively.
- A critical element within TRAC is the allocation of academic staff time to different activities. The 2003/2004 data about time allocation were usually based on staff surveys conducted in earlier years, although all of the departments in the sample indicated that they considered the data to be a reasonable representation of the real division of time. However, the data are presented as a proportion of contracted hours, whatever the total hours worked. Activities carried out beyond contracted hours will tend to distort the distribution of time over the different activities.
- More generally, 2003/2004 was still early days for the implementation of TRAC by universities. The approach has been further developed since 2003/2004 – including, in particular, a review of the approach to collecting data about the distribution of academic staff time – to ensure that the FEC approach to research projects is acceptably robust. The FEC data based on TRAC principles from years before 2004/2005 must therefore be treated with a degree of caution.

5. For example, see 2002 *Joint Costing and Pricing Steering Group TRAC Manual* Vol II.

5: Main findings

5.1: Student numbers

Although the departments in the sample ranged in size from a student load of about 150 to just fewer than 500 FTE, including all undergraduate and postgraduate students (home, EU and non-EU), the numbers were dominated by home and EU full-time undergraduates (figure 1). Only in one of the 10 departments did home and EU full-time undergraduate students represent less than 60% of the total student load. Only two institutions in the sample had significant numbers of part-time undergraduates and only two had significant numbers of postgraduate-taught students. Most of the departments in the sample offered a mixture of four-year MPhys and three-year BSc degree programmes. Most of the universities reported some difficulties in filling undergraduate places with the quality of candidates that they wanted, and for some of the years they had failed to reach their target intake. Some of the departments offered physics in combination with other subjects in an attempt to increase the intake to physics undergraduate programmes.

Figure 2 compares the home and EU full-time undergraduate student load with the student load of undergraduates from outside the EU in 2003/2004. Recruitment to physics departments in the sample in 2003/2004 of non-EU students who are not supported from public funds was very modest, with only two of the departments taking more than 10% of their undergraduate students from outside the EU. Students from outside the EU were a higher proportion of postgraduate research student numbers, but the absolute numbers were modest in relation to total student numbers.

Overall the physics departments in the sample were heavily dependent on public funding for their student-related income. In 2003/2004, across all UK physics departments, 290 full-time physics undergraduates were non-EU domiciled, representing 3.1% of the total full-time physics undergraduate numbers of 9400. For a comparison for all subjects in 2003/2004, just over 7% of full-time undergraduates were domiciled outside the EU, and for full-time undergraduates in business studies, 13.6% were from outside the EU.

5.2: Academic staff

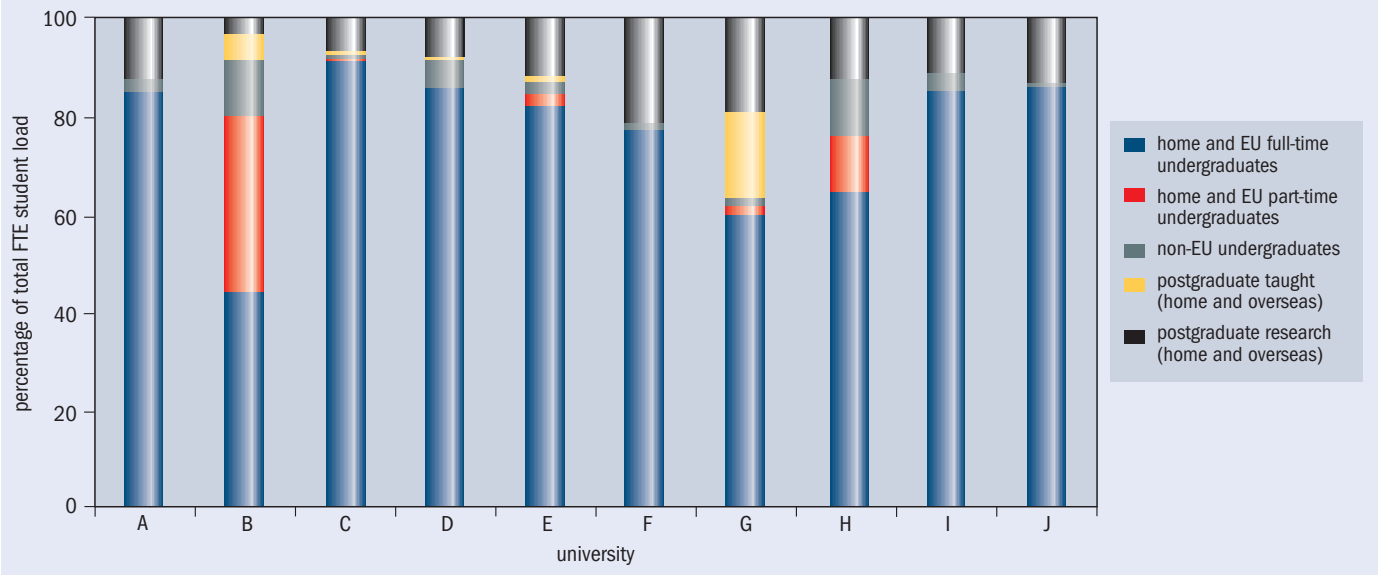
Figure 3 compares the number (FTE) of academic staff employed within the departmental budget with those funded by external grants and contracts in 2003/2004 for the physics departments in each of the universities in the sample. The proportion of externally funded posts is broadly correlated with the level of research grant and contract income. The number and type of appointments made currently reflect the attempt by departments to sustain, and if possible improve, the strength of the academic staff base for the 2008 RAE.

It is worth noting that the distinction between university funded and externally funded is no longer so clear cut. Under the FEC the research council contributes to the costs of "core" staff as well as project research staff.

5.3: Dedicated space

Figure 4 shows the space per FTE member of academic staff for each of the physics departments in the sample.There is some broad inverse correlation between the area per FTE member of academic staff and the size of the department, as measured by the number of academic staff. However, because the majority of departments occupy space constructed 30–40 years ago that has been subject to rela-

Fig. 1: Total FTE student load by type of student in the sample of physics departments in 2003/2004.



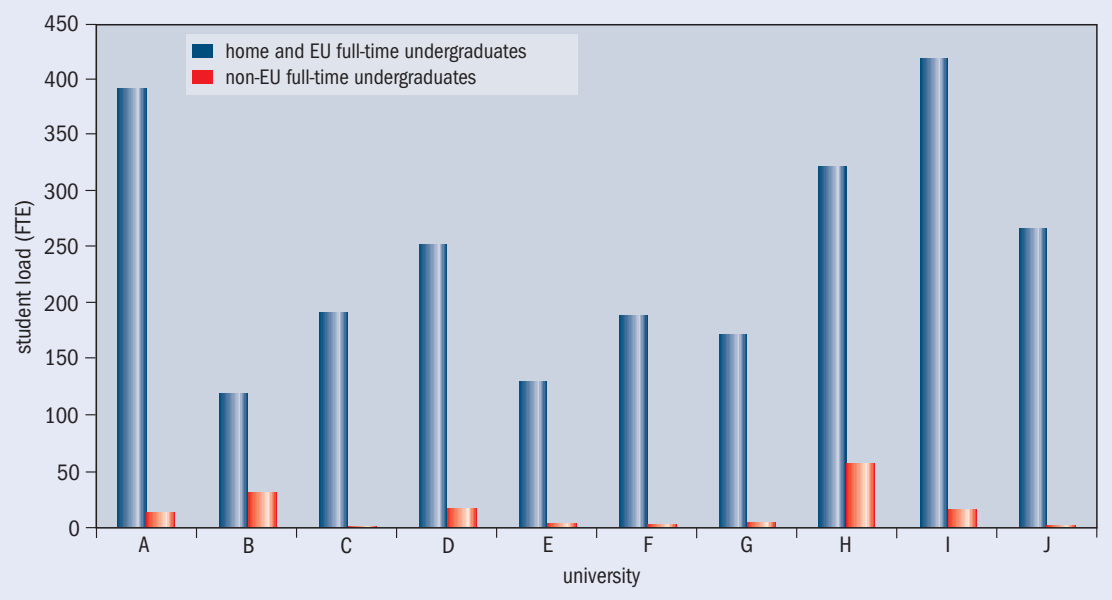


Fig. 2: Home and EU versus non-EU full-time undergraduate student load in the sample of physics departments in 2003/2004.

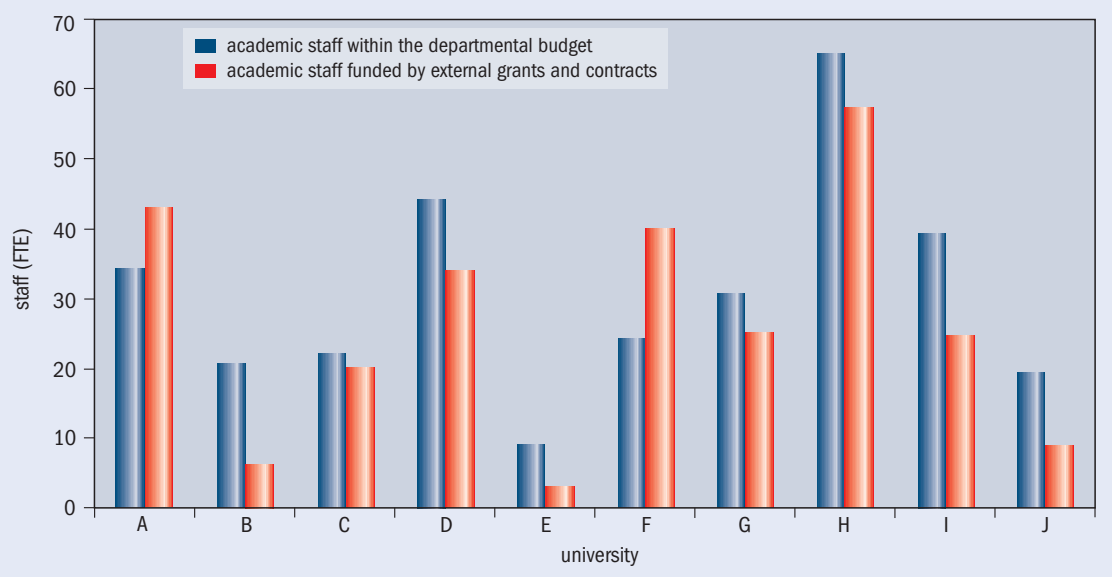


Fig. 3: Academic and research staff (FTE) in the sample of physics departments in 2003/2004.

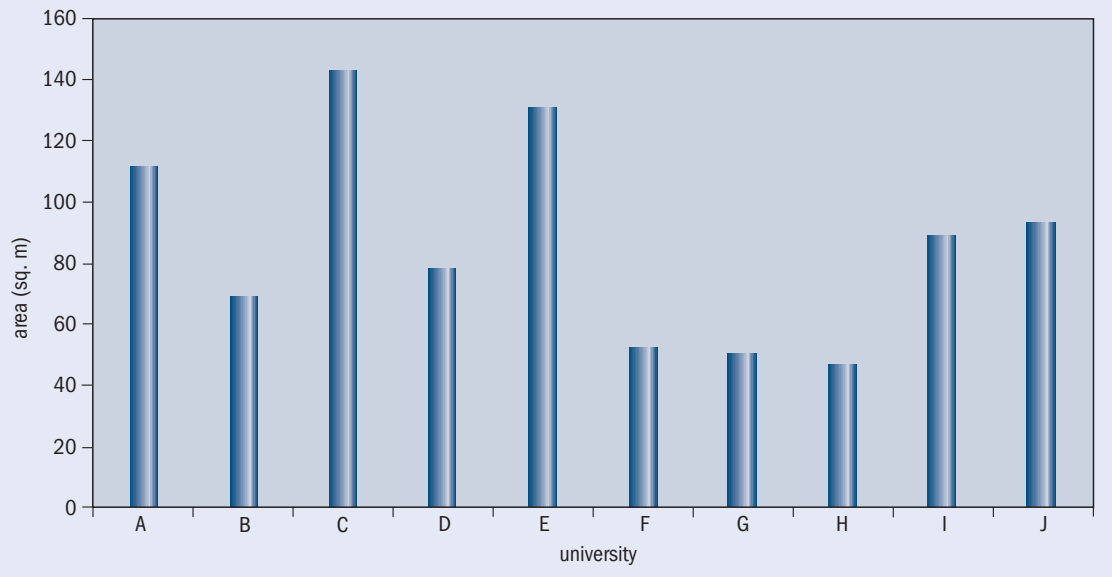


Fig. 4: Area per FTE member of academic staff in the sample of physics departments in 2003/2004.

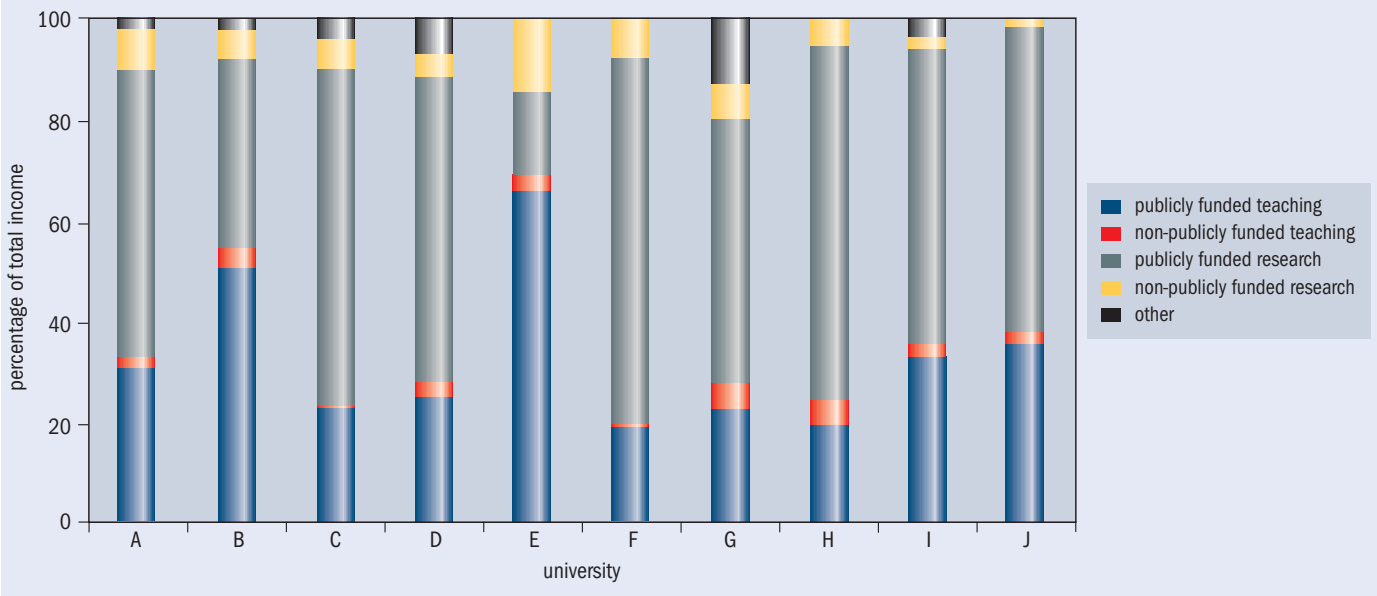


Fig. 5: Distribution of income by activity type in the sample of physics departments in 2003/2004.

tively little refurbishment, there has been little opportunity to review the space requirements as demands have changed. However, it is interesting to note that the one department benefiting from substantial recent refurbishment was able to shed substantial space for other uses.

Dedicated space drives a significant element of the academic estate costs allocated under TRAC, and this allocation must take account of the differential costs of certain types of space. This TRAC requirement was still being implemented at the time of this study, so the 2003/2004 estate cost allocations will not be fully robust. A relatively high proportion of the space in physics departments is high cost space. As universities develop approaches to the costing of space that differentiates more clearly between the costs of different types of space, physics departments will appear more expensive than they currently do with undifferentiated space costs. Physics departments will also be allocated their share of central university facilities (e.g. lecture theatres) based on estimates about usage.

5.4: Gross departmental income

Figure 5 shows the distribution of departmental gross income by activity type in 2003/2004 and so demonstrates the spread of levels of activity in the sample of departments. It further emphasises the heavy dependence of most of the physics departments in the sample on publicly funded research income. All but one received more than 80% of their income from public sources in 2003/2004. The figure also shows a good inverse correlation between the score in the 2001 RAE and the proportion of total income from teaching. In the sample, only two departments, both of which received a rating of grade 4 in the 2001 RAE, have a teaching income representing more than 50% of total income.

Figure 6 illustrates further this heavy dependence on publicly funded income for research. However, the publicly funded research income figures make no allowance, other than limited grant support for certain associated costs (e.g. travel and subsistence), for the research activity that is supported through the allocation of time on national and international facilities. The only time that an income equivalence for this type of research activity is drawn up is within the submissions to the RAE.

Figure 7 presents the data from the 2001 RAE for the sample of departments, together with the 2003/2004 research council grant figures for comparison. It shows that for the departments in the sample there was a wide variation in the proportion of total research activity supported by the research councils that was primarily in the form of the allocation of time to national and international facilities.

5.5: Allocation of academic staff time

Figure 8 shows the distribution of academic staff time in the sample of departments for 2003/2004. As one would expect, there are broad similarities in the distribution of staff time and income. However, a detailed comparison suggests that, in practice, there are implicit or explicit subsidies taking place from publicly funded teaching to research and *vice versa*.

The most commonly observed pattern in the case of five departments in the sample is that the proportion of academic staff time spent on publicly funded teaching is substantially higher than the proportion of total income attributable to that activity, while the reverse is true for publicly funded research. This is consistent with the fact that permanent academic staff undertake most of the teaching, make bids for research grant allocations and oversee the research, while much of the research activity is undertaken by full-time research staff and students.

For two of the remaining departments the proportion of academic staff time and the proportion of total income for publicly funded research and teaching are very similar. The three remaining departments show the reverse pattern, where the proportion of academic staff time allocated to publicly funded teaching is less than the proportion of total

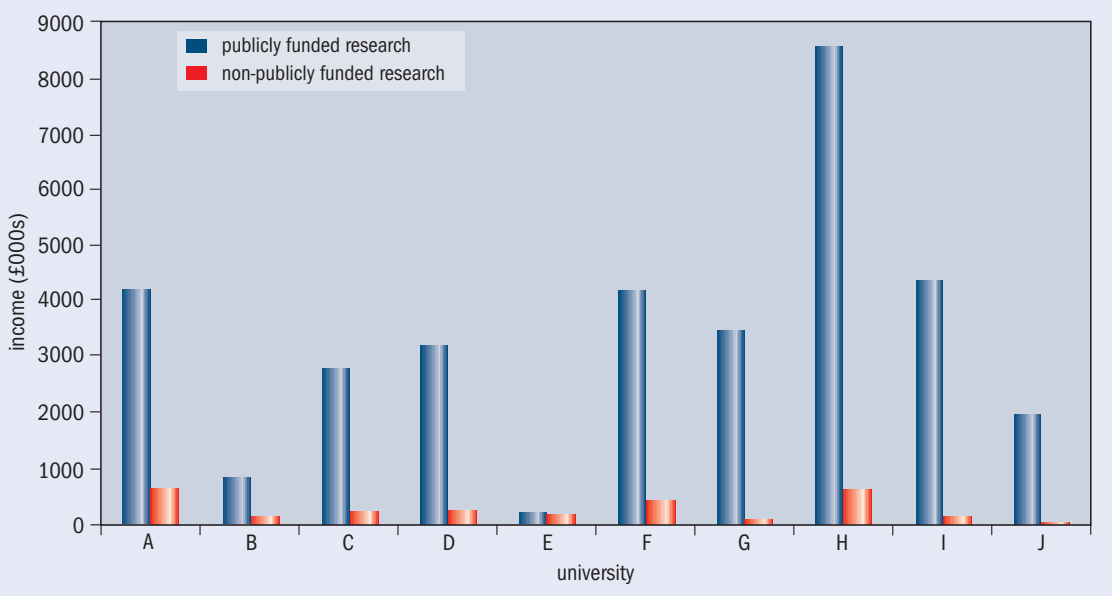


Fig. 6: Income from publicly funded and non-publicly funded research in the sample of physics departments in 2003/2004.

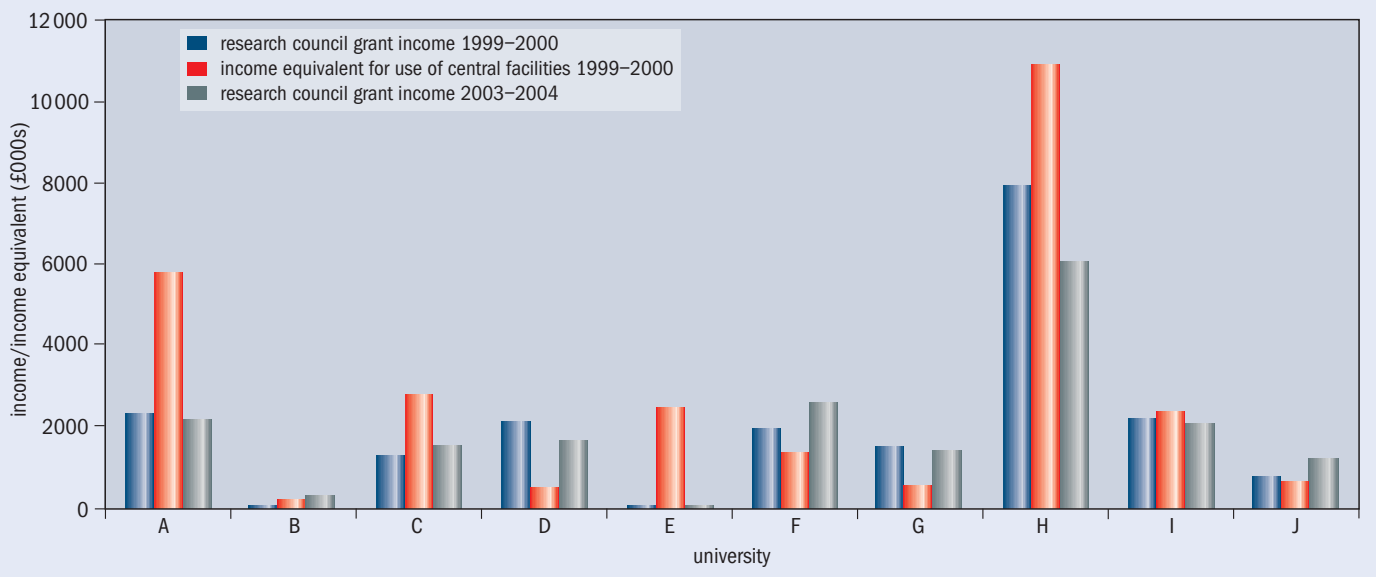


Fig. 7: Research council grants in 1999/2000 and 2003/2004 and income equivalent for the use of central facilities in 1999/2000 in the sample of physics departments.

income from that activity, with the reverse true for publicly funded research. However, these comparisons are made more difficult because of the varying proportion of publicly funded research activity that is conducted outside universities in national or international facilities and for which income is not recorded.

In one of the three cases where the allocation of academic staff time to teaching for publicly funded research is well above the proportion of income from that source, this is almost certainly linked to the depressed level of publicly funded research income – a result of the fact that a large part of the department's research council allocation takes the form of an allocation of time on central facilities.

5.6: Overall financial position

Only eight of the departments were able to provide complete FEC data. Figure 9 shows the overall financial position of these departments in 2003/2004.

On an FEC basis in 2003/2004, all of these physics departments were showing deficits ranging from about 16% to almost 45% of total income.

5.7: Financial position of academic staff time

Although for most of the departments in the sample non-publicly funded teaching (principally of overseas students) and "other" activities each contribute to the overall observed deficits, each represents only a small proportion of overall activity in the departments. The most relevant areas for considering the contributions to the deficits are publicly funded teaching, publicly funded research and non-publicly funded research. Figures 10, 11 and 12 show the contributions to the observed overall deficits from these three activities.

Figure 10 shows that most of the sample departments showed deficits in publicly funded teaching in 2003/2004, some of which were substantial in percentage terms, but

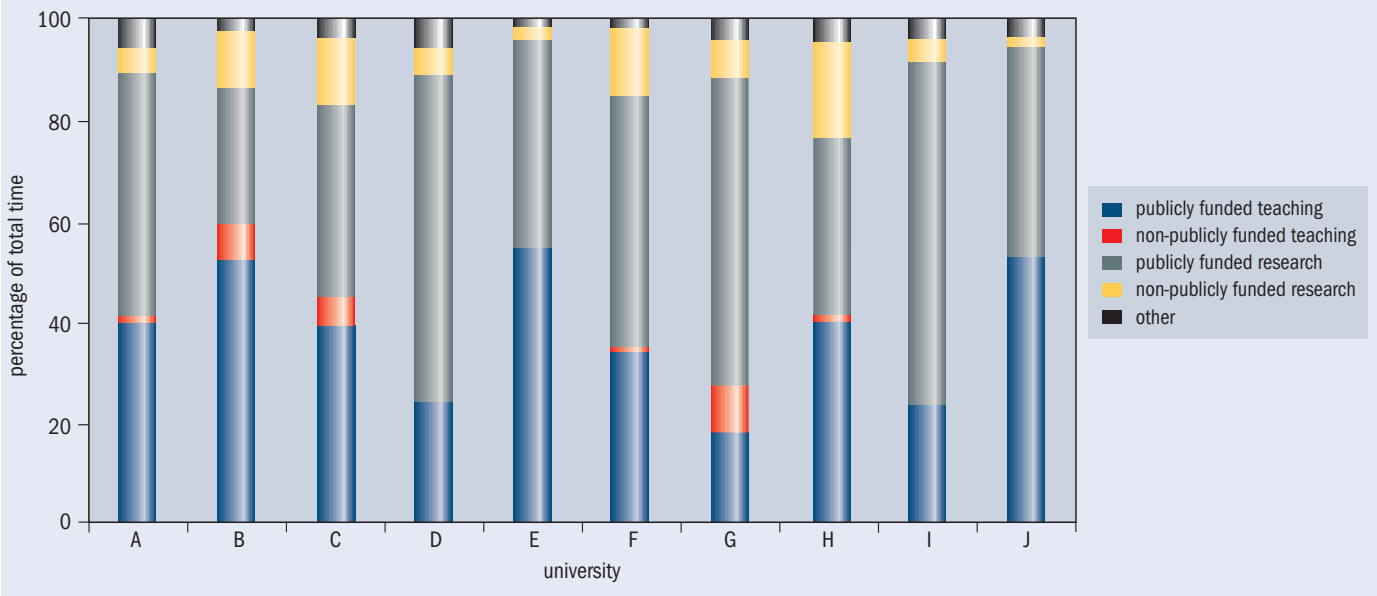


Fig. 8: Distribution of academic staff time by activity type in the sample of physics departments in 2003/2004.

two departments had surpluses. These two also showed the lowest percentage allocation of academic staff time to publicly funded teaching in 2003/2004.

For those departments in deficit in 2003/2004 for publicly funded teaching there is a broad inverse correlation between the size of the deficits and funding for teaching per FTE student. In part this may reflect student numbers in 2002/2003 (the basis for allocations in 2003/2004) being below the numbers in 2003/2004. One of the two institutions showing surpluses for publicly funded teaching in 2003/2004 had a correspondingly high level of funding per student. The two institutions in surplus also showed a significantly lower proportion of staff time given over to publicly funded teaching than the proportion of total income from this activity. These surpluses mean that it is difficult to draw conclusions about the adequacy of public funding for teaching from the cost data for 2003/2004 from the sample of departments.

Overall the position for the eight institutions taken together is a deficit for publicly funded teaching of about 22% of publicly funded teaching income. This compares with the average deficit across the eight departments for all activities of just over 30% of total income. This overall deficit for publicly funded teaching for the sample of physics departments is significantly higher than the position for publicly funded teaching across all subjects for the whole sector, which was broadly in balance in 2003/2004.

Bearing in mind the caveats about TRAC data in 2003/2004, the average observed deficit for publicly funded teaching across the eight departments that were able to supply full TRAC data implies that, under the current funding regime, a significant uplift in HEFCE grant would be required, given the fixed undergraduate fee, to bring most of these departments into balance. However, it is important that HEIs are able to refine the application of TRAC to their own circumstances so they can identify what scope there might be for improving the financial position of publicly funded teaching within the curriculum constraints that flow from meeting the requirements of professional recognition by the IOP.

Figure 11 shows that, for those departments in the sample able to provide TRAC costing data, all were in deficit for publicly funded research activity on an FEC basis in 2003/2004. This is hardly surprising given that more than 75% of the income from all research grants and contracts for these departments came from research councils and did not make a full contribution to the overhead costs of the projects that they supported. Since HEFCE QR funding allocations were intended to form the other arm of the public funding support for research, it is perhaps not surprising that the two departments rated 5* in the 2001 RAE had the lowest percentage deficits for publicly funded research in 2003/2004.

As discussed earlier, the data about publicly funded research in physics only provide a partial picture because of the high level of research council support for physics research that takes the form of time allocated on central facilities (plus some grants to cover associated institutional costs) rather than grants. Both sides of the income–cost equation are affected because the universities clearly incur lower costs for research primarily undertaken in external facilities than in house. For the sample of departments, the allocation of time on central facilities covered a substantial proportion of the total publicly funded research activity in 1999/2000, as measured for the 2001 RAE – in one case it represented almost all of the activity (figure 7).

It is clear that the Engineering and Physical Sciences Research Council and the Particle Physics and Astronomy Research Council will in future take into account and contribute to the FEC (and not simply the associated direct costs of the researchers) of the university's activities that are largely supported through allocation of time on central facilities. This will ensure that the financial position of those departments that get a large proportion of their support

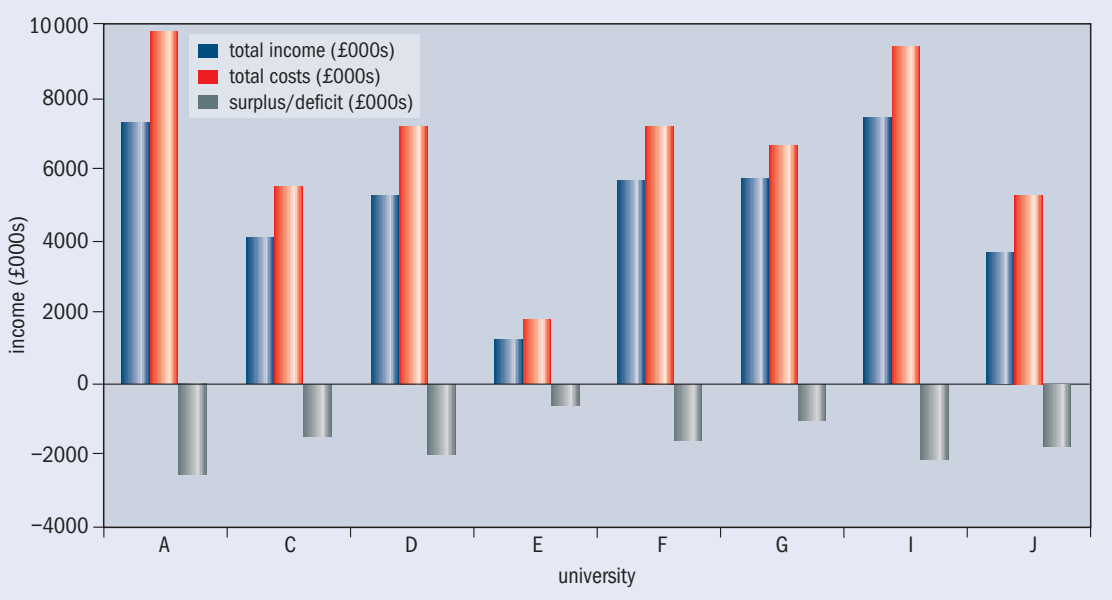


Fig. 9: Total income and total TRAC-based costs in some of the sample of physics departments in 2003/2004.

from the research councils in this form can be compared more readily with those departments that receive a smaller proportion of their support from research councils through such allocations.

Allowing for these caveats, the data do provide hard evidence of the impact of the current system under which public research grant-funding bodies pay only a proportion of overheads with reliance on the dual funding system to make good the difference. The whole sector was in deficit with regard to publicly funded research in 2003/2004. It was this kind of evidence and the evident impact on research infrastructure that led the government to agree that public funding bodies, particularly the research councils, should in future pay a larger proportion of research overheads based on the FEC of individual projects.

This lack of funding based on the FEC of research applies not just to research funded by the research councils and other UK public sector bodies but especially to research funded by the EU and its agencies. In practice in 2003/2004 the institutions in the sample received less than 5% of their total research income from EU sources, so the contribution of this to the overall deficit in publicly funded research will have been small.

Figure 12 shows that non-publicly funded research is clearly an activity for which most of the departments in the sample incurred substantial deficits in 2003/2004 on a very low turnover. One department did show a significant percentage surplus, however. The substantial percentage deficits in non-publicly funded research shown by most of the departments probably reflect the marginal nature of this activity, in the absence until now of good costing data, leading to marginal pricing. Some of the income was from UK industry and commerce, where the departments may have been seeking to develop a longer-term relationship and thus have been willing to subsidise the activity.

In addition, some of the income for some departments was from UK research charities that do not contribute towards overheads. In 2003/2004 the income from UK research charities received by the 10 physics departments in the sample was just over £0.5 m (with a similar figure from UK industry and commerce), representing between them about 4% of the total research grant and contract income of £24.6 m.

The move to the FEC for research council projects will be augmented by a prospective increase in HEFCE and other funding council research funding. Although of limited importance in physics departments, some of the additional research funds from the funding councils will be used to provide partnership funding to contribute to the overhead costs of research funded by UK research charities, which will help to reduce the deficits in non-publicly funded research sponsored by research charities.

5.8: Comparisons with the financial position of other subject areas

The universities in the sample were asked to provide financial information on a comparable basis for their chemistry department, their psychology (or other human science) department and a humanities department. With one exception the comparative data were drawn from budgets rather than TRAC. This makes it impossible to draw comparisons between the relative position of physics in different universities. Nevertheless, in 2003/2004, physics was consistently in a less difficult financial position than chemistry and in a broadly similar position to the humanities department selected. The comparison with psychology was more mixed, with some physics departments showing a more difficult financial position than psychology, while in others it was psychology that was in the more parlous financial state. It would require a much more in-depth comparative subject study than was possible here to understand the basis of these observed differences.

Fig. 10: Surpluses/deficits in publicly funded teaching in some of the sample of physics departments in 2003/2004.

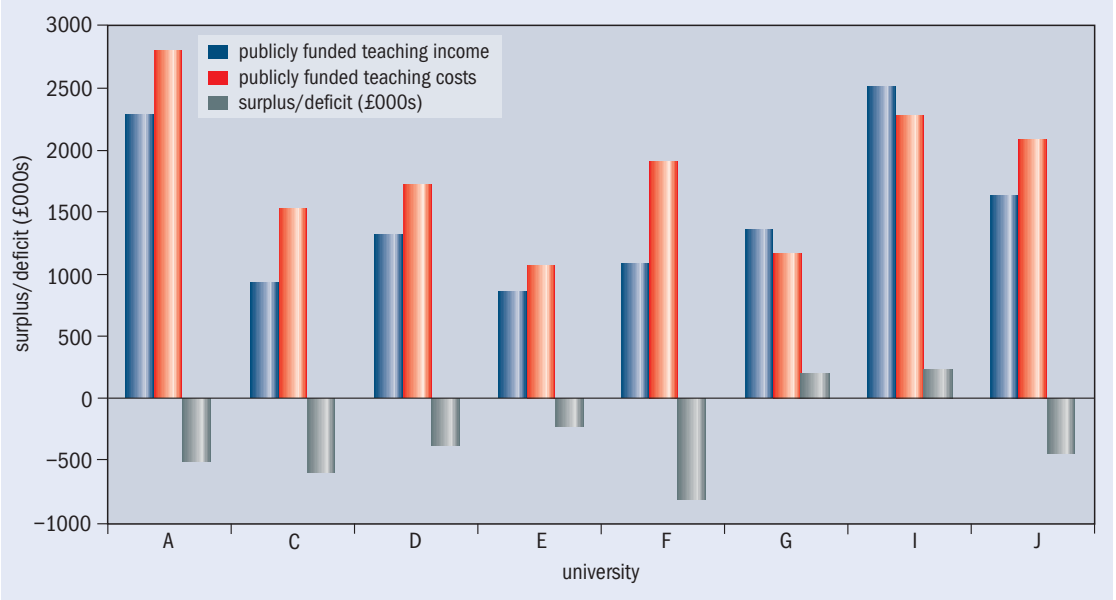


Fig. 11: Surpluses/deficits in publicly funded research in some of the sample of physics departments in 2003/2004.

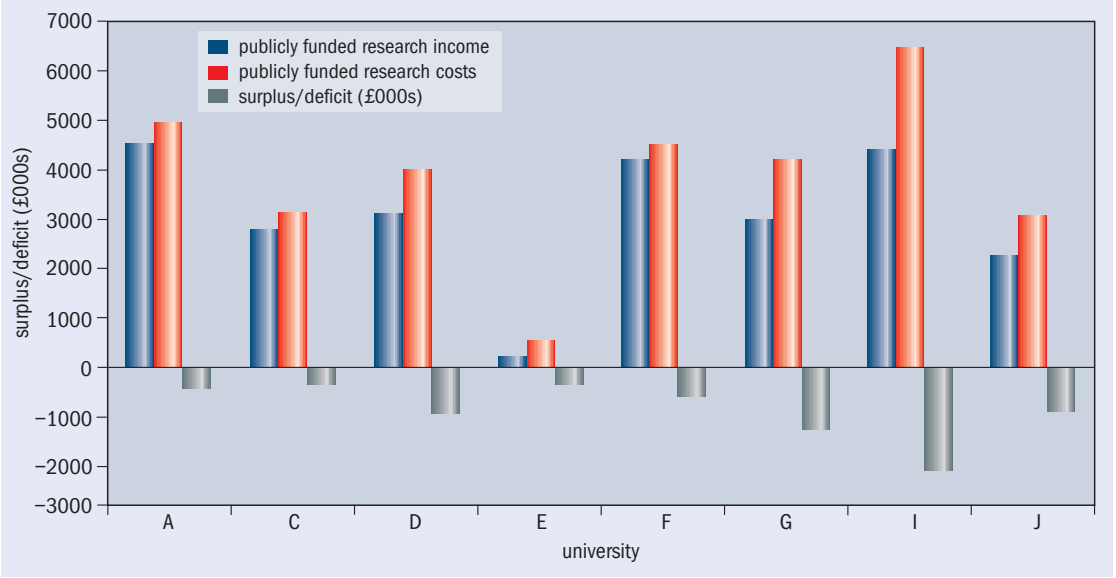


Fig. 12: Surpluses/deficits in non-publicly funded research in some of the sample of physics departments in 2003/2004.

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Notes

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