

July 2015/13

**Policy development**

**Report on survey**

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This report is for information

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This report analyses the results of the Higher Education – Business and Community Interaction survey for UK higher education institutions, referring to the academic year 2013-14.

# Higher Education – Business and Community Interaction survey

## 2013-14

**BIS** | Department for  
Business Innovation & Skills

 **Scottish Funding Council**  
Promoting further and higher education

 Department for  
**Employment  
and Learning**  
[www.delni.gov.uk](http://www.delni.gov.uk)

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## Higher Education – Business and Community Interaction survey 2013-14

To	Heads of UK higher education institutions
Of interest to those responsible for	Knowledge exchange; Innovation; Enterprise and entrepreneurship; Interactions between higher education and business, public and third sectors; Contract and collaborative research; Continuing professional development; Public engagement; Strategic planning; Economic development
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### Executive summary

#### Purpose

1. The Higher Education – Business and Community Interaction (HE-BCI) survey is in its 14th year and is an essential source of information on knowledge exchange (KE) in the UK. It focuses on specific interactions with external partners, such as contract and collaborative research, consultancy, continuing professional development (CPD) and intellectual property, rather than attempting to assess the entire contribution of higher education institutions (HEIs) throughout their teaching and research activities.
2. The exchange of knowledge described here takes place between higher education institutions and the wider world of business and the community. All 159 publicly funded UK HEIs in 2013-14 provided data for this report<sup>1</sup>.
3. Data reported in this survey provides valuable intelligence for higher education senior managers, KE practitioners and policymakers. The report also provides an in-depth commentary on the extent of, and trends in, KE activity in UK HEIs. Overall, patterns are similar in each of the four constituent nations, although some data is displayed at the national level in the main report where recommended by the Stakeholders Group (see paragraph 19).
4. This report builds on data published in previous HE-BCI survey reports, the most recent of which, 'Higher Education – Business and Community Interaction Survey: 2012-13' (HEFCE 2014/10), was published in May 2014 and analysed 2012-13 data<sup>2</sup>.

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<sup>1</sup> Liverpool School of Tropical Medicine was added this year. Data from the University of Buckingham and University Campus Suffolk is excluded from this report as these institutions are not publicly funded HEIs.

<sup>2</sup> Available at [www.hefce.ac.uk/pubs/year/2014/201410/](http://www.hefce.ac.uk/pubs/year/2014/201410/).

5. The data is collected by the Higher Education Statistics Agency. HEIs provided data for activity occurring during the academic year 2013-14. Data on strategy and infrastructure, being neither numeric nor financial, relates to the end of the academic year (July 2014). The HE-BCI survey covers a range of activities: from commercialisation of new knowledge, through delivery of professional training, consultancy and services, to activities intended to have direct social benefits. 'Business' in this context may refer to private, public and third-sector partners of all sizes, with which HEIs interact in a broad range of ways<sup>3</sup>. 'Community' in this context means society as a whole outside the HEI, including all social, community and cultural organisations, individuals and the public both national and international.

### **Key points**

6. Data collected for the academic year 2013-14 shows a continuing increase in the exchange of knowledge between UK HEIs and the public, private and third sectors. The main indicators are summarised in Table 1, below. Annex A contains a summary of the full dataset for the UK and separate subsets for England, Scotland, Wales and Northern Ireland.

7. At a time of growth in the economy following a prolonged period of economic difficulty, growth in knowledge exchange income and activity provides an excellent case for continued public investment in higher education and specifically in knowledge exchange funding streams. Annual gross domestic product (GDP) growth for the UK in 2014 was estimated to be 2.6 per cent, which was 0.9 per cent higher than the equivalent annual growth seen in 2013<sup>4</sup>. At 10.1 per cent, HE-BCI growth remained greater than overall UK GDP growth of approximately 2.6 per cent. However, while GDP comparisons provide some useful context, more sophisticated methods will be explored for future reports.

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<sup>3</sup> The 'third sector' refers to voluntary and community groups, social enterprises, charities, co-operatives and mutuals.

<sup>4</sup> Second Estimate of GDP, Q4 October to December 2014, [www.ons.gov.uk/ons/rel/naa2/second-estimate-of-gdp/q4-2014/sum-q4-2014-second-estimate-of-gdp.html](http://www.ons.gov.uk/ons/rel/naa2/second-estimate-of-gdp/q4-2014/sum-q4-2014-second-estimate-of-gdp.html).

**Table 1 Main indicators (£000s cash terms)**

<b>£000s (cash terms)</b>	<b>2012-13</b>	<b>2013-14</b>	<b>% Change</b>
<b>1a Collaborative research*</b>	<b>951,126</b>	<b>1,143,804</b>	<b>20.3%</b>
<b>1b Contract research</b>			
with SMEs	41,108	45,120	9.8%
with large businesses	399,498	418,202	4.7%
Total value with public and third-sector organisations	725,432	729,084	0.5%
<b>Total value of contracts</b>	<b>1,166,038</b>	<b>1,192,406</b>	<b>2.3%</b>
<b>2a Consultancy</b>			
with SMEs	64,169	74,272	15.7%
with large businesses (£000s)	99,237	109,166	10.0%
with public and third-sector organisations	236,332	257,990	9.2%
<b>Total income</b>	<b>399,738</b>	<b>441,428</b>	<b>10.4%</b>
<b>2b Facilities and equipment-related services</b>			
with SMEs	46,126	51,490	11.6%
with large businesses	43,802	47,946	9.5%
with public and third-sector organisations	51,586	63,490	23.1%
<b>Total income</b>	<b>141,514</b>	<b>162,926</b>	<b>15.1%</b>
<b>2c CPD</b>			
CPD for SMEs	18,797	19,707	4.8%
CE and CPD for individuals	230,429	252,708	9.7%
CPD for large businesses	131,921	130,825	-0.8%
CPD for other public and third-sector organisations	272,158	275,179	1.1%
<b>Total revenue</b>	<b>653,305</b>	<b>678,419</b>	<b>3.8%</b>
<b>3 Regeneration and development programmes*</b>	<b>172,069</b>	<b>180,606</b>	<b>5.0%</b>
<b>4c Intellectual property (IP) income</b>			
SMEs	10,674	10,466	-1.9%
Large businesses	54,941	62,786	14.3%
Public and third-sector organisations	9,379	8,806	-6.1%
Sub-total (licensing) (£000s)	74,994	82,058	9.4%
Sale of shares in spin-offs (£000s)*	11,646	49,059	321.3%
<b>Total IP revenues (£000s)</b>	<b>86,640</b>	<b>131,117</b>	<b>51.3%</b>
<b>Grand total (£000s)</b>	<b>3,570,430</b>	<b>3,930,706</b>	<b>10.1%</b>

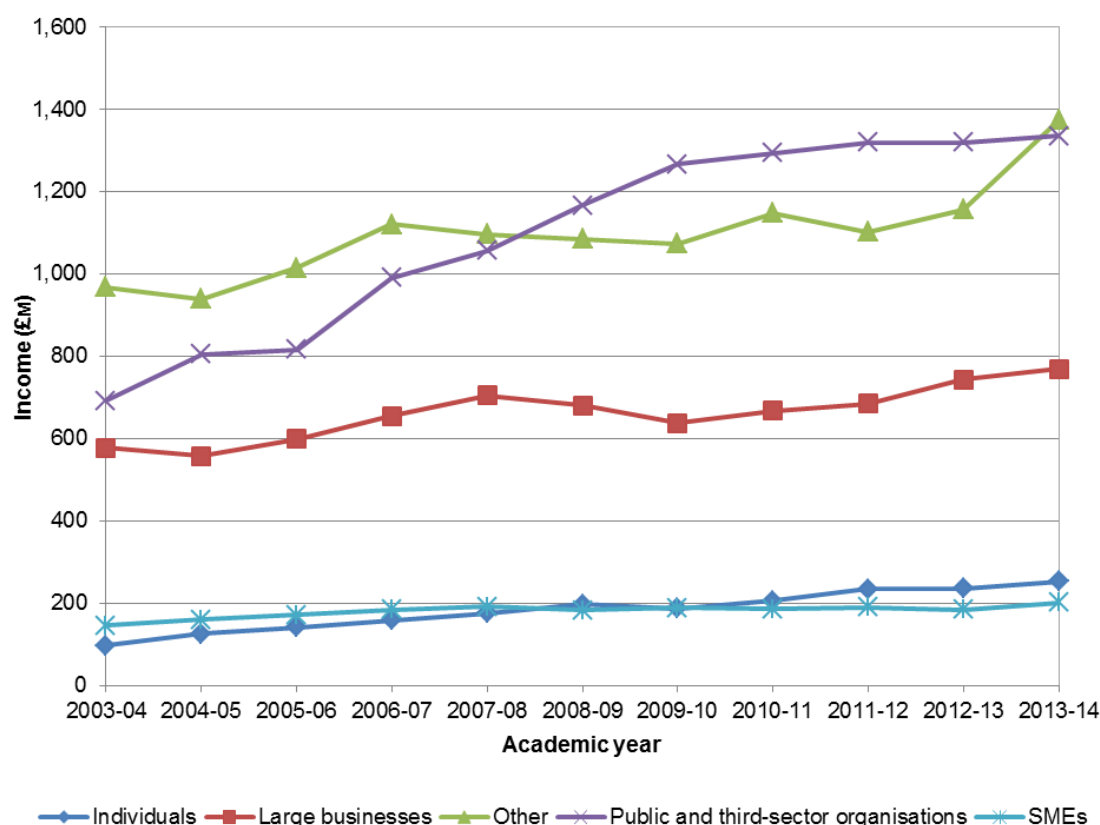
\* Denotes data not disaggregated by partner.

Note: 'SMEs' = 'small and medium-sized enterprises'; 'CPD' = 'continuing professional development'; 'CE' = 'continuing education'; 'IP' = 'intellectual property'.

## Investment in knowledge exchange by partner

8. Total KE investment across all activities from large businesses increased in cash (nominal) terms by 5.4 per cent, from £729 million in the previous year to £769 million, while small and medium-sized enterprises (SMEs) increased their overall spending by 11.2 per cent, from £181 million to £201 million. This improves upon the equivalent figure from last year, which showed a small decrease in SME income. Income to HEIs from the public and third sectors increased by 3.1 per cent, from £1,295 million to £1,335 million in 2013-14. Figure 1 shows how income from different types of partners has changed over time.

**Figure 1 Total income by partner type, 2003 to 2014 (real terms)**

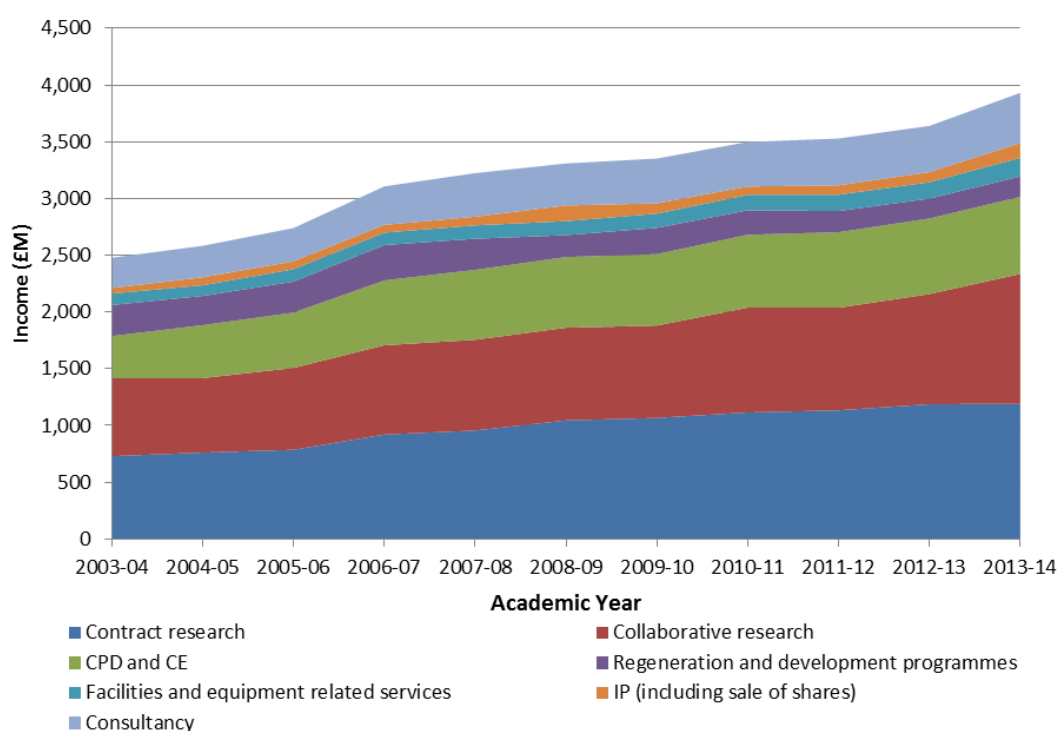


Source: HE-BCI Part B Tables 1, 2, 3 and 4c. Note: 'Other' refers to indicators which are not collected by partner type due to consideration of burden – see paragraph 29

## Collaborative research

9. Total income from collaborative research increased by 20.3 per cent during 2013-14, from £951 million to £1,144 million. Data systems have improved in HEIs, which may result from systems put in place for the Research Excellence Framework or from sharing of good practice. This has provided more accurate figures for Research Council funding. Figure 2 shows selected income incomes streams from 2003-04 to 2013-14.

**Figure 2 Selected HE-BCI income streams, 2003 to 2014 (real terms)**



Note: 'CPD' = 'continuing professional development'; 'CE' = 'continuing education'; 'IP' = 'intellectual property'. Source: HE-BCI Part B Tables 1, 2, 3 and 4c.

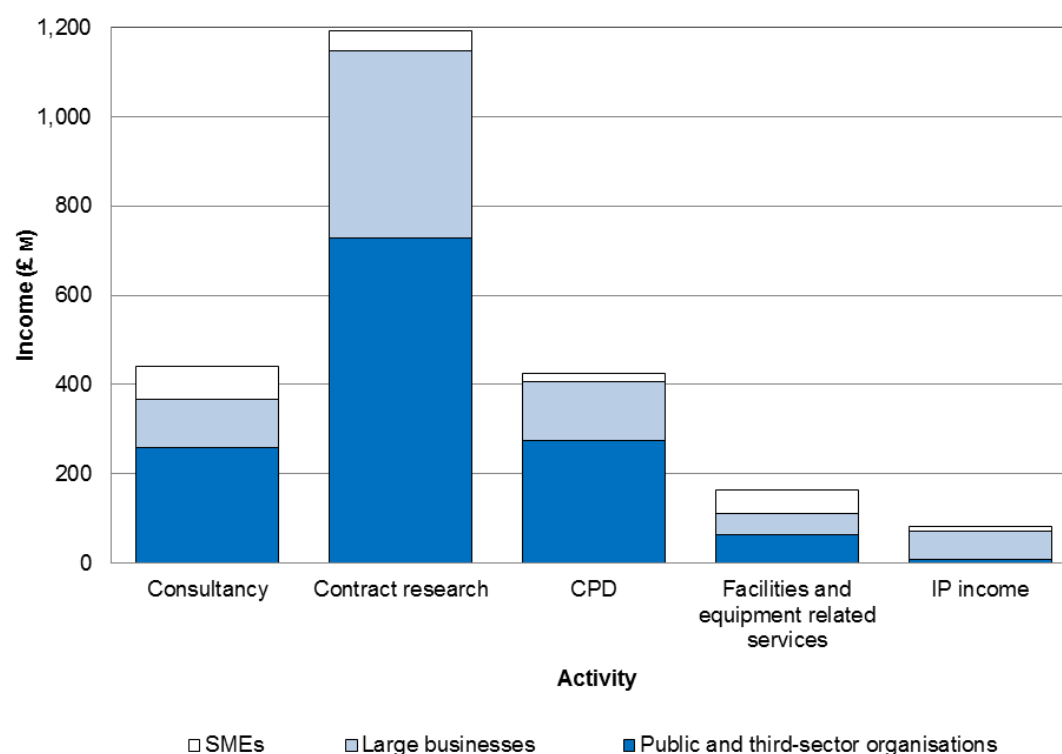
### Contract research

10. Contract research income increased by 2.3 per cent, from £1,166 million to £1,192 million. Large businesses and SMEs increased their investment in contract research by 4.7 per cent and 9.8 per cent respectively, representing an increase in income of nearly £23 million between them, which is less than the equivalent increase recorded last year. Income from non-commercial partners was stable, with a small increase of 0.5 per cent, reaching £729 million in 2013-14. Figure 3 shows income by activity and partner in 2013-14.

### Consultancy

11. Income from consultancy saw an increase from £400 million to £441 million in 2013-14, with work for large businesses and SMEs showing the highest proportional increases of 10.0 per cent and 15.7 per cent respectively. Consultancy spending from the public and third-sector partners increased by 9.2 per cent and still accounts for the majority of activity at £258 million (whereas SMEs and large businesses spent around £74 million and £109 million respectively in 2013-14).

**Figure 3 Income by activity and partner, 2013-14**



Note: 'CPD' = 'continuing professional development'; 'IP' = 'intellectual property'. Source: HE-BCI Part B Tables 1, 2 and 4c.

### Facilities and equipment

12. Income from use of facilities and equipment (for example, prototyping equipment or digital media suites) rose by 15.1 per cent overall to £163 million. Public and third-sector organisations accounted for the majority of the spending increase, with a rise of 23.1 per cent from £52 million to £63 million, while income from large businesses and SMEs saw growth of 9.5 per cent and 11.6 per cent respectively.

### Intellectual property and enterprise

13. HE-BCI identifies income from licences and the sale of spin-off companies as intellectual property income ('IP income'), although it is understood that almost all activity (collaborative research, CPD and so forth) stems from the intellectual assets of HEIs. Licensing and spin-offs are perhaps better described as income from formal intellectual property rights. There has been a significant increase of 51.3 per cent in IP income, from £87 million to £131 million in 2013-14.

### Social, community and cultural activities

14. Attendance at public events has declined, with a fall in attendee numbers of 41.9 per cent at free events and 29.1 per cent at chargeable events. This fall can be largely attributed to a small number of outliers responsible for returning a sizeable portion of the activity recorded under this heading experiencing a significant fall in their volume of



recordable activity this year. However, many free event categories saw rises in attendees.

### **Regeneration**

15. Income from regeneration programmes increased in 2013-14, suggesting that the decline which followed the winding-down of the Regional Development Agencies in England, and the general reduction in public expenditure, may have halted. The overall increase in regeneration income to UK HEIs was 5.0 per cent, from £172 million to £181 million, returning income recorded under this heading to its level in 2011-12.

### **Continuing professional development**

16. Income from CPD and continuing education activity rose from £653 million to £678 million in 2013-14. The biggest growth came from individuals (who may include sole traders as well as those studying for personal interest), who increased their collective spending by 9.7 per cent. SMEs increased their spending by 4.8 per cent, and public and third-sector partners had a small increase in spending on CPD of 1.1 per cent. Large businesses showed a 0.8 per cent reduction in CPD, which may suggest that individuals are increasingly investing in their own CPD and skills while large businesses maintain investment in CPD at a comparable level to the previous year.

### **Action required**

17. This report is for information. No action is required.

## Background and context

18. The aims of the annual Higher Education – Business and Community Interaction (HE-BCI) survey are:

- to provide data on the continuing development of interaction between higher education institutions (HEIs) and business and the wider community
- to provide reliable and relevant information to support the continued public funding of knowledge exchange (KE) activity in the UK
- to give HEIs good benchmarking and management information
- to develop a source of indicators at the level of the individual HEI, some of which can be used to inform funding bodies' allocations of continued funding
- to gain a UK-wide perspective in knowledge exchange and to highlight any significant differences across the four UK nations.

19. HE-BCI data for academic year 2013-14 was collected and validated by the Higher Education Statistics Agency (HESA) on behalf of all UK HEIs and the national funding bodies. The overall process, including this report, is overseen by the HE-BCI Stakeholders Group which includes:

- the UK higher education (HE) funding bodies
- the devolved administrations
- the Department for Business, Innovation and Skills
- the Research Councils
- Innovate UK
- the National Centre for Universities and Business
- other representative bodies such as Universities UK, GuildHE and the Confederation of British Industry.

20. The 14th HE-BCI survey is essential intelligence for all those interested in HE and the knowledge economy. Data from HE-BCI is used to develop policy and inform funding decisions for KE and related activities across the UK. The data is also valuable as management information, and supports benchmarking for a range of organisations, notably HEIs and their funding partners. Where comparable data is available for other countries, the data can provide a basis for international comparisons. HE-BCI data is accessible at no charge to UK HEIs via the Higher Education Information Database for Institutions (HEIDI); others are required to pay a small fee<sup>5</sup>.

21. The report highlights a number of caveats, although the overall dataset is considered informative and fit for purpose. Caution may be appropriate when viewing some data and trends in this report: specific concerns are highlighted in the text. In each survey year, HESA allows responding HEIs to restate previous figures to correct errors or include data that was not available at the time of submission. For the most part, this

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<sup>5</sup> Only summary data is included in this report; full data can be obtained from HESA ([www.hesa.ac.uk](http://www.hesa.ac.uk)).

report uses data as submitted (rather than restated) except where there are large effects (such as to skew the data noticeably for the UK as a whole).

22. While completion of the HE-BCI survey has been a condition of grant in Scotland since 2010-11, results do not inform Scottish funding allocation calculations as they do elsewhere in the UK. As part of its current strategic review of knowledge exchange funding, the Scottish Funding Council will work with the Scottish HE sector towards ensuring a consistent response to the survey. In Wales, although HE-BCI indicators no longer drive funding for innovation and engagement, HEFCW is working with the HE sector and the Welsh Government to drive a more consistent approach to the submission of survey data by Welsh institutions.

23. Standard practice in the HE-BCI survey is to present the current and previous years' data in cash terms, but to adjust for inflation on any time series of three or more years (given that the effect of low inflation is more significant over time than in the relatively short term). For example, graphs showing three or more years are likely to show a different (deflated) figure for 2012-13 than listed in the annex tables of this report. The latest gross domestic product deflators are used for each survey, and the figures in real terms are updated (meaning that there may be slight differences between annual reports). This approach is universal across the annual series of HE-BCI reports.

24. Most financial income data is collected by partner type:

- commercial – small and medium-sized enterprises (SMEs)
- commercial – large businesses
- non-commercial – public and third sector<sup>6</sup>.

For some indicators (collaborative research, regeneration and sale of spin-off shares) data is not available by type of partner. Such data is shown as 'other', though it will doubtless include elements of the main categories.

25. While HESA's published data on the HE-BCI survey includes all HEIs who respond to the Finance Statistics Return, this publication excludes the University of Buckingham and University Campus Suffolk. This is because they are distinct from the publicly funded HEIs in the UK who receive KE funding at present. While this will have a negligible effect on overall income indicators when comparing the HESA and HEFCE reporting, it may affect proportional calculations (for example, where data has been rounded up or down).

26. In 2005-06 the timing of the survey was changed to bring it closer to the relevant academic year, and two years of financial and numeric data was collected at one time. To limit burden, only one year of qualitative data was collected; thus there are some qualitative time-series data where points are assumed<sup>7</sup>.

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<sup>6</sup> The 'third sector' refers to voluntary and community groups, social enterprises, charities, co-operatives and mutuals.

<sup>7</sup> See 'Higher education – business and community interaction survey: 2004-05 and 2005-06' (HEFCE 2007/17), available at [http://webarchive.nationalarchives.gov.uk/20120118171947/http://www.hefce.ac.uk/pubs/hefce/2007/07\\_17/](http://webarchive.nationalarchives.gov.uk/20120118171947/http://www.hefce.ac.uk/pubs/hefce/2007/07_17/), for further detail.

## **The survey and the wider economic context**

27. HE-BCI results need to be seen in the context of wider economic and other conditions that impact on HEIs' interactions with their partners. During the early years of the HE-BCI survey the economy was fairly stable, and we highlighted that data and trends needed to be viewed in the context of changing factors in the HE environment, including the establishment of the survey itself.

28. Since the 2008 economic downturn, we have emphasised the economic and wider conditions impacting the economy and society. The positive signs of economic growth for the UK at the time of this report are reflected in some indicators, notably the increase in large business income during 2013-14. However, the economic landscape continues to evolve: for example, some industries where a large proportion of innovative businesses are SMEs may be served by more specialist HEIs such as the creative arts, the games industry, or the land-based sector. HEIs are therefore actively seeking to engage these organisations, which require very high skills and stand to benefit significantly from HE collaboration. Further factors likely to impact HEI interactions now include the following.

a. The establishment of 39 Local Enterprise Partnerships (LEPs) in England to promote economic growth and job creation in their regions (following the closure of the Regional Development Agencies, which invested in HE knowledge exchange and were clients of HE services). The LEPs work together with local authorities, HEIs and businesses to determine economic priorities and drive growth in their regions. Each LEP's board includes representation from at least one HEI. In addition, developments such as the 'Northern Powerhouse' reflect moves by the UK Government to create more favourable conditions for growth outside of London and the South East.

b. The announcement of €6.2 billion of European Structural Funds for the period from 2014 to 2020, including the European Regional Development Fund (ERDF) and the European Social Fund (ESF). The funds are intended to support local initiatives to increase economic growth and job creation. It is expected that HEIs in England will be able to apply for these funds through the LEPs while other arrangements will be in place for the devolved administrations. In Scotland, HEIs will be able to use ERDF to support SME innovation and competitiveness through Innovation Centre projects, High-Growth Spinout support and Interface Innovation Vouchers. In Northern Ireland, the European Union Investment for Growth and Jobs Programme will run until 31 December 2020. The programme, 60 per cent of whose funds come from the ERDF, will focus on strengthening research, technological development and innovation, enhancing the competitiveness of SMEs and supporting the shift towards a low-carbon economy. In Wales, the ERDF programme administered by the Welsh European Funding Office prioritises the building of research capacity and the commercialisation of research and innovation. HEIs will access this funding either as project leads, or via the suite of pan-Wales SMART Cymru programmes sponsored by the Welsh Government.

c. European Structural Investment Funds. As these are deployed in HEIs from 2015, this will be reflected in figures reported in future HE-BCI reports.

- d. The ongoing UK government policy to decrease the budget deficit through reductions in public expenditure, which adversely affects the resources available for public organisations to invest in research and knowledge exchange. However, HEIs have demonstrated an ability to adapt to this changing landscape, and total income from public and third-sector organisations shows a small increase.
- e. Changes to core funding for KE. In England for example, HEFCE's Higher Education Innovation Funding, which supplies KE formula funding, has been made more selective since 2011; in Wales there has been a phased withdrawal of Innovation and Engagement Fund funding from 2013-14 following the introduction of the new full-time undergraduate fee grant system. These changes may affect the infrastructure and income indicators recorded in this survey and in future years.

29. Most HE-BCI data is collected by partner type, which is categorised into SMEs, large businesses, the public and third sector, and 'other'. 'Other' includes collaborative income. This survey thus identifies 'income' to HEIs, which is a more efficient approach than surveying expenditure by all potential KE partners. The main indicators for which income to HEIs reflects the market value of these resources in the economy and society are collaborative research, contract research, consultancy, equipment and facilities, continuing professional development (CPD), regeneration and intellectual property (IP).

## **Next steps**

30. The HE-BCI survey is a formal part of HESA's official Finance Statistics Return, and collecting the data may be considered part of standard administrative practice. However, as with most data returns, improvements can be made to process and content. These will be balanced against the needs to keep the survey data consistent and comparable, and to respond to changing policy dynamics.

31. HESA reviewed HE-BCI data in 2012-13 with support from an expert group which included HEIs, KE professionals and policy makers. As a result a number of small improvements were suggested, along with the removal of indicators that were seen to be of limited use relative to the administrative burden. Changes took effect from the academic year 2013-14 to allow HEIs sufficient time to adapt their data systems. Further information is available on the HESA website at [www.hesa.ac.uk/c13031](http://www.hesa.ac.uk/c13031).

## **Analysis**

32. Overall, the data shows that knowledge exchange activity from the UK higher education sector has substantially improved, with increases across most indicators and an increase in total income of 10.1 per cent from 2012-13 (£3.6 billion) to 2013-14 (£3.9 billion). There have been small decreases in European regeneration funding, and a decrease in other local and regional regeneration funds of 15 per cent. However, 2013-14 has seen a rise of 40.3 per cent in UK government regeneration funds, which has contributed to a total increase in regeneration and development programmes of 5.0 per cent.

33. HEIs' income from knowledge exchange activity with large businesses increased by 5.4 per cent from £729 million to £769 million in 2013-14, while equivalent income from public and third-sector partners grew by 3.1 per cent from £1,295 million in 2012-13

to £1,335 million. HEIs increased income from SMEs by 11.2 per cent from £181 million to £201 million across the UK.

## Strategy and infrastructure

34. Indicators relating to strategy and infrastructure are collected under Part A of HE-BCI (whereas financial and numeric metrics are collected in Part B)<sup>8</sup>. These tend to be self-assessed responses in which HEIs either select from a range of options (this is how IP is handled, for instance) or place themselves on a scale of development (as with incentives to engage with business and the community, which may be ‘weak’, ‘medium’ or ‘strong’). The latter are known as ‘benchmark questions’.

35. A number of infrastructure indicators were updated for this survey, in part to reflect the development of understanding since the survey was first launched. Therefore some time-series data will not be displayed in this report<sup>9</sup>. Most of the data is designed to give an overview of how KE is being embedded in HEIs; hence it is often displayed as proportions of the sector rather than the totals used for quantitative indicators.

36. Each HEI is asked to select three areas which it regards as making the greatest contribution to economic growth – see Table 2. The options available for HEIs to select were changed in 2013-14, and therefore direct comparisons between data recorded in previous years are problematic.

37. ‘Research collaboration with industry’ is the most important single most reported contribution HEIs make to economic development, while ‘Knowledge exchange’ is the next most cited. It is likely that this reflects the new options available in the questionnaire rather than a dramatic shift in strategy during the period. ‘Knowledge exchange’ here is a more generic way of looking across a range of external interactions.

38. Previous surveys all showed ‘Access to education’ as the most cited contribution to economic development, so this year’s includes a more specific option, ‘widening participation and access’.

**Table 2 What are the top three areas of economic impact for your HEI?**

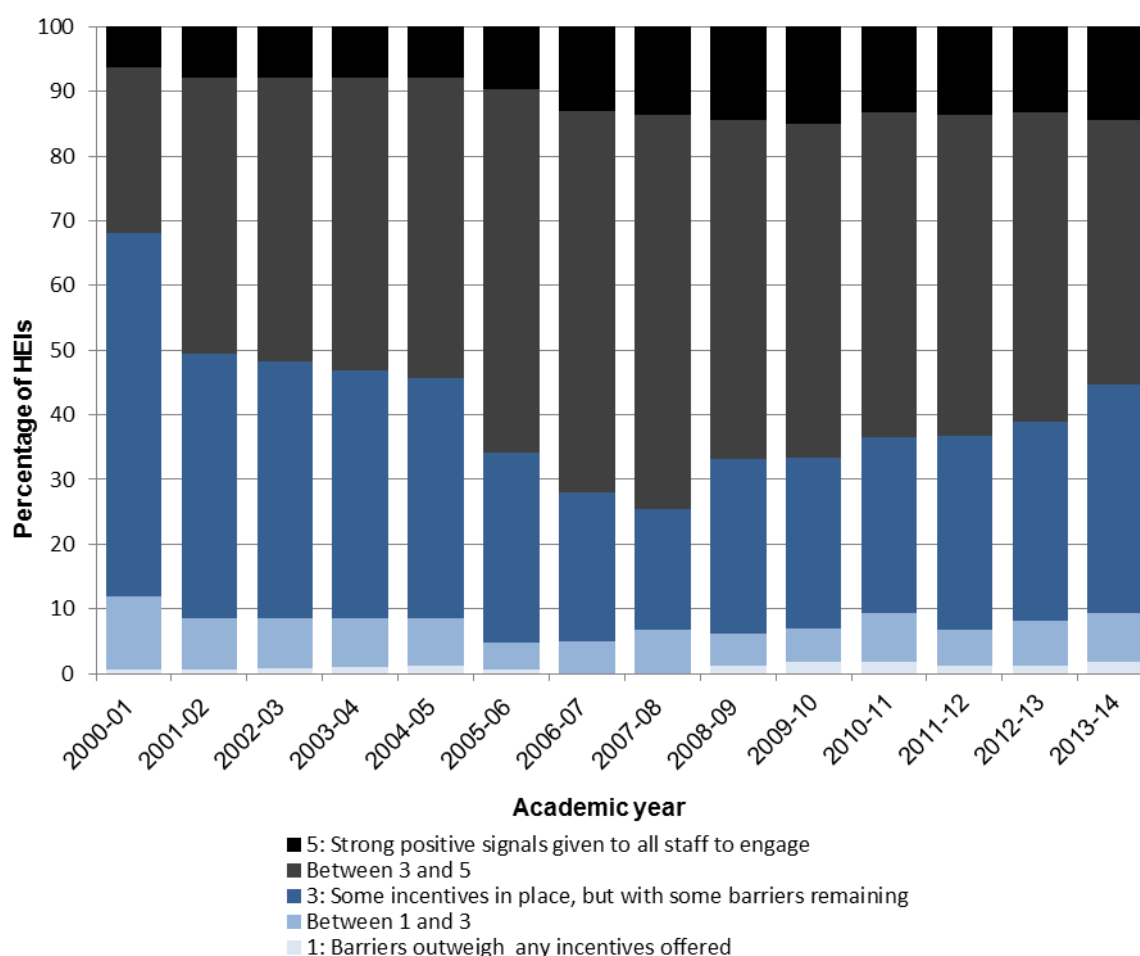
Activity	% of UK HEIs
Research collaboration with industry	43%
Knowledge exchange	40%
Widening participation and access	39%
Supporting small and medium size enterprises (SMEs)	33%
Meeting national skills needs	30%
Meeting regional skills needs	22%

<sup>8</sup> The full questionnaires are available at [https://www.hesa.ac.uk/index.php?option=com\\_studrec&Itemid=232&mnl=13031](https://www.hesa.ac.uk/index.php?option=com_studrec&Itemid=232&mnl=13031).

<sup>9</sup> Further information is available in ‘Changes to the HE-BCI Survey Part A’, available at [https://www.hesa.ac.uk/index.php?option=com\\_studrec&Itemid=232&mnl=13031](https://www.hesa.ac.uk/index.php?option=com_studrec&Itemid=232&mnl=13031) under ‘Guidance for Higher Education – Business Community Interaction (HE-BCI) Survey Part A’.

Developing local partnerships	21%
Attracting non-local students to the region	16%
Graduate retention in local region	14%
Commercialisation (for instance spin-off activity or licensing)	9%
Helping with student and graduate enterprises	7%
Support for community development	7%
Provision of incubator support	7%
Management development	6%
Attracting inward investment to region	4%
Facilitating networks	1%

**Figure 4 Incentives for staff to engage with business and the community, 2000 to 2014**



Source: HE-BCI Part A Question 7 (data for 2002-03 and 2003-04 are assumed – see paragraph 32).

39. Figure 4 shows how HEIs rate the level of incentive for staff to engage with business and the community, assessing themselves against a five-point scale where '1' represents barriers outweighing incentives and '5' suggests strong incentives in place.

40. The numbers of HEIs reporting strong staff incentives to engage with external partners have increased slightly by 2 per cent from the previous year. There has been an increase since 2011-12 in the proportion choosing option 3, that there are some incentives in place but with some barriers remaining. However, a decline in the number selecting option 4 means that, overall, 57 per cent of HEIs report more incentives than barriers, which is a reduction of 5 per cent from the previous years' figures.

41. A five-point benchmark assesses the extent to which business support strategy is embedded within HEIs. The data for 2013-14 shows a decrease, with 38 per cent responding that their strategic plan is developed and implemented as a result of an inclusive process across the HEI, in comparison with last year's figure of 43 per cent. However, the question used in previous years has been amended, and now asks HEIs to reflect on whether a strategic plan has been 'developed and implemented as result of an inclusive process' across the whole HEI. This might be expected to result in a lower overall score than previous years. In another five-point scale used to indicate the strategy for public and community engagement 34 per cent of HEIs selected the highest category, a figure which has increased by 3 per cent from the previous year.

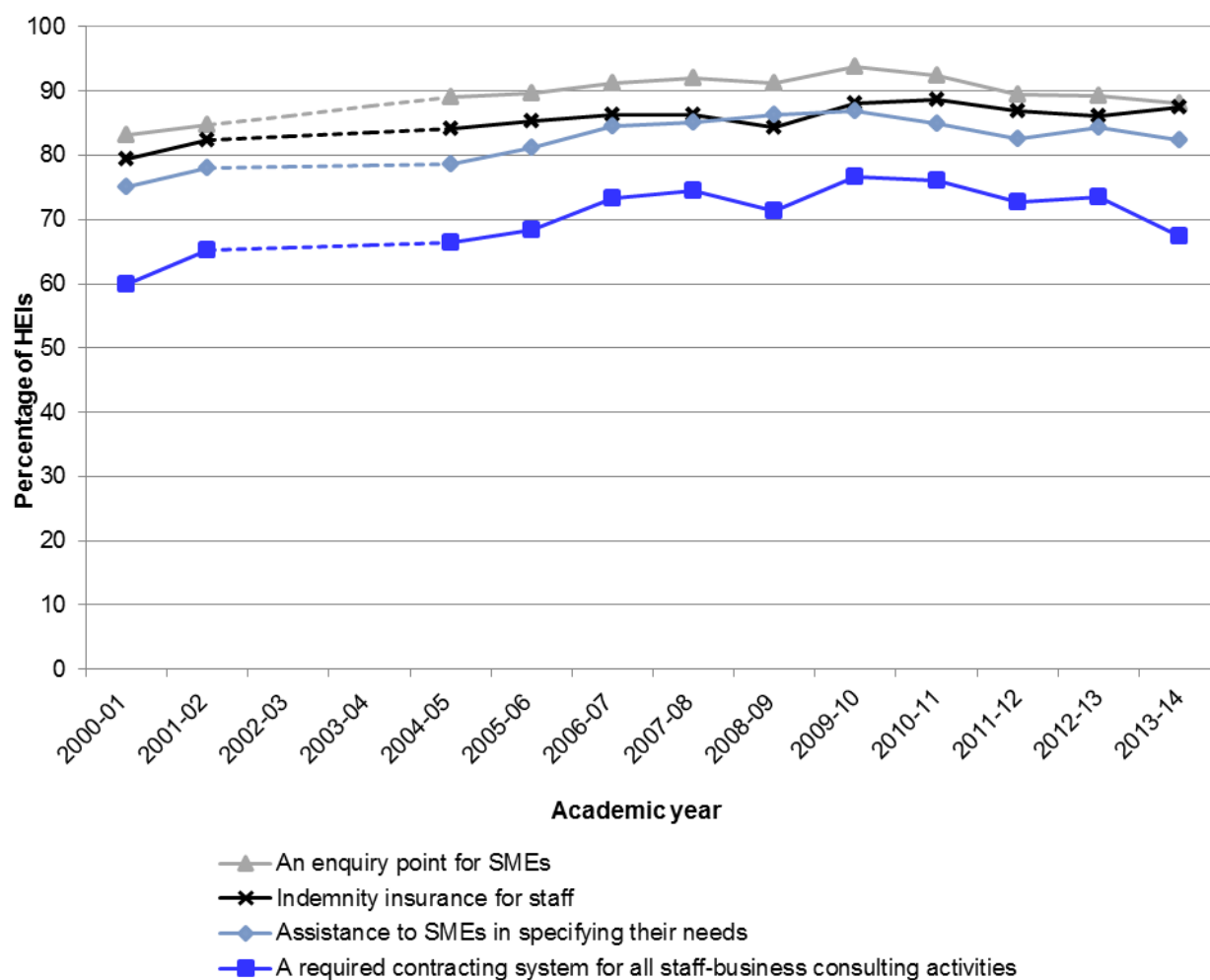
42. Figure 5 shows some changes in infrastructure indicators, with three of the indicators declining from the figures recorded last year. There has been some slight increase in HEIs providing indemnity insurance for staff (to protect both people and institutions in the event of legal or contractual dispute). The continued decline of a 'required contracting system for staff-business consulting activities' is likely to represent development and diversity of practice rather than retrograde steps, but further investigation will be needed to determine what is driving this.

43. Not all HEIs have a sufficient 'pipeline' of technology to warrant a dedicated unit or specialist staff (such as IP lawyers) to commercialise research, although some employ private-sector intermediaries. The question was updated for 2013-14, so may not be directly compared with previous data (note that HEIs may select more than one option).

44. Table 3 shows the internal mechanism: how HEIs identify IP with economic and social potential. Table 4 is the mechanism used to collaborate with external parties to exploiting the IP.



**Figure 5 Selected infrastructure indicators, 2000 to 14**



Source: HE-BCI Part A Question 11 (data for 2002-03 and 2003-04 are assumed – see paragraph 32).

**Table 3 How HEIs identify and protect IP**

	UK	England	Northern Ireland	Scotland	Wales
HEI files IPR in house (including HEI shared or collaborative action)	38%	38%	25%	39%	38%
HEI outsources filing on IPR (to a non-HE organisation)	64%	63%	50%	61%	100%
HEI takes other IP protection action	52%	54%	50%	33%	50%

Note: 'IPR' = 'intellectual property rights'.

**Table 4 How HEIs identify commercial opportunities for protected IP**

	UK	England	Northern Ireland	Scotland	Wales
No action taken	<b>15%</b>	16%	50%	6%	0%
Yes, external agency	<b>10%</b>	11%	0%	0%	25%
Yes, in-house capability	<b>43%</b>	39%	25%	67%	63%
Yes, in-house capability and external agency	<b>32%</b>	34%	25%	28%	13%

Source for Tables 2 and 3: HE-BCI 2013-14 Part A.

45. The data suggests that external parties are used most in identifying potential IP (64 per cent of UK HEIs) (Table 3), while 'in-house' is the most common response in terms of finding the right partner for the IP (Table 4). The data is relatively consistent across UK nations. However, both tables show that HEIs may have more than one route available for both parts of the process, which seems reasonable given the diversity of types of, and potential partners for, IP.

### **Research-based interactions**

46. Research-based interactions cover a very wide spectrum of activities, from collaborative research (perhaps the most distant from the market) through to the commercialisation of ideas and the establishment of new companies (close to the market). Many organisations that operate partnerships with HEIs note that direct engagement in collaborative research is particularly valuable for sparking new ideas and approaches.

#### **Collaborative research**

47. Although income from IP is a useful measure of an HEI's strategy in commercialising its research, collaborative research may be more useful for understanding the value of long-term relationships between HEIs and their partners in business and the wider community. Collaborative research as defined in HE-BCI is academic research which has public sponsorship and at least one other external partner. It is undertaken with partners such as research organisations, private business, other HEIs, government or the third sector, and includes at least one other non-academic organisation. The fruits of the research are assumed to be shared among all partners.

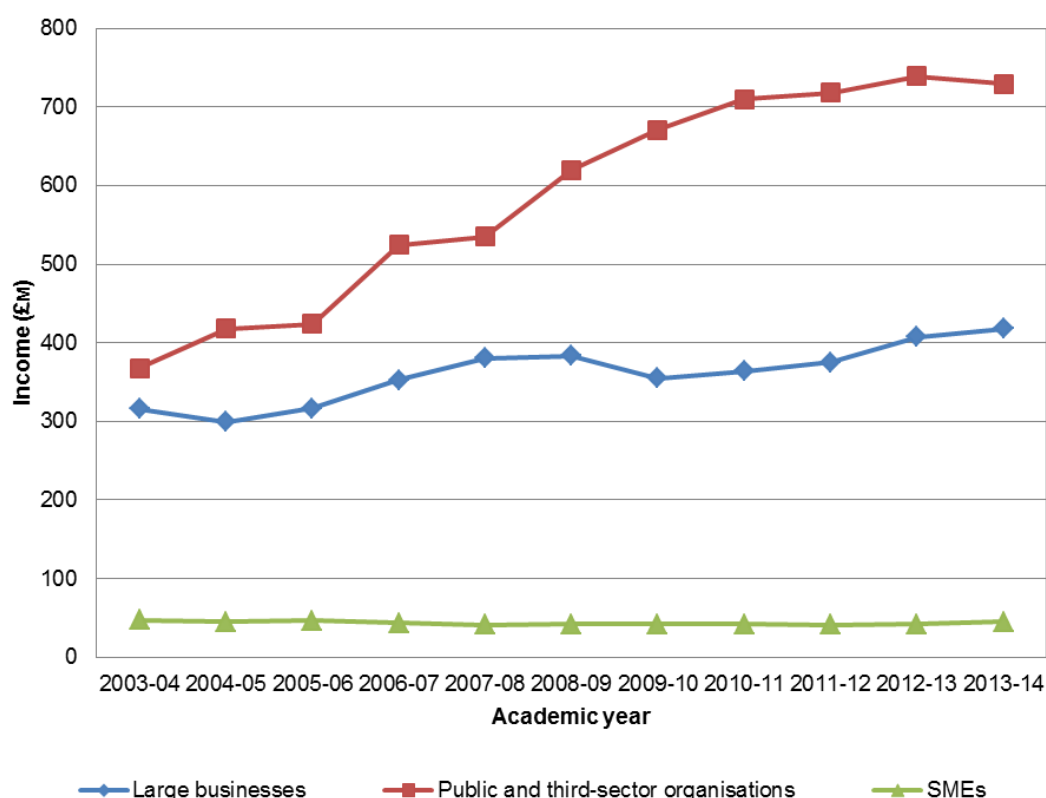
48. Collaborative research is often multidisciplinary and individual to the context of a particular project and its partners. To complement other sources of data (such as industrial research income as collected in the main HESA finance record), the HE-BCI survey examines only a subset of collaborative research. Income should be recorded only where the activity has a defined aim and there is input from at least three parties: the HEI, a public funder and one or more external partners. To measure the most complete proxy for the value of the collaborative research, HEIs provide figures on the public contribution (in money) and both money and in-kind contributions from the external partner.

49. The total reported income for collaborative research rose by 20.3 per cent last year, from £951 million to £1,144 million. The majority of the increase (76.2 per cent ) is attributed to public funding, with the remainder attributed to collaborative cash and in-kind contributions. Increases were seen across all public funders. The majority of the increase came from public funders, with a 37.3 per cent rise in reported Department for Business, Innovation and Skills Research Council income, 19.9 per cent from other UK government departments, and 7.3 per cent from European Union Government. Support in kind from external partners also increased by 29.5 per cent. The increase in cash from external partners was smaller in value and percentage terms than in-kind contributions.

### Contract research

50. Contract research, usually where a specific question is being researched, is a simpler transaction where the benefit is assumed to be primarily to the external partner, in contrast with the mutual gains obtained by collaborative research. Total income from contract research rose by 2.3 per cent to £1.192 billion in 2013-14. Spending by large business increased by 4.7 per cent (to £418 million) and income from SMEs by 9.8 per cent (to £45 million), which is a further encouraging sign of economic growth. However, income from public and third-sector partners (which remains the largest share by a margin) increased by only 0.5 per cent to £729 million<sup>10</sup>. Figure 6 shows how contract research income has varied over time.

**Figure 6 Contract research income, 2003 to 2014 (real terms)**



Source: HE-BCI Part B Table 1.

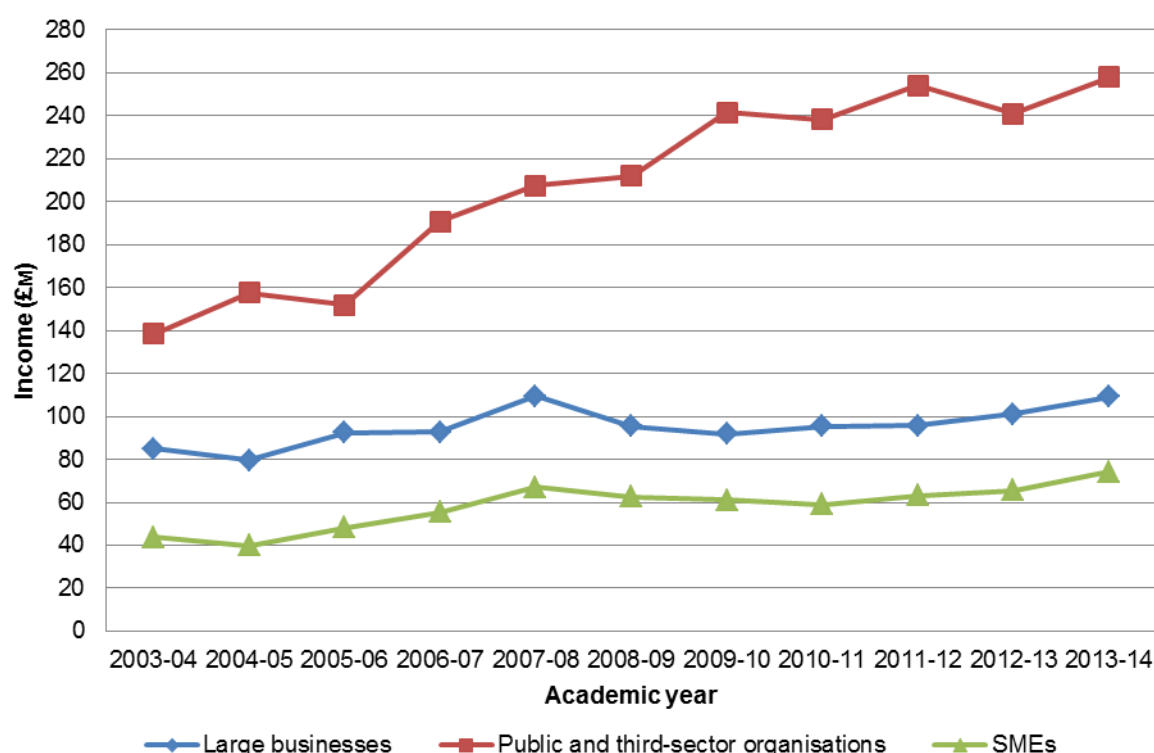
<sup>10</sup> This takes into account a correction made to data from 2011-12 by a Scottish HEI.

## Consultancy

51. Consultancy agreements deliver expert advice and intellectual input to assist a client in analysing a particular issue ('the innovative application of existing knowledge'). In this survey, HEIs' innovative application of existing knowledge on behalf of an outside party is defined as 'consultancy'; this, rather than more formal research, may be the preferred method to access expert advice and less tangible knowledge. The knowledge itself may not be new, but it can often inform more immediate innovation. Indeed, this may be a source of 'open innovation' practice, where IP rights are less important than the usefulness of the knowledge to a particular situation or problem.

52. HEI income from consultancy grew from £400 million in 2012-13 to £441 million in 2013-14. The largest proportional increase was from SMEs, which spent 15.7 per cent more on HE consultancy – from £64 million in 2012-13 to £74 million in 2013-14. Income from large businesses increased by 10.0 per cent to £109 million, while non-commercial partners increased investment by 9.2 per cent to £258 million. Figure 7 shows consultancy income from 2003 to 2014.

**Figure 7 Consultancy income, 2003 to 2014 (real terms)**



Source: HE-BCI Part B Table 2a.

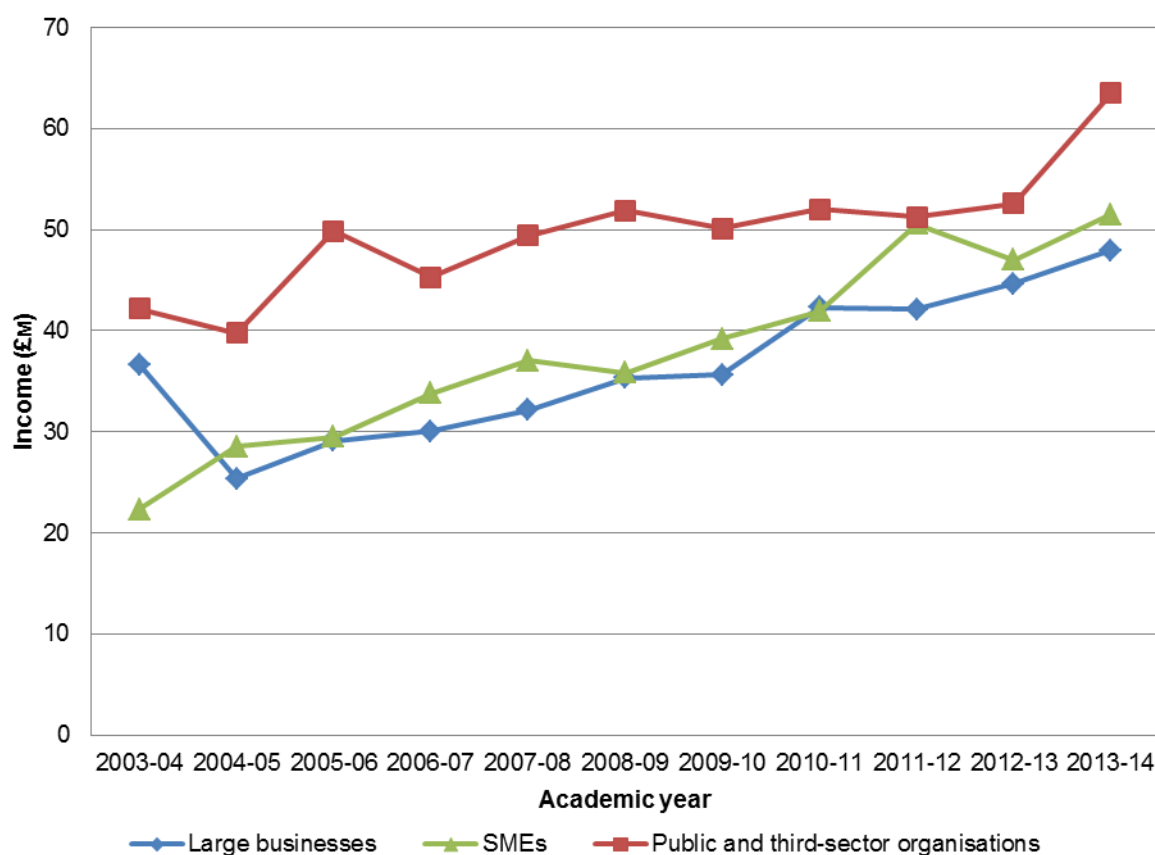
## Facilities and equipment

53. HEIs' specialist equipment and facilities, such as 3D printing, digital media suites and biomechanical consultancy, support their teaching and research. There are many benefits from providing access to these resources for partners, including building income

and relationships. The external partner benefits and gains access to facilities that they may not have the resources to secure in-house.

54. Overall, income from facilities and equipment saw growth of 15.1 per cent, from £142 million to £163 million in 2013-14. Public and third-sector partners' spending increased by 23.1 per cent from £52 million to £63 million. Increases were reported by a range of HEIs rather than a small number of outliers, and evidence suggests a combination of increased public sector engagement (with the NHS for example), with improvements to data systems. Spending by large businesses and SMEs showed much improved growth rates, of 9.5 per cent and 11.6 per cent respectively. Figure 8 shows facilities and equipment income values between 2003-04 and 2013-14.

**Figure 8 Facilities and equipment, 2003 to 2014 (real terms)**



Source: HE-BCI Part B Table 2b.

## Intellectual property and enterprise

55. The translation of research outcomes into products and services can be a long process, and further time is then required for the technology to prove itself in the marketplace. Once the HEI has acquired formal intellectual property rights – through patents, copyright, design registration or (more rarely) trademarks – it is common either to license the innovation to an existing company or to set up a new ('spin-off') company, which will likely take more time to generate significant financial returns.

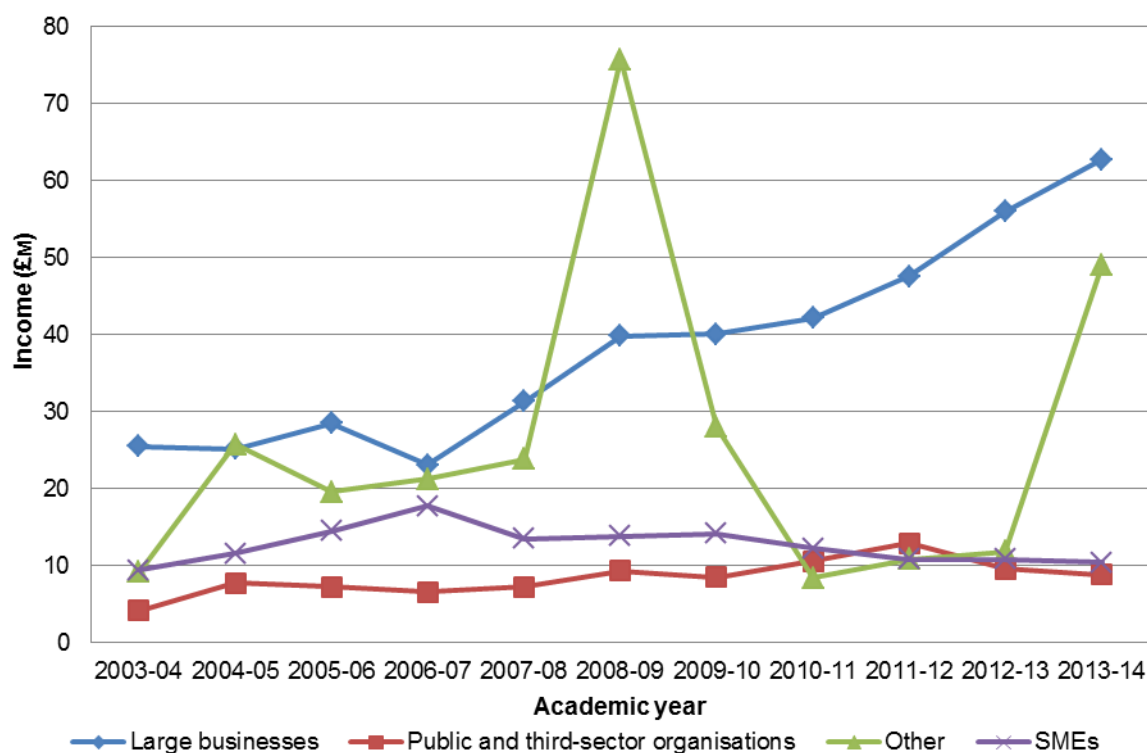
56. When a new company is set up, the HEI may choose to own it outright, retain a proportion of the stock, or float it all. The HE-BCI survey measures the income from the sale of shares in such companies. Hence, to gain a complete picture of the return from an HEI's IP rights one should always consider both the licensing and spin-off routes.

57. The timescales associated with the formal commercialisation of IP rights are especially long for fields linked to medicine or defence. A small number of outliers were responsible for a significant proportion of the reported external investment received for staff start-ups and sale of shares in spin-offs.

58. There has been a significant increase of 51.3 per cent in IP income, from £87 million to £131 million in 2013-14. When we look at the income from licensing only (thus excluding the sale of spin-off companies) there was an increase from £75 million to £82 million in 2013-14 – a rise of 9.4 per cent. Data is collected separately for software and non-software licences because the former typically have shorter life-spans and lower values (though this does not mean they are less important). This is because incremental improvements to software can be made far more readily than, say, changes to the engine of a passenger jet.

59. There are noticeable differences in the income by partner and type of licence. Large business spending on licences increased significantly, from £55 million to £63 million in 2013-14 (14.3 per cent). Public and third-sector spending decreased by 6.1 per cent, and income from SMEs fell by 1.9 per cent. Figure 9 shows income from intellectual property between 2003-04 and 2013-14 by partner type.

**Figure 9 Income from intellectual property, 2003 to 2014 (real terms)**



Source: HE-BCI Part B Table 4c.

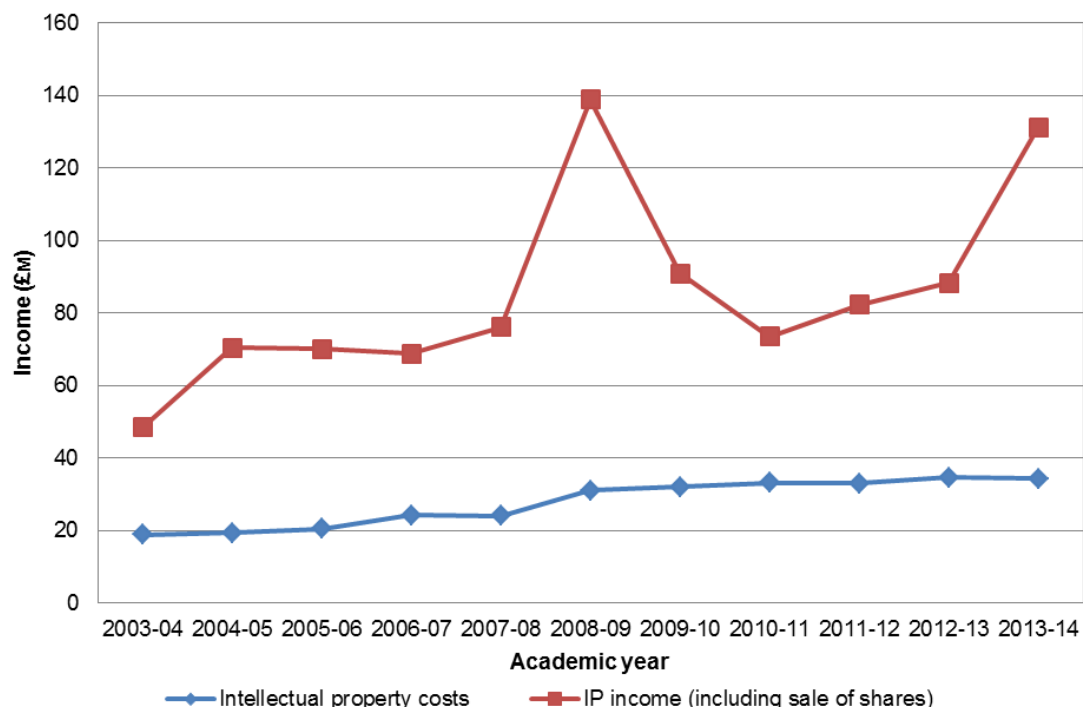
60. Income from non-software licences grew by 12.3 per cent, from £59 million in 2011-12 to £66 million in 2013-14, with growth coming from large business income.

61. Software licences and 'Other' are much smaller categories than non-software licences. Software licences saw an income growth of 1.1 per cent, from £6.68 million to £6.75 million in 2013-14, with all growth from the large business sector. Given the complex nature of IP there are activities where income is received without a licence being in place, referred to simply as 'other' IP income; this indicator fell by 2.5 per cent to £9.2 million in 2013-14. Sale of shares in spin-off companies quadrupled to £49 million in 2013-14. This total figure incorporates two substantial investments made in spin-offs from one HEI. A similar peak in income to that experienced in 2008-09 appears in Figures 9 and 10.

62. Data for 2013-14 saw IP protection costs increase marginally from £33.9 million to £34.2 million. These costs include formal fees for patents and associated staff costs (of, for example, patent lawyers).

63. As illustrated in Figure 10, the sector as a whole received more than three times as much income from licensing and spin-off equity as it spent on IP protection. The majority of HEIs report that income exceeds expenditure, although there remain 27.0 per cent of HEIs in 2013-14 spending more on protection. The UK performs favourably against other nations where data is available (more information at Annex B).

**Figure 10 Income and expenditure on intellectual property, 2003 to 2014 (real terms)**



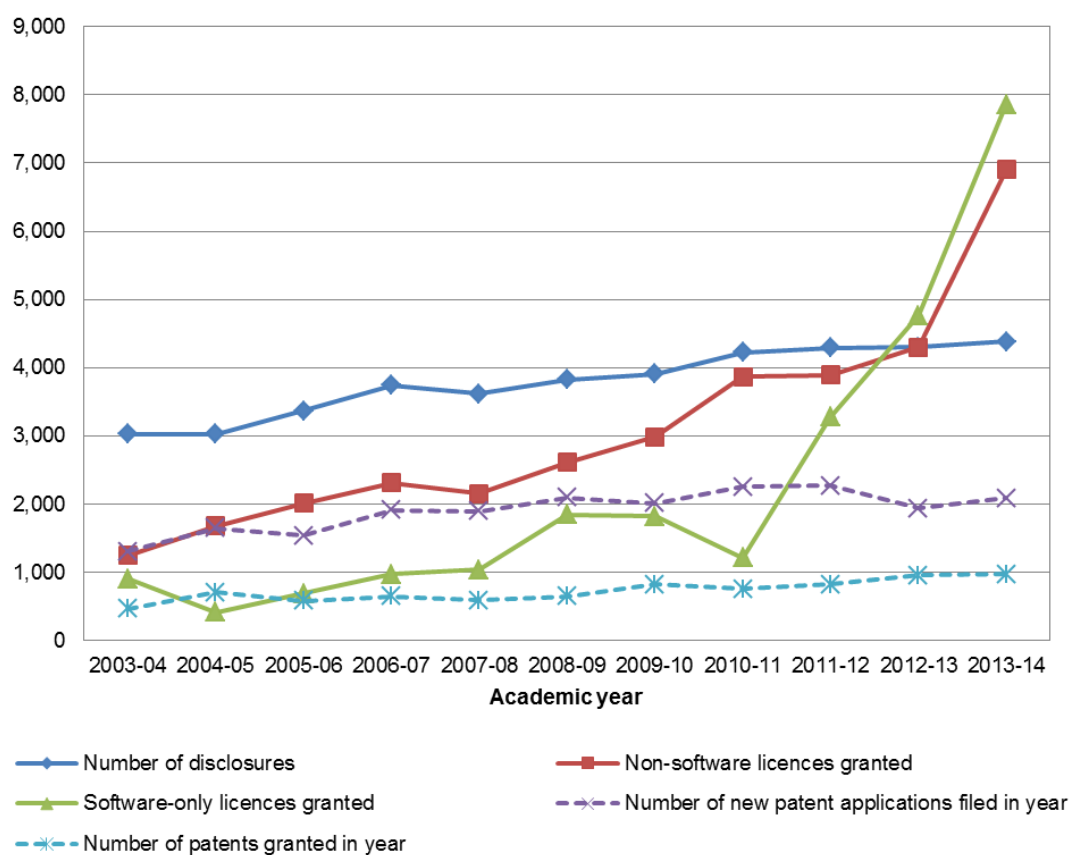
Source: HE-BCI Part B Table 4c

64. There was a 2.2 per cent increase in the number of patents granted, from 955 to 976 in 2013-14. This was lower than the equivalent rise of 15.6 per cent recorded last year, and was as expected following the fall in patent applications recorded last year. Patent data should be viewed over a longer time series because of the time lag between applications and grants. Patent applications have increased by 7.4 per cent, from 1,942 in 2012-13 to 2,086 in 2013-14. Since 2003-04 (Figure 11), HEIs have seen more disclosures from their staff that have translated into patent applications, and higher numbers of active patents. Patent applications recorded in 2013-14 were roughly double the number of patents granted during the same year.

65. Growth in the number of non-software licences granted has risen by 60.6 per cent for 2013-14, while the number of software licences has also increased by 64.8 per cent.

66. The value of software licence income from SMEs has fallen by 28.4 per cent, while the number of software licences with SMEs has increased by 0.7 per cent. Non-software licences with large businesses have increased by 0.6 per cent, while income in this category has increased by 15.7 per cent. The number of non-software licences for public and third-sector organisations has increased by 184.1 per cent, but these have fallen in value by 7.1 per cent. These trends may be skewed by a small number of HEIs which report a large volume of activity.

**Figure 11 Disclosures and patent numbers, 2003 to 2014**



Source: HE-BCI Part B Tables 4a and 4b.

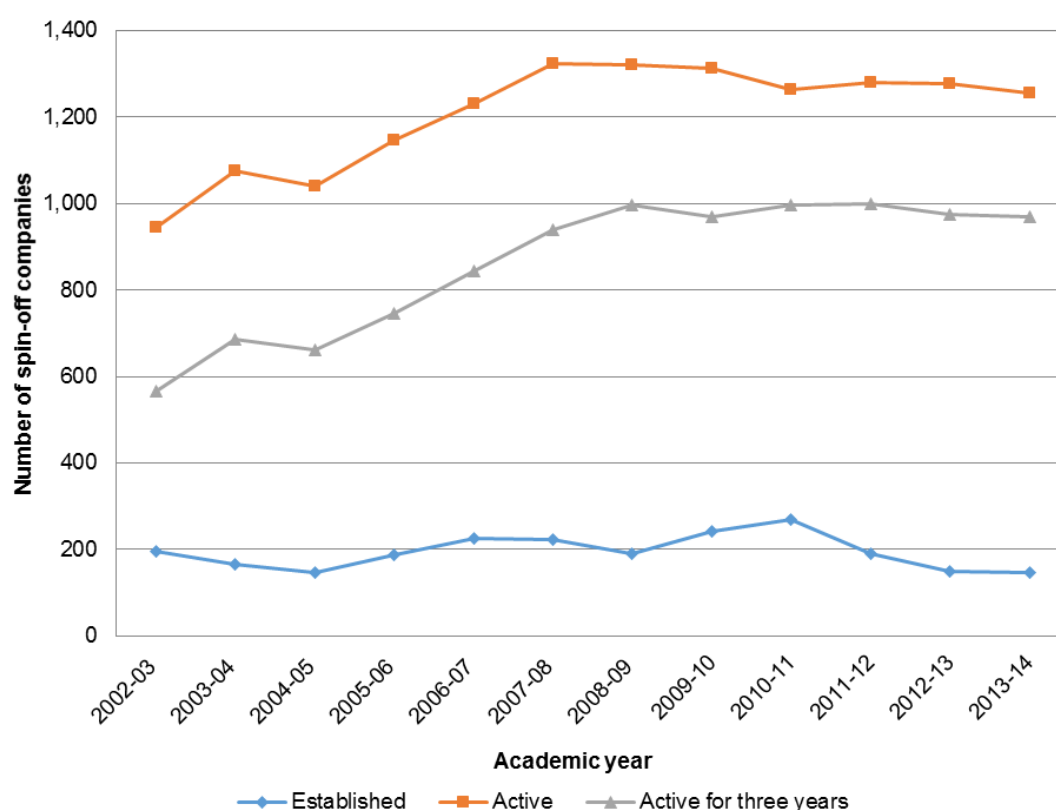


67. The diversity of practice in how numbers of licence are recorded makes analysis problematic: for example, the invention of a computer operating system may be considered a single piece of IP (most likely copyright), while, in fact, users are required to buy one licence for each machine that runs the system. Both methods are valid, and the HE-BCI guidance will be updated in future to provide greater clarity.

68. The HE-BCI survey collects data on formal spin-off companies based on IP where the HEI maintains some ownership, and those that are sold outright. For total spin-off numbers these two datasets are summed (see Figure 12). The licensing of new inventions to an established company is usually the most efficient way of exploiting IP, but in some contexts, such as a lack of suitable clients, creating a spin-off company is the best choice. Spin-offs are unlikely ever to be the most popular option for exploiting IP, but for some particularly promising ideas they can be the best way to maximise impact and value for the HEI and for the economy more broadly.

69. Data from 2013-14 continued to show a decline in the number of new spin-off companies, from 150 in 2012-13 to 147 in 2013-14; this represents a 2.0 per cent drop. The number of spin-off companies surviving three or more years fell, from 975 to 970 active firms in 2013-14, which is a slower decline than recorded last year. However, the decline of the last two cycles seems to be levelling out in 2013-14 (caution is always suggested, as commercialisation cycles are in general much longer than 12 months).

**Figure 12 Spin-off companies formed, 2003 to 2014**



Source: HE-BCI Part B Table 4d

70. Staff start-up companies are businesses set up by HEI staff. They are distinct from spin-off companies as they are not specifically based on IP emerging from an HEI, and may not even be directly related to the academics' areas of expertise (although most certainly are). The number of start-up companies set up by HEI staff increased by 9.7 per cent in 2013-14 from 62 to 68. Those surviving three or more years increased by 3.0 per cent, from 298 in 2012-13 to 307 in 2013-14 across the UK.

71. Data on company formation is likely to be incomplete, so must be treated with caution. HEIs have developed new systems and improved existing systems to record such data, but income to businesses is not as efficient a proxy of knowledge exchange as income to HEIs. Estimates of the turnover of formal spin-offs and their staffing fell in 2013-14, by 52.1 per cent and 28.2 per cent respectively. This fall resulted, in part, from continuing businesses no longer utilising a number of outliers' specific licensed IP.

72. Graduate start-ups are defined as companies formed within two years of graduation, which may or may not be IP-based and include various types of enterprise including commercial and social enterprises. The number of start-ups increased by 31.4 per cent, from 3,502 in 2012-13 to 4,603 in 2013-14, and the number surviving three or more years rose by 18.4 per cent.

73. Reported staff levels and turnover for graduate start-ups increased last year by 19.1 per cent and 26.1 per cent respectively. Data on graduate start-ups is difficult for HEIs to track effectively because it is only available when volunteered.

74. Recent years have also seen a greater interest, especially among graduates, in social enterprises (organisations that apply commercial strategies to maximise improvements in human and environmental well-being, rather than profits for external shareholders). From 2013-14, HE-BCI is collecting specific data on social enterprises. Although there were concerns that the introduction of this category could lead to an apparent reduction in the number of start-ups from students and staff, as social enterprises would have been counted within those categories in previous years, a decrease in these indicators has not been observed in 2013-14. A number of outliers contributed significant proportions of the estimated figures for the current turnover of all active social enterprise firms, and for the external investment received by social enterprise spin-offs. New data always requires extra caution.

### **Social, community and cultural activities**

75. The HE-BCI survey also collects data on public events run by HEIs. These illustrate the wide-ranging civic, community and cultural contributions that HEIs make, though they describe only a small part of that range.

76. The HE-BCI survey looks at the commitment made by HEIs to public and community engagement by counting attendees at public events, such as dance, drama, other performances, film and public lectures. Attendance levels are an imperfect proxy for the range of activity that engages the public. Data for 2013-14 shows substantial changes since the previous year<sup>11</sup>.

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<sup>11</sup> Such data is very difficult to collect consistently across the sector, because it encompasses a broad range of activities and is not directly used in funding.

77. Attendance at public events has declined, with a fall in attendee numbers of 41.9 per cent at free events and 29.1 per cent at chargeable events. This fall can be largely attributed to a small number of outliers responsible for returning a sizeable portion of the activity recorded under this heading experiencing a significant fall in their volume of recordable activity this year.

78. The number of attendees at free public lectures increased by 2.0 per cent. An increase for free performance arts events of 793.7 per cent was attributable in great part to a substantial increase in the figures recorded for a single institution which played a leading role in a series of international events. A substantial decrease of 43.9 per cent in the number of attendees at 'other' free events (which include TV and radio broadcasts, YouTube, iTunes and virtual learning environments) can be attributed in great part to a reduction in broadcast audiences for one HEI that returns a significant portion of the total figure for this indicator.

79. To illustrate the scale of HEIs' commitment to social, community and cultural activities: if we assume a consultancy rate for academics of £500 per day, the value of the total academic time devoted to public events is over £57 million.

## **Regeneration**

80. Regeneration funding is an important way for HEIs to invest intellectual assets in economic, physical and socially beneficial projects. Projects often link to other activities, such as matched funding for SMEs to access consultancy or CPD. There are also larger, more transformative programmes such as the Local Growth Fund and European Structural Investment Funds, where HEIs act as anchors for local economic development and regeneration.

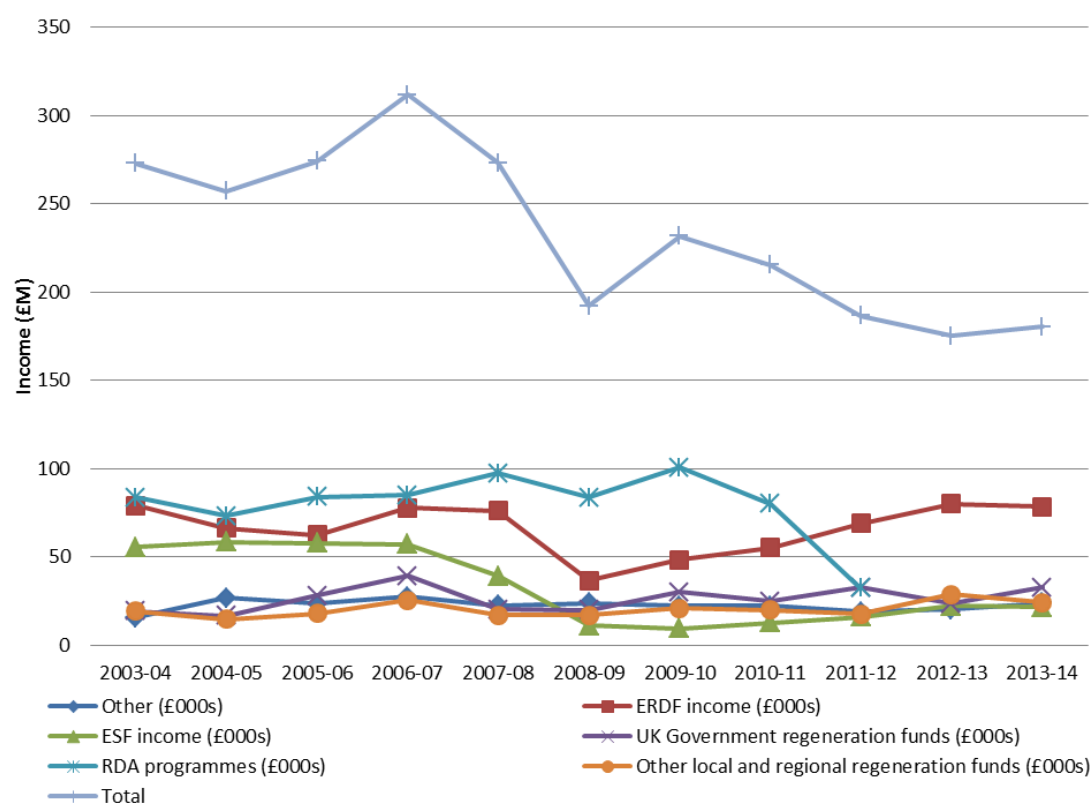
81. Regeneration activity covers a wide range of interactions, from urban renewal to community development. HEIs are involved in a variety of such initiatives, including large-scale European structural regeneration projects, as well as providing targeted support to recently redundant individuals and employability advice and training to graduates.

82. Total income from regeneration activity as reported by HEIs increased by 5.0 per cent, from £172 million to £181 million in 2013-14. This included a rise of 40.3 per cent in UK government regeneration funds, from £23.3 million to £32.7 million in 2013-14.

83. This compensated in part for falls in income from other sources. Small falls in the level of ERDF and ESF income were recorded, of 0.5 per cent and 1.4 per cent respectively; these falls were lower than last year. Other local and regional regeneration funds fell by 15.1 per cent. It is likely this indicator will rise again when the next tranche of European Structural and Investment Funds begins to flow from 2014-15. Overall regeneration funding remains at a lower level than that recorded in 2010-11.

84. Table 5 shows how HEIs deploy regeneration funding (more than one option may be selected). In general, research and teaching facilities benefit, many of which then promote the HEIs external engagement. These activities further support the position of HEIs as regional 'anchors' for social and economic benefit. For example, HEIs are often central to relatively large capital projects which provide opportunities for further interaction with partners in the locality and beyond.

**Figure 13 Regeneration income, 2003 to 2014 (real terms)**



Note: 'RDA' = 'Regional Development Agency'. Source: HE-BCI Part B Table 3.

**Table 5 Benefits from regeneration funding programmes**

Activity	England	Northern Ireland	Scotland	Wales
Adding and improving capability for				
- research (resource)	44%	25%	72%	88%
- teaching and learning (resource)	36%	0%	44%	38%
New and additional funds for				
- research capital (buildings)	21%	25%	28%	50%
- research capital (equipment)	19%	50%	33%	50%
- teaching capital (buildings)	9%	0%	0%	13%
- teaching capital (equipment)	2%	0%	6%	0%
Not engaged in any regeneration programmes	37%	50%	17%	0%
Strengthening and facilitating links with the non-academic community	56%	50%	67%	63%

## Continuing professional development

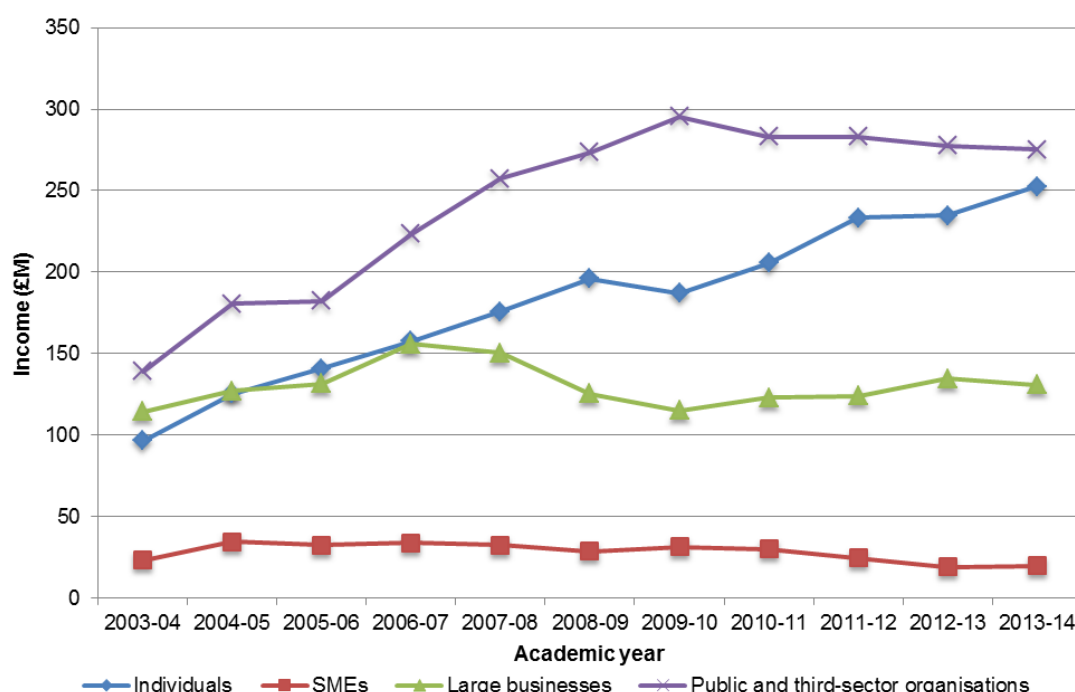
85. CPD is an important engagement activity for HEIs. Some CPD courses are relatively formal, enabling students to retain a licence to practise or gain membership of a professional, statutory or regulatory body; other CPD is more task-focused, for instance selecting particular modules from an MBA course to develop a specific business

resource. CPD provision may or may not contribute to course credits, and may lead towards a named award and a qualification.

86. It is, however, very difficult for HEIs to collect complete, accurate data on the potential impact of CPD, given that any module may contain a range of learners including students who are aiming for course credit and those who are not.

87. CPD is paid for by a variety of sources including employers and the students themselves. (Individuals may sign up for education courses and be reimbursed later by their employer – a fact that may not be apparent to the HEI – while sole traders may not see the distinction between employer and self-funding as relevant.) Since disaggregating this data would be overly burdensome, data is also returned for individuals in continuing education. It is, however, assumed that much of this education is of benefit to the wider economy.

**Figure 14 CPD and continuing education income, 2003 to 2014 (real terms)**



Source: HE-BCI Part B Table 2c.

88. Recorded income from CPD rose from £653 million to £678 million in 2013-14, a 3.8 per cent rise. Within this amount, there are significant differences in spending between types of partner, with income from large businesses falling by 0.8 per cent and income from SMEs experiencing a rise of 4.8 per cent from £19 million to £20 million. In addition, continuing education and CPD for individuals experienced a rise of 9.7 per cent, from £230 million to £253 million in 2013-14.

89. Overall demand for part-time study at undergraduate and postgraduate level has declined significantly since 2010-11, which may be due to rising fees and challenging economic conditions for individuals. The HEFCE report 'Higher education in England

2014: Analysis of latest shifts and trends' (HEFCE 2014/08) provides further analysis of the decline in overall part-time numbers.

90. Total 'learner days' of CPD and continuing education (which, it should be noted, are difficult to calculate accurately) were recorded at 3.8 million in 2013-14, representing a 4.6 per cent increase from the previous year.

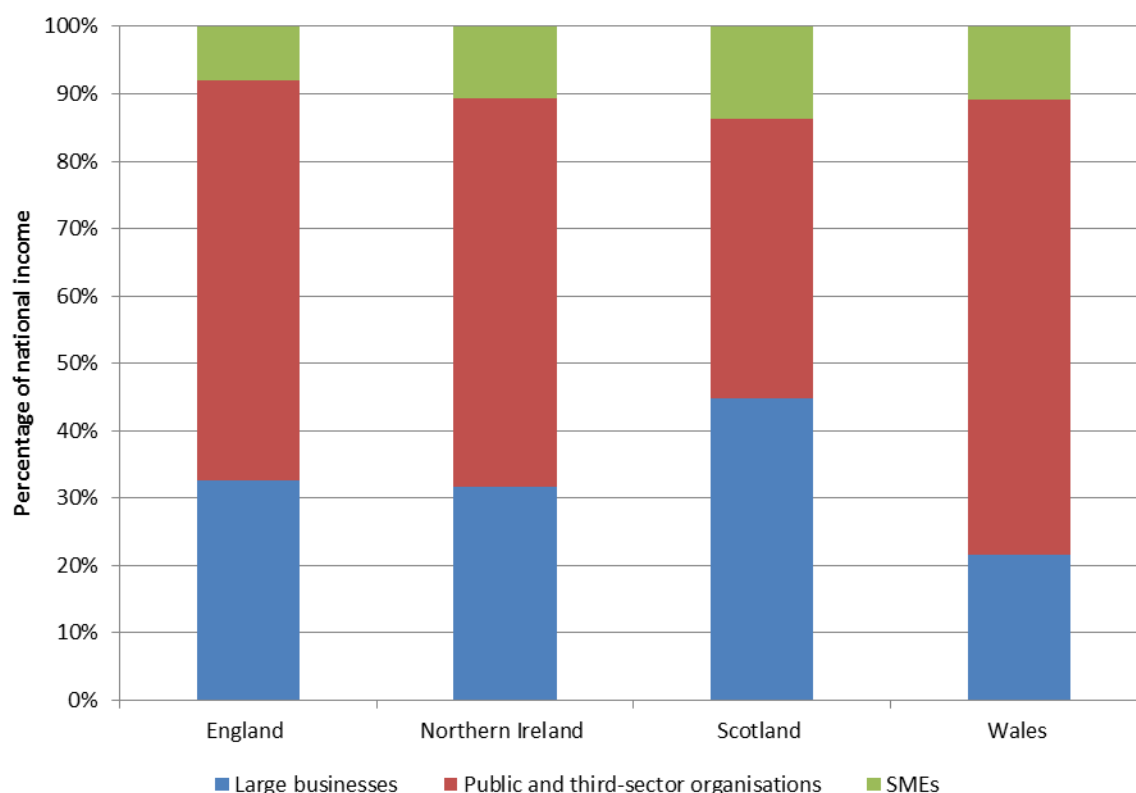
## Annex A: Summary data by UK, England, Scotland, Wales and Northern Ireland

1. Data on the constituent UK nations can be accessed as a separate Excel file alongside this publication at [www.hefce.ac.uk/pubs/year/2015/201513/](http://www.hefce.ac.uk/pubs/year/2015/201513/).
2. Data recorded in these annexes for 2012-13 is as originally reported. Restated data is not included in these documents.

### Comparisons between UK nations

3. Overall income from activities and partners is broadly comparable between the four UK nations, as shown in Figures 15 and 16. Data for selected indicators is displayed as a proportion of income for the higher education institutions (HEIs) in those nations, so as not to reflect relative economic size.

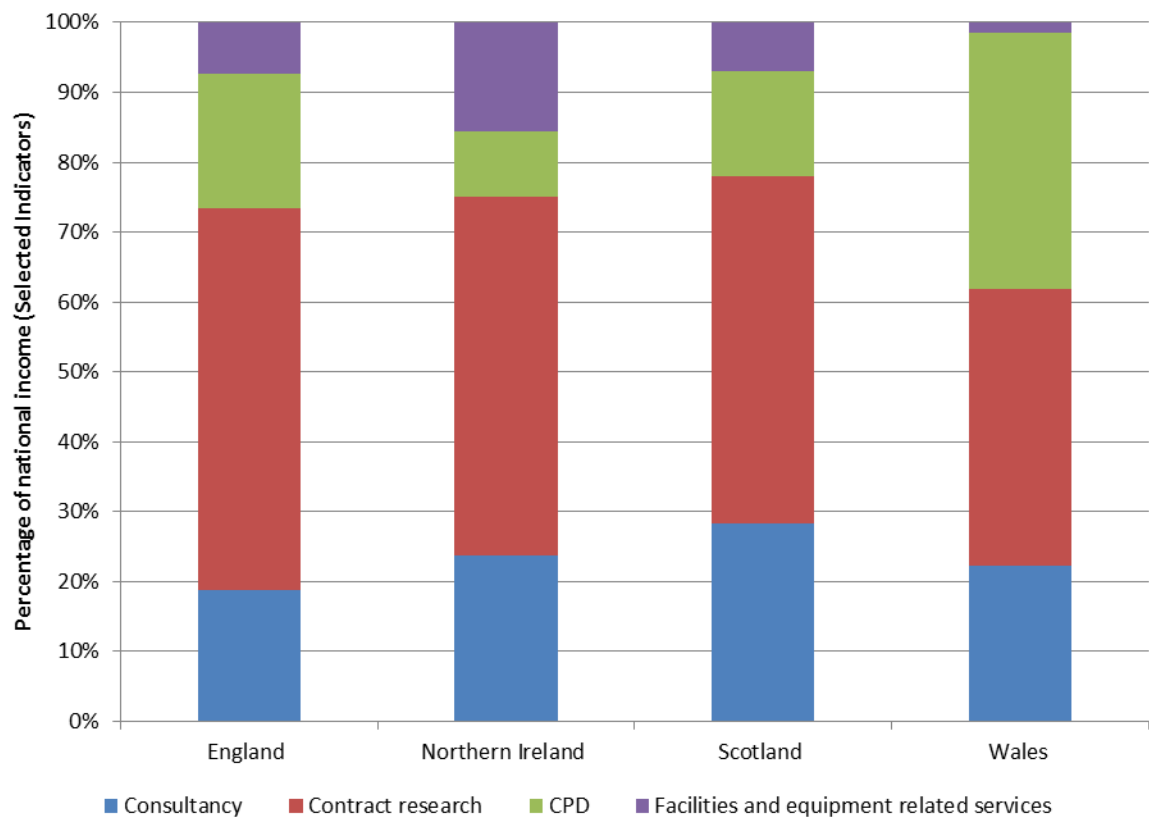
**Figure 15 Income across UK nations**



Note: 'SMEs' = 'small and medium-sized enterprises'. Source: HE-BCI Part B Tables 1 and 2.

4. Figure 15 shows relative proportions of income by partner. The income from selected activities is roughly similar, although Scotland shows a higher proportion of income from both large business and SMEs than the other nations.
5. Figure 16 the results are again broadly similar, although it can be seen that HEIs in Wales receive relatively more income from continuing professional development and less from facilities, while the reverse is seen for Northern Ireland.

**Figure 16 Income from contract research, consultancy, facilities and equipment and CPD by partner across UK nations**



Note: 'CPD' = 'continuing professional development'. Source: HE-BCI Part B Tables 1 and 2.



## **Annex B: IP-related international comparisons**

1. As in previous years we have compared the Higher Education – Business and Community Interaction (HE-BCI) survey data with the Association of University Technology Managers (AUTM) Licensing Survey. For 2013-14, individualised institutional data is available for US universities and we have aggregated this data in our comparisons.
2. We have also received data from the University Network for Innovation and Technology Transfer (UNITT) in Japan for 2013.
3. Comparing raw data may not be useful in itself because this does not consider the different size of higher education (HE) sectors in each country; any useful benchmark must take this factor into account. For this reason some form of scale normalisation is needed to allow a valid comparison. In previous HE-BCI surveys we have used research income and expenditure as the most appropriate proxy for scale, because this information is available for institutions, and is clearly linked to the value of available resources. Benchmarking is also difficult because definitions used may vary between the two surveys.
4. Further, UK data under HE-BCI is collected by an official body, the Higher Education Statistics Agency (HESA), and undergoes more comprehensive validation than that from the US and Japan which is submitted to sector-representative bodies.
5. With the caveats above in mind, the data suggests that the UK performs well compared with both the USA and Japan. The UK produces a similar number of spin-off companies per resource to the USA, and both produce substantially more than Japanese universities (despite the latter having a very high rate of patenting per resource).
6. US universities do produce relatively more licences (referred to as intellectual property (IP) income) than the UK, although both are apparently far ahead of Japan. This is arguably a more immediate form of knowledge exchange than spin-off companies. The UK receives the greatest proportion of research income from industry.
7. As noted above, further work to benchmark and normalise this data may be of use, but the clear picture is one of the UK being globally competitive in terms of commercialising knowledge.

**Table A Commercialisation activity in higher education institutions in 2013-14 for the US, UK and Japan**

	<b>US AUTM</b>	<b>UK HE-BCI survey</b>	<b>Japan UNITT</b>
Total research resource (£M)	35,722	7,043	14,715
IP income including sales of shares in spin-offs (£M)	1,290	131	18
IP income as percentage of total research resource	3.6%	1.9%	0.12%
Spin-off companies formed	747	147	18
Research resource per spin-off (£M)	48	48	817
Patents granted	5,163	976	4,776
Research resource per patent (£M)	7	7	3.1
Industrial contribution (£M)	2,330	508	64
% industrial research	6.5%	7.2%	0.4%
US cashed-in equity and UK sale of spin-off shares (£M)	20	49	3.6
(Cashed-in equity and sale of spin-off shares) as a % total research resource	0.06%	0.7%	0.02%

### **Guide to Table A data**

8. Some caution must be taken when comparing the three sets of data, because the US AUTM survey, Japanese UNITT and UK HE-BCI survey are not identical, and use differing definitions and accounting periods because they have differing purposes and scope.

9. The total number of UK HEI spin-off companies in Table A is derived from the HE-BCI survey, including those companies with some HEI ownership and those that use HE-generated IP as a basis for their operation.

10. UK HEIs are free to use their total block grant funds from funding councils for teaching or research as they feel appropriate. Since full details of spending from the block grant are not collected, it is assumed in this calculation that all of the research block grant funds and other research income is spent on research. Data is taken from HESA Finance Statistics Return 2013-14, Table 6b: Income analysed by source. This income is taken as the available resource for UK HEIs.

11. The number of start-up companies formed is divided by the total research resource. The start-up companies defined in the AUTM survey are those dependent on

institutions' technology for initiation, and so are equivalent to those spin-off companies recorded in the UK's HE-BCI surveys. Research expenditure is taken over the 2013 fiscal year and is taken as being the available resource for US universities.

12. The US AUTM survey allows for confidential returns; these have been excluded as the impact of their exclusion is small and has a minimal impact on the ratio figures of IP income as a percentage of research expenditure and the spin-offs formed per £ million of research expenditure.

13. The UNITT survey loosely mirrors the AUTM process.

14. For the UK, HESA data on research income from industry, commerce and public corporations from UK and overseas sources is used to give the industrial contribution. For US and Japanese universities, expenditure from industry is used.

15. Income from cashed-in equity is recorded in the AUTM and UNITT surveys and is assumed to be broadly equivalent to the income from the sale of shares in spin-off companies collected in the UK HE-BCI survey.

16. The exchange rate used is the annual average spot exchange rate for 2013-14 UK academic year (August to July) from the Bank of England: \$1.61 to £1 and ¥ 165.2 to £1.

## List of abbreviations

<b>AUTM</b>	Association of University Technology Managers (USA)
<b>CE</b>	Continuing education
<b>CPD</b>	Continuing professional development
<b>ERDF</b>	European Regional Development Fund
<b>ESF</b>	European Social Fund
<b>GDP</b>	Gross domestic product
<b>HE</b>	Higher education
<b>HE-BCI</b>	Higher Education – Business and Community Interaction survey
<b>HEFCE</b>	Higher Education Funding Council for England
<b>HEI</b>	Higher education institution
<b>HEIDI</b>	Higher Education Information Database for Institutions
<b>HESA</b>	Higher Education Statistics Agency
<b>IP</b>	Intellectual property
<b>IPR</b>	Intellectual property rights
<b>KE</b>	Knowledge exchange
<b>LEP</b>	Local enterprise partnership
<b>RDA</b>	Regional Development Agency
<b>SME</b>	Small or medium-sized enterprise
<b>UNITT</b>	University Network for Innovation and Technology Transfer (Japan)