March 2003/11
Policy development
Report on survey

This report is for information

This report analyses the results of the 2002 Higher Education-Business Interaction (HE-BI) survey for UK higher education institutions (HEIs). It is a follow-up to a similar survey in 2001, and demonstrates widespread improvement in interaction between the higher education sector and business, compared with 1999-2000. These surveys may form the basis of an annual information request from HEIs to identify trends in interaction with business.

March 2003/11

Higher education-business interaction survey 2000-01

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Higher education-business interaction survey 2000-01

To	Heads of publicly-funded higher education institutions in the UK
Of interest to those responsible for	Links with business and the community, Research, Continuing vocational education, Funding, Planning
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Executive summary

1. This report presents the analysis of the 2002 Higher Education-Business Interaction (HE-BI) survey. It was commissioned by HEFCE on behalf of a group of stakeholders, which are listed at Annex E. It is a follow-up to HEFCE 01/68, 'Higher education-business interaction survey: A report by the Centre for Urban and Regional Development Studies, University of Newcastle upon Tyne'. These surveys may form the basis of an annual request for information from higher education institutions (HEIs) on 'third-leg' activities.

2. This report is based on data for the academic accounting year August 2000 to July 2001. The objectives of the survey were:

- to identify trends in interaction between HEIs and business (often referred to as third leg activity)
- to develop the relevance and reliability of selected indicators which might inform decisions on funding for knowledge transfer activities
- to help develop processes for an annual gathering of data via a standard procedure designed not to be overly burdensome on HEIs. Such data will give valuable support for a more embedded 'stream' of third leg funding. For information from academic year 2000-01, the survey was managed by HEFCE. In due course, it is intended that much of the data be gathered by the Higher Education Statistics Agency (HESA).

3. The survey has arisen as a result of growing recognition of the importance and need to evaluate the third leg of higher education's activities, alongside the two other 'legs' – research, and learning and teaching. Development of

capability in third leg activities has been supported since 1999 through the University Challenge, Science Enterprise Challenge, Higher Education Reach-out to Business and the Community schemes (latterly the Higher Education Innovation Fund), the Knowledge Transfer Grant in Scotland and the Higher Education Economic Development (HEED) fund in Wales.

4. The survey, which builds on the 2001 survey by the Centre for Urban and Regional Development Studies (HEFCE 01/68), covers the whole of the UK and includes questions covering aspects of higher education institutions' policies, organisation, activities and outputs related to working with companies of all sizes and sectors and other organisations, including the public sector, in the wider community.

5. The survey response rate was 98 per cent of UK HEIs, giving a highly representative indication of the whole sector.

6. Data are presented in tables and graphs throughout this report, except in cases where it is considered unreliable. Where meaningful, tables show comparative data for institutions by level of research intensity (RI) – they have been grouped into lower, medium or higher level of RI. (How the RI is calculated is described in paragraph 40.) This grouping of HEIs is intended to inform considerations of the differing mix of third leg activities for different types of institution.

7. Robustness of the survey data continues to improve, due to a higher institutional response rate, apparently greater commitment by HEIs to the reporting process, extensive validity and confidence checking. Separate data for England, Northern Ireland, Scotland and Wales are included. Data by English region were excluded from this report as they were considered less meaningful.

8. The survey demonstrates a marked and widespread improvement in the interaction between the higher education (HE) sector and business, compared with 1999-2000. Positive benchmarking and other trends indicate a progressively more strategic and embedded approach by HEIs to HE-business interactions.

9. We have reached a stage where it is practical to identify a core set of quantitative and objective, qualitative indicators which HEIs can apply to their individual third leg strategies. Year-on-year performance comparisons are becoming sufficiently reliable to give evidence of change; in almost every category of data, development of activity and outputs are indicated. Comparisons between the priorities and specific returns for HEIs in the three levels of research intensity suggest that such an overall basket of indicators will give scope for:

- identifying UK-wide and national trends
- use by individual institutions for management purposes
- informing third leg funding and in due course the regional impact of higher education.

10. Referring to HEIs' own intentions regarding business interactions and partnerships, access to education remains the most important. Development of local partnerships and meeting regional skills needs are the priority for institutions classed as lower research intensity. There is evidence of:

- increased strategic planning for business support
- ICT being the highest priority business sector or cluster; cultural and creative sector are also important
- focus on not-for-profit and public sector collaboration for lower RI
- greater reference to Regional Development Agency (RDA) priorities
- importance of 'best fit with institutions' expertise' and response to business demand.

11. Approximately 60 per cent of HEIs report the involvement of senior HE staff in the development of regional skills strategies. The most common geographical focus for institutions is (equally) the government administrative region and the region defined by the HEI itself; a more local or city focus is much less significant.

12. Most HEIs are still developing their data recording processes, to capture information

which has not been statutorily required but which both responds to the survey and gives useful institutional management data. This applies particularly to recording the degree of business involvement in, for example, Research Council grants and the distinction between large enterprises and small and medium sized enterprises (SMEs)[1]. It is reported that:

- 37 per cent of business contracts were with SMEs (for lower and medium RI the proportion is higher), representing 13 per cent by value
- there is a healthy continuing growth in TCD-mediated activities
- there is a 15 per cent increase in the number of businesses taking up equipment related services such as analysis and testing.

13. Regarding intellectual property (IP), there is indication of continuing growth in activity and possibly of more business- and market-awareness in its management. There has been:

- an increase of approximately 25 per cent in IP disclosures
- an increase of more than 20 per cent in patents granted
- a continuing rise in the development of in-house licensing capability by medium and higher RI
- over 30 per cent increase in licences to UK companies; the overseas balance has shifted from software to non-software licensing.

14. HEIs appear to be broadening their IP base, with a rise in attention given to industrial design and trademark activity. Lower and medium RI show development across virtually all types of IP based activity.

15. Many HEIs do not yet have a centrally co-ordinated consultancy procedure, and data capture is therefore likely to be incomplete. However, the sector reports a rise in all aspects of this activity:

- over 80 per cent now provide enquiry services for SMEs
- there is a significant increase in the number of companies receiving consultancy help
- there is an increase of approximately 25 per cent in consultancy income.

16. There has been a reduction in the number of HEIs depending on external companies for managing their consultancy and an increase in those using both external and internal management.

17. The number of full-time equivalent (FTE) staff employed in HEIs' commercialisation and other third stream offices has risen from 1,268 to 1,529. Lower RI now have a similar average third stream staffing to medium RI.

18. Despite difficult conditions worldwide for knowledge-based businesses during 2000-01, 20 per cent more spin-off companies were created than reported in the previous (2001) survey, with over 30 per cent increase in spin-offs which had survived over three years. Note that this figure does not (yet) distinguish between highly active and inactive companies. There was evidence of a reduced and erratic income from spin-off company share sales; again this may be connected to external economic conditions. Provision of support for spin-off activity is more from HEIs themselves than from external partners, especially in entrepreneurship training and business advice.

19. Comparisons between the UK and the US continue to show that the HE research expenditure per spin-off is much lower in the UK (£46 million per spin-off in the US and £12 million in the UK). Conversely the licence income generated by HEIs is 4.3 per cent of research expenditure in the US and 0.6 per cent in the UK. This indicates significantly different strategies and probably different maturities of HE commercialisation in the two territories. It is not possible to compare the respective economic benefit of these strategies directly due to lack of availability of comparable data.

1 As defined by the Department of Trade and Industry

20. Knowledge transfer and the delivery of social/economic benefit in HEIs are characterised by various forms of people movement and interaction involving HEI staff, students or business staff; examples are student placements and jointly designed continuing professional development courses. At present, not all HEIs maintain an institution-wide record of student placements, which are often arranged at the HEI's Department or School level; placement data are therefore far from complete. The same applies to consultancy. HEIs report that they generally consult directly with employers rather than using formal labour market intelligence in the design of courses and perhaps in arranging placements. Lower RI institutions report more such interactions than medium and higher RI institutions; lower and medium RI institutions show an increase in their planning on the basis of recognised skills needs. Overall there has been more than 25 per cent growth in income to HEIs from courses for business.

21. Regional Development Agencies and other regional bodies have an emerging role in regional economic development. All sources of economic regeneration funding available to HEIs are perceived as being more significant to lower RI institutions than to medium and higher RI institutions. There is a general broadening in the range of HEI activities supported by such funds; lower RI institutions in particular have increased their focus on facilitating partnerships and community development, rather than on teaching.

22. The declared cost to HEIs of completing the HE-BI survey was approximately £150,000 for the UK overall. HEIs had difficulties with some questions, commonly because data were not already collected for other external or internal purposes; or there were residual ambiguities in the survey. There is strong evidence that HEIs are finding some of the data valuable for internal management uses, and some are developing embedded and co-ordinated processes. As it becomes possible to route some data collection through the HESA Finance Statistics Return, the burden of completing the survey will reduce and reliability of data will be enhanced.

23. The improved response rate of the HE sector and the developing robustness of the indicators, data collection and analysis are a secure basis for a possible annual HE-BI survey. This would involve further refinement of the indicator set and appropriate involvement of HESA for collecting data from all institutions. The burden of the process to HEIs could be reduced by recognising which indicators are less changeable and checking these less frequently. Any process developed should also be informed by related studies and surveys.

Background and purpose

24. Universities and higher education colleges in the more developed economies of the world have been encouraged in the last 10 or more years to develop a richer range of ways of contributing to social and economic benefit. This is commonly in recognition of the public funding which supports their infrastructure and capabilities. This has stimulated a search for indicators or metrics of performance in a third stream of HE activity alongside learning and teaching, and research.

25. The overall aim of this third stream is to develop effective means of knowledge transfer, or rather exchange, between business and higher education institutions. Business is taken to mean companies of all sizes and sectors and other bodies in the wider community. The initiation of the Higher Education Reach-out to Business and the Community Fund in England and Northern Ireland and the Higher Education Innovation Fund, University Challenge and Science Enterprise Challenge have paved the way for a permanent third stream of funding for HE.

26. The UK higher education constituency is diverse, including small specialist institutions, often with a creative and cultural focus, and large multi-discipline institutions often with a strong science and technology capability. The Higher Education-Business Interaction Survey is designed to recognise this diversity. It was carried out by HEFCE in 2002, on behalf of the HE funding bodies for England, Scotland, Wales and Northern Ireland and the Department of Trade and Industry, Office of Science and Technology (OST). It requested all HEIs in the UK to provide data related to the 2000-01 academic year and builds on the similar survey carried out by the Centre for Urban and Regional Development Studies (CURDS) at the University of Newcastle in 2001 (HEFCE 01/68), for the same main stakeholders; that survey collected data mainly from 1999-2000. The response rate for the 2002 survey was 98 per cent (compared with 89 per cent in 2001).

27. The objectives of the 2002 survey were: to update the 2001 HE-BI survey; to begin to identify trends in HE-business interaction; to develop the relevance and reliability of potential performance indicators; and to refine the overall process, format and content of questions for gathering such data, to move towards a standard annual process with the minimum possible administrative burden on all parties.

28. The 2002 questionnaire is based on that used in 2001 modified to change questions for which data collection is particularly difficult and to eliminate ambiguity in the interpretation of questions. Changes have been kept to a minimum, to enable year on year comparison. When the previous (2001) HE-BI survey was launched, it stated that a medium to long term aspiration is to have a set of indicators that could inform allocation of the third stream of funding. Because of the importance of addressing the activities of the whole HE sector, and the diversity mentioned above, indicators relevant for one HEI may not be the same as for another. Hence the 2002 survey has maintained the breadth of the 2001 survey so as not to pre-empt any decision on the application of particular indicators.

29. During 2002, several other studies were carried out in the general field of UK third stream indicators or metrics. These include the University Companies Association/Nottingham University Business School (UNICO/NUBS) commercialisation survey, the Russell group/SPRU conceptual framework study, and more recently the Council for Industry and Higher Education (CIHE)/Salford University benchmarking of socially inclusive third stream actions. The key initiators of these studies and other key stakeholders have begun a fruitful exchange of aims and methodology, as part of an ongoing dialogue on objective ways of recognising the impact of higher education in this field.

30. Stakeholders in both the 2001 and 2002 HE-BI surveys include government departments, HE representative bodies, the Confederation of British Industry (CBI) and HESA (see Annex E). The Analytical Services Group of HEFCE has been particularly engaged in the design, validation and analysis procedures of the 2002 process. The stakeholders will have access to the

full data set produced by the survey. However, public reporting will be limited so that individual HEIs will not be explicitly identified. This also reflects the need to ensure that data are reported only when they are robust and are less vulnerable to misuse.

31. For a fuller discussion of the context of the HE-Business Interaction Survey, see the report for the 2001 HE-BI survey (HEFCE 01/68).

Methodology (process) and robustness

32. The HE-BI 2002 survey covers the whole UK HE sector and has been overseen by a stakeholders group (listed in Annex E). A steering group was set up by the stakeholders to monitor and advise on the data collection process.

Survey initiation

33. It was agreed that while it was desirable to address some of the perceived ambiguities of the HE-BI 2001 survey and limit burden on all parties, the document should be changed as little as possible to allow comparisons to be drawn between the two years. Several questions from the previous survey were excluded and some had wording altered to clarify what was required.

Data collection

34. Data were collected electronically. Each HEI completed a Microsoft Excel workbook, and these were loaded onto a dedicated database at HEFCE.

Robustness

35. To ensure that the data are reliable, detailed validation and data checks have been applied throughout the survey. The Excel workbook that institutions completed contained validation checks, mostly to ensure that institutions had completed all necessary information. Once data were loaded onto the dedicated database they were validated by:

- comparing data returned in the 2002 survey with that returned in the previous year and querying sizeable differences
- comparing data across all institutions and questioning outliers
- where appropriate, comparing data to those in HEIs' finance return to HESA, again raising queries with institutions where data were inconsistent (in a small number of cases, after questioning institutions, it was necessary to correct data previously collected for 1999-2000).

Unless otherwise stated, data are not subject to any substantial validation concerns and would be useful in any surveys. Where there are particular comments on the robustness of data, reference is made within the discussion text of the question.

Survey sample

36. The number of institutions responding was significantly higher in 2002. In 2001, 144 HEIs responded, approximately 89 per cent of the total UK sector; in 2002, 160 out of 164 HEIs responded, 98 per cent of the total UK sector. While this almost total coverage is desirable for ongoing monitoring of metrics or other indicators of performance and success, it will mean that comparison with the previous survey will show apparent increases where none exist, a factor which cannot be systematically eliminated. Any changes shown by the two surveys that are not based on percentages of the responding cohort should be viewed with this in mind.

37. As well as a higher response rate, individual responses were often more complete in 2002. Many institutions found some data impossible to return. However some of those who put in place data systems following their experience of the 2001 survey have been able to complete more of the 2002 survey.

38. Further points regarding process and robustness are at Annex G.

Analysis (deductions and trends/comparisons)

39. The data relating to each sub-section of the questionnaire have been tested and corrected, as described in paragraph 35. For each question, the level of analysis has been chosen on the following bases:

- overall importance of the data
- validation concerns

- confidence in the data collection for academic years 1999-2000 (the 2001 survey), 2000-01 (this report) and the likely confidence in 2001-02 data, subject to process changes which have been identified
- usefulness of separate national data
- relevance of comparison by research intensity (RI, see below)
- change in the scale and (less significantly) the mix of responding HEIs between the 2001 and 2002 surveys.

40. In the 2001 survey, analysis and comparisons were carried out across three groups of HEIs: pre-1992 universities, post-1992 universities and HE colleges. The stakeholders' group for the 2002 survey recommended that three categories of HEI divided by level of research intensity should be used instead, recognising the continuing evolution of the HE sector at large and to help determine which indicators could be most relevant for the differing academic profiles of institutions. Research intensity has been calculated by taking the total of funding council recurrent research funding and OST research grant as a proportion of the HEI's total income. HEIs were then placed in order of RI and divided into three groups of equal number: Higher, Medium and Lower. This division is arbitrary, to provide information about the shape of the sector at large, and does not indicate specific strengths of individual HEIs. Data are shown separately by research intensity where this could be informative and the returns indicate significant differences.

41. Separate national data for all questions are included in Annex A to enable national bodies to undertake further analysis or comparisons. In addition, raw data will be made available to the stakeholders to permit more detailed analysis, for example by regional group. Where any question has a regional context, HEIs were given freedom to relate these to their particular operational 'region' which might or might not correspond to government-defined regions. This gives a more realistic indication of the collaborative and economic development input from HEIs and is a less burdensome process than the re-categorising of data to suit the regions. Questionnaires for Scotland, Wales and Northern Ireland were specific to those nations. In cases where specific reference was made (questions A4, A7, B3, B4 and D2), nation was substituted for region. Any other reference to 'region' was considered to mean Scotland, Wales or Northern Ireland for those institutions.

42. In many cases, data have been presented as percentages in order to avoid differences that are solely a result of difference in number of respondents between the 2001 and 2002 surveys. Analysis is based on all responding institutions who were directly funded HEIs on 1 August 2000. Response rates for 2001 and 2002 differ significantly: the additional responses in 2002 have altered the overall HEI mix in a minor way. Therefore no single factor can be applied to all questions to enable robust, year on year numerical comparison. Apparent trends must therefore be viewed with caution. The higher response rate in 2002 has provided more scope for in-year validation and for making deductions about the reliability of previous reporting. In several instances HEIs had enhanced their procedures for capturing data in the later survey.

43. Questions include both the qualitative (for example, relating to organisational practice and self-assessed benchmarking) and quantitative (which include both activity and output measures). This reflects the continuing debate about the information content of different types of indicators for the social and economic impact of third stream activity. The questions were written to take account of the fact that different third-stream activities take place in different types of HEI, and some is less amenable to simple, numerical metrics. Where benchmarking is used, there is a degree of subjectivity; however, as good practice is disseminated and recognised sector-wide, it will be important to have such benchmarking in place, carried out by professional staff working to accepted norms.

Section A: Institutional strategy and economic development

44. Questions in this section refer to institutions' own policies, priorities and, to a degree, intentions regarding working with business and in other partnerships, including within a regional context. Data reported are therefore subjective and in some instances qualitative. However they indicate the perception in the sector – both for HEIs which are mature in third stream activity and those which are not – of the match between their missions, their capability and the expectations of funding bodies.

A1. In what areas do you see the HEI as whole making the greatest contribution to economic development?

45. Institutions were asked to pick the three most important areas where they contribute. Figure A1 shows that access to education remains the highest priority. Developing local partnerships and meeting regional skills needs now have a substantial bias towards lower research intensity HEIs. Technology transfer and research collaboration have a substantial bias towards higher research intensity.

Table A1 **HEIs' contribution to economic development**

		Research intensity			
Areas of activity		**Higher**	**Medium**	**Lower**	**UK total**
Access to education	2000-01	38%	57%	71%	55%
	1999-2000	27%	60%	67%	50%
Graduate retention in local region	2000-01	8%	21%	24%	17%
	1999-2000	12%	19%	16%	15%
Technology transfer	2000-01	57%	40%	14%	37%
	1999-2000	63%	44%	14%	42%
Spin-off activity	2000-01	13%	9%	2%	8%
	1999-2000	n/a	n/a	n/a	n/a
Supporting small and medium size enterprises (SMEs)	2000-01	8%	28%	33%	23%
	1999-2000	8%	27%	42%	24%
Attracting inward investment to region	2000-01	17%	0%	0%	6%
	1999-2000	17%	0%	5%	8%
Research collaboration with industry	2000-01	70%	40%	8%	39%
	1999-2000	71%	44%	9%	43%
Strategic analysis of regional economy	2000-01	2%	0%	0%	1%
	1999-2000	2%	0%	0%	1%
Attracting non-local students to the region	2000-01	23%	9%	10%	14%
	1999-2000	17%	6%	9%	11%
Support for community development	2000-01	4%	8%	20%	10%
	1999-2000	2%	4%	21%	8%
Developing local partnerships	2000-01	11%	23%	37%	24%
	1999-2000	17%	21%	26%	21%
Management development	2000-01	2%	8%	10%	6%
	1999-2000	6%	15%	14%	11%
Meeting regional skills needs	2000-01	9%	32%	47%	29%
	1999-2000	8%	31%	44%	27%
Meeting national skills needs	2000-01	40%	25%	22%	29%
	1999-2000	42%	27%	16%	29%

A2. Does the HEI have a strategic plan for business support? Please indicate on a scale from 1-5 which of the following statements most closely accords with your state of implementation in 2000-01.

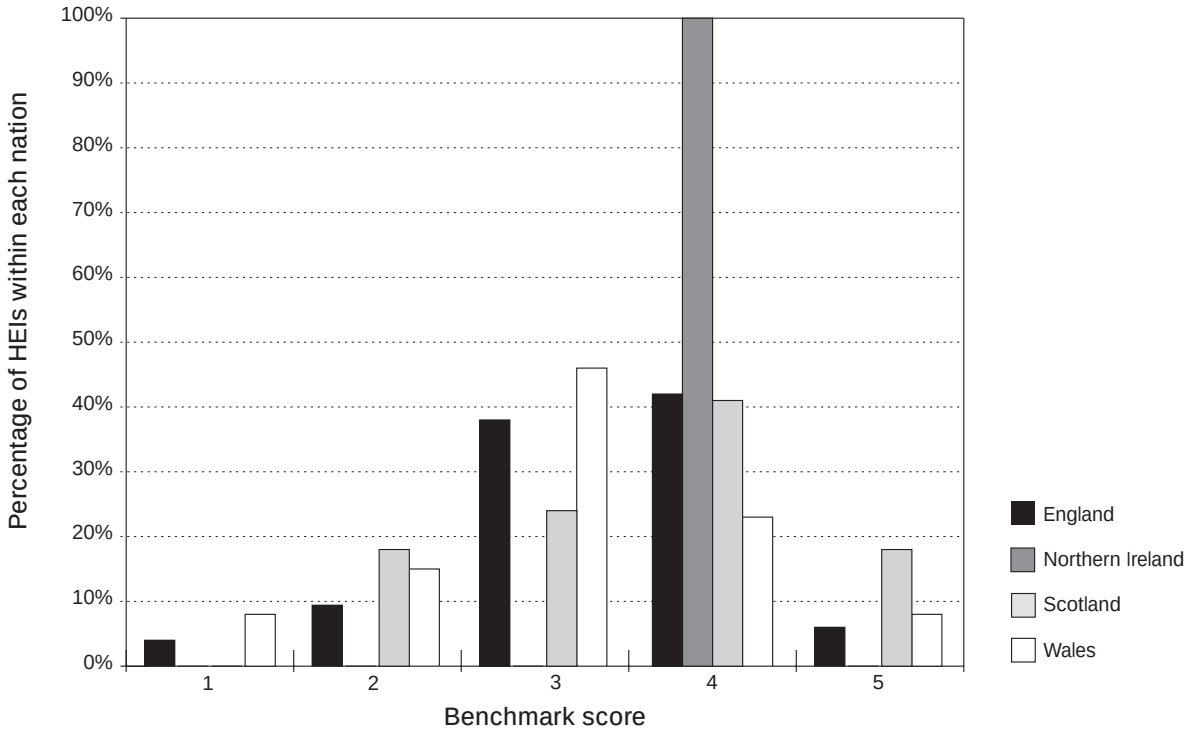
46. The need for HEIs to develop plans for their third stream activities has encouraged a higher degree of strategic planning. The proportion of HEIs now rating themselves at 4 or 5 has risen from 36 per cent to 47 per cent.

1	2	3	4	5
No strategic plan in place. Ad hoc approach to business support.		Strategic plan developed and only partially implemented, or restricted to certain departments or central functions only.		Strategic plan developed as a result of an inclusive process across the whole HEI. Accepted across almost all units and recommendations implemented. Use of plan to set targets and monitor achievement.

Table A2i **Strategic plan for business support benchmark**

		England	Northern Ireland	Scotland	Wales	UK total
1	2000-01	5	0	0	1	6
	1999-2000	6	0	1	1	8
2	2000-01	12	0	3	2	17
	1999-2000	19	0	5	4	28
3	2000-01	48	0	4	6	58
	1999-2000	47	1	4	2	54
4	2000-01	52	2	7	3	64
	1999-2000	32	1	6	5	44
5	2000-01	8	0	3	1	12
	1999-2000	7	0	1	0	8

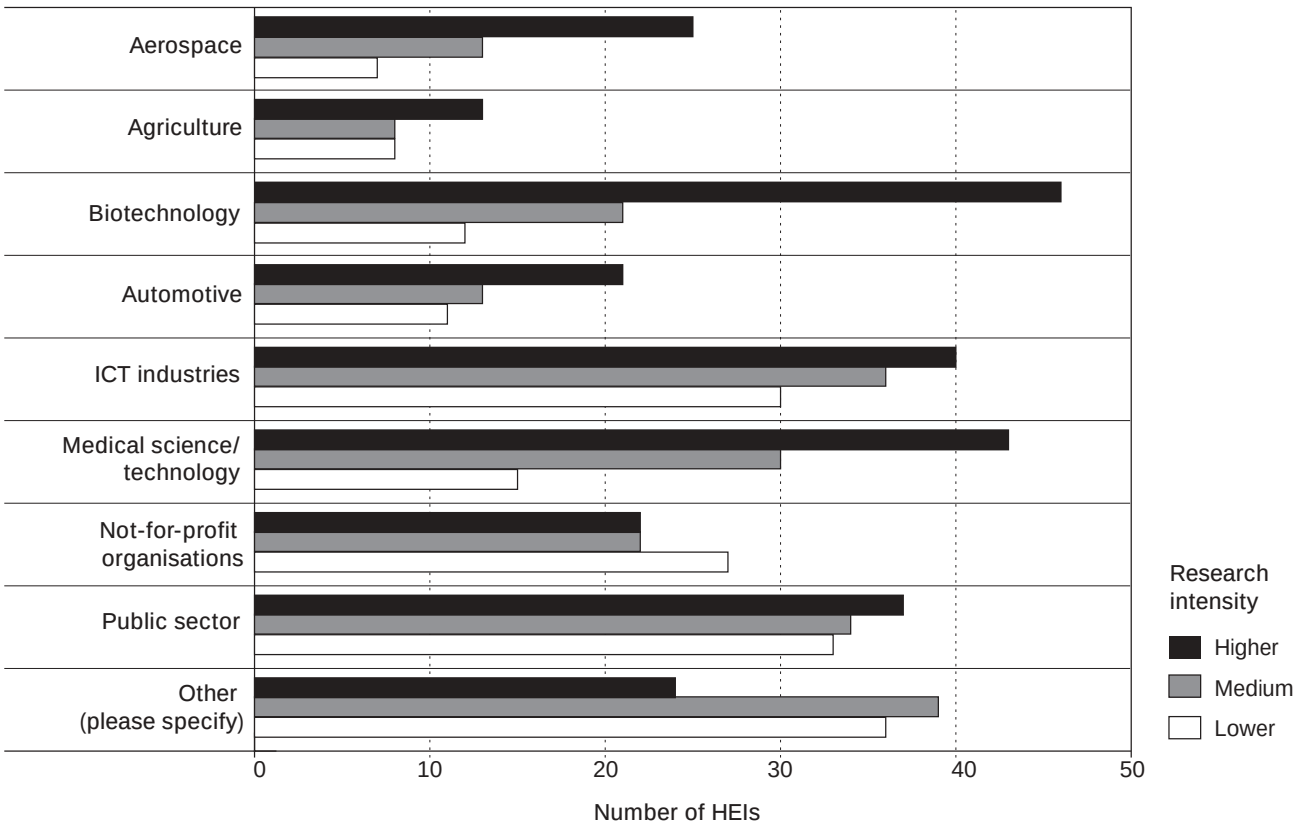
Figure A2ii **Percentage of HEIs' level of strategic support for business by nation**



A3. Does the HEI set out to work more closely with particular business sectors or clusters?

47. HEIs were asked to tick all relevant sectors. Information and communication technologies (ICT) rated the highest in aggregate. Higher and medium research intensity institutions do not have markedly different profiles, tending to rate science and technology more highly. Lower research intensity HEIs show more strongly in Not-for-profit, Public sector and Other. Creative and cultural industries (including new media) were a popular response when the Other responses were analysed.

Figure A3 **Number of HEIs addressing particular business sectors/clusters**



A4. If you answered question A3, please indicate how these priority sectors were determined.

48. HEIs with different research intensity have similar profiles. There has been a rise in reference to Regional Development Agency priorities, and the 'best fit with institution's expertise' was the first priority for all. Response to demand was a strong second, which indicates the importance of developing intelligent business demand, for example for knowledge transfer.

Table A4 **How are priority sectors identified?**

		Research intensity			
		Higher	**Medium**	**Lower**	**UK total**
The HEI is a specialist institution focused on sector-specific areas	2000-01	32%	42%	45%	39%
	1999-2000	29%	46%	51%	41%
The HEI took its cue from priorities in RDA regional strategies	2000-01	49%	49%	41%	46%
	1999-2000	33%	38%	40%	36%
Response to demand from companies in these sectors	2000-01	64%	62%	59%	62%
	1999-2000	67%	69%	67%	68%
The HEI identified important business clusters in its region	2000-01	49%	58%	47%	52%
	1999-2000	46%	56%	53%	52%
These sectors had best fit with the institution's expertise	2000-01	92%	81%	76%	83%
	1999-2000	88%	83%	77%	83%
The HEI focused on a 'gap in the market' left by other HEIs	2000-01	4%	17%	24%	15%
	1999-2000	4%	17%	28%	15%
Other (please specify)	2000-01	2%	4%	4%	3%
	1999-2000	6%	6%	9%	7%

A5. Is the HEI involved in the development and implementation of regional skills strategies in terms of the provision of expertise and data and the involvement of senior HE staff in regional partnerships?

49. Responses show improvement, with about 60 per cent of HEIs reporting 4 or 5 (from just under 50 per cent in 1999-2000).

1	2	3	4	5
Passive response to skills strategies. No involvement in steering committees, no provision of data or expertise. No attempt to influence or respond to strategy during consultation.		Some engagement with regional partners and provision of expertise and data, but approached as a narrow sectoral interest. Involvement from officers with defined role rather than leadership inputs.		Pro-active engagement providing expertise data, interpretation and leadership inputs. HEI seen as a core asset in the region and becomes a central element within the strategy.

Table A5 **Regional skills provision benchmark (% of HEIs)**

		England	Northern Ireland	Scotland	Wales	UK total
1	2000-01	6%	0%	0%	0%	4%
	1999-2000	4%	0%	0%	0%	3%
2	2000-01	5%	0%	0%	15%	5%
	1999-2000	9%	0%	24%	8%	10%
3	2000-01	33%	0%	41%	15%	32%
	1999-2000	37%	50%	47%	25%	37%
4	2000-01	44%	100%	53%	62%	47%
	1999-2000	39%	0%	24%	50%	38%
5	2000-01	13%	0%	6%	8%	11%
	1999-2000	11%	50%	6%	17%	11%

A6. Is there business representation on your governing body?

50. Allowing for the higher survey response rate, the number of governors has risen by approximately 10 per cent, with the proportion of governors from business remaining approximately constant. Confidence in the data is reasonably high, though variable between nations.

51. This indicator is of lower importance as a proxy for desired impact, but could be retained in future to check for correlation with other desirable changes in level of business interaction.

A7. Which of the following regional/local/other units is of greatest priority in your university's institutional mission?

52. For all levels of research intensity the top priority is almost equally split between the government administrative regions and the regions defined by individual HEIs as their operating area. These two options represent the working area of over three-quarters of the UK HE sector. It was reported by a small number of HEIs that the priority varied across their institutions, but this is not a serious validation concern because HEIs selected one option as appropriate to their overall institutional mission.

Table A7 **Geographic priorities for institutional mission**

		Research intensity			
		Higher	**Medium**	**Lower**	**UK total**
Regional/local/other area not of any significance to mission	2000-01	15%	9%	2%	9%
	1999-2000	6%	2%	5%	4%
RDA area (eg, East Midlands, Scotland)	2000-01	43%	43%	35%	41%
	1999-2000	42%	44%	42%	43%
Local authority area (county or unitary)	2000-01	0%	4%	8%	4%
	1999-2000	2%	4%	9%	5%
Locality – city or town	2000-01	6%	9%	6%	7%
	1999-2000	12%	10%	2%	8%
Area defined by the HEI (eg, surrounding counties especially if crosses regional boundaries or is multi-county)	2000-01	36%	34%	49%	39%
	1999-2000	37%	35%	42%	38%

A8. How would you rate the level of incentives for your staff to engage with industry and commerce?

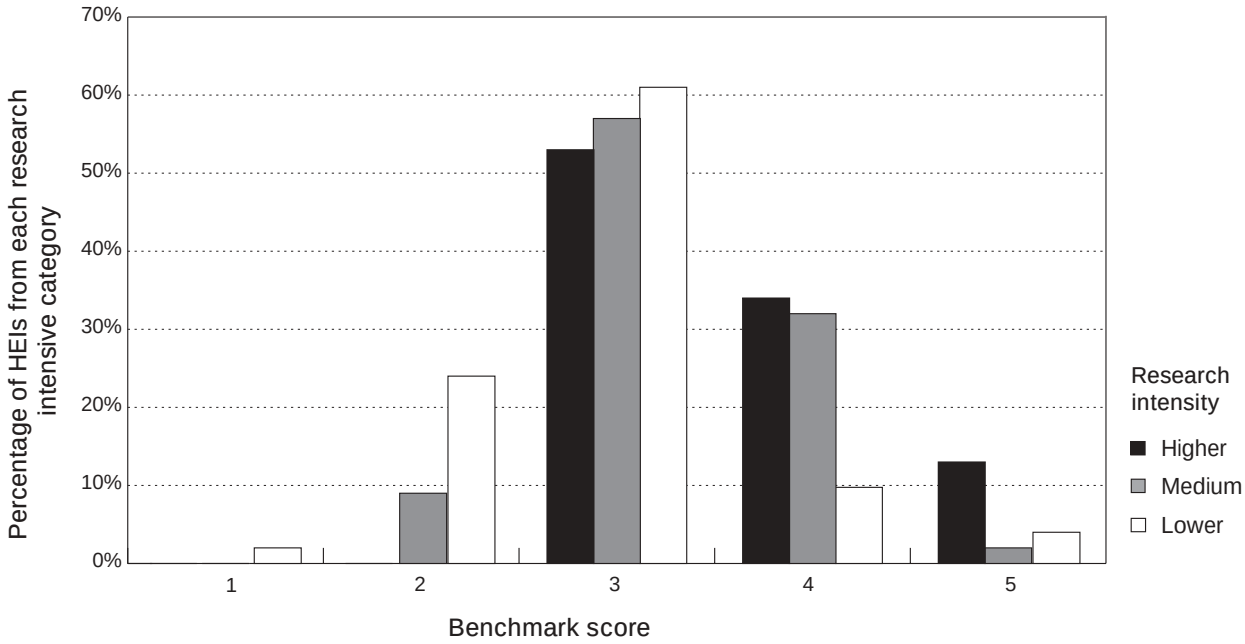
53. There is a modest trend towards greater incentives for staff to engage with business, although the majority rating is still 'some incentives in place'. This may reflect a Research Assessment Exercise (RAE) halo effect (emphasis on published Research) during the survey period. Lower research intensive HEIs rated themselves lower; this may be explained by their having less scope to generate net income from working with business. Confidence in the data is high, but for future surveys the question could be re-cast to encompass the social economy, to capture more of the spectrum of third stream activity.

1	2	3	4	5
Barriers outweigh any incentives offered. General corporate culture is focused on internal activities and narrow interpretation of teaching and research. Collaboration with industry seen by staff as detrimental to career progression.		Some incentives in place, but with some barriers remaining. Typically policy may be generally supportive but there is a lack of understanding across the institution. Promotions committees still take a narrow focus on research even though guidance suggests industrial collaboration is valued equally.		Strong positive signals given to all staff to encourage appropriate levels of industrial collaboration. Incentive procedures well established and clearly understood and applied.

Table A8i **Staff incentives to engage with industry benchmark**

		Research intensity			
		Higher	**Medium**	**Lower**	**UK total**
1	2000-01	0%	0%	2%	1%
	1999-2000	0%	0%	0%	0%
2	2000-01	0%	9%	24%	11%
	1999-2000	13%	10%	28%	17%
3	2000-01	53%	57%	61%	57%
	1999-2000	38%	56%	51%	48%
4	2000-01	34%	32%	10%	25%
	1999-2000	33%	29%	14%	26%
5	2000-01	13%	2%	4%	6%
	1999-2000	13%	4%	5%	8%

Figure A8ii **Staff incentives to engage with industry**



Section B: Collaborative research with business

54. Questions in this section refer to research oriented activities, some of which have a public funding component (B1, B3 and B4) and some more often described as contract research (B2) or potentially net revenue generating (B5). Validation checks revealed a range of discrepancies, both between 1999-2000 and 2000-01 data and between the HE-BI survey and HESA reporting. These were investigated and appear not to be systematic errors across the sector. However, they do indicate that HEIs are still developing their recording systems for extracting data at the inception of new 'projects'. Business contributions in Research Council awards, for example, range from major and critically important to limited and tentative; previous statutory reporting has not required separate recording of the business content.

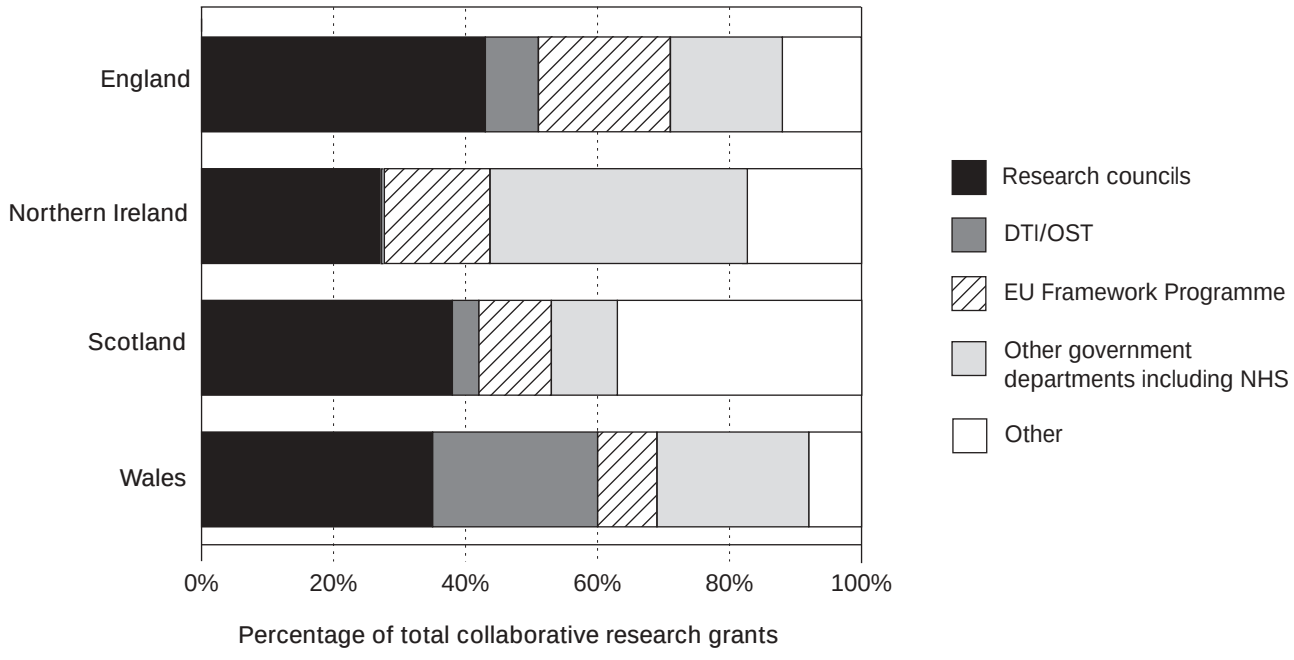
55. The level of accuracy of expert estimating by HEIs appears to be improving, according to comparisons with HESA data. In a small number of instances the 2002 validation check has led to revisions in the 2001 figure used for comparison purposes. Confidence in data, however, remains low in parts of three of the five questions (B1, B2 and B5), and comparison between years is not justified.

B1. What was the HEI's income from public-funded collaborative research grants involving business co-funding or formal collaboration?

56. This question is potentially one of the most valuable when determining success of third-stream activity, but answering it can be complex. Validation checks revealed that some previous data collected in 2001 had been based, necessarily, on estimates and some were now confirmed by the HEIs as in need of correction. HEIs have not historically been obliged to record the detail of business contributions to public-funded research grants, and the burden of analysing records in detail was or would have been very high. The proportionate mix of various types of research grant is moderately robust and shows the breadth of business involvement, with very different national profiles.

57. It is desirable that this question be retained in any future HE-BI survey and refined in parallel with strong continuing encouragement to HEIs to record data at grant inception.

Figure B1 **Percentage of income from public-funded collaborative research grants**



B2. Approximately how many contracts with businesses were signed during 2000-01 and what was the total value? How many and what was the value of contracts with SMEs?

58. While higher research intensive institutions account for the great majority of contracts representing over two-thirds of the total value for the sector, medium and lower research intensive HEIs have a larger proportion of contracts with SMEs. In total, almost 40 per cent of contracts by number were with SMEs, but they made up only 13 per cent by value. This indicates the potentially greater administrative load of interacting with smaller companies. There were some validation concerns, largely due to inability of some HEIs to disaggregate SME partners from others, so the data are presented for 2002 only. Data on total numbers and income are highly relevant to the survey, and HEIs should be encouraged (see B1) to apply low-burden recording regarding SMEs' involvement at contract inception, so that these data can be used confidently in future surveys.

Table B2 **Number and value of contracts**

Research intensity	Number of contracts	Number of contracts with SMEs	% of number of contracts with SMEs	Total value of contracts (£000s)	Total value of contracts with SMEs (£000s)	% of value of contracts with SMEs
Higher	6,531	2,136	33%	185,502	21,051	11%
Medium	3,499	1,465	42%	56,795	11,057	19%
Lower	921	462	50%	18,617	2,613	14%
UK total	**10,951**	**4,063**	**37%**	**260,914**	**34,721**	**13%**

59. HESA data from 2000-01 show a 6.9 per cent increase in UK industry funding over 1999-2000. This is now 11.7 per cent of the total research grant and contract income for the sector (1999-2000: 12.3 per cent).[2]

B3. How many CASE awards did the HEI hold (number of students funded) and for how many was the partner within the same region?

60. The question did not give any validation concerns and overall showed no significant trends. Co-operative Awards in Science and Engineering (CASE) awards are most often initiated on the basis of research activity rather than to generate business interaction per se. However both can lead to wider collaborations and form part of strategic relationships. Confidence in the data is high, and thought should be given to how the question can be made more informative for possible future use.

Table B3 **Number of CASE awards and those in the same region**

Research intensity	Total number of CASE awards		Number with partners in the same region	
	2000-01	1999-2000	**2000-01**	1999-2000
Higher	**1,504**	1,574	**396**	408
Medium	**101**	105	**33**	61
Lower	**7**	8	**3**	3
UK total	**1,612**	1,687	**432**	472

[2] Source: HESA Finance Record 1999-2000 and 2000-01, Table 5b

B4. What were the numbers of Teaching Company Programmes and Teaching Company Associates, and what proportion were with firms within the same region?

61. This question revealed healthy growth in TCD-mediated activities, especially for medium research intensive HEIs. There is a strong bias toward working in the home region for all institutions, especially in lower research intensive institutions.

Figure B4i **Numbers of TCS programmes and associates and number in the same region**

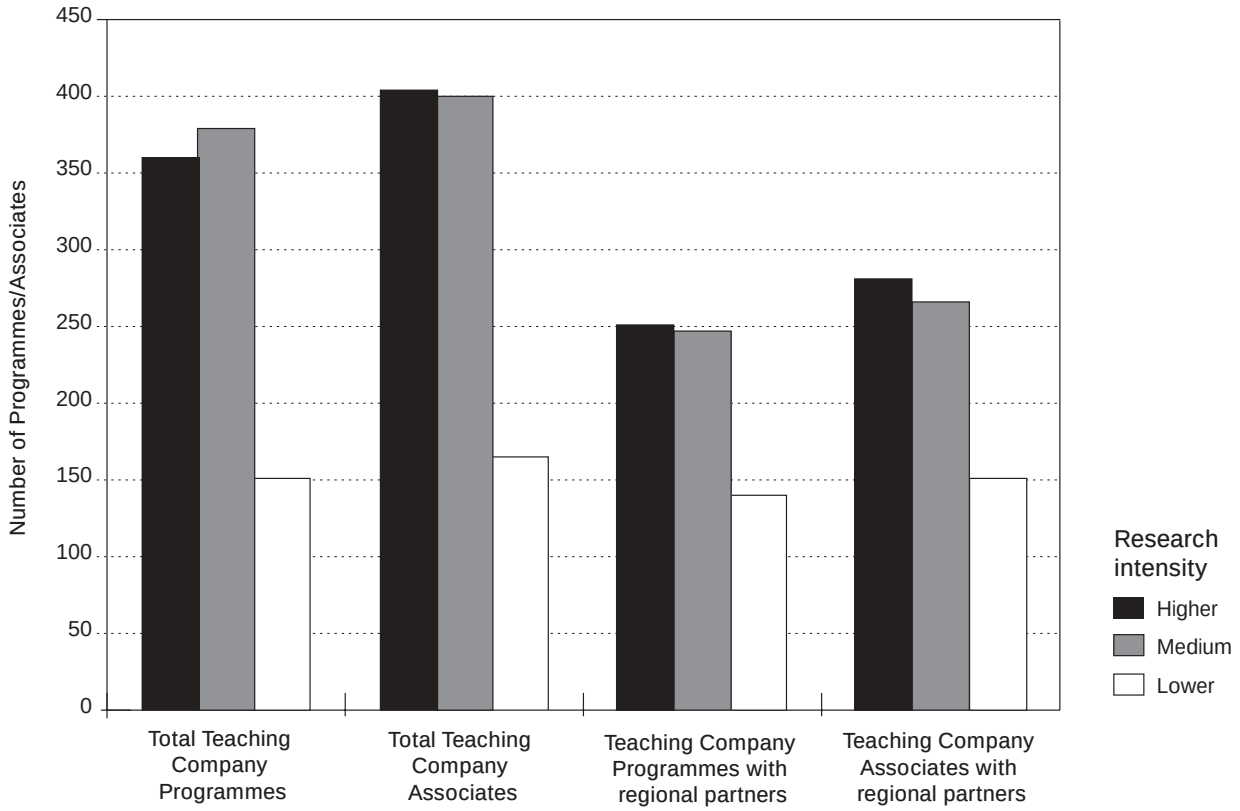


Table B4ii **Numbers of TCS programmes and associates and number in the same region**

		Research intensity			
		Higher	**Medium**	**Lower**	**UK total**
Total Teaching Company Programmes	2000-01	360	379	151	890
	1999-2000	317	292	125	734
Total Teaching Company Associates	2000-01	404	400	165	969
	1999-2000	364	330	130	824
Teaching Company Programmes with regional partners	2000-01	251	247	140	638
	1999-2000	229	208	113	550
Teaching Company Associates with regional partners	2000-01	281	266	151	698
	1999-2000	270	223	119	612

B5. Does the HEI provide equipment-related services for industry, such as analysis, measurement and testing?

62. This is an important question but currently difficult for HEIs to answer accurately. Much provision of services or access to facilities is handled locally by HEIs' Departments or Schools, and central recording is sometimes patchy. It is also likely that non-technical provision (such as performance space or facilities) has not been captured well. Nevertheless, a small increase in income is reported, and a 15 per cent increase in companies involved (calculated using only those HEIs who reported both years). Confidence in the data is low, but could be substantially higher with more explicit rewording and guidance to HEIs; it can be retained for future surveys if these changes are made.

Section C: Intellectual property (IP)

63. Questions in this section refer to both policy and practice regarding the volumes of IP based activity and income generated. Validation checks showed some inconsistencies between years, but data confidence levels are medium to high, following the corrections indicated in the methodology (process) and robustness section (see paragraphs 32-38). It is certain that a significant research base is a major advantage in generating most varieties of IP. Year on year comparison is sufficiently robust and indicates continuing growth in activity. It is also likely that the perceived strong pressure on HEIs to file patents has reduced in favour of more business-aware selection processes; the significant rise in licences and options supports this.

64. This is probably the most highly developed field of HE-business interaction, although not necessarily that with the greatest impact nor indeed with perfectly reliable data. The focus of HEIs engaged in the professional identification, protection and exploitation of IP has often been on generation of net income to institutions. Experience in the UK and the US shows that making a profit is possible but is achieved by only a minority of mainly research intensive universities. In recent years it has been recognised that HEIs have a responsibility for the proper handling of IP, which brings a range of benefits to them, the region and the nation, and can be an integral part of strategic relationships where the main benefits to the HEI could be academic development through wider knowledge exchange.

C1. Do you monitor the number of invention disclosures made each year?

65. Allowing for the increase in response rate for the survey, there is little change in the proportion of HEIs that monitor disclosures. There were no validation concerns, although data confidence is moderate because there is an indication that the 'disclosure' concept does not have a common definition; this will need to be addressed. The question could be merged with C2 for any future surveys.

Table C1 **Monitoring of invention disclosures (number of HEIs)**

	Yes		No	
	2000-01	1999-2000	2000-01	1999-2000
England	74	65	51	43
Northern Ireland	2	0	0	2
Scotland	13	13	4	4
Wales	6	6	7	6
UK total	95	84	62	55

C2. If yes, how many disclosures have been made in 2000-01?

66. There is an encouraging increase in disclosures overall, although not equally across the UK. Disclosure rates are often an indicator of academic awareness and motivation. This is a useful indicator, if only in conjunction with questions C3 and C4, although better guidance on definition would be useful.

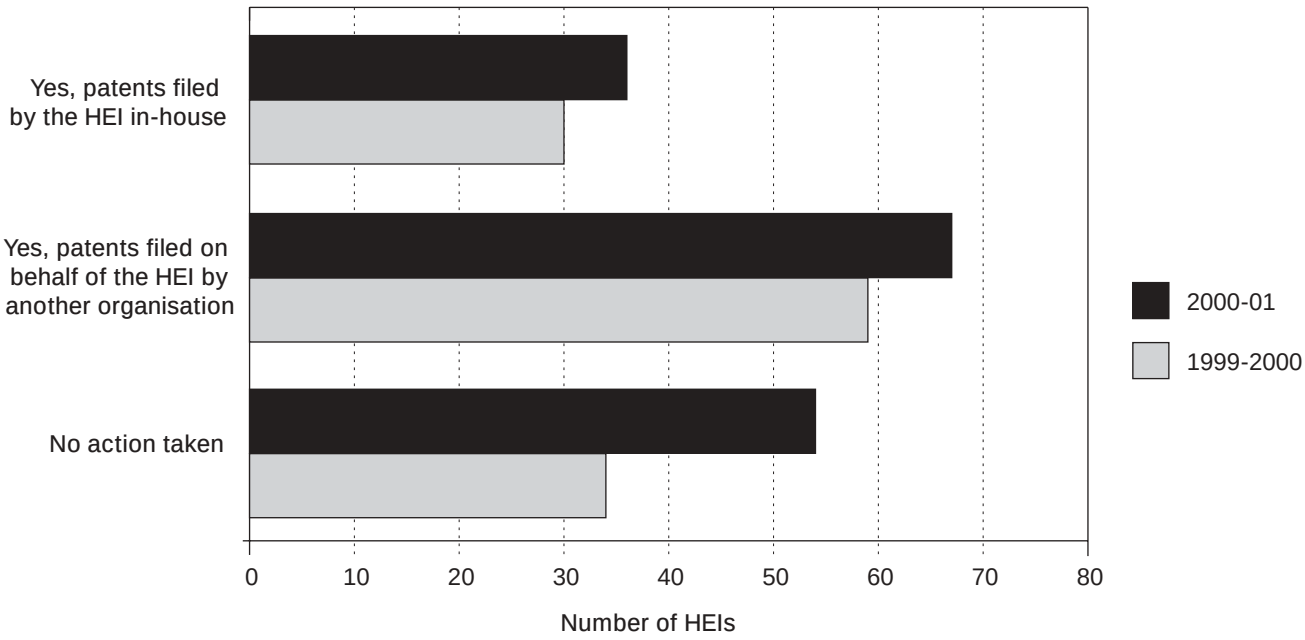
Table C2 **Number of invention disclosures made**

	2000-01	1999-2000
England	1,745	1,430
Northern Ireland	41	0
Scotland	302	459
Wales	71	23
UK total	2,159	1,912

C3. Does the HEI exert ownership over intellectual property by filing patents?

67. This question refers to a mature field of work for many HEIs. The increased number of 'no action' returns probably reflects the fact that new respondents included a relatively low proportion of institutions with a strong IP track record.

Figure C3 **Method of exerting ownership over IP**



C4. How many patents have been filed by or on behalf of the HEI in the last year?

68. The number of new (initial) patents filed rose substantially, in contrast to a fall in the total filings (including extensions). Together with an increase of over 20 per cent in patents granted, this suggests improved accuracy of choosing what to patent and more selective extensions. Some validation concerns arose over terminology, and more specific guidance will be needed to raise the confidence in reported data from medium and higher RI for this important question.

Table C4 **Number of patents filed**

	Number of total UK patents filed		Number of new UK patents filed		Number of UK patents granted	
Research intensity	2000-01	1999-2000	2000-01	1999-2000	2000-01	1999-2000
Higher	1,254	1,319	764	582	186	136
Medium	209	195	121	119	40	42
Lower	52	30	28	24	8	10
UK total	1,515	1,544	913	725	234	188

C5. Does the HEI have an in-house capability to seek out licensing opportunities for its IP, or does it use an external agency?

69. Data returned under this question display an increasing development in in-house capability in preference to use of external agencies, especially in the medium research intensity group. There is a clear preference for the higher and medium research intensive institutions to manage their own IP; however many lower research intensive HEIs have no procedures in place.

Figure C5i **Process for licensing**

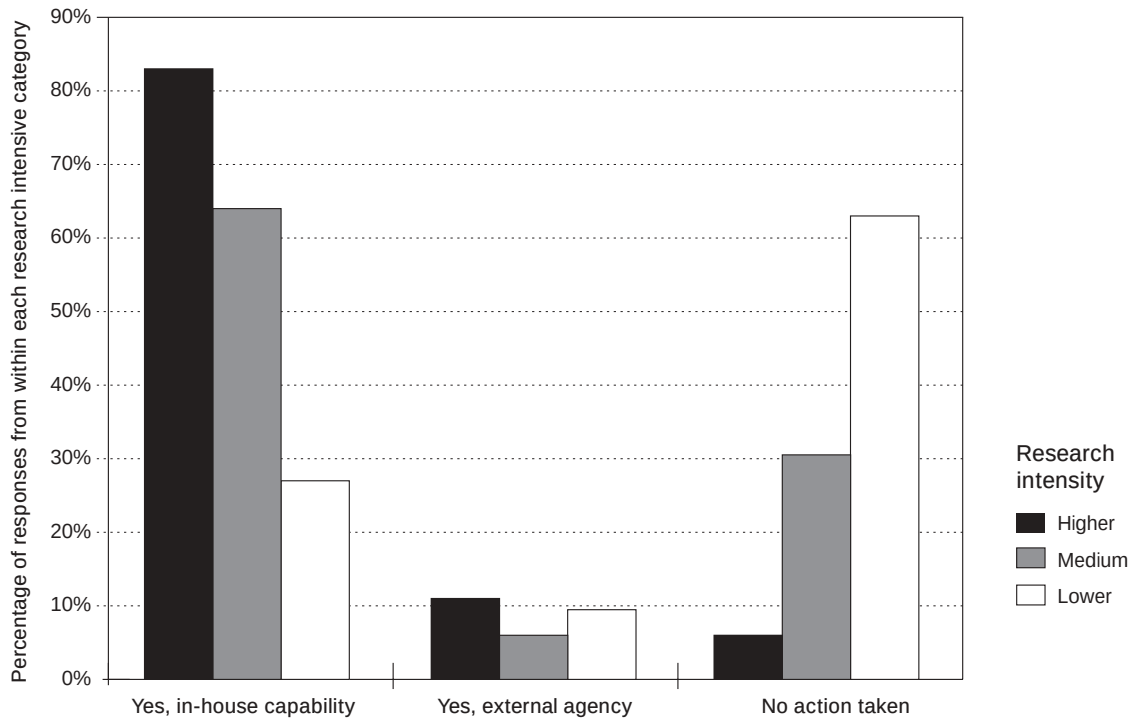


Figure C5ii **Process for licensing**

	Yes, in-house capability		Yes, external agency		No action taken	
Research intensity	2000-01	1999-2000	2000-01	1999-2000	2000-01	1999-2000
Higher	83%	81%	11%	13%	6%	6%
Medium	64%	52%	6%	8%	30%	25%
Lower	27%	26%	10%	12%	63%	53%
UK total	59%	55%	9%	11%	32%	27%

C6. How many licences/options have been executed on the basis of HEI-owned intellectual property over the last year?

70. There has been an increase of over 30 per cent overall in licences granted to UK companies and little change in the overall figure for overseas licences. However the overseas balance has shifted strongly from software to non software licensing. This may be linked to changes in the world economic scene.

Figure C6i **Number of non-software licences granted**

	Non-software licences			
	Licences granted to UK based companies		Licences granted to companies based overseas	
	2000-01	1999-2000	2000-01	1999-2000
England	254	207	103	60
Northern Ireland	8	0	3	0
Scotland	38	29	19	13
Wales	6	2	2	0
UK total	306	238	127	73

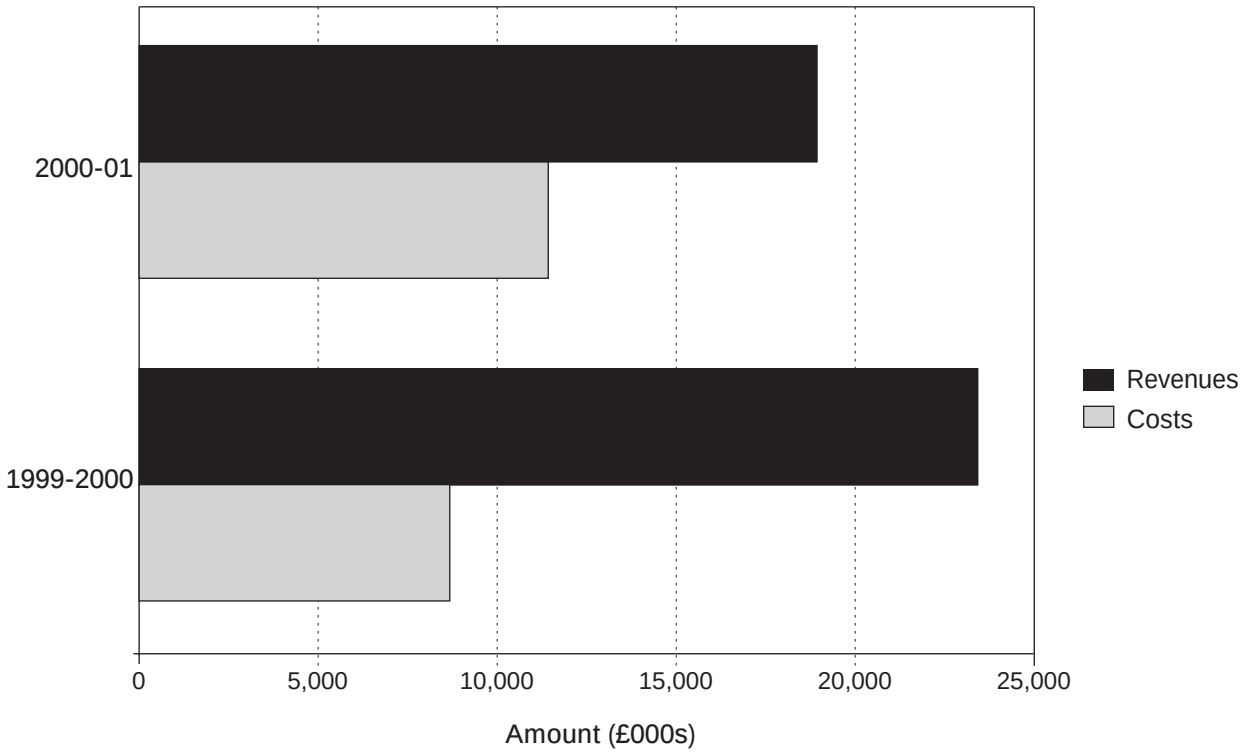
Figure C6ii **Number of software licences granted**

	Software licences			
	Licences granted to UK based companies		Licences granted to companies based overseas	
	2000-01	1999-2000	2000-01	1999-2000
England	197	86	41	110
Northern Ireland	2	0	0	0
Scotland	19	57	31	15
Wales	3	1	2	1
UK total	221	144	74	126

C7. and C8. What have been the total revenues and costs from IP?

71. There is limited confidence in the IP revenue figures due to differences with the most relevant HESA data. It is notable that the revenue in 2000-01 again exceeds costs, which is due to a small number of major income-generating HEIs masking the more general position: that full costs are rarely covered in a predictable manner. The overall modest fall in income reflects the market movement between two survey years, as well as the beginning of significant investment in building more professional IP teams in HE, through third stream funding. There were no validation concerns regarding cost data, and all data had medium confidence. This question should remain in future surveys with HESA reconciliation.

Figure C7 **What was the total income and what were the total costs of IP?**



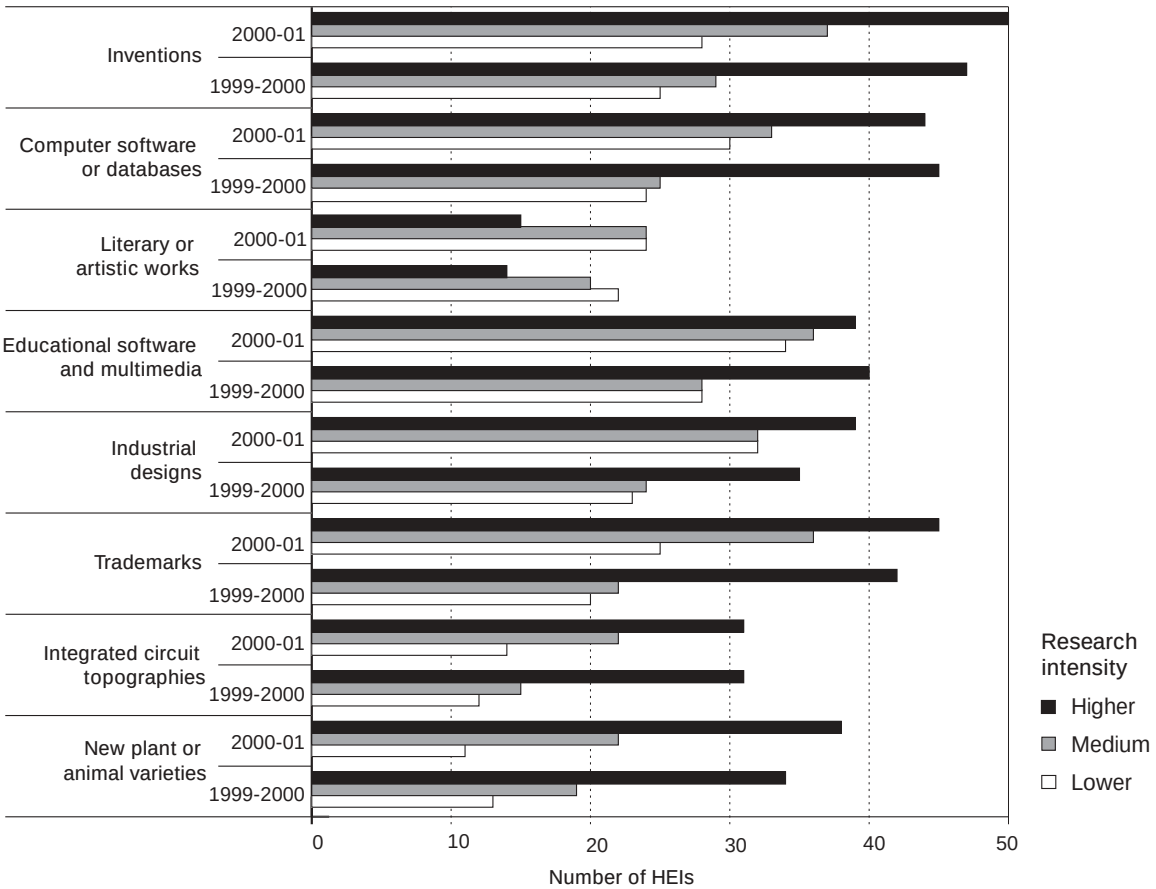
C9. Is there a requirement within the HEI to report the creation of the following types of intellectual property?

72. This table shows a broadly stable balance regarding reporting requirements, despite increasing numbers of disclosures (as measured in question C2). There is evidence of a broadening IP base to include industrial designs and trademarks. The breakdown by research intensity shows a growing focus by both medium and lower research intensive HEIs across nearly all categories; however, the higher research intensity institutions are strongest in all but one category.

Table C9i **Protection of IP by nation (% of HEIs)**

		England	Northern Ireland	Scotland	Wales	UK total
Inventions	2000-01	70%	100%	88%	77%	73%
	1999-2000	64%	100%	82%	38%	64%
Computer software or databases	2000-01	68%	100%	71%	62%	68%
	1999-2000	60%	100%	71%	38%	60%
Literary or artistic works	2000-01	38%	100%	53%	31%	40%
	1999-2000	35%	50%	47%	23%	36%
Educational software and multimedia	2000-01	71%	100%	76%	38%	69%
	1999-2000	62%	100%	82%	23%	61%
Industrial designs	2000-01	63%	100%	94%	46%	66%
	1999-2000	51%	100%	71%	31%	52%
Trademarks	2000-01	65%	100%	82%	69%	68%
	1999-2000	52%	100%	71%	38%	54%
Integrated circuit topographies	2000-01	41%	100%	53%	38%	43%
	1999-2000	34%	100%	59%	23%	37%
New plant or animal varieties	2000-01	46%	100%	53%	23%	45%
	1999-2000	40%	100%	59%	31%	42%

Graph C9ii **Protection of IP by RI**



C10. & C11. Are individuals rewarded by the institution for their intellectual property?

73. These questions are important and show a static position. However, the rewarding of academic staff is more complex than simple finances, and HEIs have a range of financial schemes which were not well captured by the question. We could improve confidence in the data by allowing more flexibility for responses. However, data did reveal that around two-thirds of institutions rewarded their staff directly, with a substantial number offering 40 per cent or more to the inventor if income exceeds £100,000.

Table C10 **Number of HEIs that reward individuals for IP**

	2000-01	1999-2000
Yes	103	104
No	54	34

Section D: Consulting activities

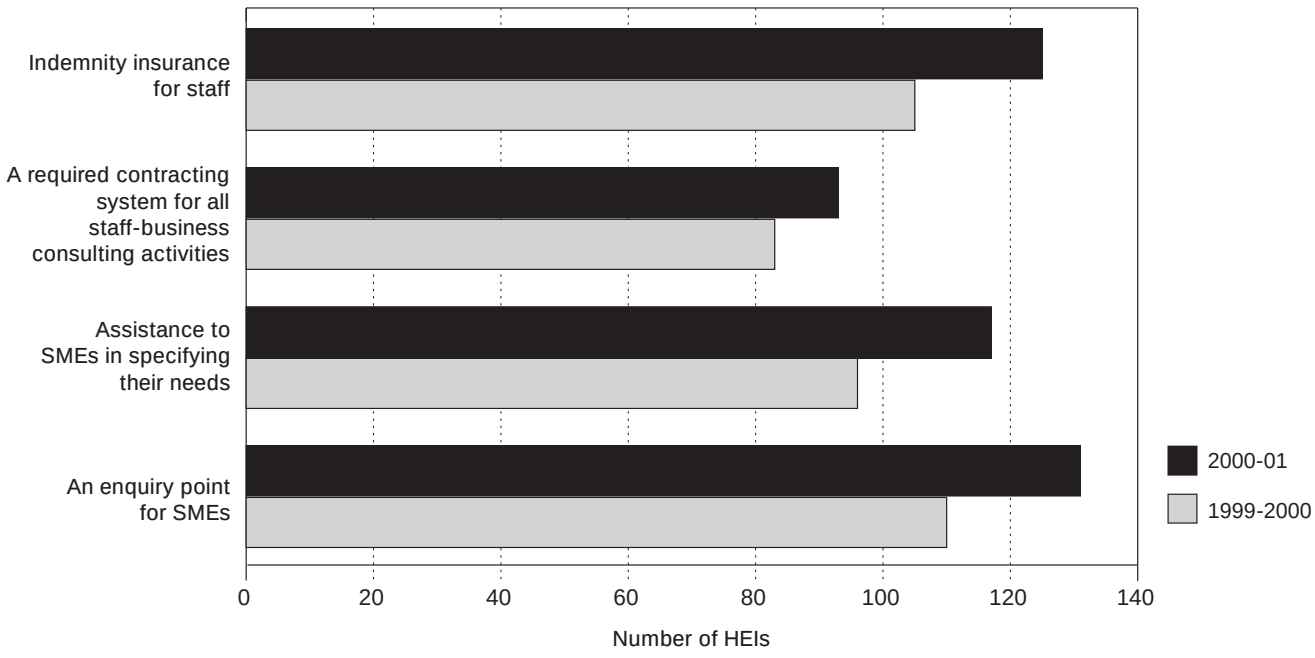
74. Questions in this section refer to the provision of expert advice and work which, while it may involve a degree of analysis, measurement or testing (as in question B5), is crucially dependent on a high degree of intellectual input from the HEI to business. Such work is usually paid for at a market rate, and may deliver stronger IP rights to the business client than would apply in a collaborative research relationship. Where consultancy develops into research, the generation of new knowledge or understanding, it would more properly be recognised as research rather than consultancy, and the HEI would often expect to reap academic benefits.

75. Questions in this section relate to structure, process and volume measures. It is reported across the sector that it has been difficult to capture at an institutional level the full data from individual Departments or Schools, which may account for the somewhat erratic figures between survey years. Anecdotal evidence strongly indicates that central recording is the aim of most institutions and is now (academic year 2002-03) much more commonly installed than in the year reported in the 2002 survey.

D1. Does the HEI have a central dedicated unit which provides the following?

76. There has been a notable increase in provision of consulting support, with almost 60 per cent of UK HEIs providing central support in these areas. Over 80 per cent of institutions provide specific assistance to SMEs.

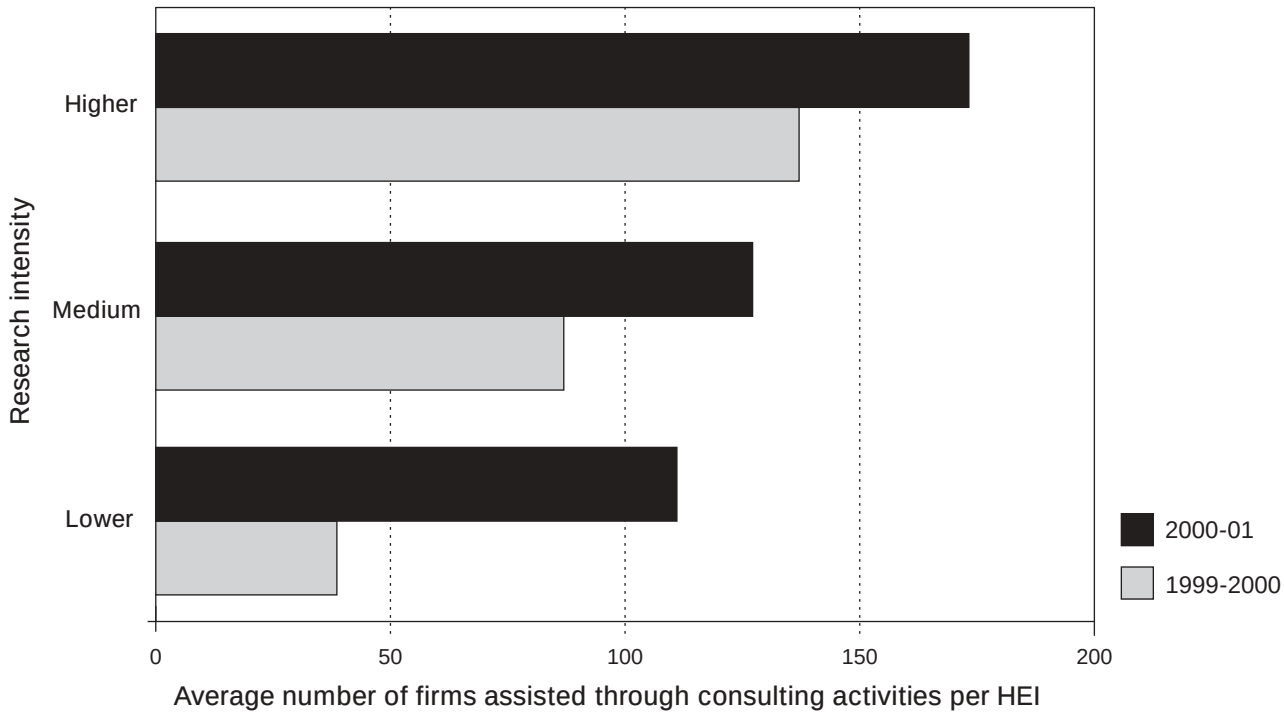
Figure D1 **Does the HEI have a central dedicated unit which provides the following?**



D2. How many firms have been assisted through consulting activities and what percentage have been based in the region?

77. There were validation concerns due to unexplained movements in national figures. Overall confidence is low, but data indicate a significant increase in the number of companies assisted by medium and lower research intensive HEIs. In view of the progress in establishing central consultancy units some of this increase will be confirmed by better data capture. Many HEIs commented that data on the location of a partner are not recorded at the time of contract and therefore this information can be difficult to collect later; however, in many cases data systems are being developed to capture this information. We need to enhance reporting reliability of this question in any future surveys.

Figure D2 **How many firms have been assisted through consulting activities?**



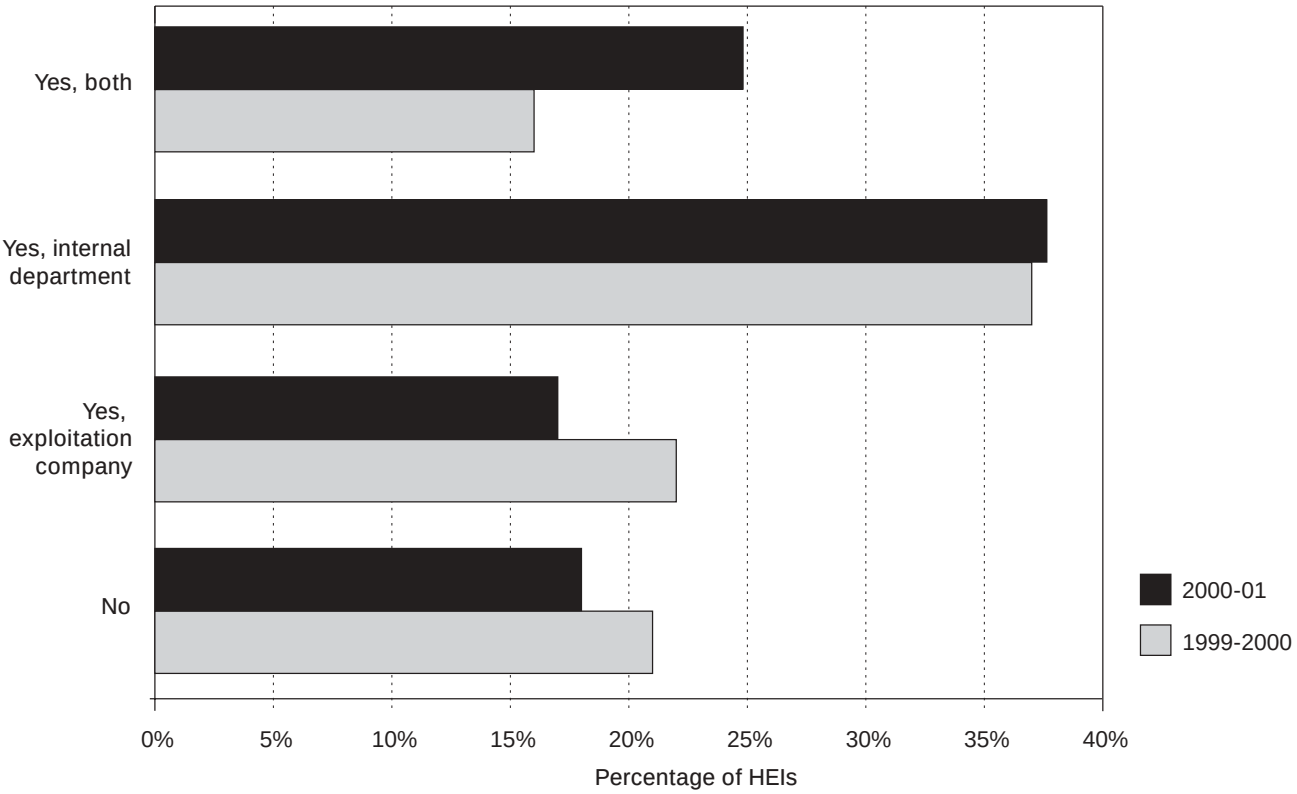
D3. What was the total income from consulting handled through formal HEI channels?

78. As for question D2, there are variations in national trends. Overall the UK shows a 24 per cent increase in consulting through formal HEI channels for those HEIs responding in both years. Comparison with D2 confirms that some consultancy contracts are with more than one company client. Confidence in the data is not high but the question is useful and should be retained as reporting reliability develops.

D4. Does the HEI have a commercialisation company or department to manage consulting links and other external interactions?

79. There is a reduction in the sole use of exploitation companies and an increase in HEIs having both internal support and using a separate company to manage consultancy. A moderately useful question, so far as correlation between method and outcomes can be confidently made.

Figure D4 **Does the HEI have a commercialisation company or department to manage consulting links and other external interactions?**



D5. How many staff are employed in commercialisation and industrial liaison offices?

80. Question D5 is not specifically connected to consultancy and repeats the check on staff resource in what were usually known as industrial liaison offices. The total number of FTE staff employed in these offices has increased from 1,268 to 1,529; the significant increase in England results in an aggregate increase of 12 per cent across the UK for institutions who responded in both years. While the higher research intensity HEIs employ more commercialisation staff, the lower research intensive HEIs now equal the medium RI HEIs.

Figure D5i **Average staff (FTE) employed in commercialisation offices per institution by nation**

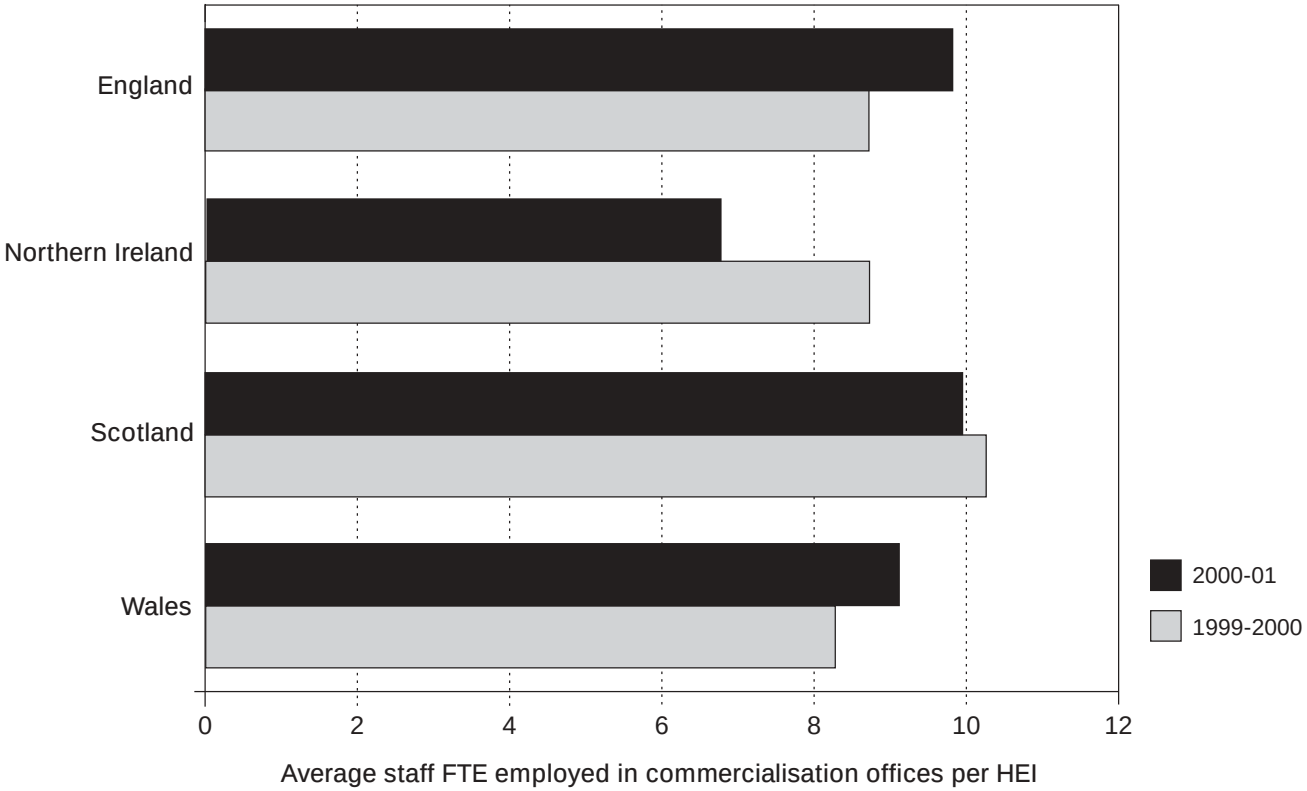
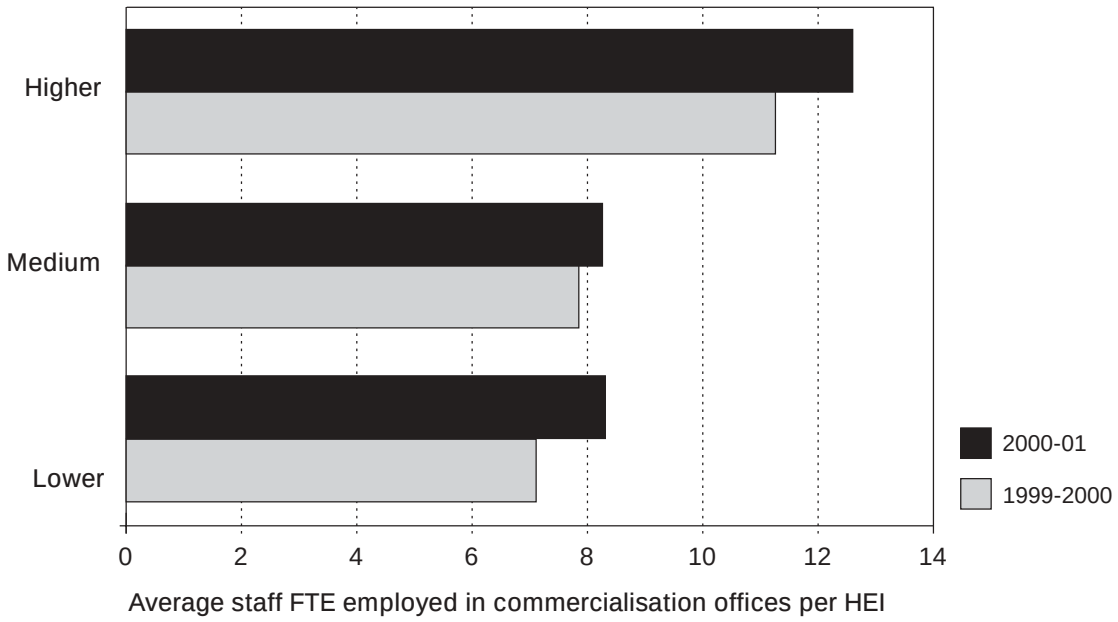


Figure D5ii **Average staff (FTE) employed in commercialisation offices per institution by RI**



Section E: Spin-off firms

81. Questions in this section refer to the establishing of new legal entities and enterprises created by the HEI or its employees to enable the commercial exploitation of knowledge arising from academic research. Such companies may or may not be partly owned by the relevant HEI, or by existing or previous members of the HEI. Other start-up companies may be formed by HEI staff or students, without the direct application of HEI-owned IP.

82. Since the focus of the survey is on the economic or social impact of the HEI, at its broadest, the usual criterion is that the new company would not have come into existence without intellectual input from the institution. Data were collected on volume (number of spin-offs and turnover) and support mechanisms provided. A substantial number of HEIs were unable to provide comprehensive data, especially related to turnover. Where an HEI is a shareholder, some company information is provided but may not be publicly available until accounts are filed with Companies House. Validation of data was complex, and confidence is higher for the number of spin-offs established than for financial information.

83. It is believed that, as with other recently introduced categories of reporting, a significant proportion of the reported increase in activity and performance is due to more complete capture of activity by HEIs. However the increased response rate and slightly changed mix of HEIs in the 2002 survey do not explain all of the increase in numbers and turnover reported. Evidence suggests a degree of under-reporting by individual HEIs in previous surveys, which is being corrected by the progressively more effective and centralised 'institutionally owned' third stream of HEIs' activity. Nonetheless, the more than 20 per cent increase in reported employment of all active HEI spin-offs across the UK can be taken as a confident indicator of a substantial upward trend.

E1. In the following table please insert the required information concerning each group of firms.

84. This question is hard for HEIs to complete due to the external nature of these companies once they have been set up. While responses for this question are more complete than last year there is still limited confidence in the data. The majority of spin-offs have some HEI ownership. Turnover has risen due to more complete reporting and real development in activity. The number of new spin-offs formed in the year rose from 203 to 248. The question should be retained, standardising on monitoring the three-year survival measure, and distinguishing between active and dormant companies.

Table E1 **Spin-offs and new commercial companies from HEIs**

		Spin-offs with some HEI ownership	Formal spin-offs, not HEI-owned	Staff start-ups	Graduate start-ups
Number established	2000-01	220	28	69	238
	1999-2000	187	16	48	179
Number still active which have survived at least 3 years	2000-01	425	57	166	140
	1999-2000	303	55	162	56
Estimated employment of all active firms (FTE)	2000-01	4,979	5,731	356	531
	1999-2000	3,996	1,805	1,141	718
Estimated turnover of active firms (£000s)	2000-01	162,091	33,586	88,240	53,600
	1999-2000	98,066	35,800	69,051	24,430

E2. What has been the income to the HEI from the sale of shares in spin-off companies during 2000-01?

85. Income from share sale is likely to be erratic until the aggregate HE portfolio is substantial and mature, which may explain the drop between the reporting years. The sale of equity will also be very dependent on overall economic conditions and may be a good indicator of this. A drop of just over 20 per cent in share sale income is indicated but cannot be taken as evidence of an underlying trend, especially as a large proportion of the reported income is from fewer than five institutions. However, due to the collapse in the technology market when the dot-com bubble burst, it may be that figures from 1999-2000 were artificially high. There may be better ways to monitor company-related performance in place of HEIs' central mechanisms themselves, such as that used in question E1; the UNICO/NUBS survey covers some of these activities in greater detail.

Table E2 **Income from the sale of shares in spin-off companies (£000s)**

Research intensity	2000-01	1999-2000
Higher	29,906	38,294
Medium	2	75
Lower	216	0
UK total	30,124	38,369

E3. Does the HEI provide support for spin-offs through the following mechanisms, either provided by the HEI or in collaboration with a partner organisation?

86. HEI provision of support was much more common than support via partner organisations. This may change as the effect of University Challenge encourages the involvement of business oriented processes. Every category of support is growing, particularly entrepreneurship training.

Table E3i **Support mechanisms for spin-offs (HEI provided)**

		Research intensity			
		Higher	**Medium**	**Lower**	**UK total**
On-campus incubators	2000-01	42%	42%	33%	39%
	1999-2000	42%	31%	19%	31%
Other incubators in the locality	2000-01	17%	9%	18%	15%
	1999-2000	12%	10%	9%	10%
Science park accommodation	2000-01	23%	19%	4%	15%
	1999-2000	21%	19%	5%	15%
Entrepreneurship	2000-01	75%	66%	63%	68%
	1999-2000	63%	60%	47%	57%
Seed corn investment training	2000-01	55%	42%	14%	37%
	1999-2000	48%	33%	12%	32%
Venture capital	2000-01	13%	9%	4%	9%
	1999-2000	13%	10%	0%	8%
Business advice	2000-01	89%	75%	59%	75%
	1999-2000	79%	67%	63%	70%

Table E3ii **Support mechanisms for spin-offs (partner provided)**

		Research intensity			
		Higher	Medium	Lower	UK total
On-campus incubators	2000-01	17%	9%	4%	10%
	1999-2000	13%	10%	0%	8%
Other incubators in the locality	2000-01	42%	40%	25%	36%
	1999-2000	33%	44%	19%	32%
Science park accommodation	2000-01	30%	15%	14%	20%
	1999-2000	31%	19%	5%	19%
Entrepreneurship training	2000-01	21%	26%	18%	22%
	1999-2000	8%	15%	12%	11%
Seed corn investment	2000-01	51%	26%	18%	32%
	1999-2000	38%	33%	16%	30%
Venture capital	2000-01	60%	38%	24%	41%
	1999-2000	56%	42%	16%	39%
Business advice	2000-01	49%	40%	35%	41%
	1999-2000	44%	38%	28%	37%

International comparisons

87. To compare the UK and non-UK HE sectors, internationally equivalent statistics must be available from each country. For the US and Canada the Association of University Technology Managers (AUTM) Licensing Survey collects information for North American HE institutions similar to that which is gathered in the HE-BI survey within the UK. In addition, the University Companies Association – Nottingham University Business School survey (UNICO-NUBS) is specifically arranged to collect UK data in a way which is directly comparable to the AUTM survey. Currently few other internationally comparable statistics are collected. Methodology for the international comparisons is at Annex F.

88. Comparing raw data is not useful in itself as this does not account for the different numbers and sizes of institutions in each country, and any useful benchmark must take this into account. Benchmarking is also difficult as definitions used may vary from survey to survey, and AUTM samples only the top North American research institutions rather than the whole HE sector. For this reason some form of normalisation is needed to allow for valid comparison. The HE-BI and the UNICO-NUBS surveys use research expenditure as the most appropriate proxy for unit of resource. The number of spin-off companies has been compared to research expenditure in both surveys. Small differences in definitions and methods could make large differences in the benchmarking figures; international differences in the handling of patent awards make them a less robust comparative indicator. Therefore only the formation of new spin-off companies and licence income are compared. Annex F contains details of how these benchmarks were calculated.

89. US institutions spent approximately £46 million[3] for every spin-off company formed compared to around £12 million in the UK in 2000-01. While this is encouraging, spin-off formation is not the only method of generating wealth from IP. Licensing technology provides another route for income generation and for delivering benefit. Comparing licence income as a percentage of research expenditure, the US

[3] Association of University Technology Managers Licensing Survey: FY2000

institutions generated 4.3 per cent, compared to 0.6 per cent for UK institutions. Taken together, these figures suggest that different strategies dominate the exploitation of IP in the US and UK. US institutions perform more strongly in licensing than the UK, and in the UK new spin-off companies are more likely to be formed. The HE-BI survey found that almost 30 per cent of non-technology licences and 40 per cent of software licences are granted to overseas companies. Caution must be used in relating income generation through licensing to the number of spin-off companies rather than representing actual current income, since spin-off companies are only a proxy for potential wealth generation.

Table E4 **HEI commercialisation activity in the US and UK**

	US Universities AUTM survey*	UK Universities HE-BI survey
Number of institutions	142	157
Research funding Industrial (000s)	£1,458,164	£206,663
Research funding Public (000s)	£10,610,743	£1,926,270
Total research Funding (000s)	£17,001,595	£2,949,660
Licences	3,606	728
Licence income (000s)	£731,915	£18,934
Licence income as percentage of total R expenditure	4.3%	0.6%
Spin-out companies formed	368	248
Survey research £ expenditure per spin-out (000s)	£46,200	£11,894

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Section F: Training and personnel links

90. Questions in this section refer to the process HEIs use to determine what training to make available to employers and to the arrangements for undergraduate placements in business. Interaction between staff, students and business is recognised as a key part of the higher levels of people movement and interaction that characterise much effective transfer or exchange of knowledge. There are no serious validation concerns regarding the training and placement policy questions (F1, F2 and F4) and confidence is high in the responses in 2001 and 2002. In contrast, and for a similar reason to that for consulting activities (Section D), central reporting for the volume of student placements is not fully robust; this is likely to be due to a high degree of devolution of this activity to individual HEI Departments.

F1. To what extent does the HEI monitor skills needs and sectoral change though labour market intelligence (LMI), and take this into account in planning provision?

91. There is a notable increase in the monitoring of skills needs by medium research intensive HEIs. Lower research intensive institutions are also showing substantial improvement, with the highest proportion of responses in band 4. The positive trend shows an increasingly strategic approach to skills provision.

1	2	3	4	5
No monitoring of skills, general use of LMI, or collaboration with employers.		Moderate responsiveness – some changes in provision based on forecasting of demand using LMI, but little ongoing dialogue with employers and other bodies. LMI would typically be examined in central service units but not disseminated and used in departments.		Sophisticated monitoring systems at HEI level, with provision of appropriate data to individual departments. Evidence that information from LMI and employer suggestions are acted upon at central and departmental levels.

Table F1 **Monitoring of LMI benchmark**

		Research intensity			
		Higher	**Medium**	**Lower**	**UK total**
1	2000-01	9%	8%	4%	7%
	1999-2000	12%	8%	7%	9%
2	2000-01	15%	11%	4%	10%
	1999-2000	13%	15%	12%	13%
3	2000-01	45%	40%	39%	41%
	1999-2000	46%	44%	42%	44%
4	2000-01	26%	34%	49%	36%
	1999-2000	25%	25%	28%	26%
5	2000-01	2%	4%	4%	3%
	1999-2000	0%	4%	12%	5%

F2. To what extent do individual courses actively involve employers in the development of content and regular reviewing of the curriculum?

92. This shows a similar trend to question F1 in that lower research intensity institutions claim to be more in touch with employers' requirements. However, the 2000-01 data show that a much higher proportion of HEIs consult with employers regarding courses than monitor labour market intelligence and similar data. This implies a tactical rather than longer-term strategic approach. Increasing confidence in third stream policy and funding may increase the level of strategic planning in this area; this question may be a valuable indicator of such change in any future survey.

1	2	3	4	5
No links with employers in development of locally oriented courses or overall shaping of the curriculum.		Some dialogue with employers and other bodies about the nature of courses, but limited for example to specific vocational areas, or one-off exercises.		All departments regularly consult with employers and other partners on curriculum where relevant. Specialist subjects are kept up to date and relevant to the labour market. More generic skills developed in all courses as required.

Table F2 **Involvement of employers in curriculum benchmark**

		Research intensity			
		Higher	**Medium**	**Lower**	**UK total**
1	2000-01	2%	2%	0%	1%
	1999-2000	2%	0%	0%	1%
2	2000-01	4%	6%	0%	3%
	1999-2000	6%	4%	7%	6%
3	2000-01	49%	32%	22%	34%
	1999-2000	50%	19%	16%	29%
4	2000-01	32%	42%	51%	41%
	1999-2000	29%	33%	35%	32%
5	2000-01	13%	19%	27%	20%
	1999-2000	6%	27%	26%	19%

F3. How many undergraduates undertake placements in business?

93. The data are not fully robust, and show variability between years and between nations. This is largely a result of this question being particularly sensitive to deficiencies in HEIs' central data capture. The significant rise in shorter placements in Scotland appears to be a result of institutions including NHS students in their 2000-01 return (having not done so for the previous year).

Table F3 **Undergraduate placements in business**

		England	Northern Ireland	Scotland	Wales	UK total
1 year sandwich placement	2000-01	27,064	1,547	987	858	30,456
	1999-2000	30,083	1,224	1,160	492	32,959
Shorter placements required for course	2000-01	34,268	194	9,053	336	43,851
	1999-2000	43,680	100	1,461	968	46,209
Optional placements organised by HEI	2000-01	8,404	178	457	332	9,371
	1999-2000	6,242	162	213	236	6,853
Other	2000-01	13,052	144	1,649	132	14,977
	1999-2000	13,306	172	107	80	13,665
Total	2000-01	82,788	2,063	12,146	1,658	98,655
	1999-2000	93,311	1,658	2,941	1,776	99,686

F4. How are these placements organised?

94. It remains true that individual Schools or Departments are often the main organisers of placements, but there is good evidence of a trend toward centrally co-ordinated organisation of these.

Table F4 **Undergraduate placement organisation methods (number of HEIs)**

		England	Northern Ireland	Scotland	Wales	UK total
None are currently arranged	2000-01	7	0	0	1	8
	1999-2000	n/a	n/a	n/a	n/a	n/a
Via a central placement department	2000-01	41	1	2	6	50
	1999-2000	25	2	2	4	33
Individual school or department	2000-01	93	2	12	7	114
	1999-2000	99	2	15	9	125
Via careers service	2000-01	50	2	2	7	61
	1999-2000	52	2	4	7	65
Via students union	2000-01	11	0	0	1	12
	1999-2000	16	0	0	1	17
Ad hoc between students and businesses	2000-01	67	1	8	5	81
	1999-2000	62	0	5	6	73
Via external intermediary (please specify)	2000-01	11	0	2	1	14
	1999-2000	17	0	1	0	18

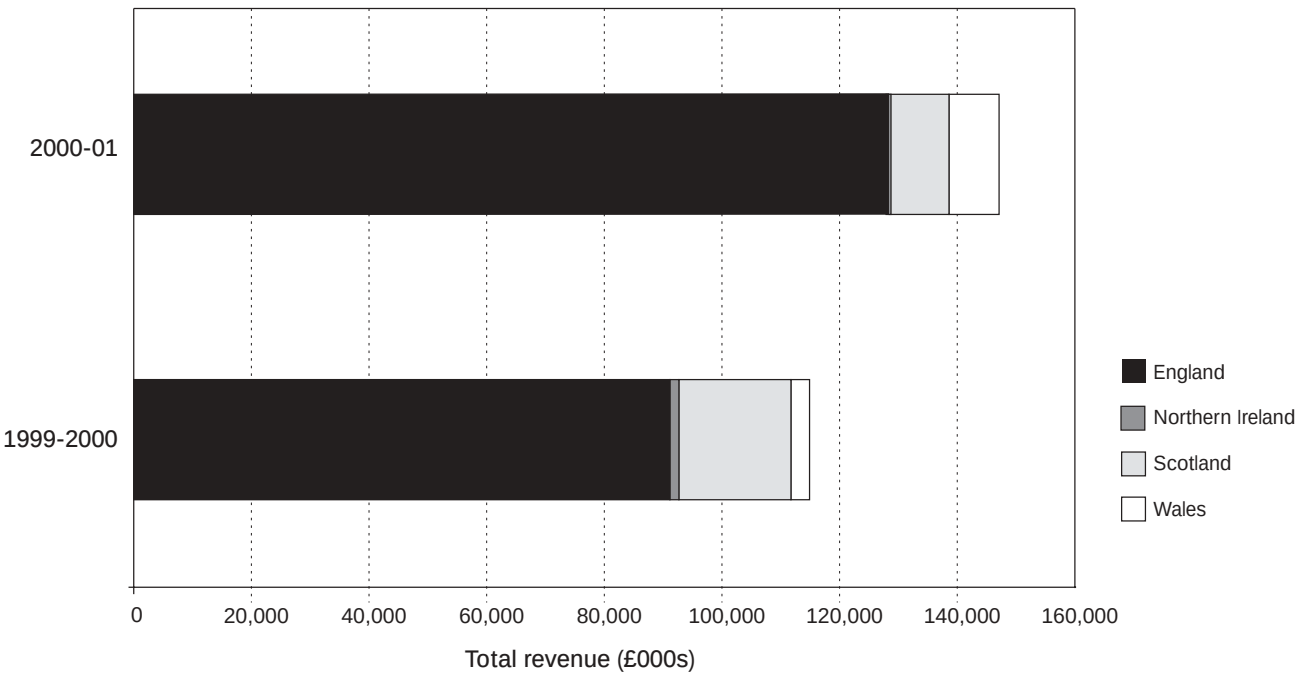
F5. Does your institution provide courses for business and if so, what was the total revenue in 2000-01?

95. There is no strong variation by research intensity in provision of courses for business. The total income figures are robust and show a substantial increase for England and Wales, contributing to over 25 per cent UK growth in income from such activity.

Table F5i **Provision of courses for business**

		Research intensity			
		Higher	**Medium**	**Lower**	**UK total**
Distance learning for businesses	2000-01	57%	57%	47%	54%
	1999-2000	48%	65%	51%	55%
Continuous work-based learning	2000-01	40%	42%	37%	39%
	1999-2000	35%	56%	49%	46%
Short bespoke courses for business on campus	2000-01	79%	66%	75%	73%
	1999-2000	83%	77%	84%	81%
Short bespoke courses at companies' premises	2000-01	66%	60%	65%	64%
	1999-2000	67%	73%	77%	72%

Figure F5ii **Total revenue from courses for business**



Section G: Support for economic development activity (national and regional)

96. Questions in this section refer to the sources, scale and application by HEIs of various economic development funds and initiatives, and to the levels of engagement between HEIs and local and regional bodies. Data in this section suggest movement towards more strategic links with industry. The role of RDAs, Government Offices and other regionally based bodies with an economic development agenda is developing rapidly, including in partnerships with HE; this and the commitment to a permanent third stream of funding are likely to continue, resulting in substantial changes to the range and mix of HEIs' economic development activity.

97. No significant validation concerns remained unresolved, and the confidence in 2001 and 2002 data is medium or high throughout; inter-year comparisons and some analysis by research intensity are sufficiently robust.

G1. & G2. Has the HEI received funding from any of the following programmes in 2000-01? If so, how much?

98. Substantial validation questions arose and most were resolved; the data regarding such funding are apparently often not readily accessible to the nominated HEI contacts. European funds dominate economic support funding for HEIs. In five of the seven schemes discussed, fewer HEIs report receiving funds than in the 1990-2000 survey. Allowing for the typically lower turnover of lower research intensive institutions, every type of economic regeneration funding is more significant to them than to the medium and higher research intensive institutions. The data may be a proxy for direct impact of HEIs on local and regional communities, although funding levels may fluctuate substantially from year to year due to the competitive nature of such funding.

Table G1 **HEIs funded under development initiatives**

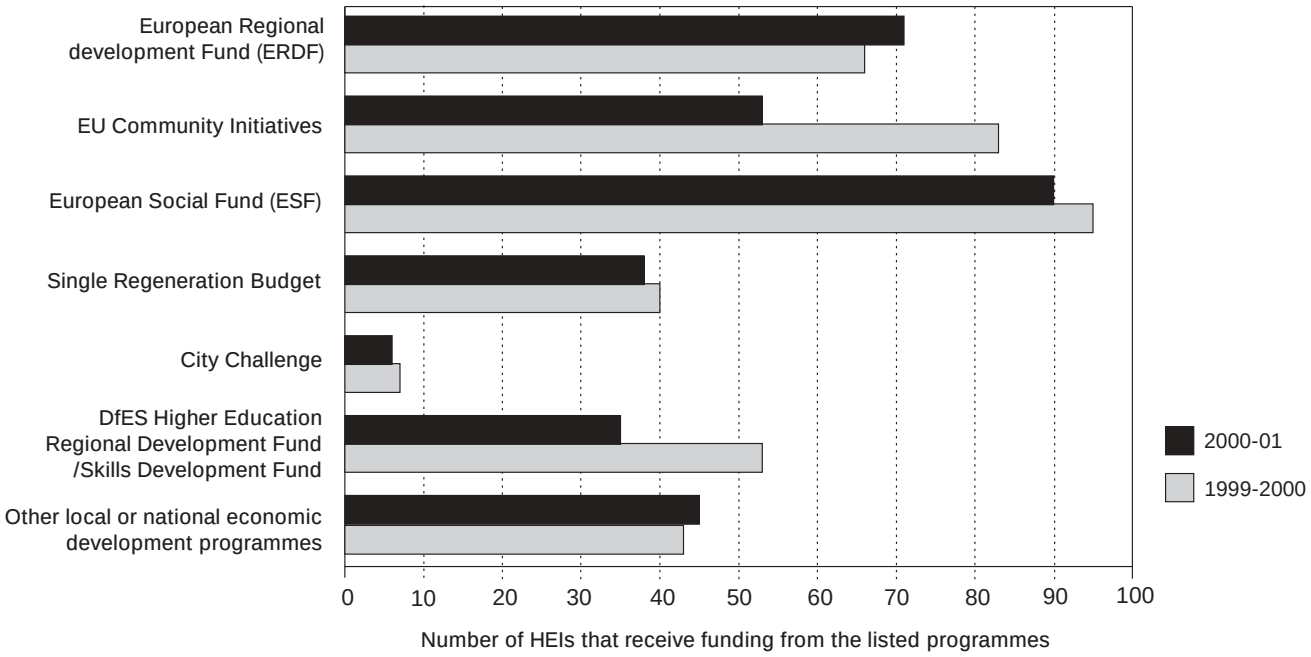
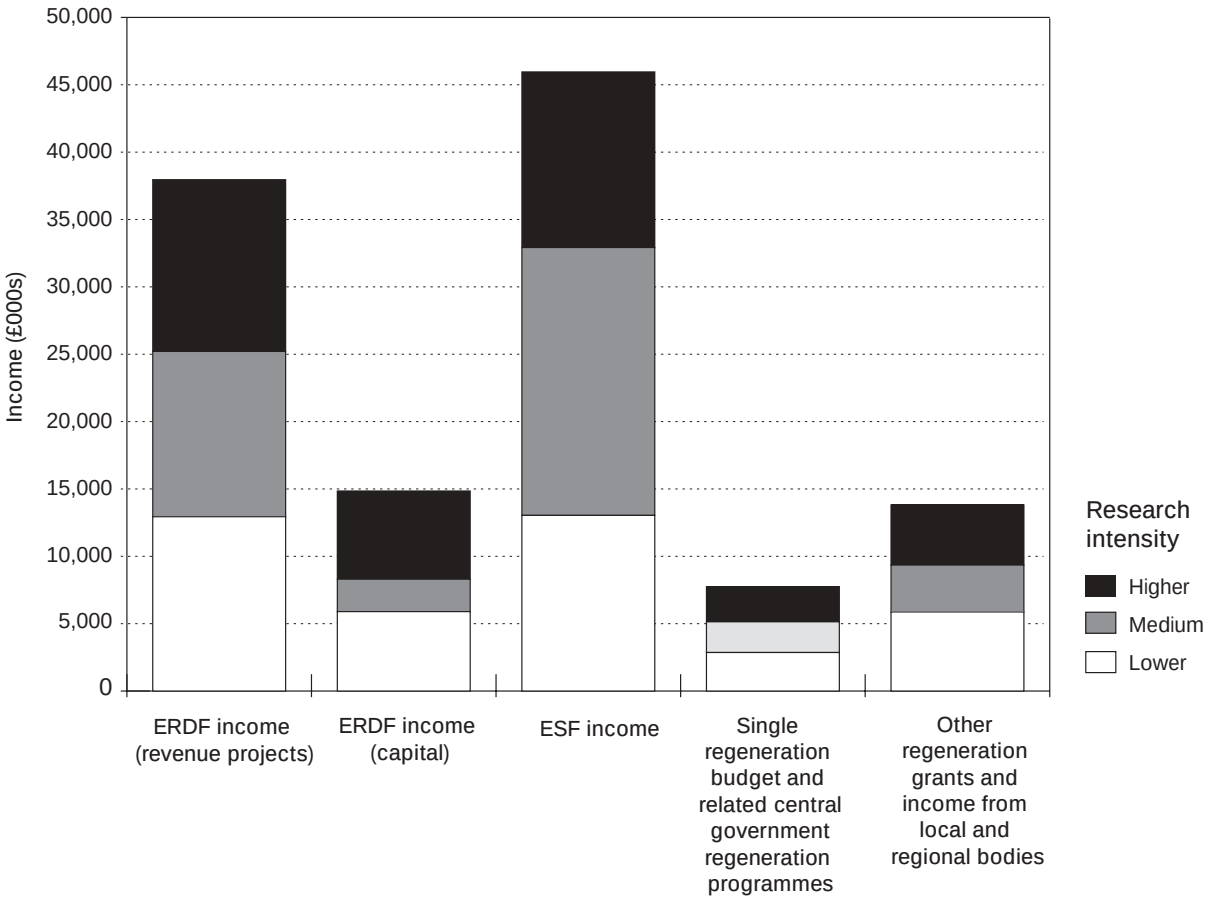


Figure G2 **Income development initiatives in 2000-01**



G3. What role do these regeneration programmes play for the HEI?

99. Data show a general movement from 'additional teaching' towards a broader base of the application of regeneration programme funding (see G1 and G2), with lower research intensity HEIs taking a significant step toward facilitating partnerships and community development and building links with local industry.

Table G3 **Role of regeneration programmes**

		Research intensity			
		Higher	Medium	Lower	UK total
Additional funds for teaching, training	2000-01	40%	34%	39%	38%
	1999-2000	46%	42%	51%	46%
Additional funds for research	2000-01	26%	26%	6%	20%
	1999-2000	23%	31%	9%	22%
Enabling capital projects – new building/ accomodation	2000-01	23%	11%	18%	17%
	1999-2000	23%	8%	19%	17%
Acquiring research equipment (used also by industry	2000-01	9%	8%	6%	8%
	1999-2000	12%	8%	0%	7%
Building strategic links with local industry	2000-01	40%	49%	39%	43%
	1999-2000	40%	48%	30%	40%
Fulfilling regional mission through new services to industry	2000-01	34%	40%	43%	39%
	1999-2000	31%	42%	44%	38%
Facilitating partnerships	2000-01	32%	25%	53%	36%
	1999-2000	38%	40%	26%	35%
Enhancing knowledge of labour market needs	2000-01	11%	4%	12%	9%
	1999-2000	4%	2%	12%	6%
Enhancing redesign of curriculum	2000-01	0%	9%	14%	8%
	1999-2000	4%	10%	7%	7%
Facilitating community development	2000-01	8%	15%	33%	18%
	1999-2000	6%	13%	26%	14%
Other (please specify)	2000-01	4%	4%	6%	4%
	1999-2000	0%	4%	7%	3%

G4. Which of the following statements best describes your partnership arrangements with local and regional bodies?

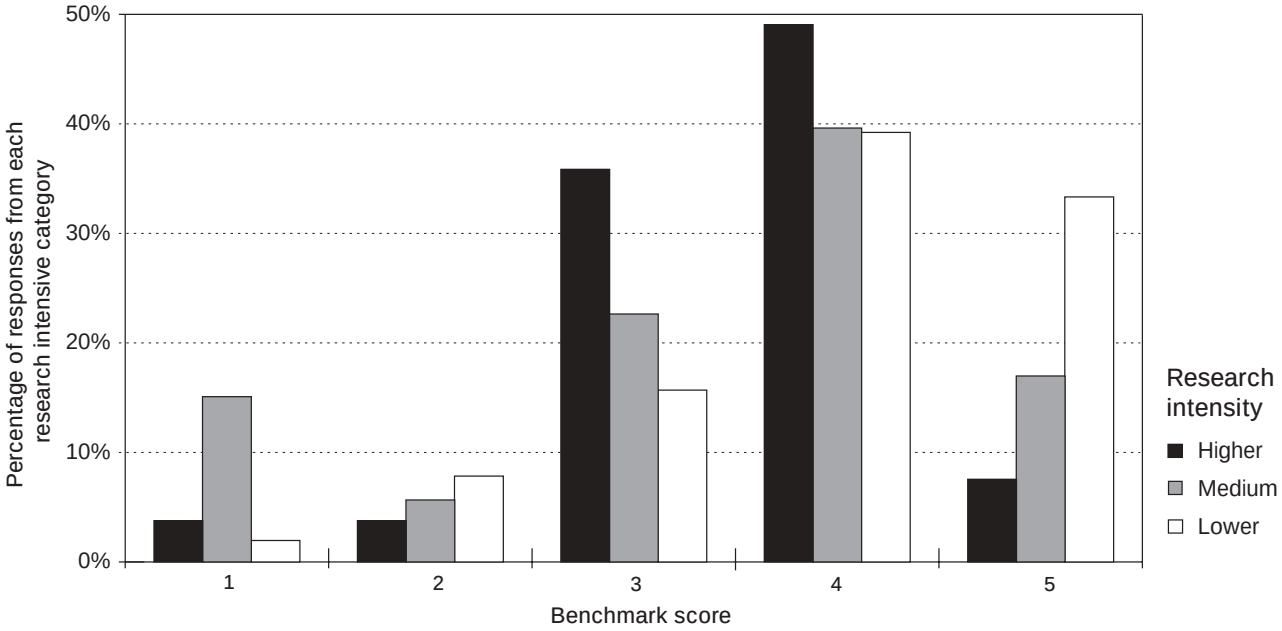
100. Overall partnerships have become more prevalent and developed. This indicates an encouraging change in emphasis across the UK which is likely to be in part a result of third stream funding and a recognition of the developing profile of RDAs. Sixty-two per cent of the UK is reported in bands four and five, including 74 per cent of lower research intensive institutions.

1	2	3	4	5
No engagement with community regeneration schemes, apart from individual efforts.		Some representation of the HEI on local partnerships at senior management level, but with limited implementation capability. Main focus is on research role and possible property development role.		Active and creative engagement with community programmes, with the HEI taking a leadership position and applying a wide variety of resources. Community regeneration seen as a mainstream activity with role for access policy, link to student community action and staff involvement as part of staff development.

Figure G4i **Local and regional partnerships benchmark**

		Research intensity			
		Higher	**Medium**	**Lower**	**UK total**
1	2000-01	4%	15%	2%	7%
	1999-2000	2%	8%	5%	5%
2	2000-01	4%	6%	8%	6%
	1999-2000	6%	4%	7%	6%
3	2000-01	36%	23%	16%	25%
	1999-2000	50%	19%	16%	29%
4	2000-01	49%	40%	39%	43%
	1999-2000	27%	48%	37%	37%
5	2000-01	8%	17%	33%	19%
	1999-2000	10%	15%	28%	17%

Figure G4ii **Local and regional partnerships by RI**



Section H: Administration of the questionnaire

101. There is practically no limit to the amount and level of detail of reliable quantitative and qualitative data which could be obtained from the HE sector. However, the cost of collecting data rises steeply as the information departs further from that which is directly useful and/or already available to the HEIs for their own management purposes. Costs of data reporting can be measured simply in terms of time and employment, but it is also important to recognise the opportunity and potential demotivation costs incurred in increasingly onerous data gathering. The reliability of data is important and is best maintained when data are simple, repeatably gathered and locally valuable, avoiding any incentive to use inaccurate estimation.

H1. Approximately how much time was spent in completing this questionnaire, and what do you estimate was the cost to your institution?

102. The total reported cost to the sector for completing the survey was just under £150,000, approximately the same as for the 2001 survey. A number of institutions did not return estimates for the time and cost of completing the survey, commenting that it involved many people from across the institution and was impossible to calculate.

103. As may be expected, the exercise was more costly for institutions of higher research intensity. The cost will reduce as data collection systems for third stream activity are embedded.

Figure H1i **Time taken in completing HE-BI survey**

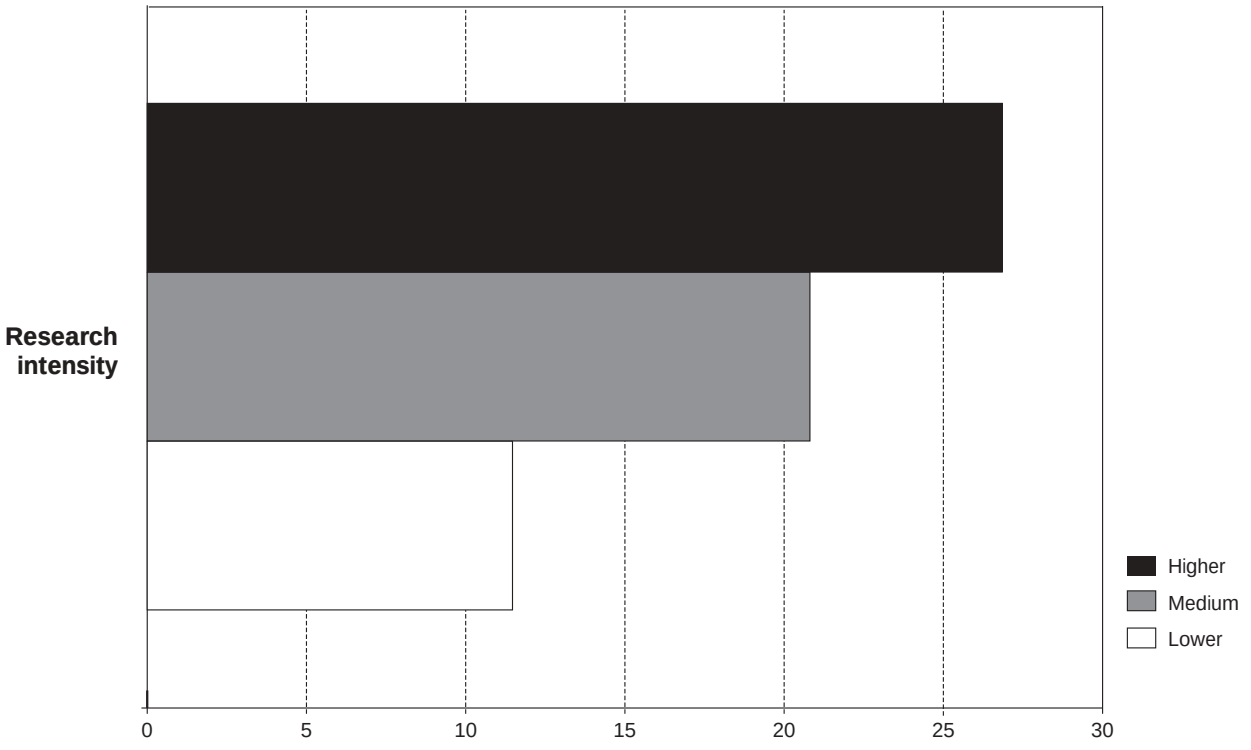
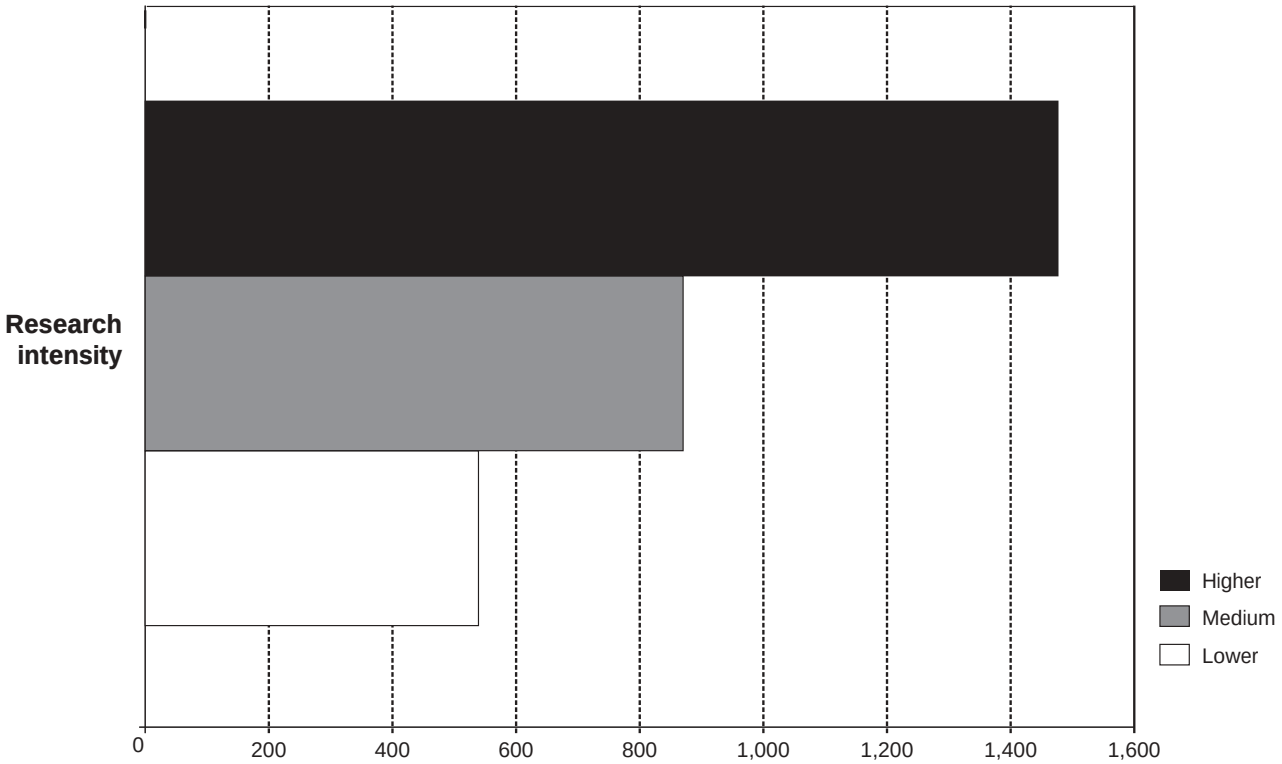


Figure H1ii **Cost of completing HE-BI survey**



H2. Were any of the questions impossible to answer due to the unavailability of data?

104. A number of questions proved difficult for institutions to answer, most commonly B1, B2, B5, D2, D3, E1, F3 and F5. Questions with detailed financial components caused the most difficulty. Although overall financial data are collected through HESA, they are not necessarily disaggregated in a way that is useful for the HE-BI survey. For example, in question B2 most institutions were able to provide the total number and value of contracts, but many could not break down these data to return the number and value of contracts with SMEs. Similarly in question D2 the number of consultancy contracts could be easily returned but the number that originated in the HEI's operational region is often not recorded.

105. Institutions have asked for advance warning of the data which may be required annually so as to put in place collection systems. A number of HEIs commented that centralised systems have been put in place following the 2001 survey in which the institutions found the data to be valuable for their own control and planning. However, improvements in procedure will mean that another year of data collection will be needed before fully robust year on year comparisons are possible.

H3. Were any of the questions difficult to answer without an excessive degree of additional analysis?

106. The problematical questions here were broadly those mentioned in paragraph 104, although Sections C and G were also seen as requiring excessive analysis. Where the size of the industrial partner is not recorded at inception, a staff member may have to work through individual contracts to gather the data requested. Linked to this was the common difficulty of data not being held centrally. If information on consultancy clients is held only at departmental level, the gathering process required the input of a range of institutional staff. Again HEIs have commented that specific data collection systems are being put in place.

Potential future actions

107. An annual process has been envisaged for reporting HEIs' third stream activities, in a standard and robust manner. HE-BI survey stakeholders will wish to consider the way forward, in the light of the survey reported here and other studies referred to in paragraph 29. It is expected that a 2003 survey would reflect further impact of HE's developing commitment to third stream activities.

108. If an annual data gathering exercise were to happen, further development of the questions used in 2002 (see Annex B) would be required (while maintaining as much year to year comparability as would be feasible):

- to increase the reliability of existing important questions
- to remove questions that are less relevant and any that are likely to remain unreliable, for example for indicating trends
- to give HEIs concrete information which they can use to put in place longer term information collection – for internal management purposes and for reporting UK-wide
- to make effective use of the existing HESA reporting process, where feasible; this will be simplest where data fit in the HESA Finance Record.

Proposed changes are listed below.

109. An ongoing HE-BI survey should ask some questions annually, where data may be dynamic, and report other data every three years, for example on policies and some benchmarking where change is likely to be slower. It is desirable to identify a core of indicators which are relevant to most of the UK HE sector and consider how to identify subsets of the whole set which have a close fit to specific types (for example, levels of research intensity) of HEI. It would be appropriate to review the principle of institutional anonymity that has applied to data in existing HE-BI surveys. In any future surveys data collection would be entirely electronic and reliability would increase as HEIs become more familiar with the overall process.

110. Some information on third stream activities is quantitative, easy to define – and perhaps to collect. These data may also be intuitively closer to the wealth creation process and amenable to financial metrics, for example the licence income generated by an HEI from its exploitation of intellectual property. (The UNICO/NUBS survey is likely to be repeated in 2003 and a degree of complementarity may be practical.) Some, but not all, such metrics relate to the optimum impact of HEIs on society and the economy, but it is likely that some harder-to-define or qualitative information represents important aspects of the HE third stream's impact. In particular, since the market is not yet mature, income to a HEI is probably not an inclusive or even close proxy for the benefit being delivered to the wealth creation process, or indeed to the health of the social economy.

111. There is a well recognised process of distortion, in HE and elsewhere: that if resources (such as HE core funding) are allocated according to particular metrics, the HEIs' actions will tend to be shaped to maximise the aforesaid funding. This underlines the importance of choosing indicators with a good correlation with the strategic aims of third stream funding. The robust indicators may be different, at least in part, for different types of HEI. External impact or HEI commitment to key principles may be difficult to measure; outputs easier, and activities easier still. The continuing liaison between the HE-BI survey and other surveys/information-gathering exercises will be a necessary aspect of establishing a low-burden, sector-wide and robust set of indicators, one of value to HE sector, funding and other stakeholders, and one able to inform the permanent third stream of funding.