



# **Lambert Review of Business-University Collaboration**

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**Summary of Consultation Responses  
and Emerging Issues**

July 2003



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# INTRODUCTION

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**1.1** The Government asked me to examine how the long-term links between British business and universities could be strengthened to the benefit of the British economy. The context for the review was a sense that the UK performs well in terms of the academic quality of its science and technology base, but is not as good at commercialising the knowledge generated in its universities<sup>1</sup> as some other countries – notably the USA.

**1.2** The full terms of reference for the review are to:

- identify the benefits to business of greater interaction with higher education, how this can be promoted and how any barriers holding back business demand for universities’ knowledge and skills outputs can be addressed;
- examine the national, regional and local economic impacts of business-university interactions, including how Regional Development Agencies (RDAs) and Sector Skills Councils can best support such interactions;
- assess the lessons to be learned from business-university interaction across a range of countries and from best practice across the UK;
- analyse how business employers can better communicate their skills requirements to a responsive university sector and how they can improve the attractiveness of career paths to graduates and postgraduates, especially in technology; and
- examine the effectiveness of measures such as the Research and Development (R&D) tax credits on business demand for research and skills.

**1.3** In addition, the Government White Paper, *The Future of Higher Education*<sup>2</sup>, announced that the review would ask business for its views on the present governance, management and leadership arrangements of higher education institutions and their effectiveness in supporting good research and knowledge transfer and providing relevant skills for the economy.

## CONSULTATION

**1.4** I wrote to around 500 higher education, business and intermediary organisations seeking their views on current best practice in business-university collaboration, barriers to greater collaboration and some specific issues relating to skills and funding.

**1.5** The consultation process has now closed. The review team received around three hundred written responses – split roughly equally between business, university and intermediary organisations, such as the RDAs and professional bodies. We have also

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<sup>1</sup> Throughout the paper the term “universities” is used as a shorthand for all higher education institutes

<sup>2</sup> *The Future of Higher Education*, Department for Education and Skills, January 2003

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undertaken well over a hundred interviews, both in the UK and abroad, in countries as diverse as the USA, Japan, Finland, Australia and Germany. We are extremely grateful to all those who have contributed to the review.

**1.6** This paper aims to summarise the main themes that have emerged from the consultation process. We are not seeking further contributions to the review or specific responses to this paper. The review team will contact individual organisations to seek advice on specific issues that have been raised and will submit the final report, with recommendations, to the Government in October. The final report will include case studies of good practice and examples of excellence.

### EMERGING THEMES

**1.7** The consultation process has highlighted the growing amount of collaboration underway in the UK between the higher education sector and businesses. These collaborations include personal contacts and staff exchanges; business support and consultancy; collaborative and contract research; and the establishment of joint ventures, licensing agreements and spinout companies. One representative organisation said in its response, *“In our view, business interaction with higher education is more widespread and firmly based in the UK than in most other countries in the world.”*

**1.8** However, the review highlights some important issues for public policy. While the research output of British universities compares favourably with that of many other developed countries, relatively few British companies and companies based in Britain are research-led. A number of those businesses which once had big research activities have run into difficulties, leaving an even greater concentration than before on the pharmaceutical and defence/aerospace sectors.

**1.9** At the same time, companies around the world are increasingly outsourcing their R&D activities so that the role of universities in economic development everywhere is becoming more important. Given the UK’s relatively weak starting point in business R&D, the question is whether and how Government should respond to this trend.

### BUSINESS

**1.10** The overall record of both business and government R&D investment in the UK is poor compared to other G7 countries. The UK ranks fifth in the G7 in terms of the share of national income invested in R&D and below the average for all OECD countries. UK businesses perform less than half the R&D per worker of the US, Japan and Germany. It has been estimated that around a quarter of the UK’s productivity gap with the US and a sixth of the gap with France can be attributed to differences in expenditure on R&D.<sup>3</sup>

**1.11** In the UK the most R&D intensive industries are pharmaceuticals, aerospace, transport equipment and communications equipment. Apart from these industries there are relatively few research intensive ones. Furthermore, within these sectors the R&D is concentrated amongst relatively few firms.

**1.12** The low research intensity of businesses located in the UK means that overall demand from businesses for the knowledge generated within universities is weak. It is estimated that only around 16% of UK businesses use information from the higher

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<sup>3</sup> *A perspective on UK productivity performance*, Crafts and O’Mahoney, Fiscal Studies, 2001

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education sector to help with innovation.<sup>4</sup>

### BENEFITS TO BUSINESS

**1.13** It is clear from the consultation responses and from other data that the benefits to businesses that do engage with universities are significant, and that the importance of these relationships is likely to grow in the future. The US experience demonstrates that universities have a vital role to play in driving growth in a modern economy.

**1.14** Benefits cited by business in consultation responses varied greatly by sector and by the size of the company, but included access to:

- a supply of skilled graduates and postgraduates for recruitment;
- highly skilled scientists and researchers;
- the latest research and cutting-edge technology;
- international networks of academics; and
- continuing professional development for staff and management.

**1.15** A number of respondents noted the importance of building partnerships between universities and new high growth sectors such as the creative and media industries in addition to the more traditional manufacturing and research-intensive sectors. The consultation showed that there are some interesting collaborations in these sectors with universities but also that some of the companies involved feel that their sectors are not well served by the DTI's business support activities.

### BARRIERS IDENTIFIED BY BUSINESS

**1.16** A number of business respondents commented that universities still had some deficiencies in terms of customer service, project management and delivering to agreed timescales and deadlines. The CBI's survey of 200 of its largest companies suggested that 50% of those who responded saw deficiencies in customer service as the biggest problem that they had encountered in dealing with universities.

**1.17** The difficulty of finding out "who does what" within universities was also a recurring theme in responses. A number of large multi-national companies noted that over time they had built up relationships with individual academics – but they commented on the difficulties of maintaining those links if those individuals moved on, and recognised the significant challenges that a small or medium sized company (SME) would face in navigating these complex institutions.

**1.18** A number of businesses reported that some universities had become too aggressive in their valuation of, and negotiations over, intellectual property (IP). We were told of deals that business had walked away from and that universities underestimated the significant investment required from industry to translate a brilliant idea or technology into a real world product or process. For their part, universities reported that business had become accustomed to receiving university intellectual

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<sup>4</sup> UK Community Innovation Survey, Department for Trade and Industry, 2001

property for free in the past and therefore had unrealistic expectations.

**1.19** A number of business respondents noted that academics had much greater incentives to publish academic research that could be submitted to research assessment exercise (RAE)<sup>5</sup> panels than to undertake joint research with industry. It was felt that the RAE acted as a significant barrier to greater collaboration with industry. Some businesses also reported that a multi-disciplinary approach was needed to meet their research needs – yet many of the funding streams available for university research projects were not sufficiently organised in this way. Businesses also commented on the lack of an effective mechanism for industry and universities to identify future skill requirements and to influence course design.

**1.20** Finally a number of businesses who had entered into strategic partnerships requiring significant investments commented that some universities' management and governance structures needed to be modernised to enable them to take calculated risks, to behave in a more entrepreneurial and outward looking fashion and to make strategic decisions in a timely way.

### BUSINESS PROPOSALS TO ENCOURAGE COLLABORATION

**1.21** The Government supports technological innovation through investment in the science base, investment in knowledge transfer and the R&D tax credits. The review was asked to examine the effectiveness of the R&D tax credits on business demand for research and skills. A number of respondents from both business and universities welcomed the introduction of the tax credits but said that it was too early to tell whether they would have any positive effect on business collaboration with universities. A number of respondents have called for an extension to the scope of tax credits for university research.

**1.22** Business representative organisations have made suggestions for other incentives to encourage business to collaborate with universities. The Council for Industry and Higher Education proposed a tax credit to encourage employers to increase the number of student work placements. The CBI proposed a searchable national database of areas of research excellence across the UK. The review will consider these and other proposals to encourage more businesses to engage with universities.

### UNIVERSITIES

**1.23** It is clear from our work so far that many universities have recognised their wider economic role in addition to their core missions of teaching and research. Government funding – the so-called third stream funding – has encouraged universities to build the capacity required to disseminate knowledge to the wider community and has helped to generate a marked culture change. The role of universities in their local economies has changed significantly over the last decade – with many of them emerging as major economic forces in their region. Overall the review team has been impressed by the efforts that many universities are making to disseminate knowledge and by their increasing willingness to collaborate and share ideas with the business sector.

**1.24** As identified in the recent higher education white paper, universities have different missions and objectives and some have given a higher priority to knowledge

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<sup>5</sup> The RAE is the metric of university research quality, which is one of the key determinants for the allocation of research funding from the higher education funding bodies.

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transfer than others. Performance at knowledge transfer is patchy – some institutions are first-rate whilst others are less impressive.

### BENEFITS TO THE UNIVERSITY

**1.25** It is clear from the extent of collaborations reported by the universities that they perceive value in collaborating with business. The benefits vary from university to university. They include:

- an enhanced role in regional and national economic development;
- funding which is not earmarked for specific purposes;
- access to research funding;
- access to challenging real world problems and the satisfaction of seeing good ideas brought to the marketplace;
- access to new facilities/ research centres and to sophisticated equipment; and
- incentives to help recruit, reward and retain faculty members.

### BARRIERS IDENTIFIED BY THE UNIVERSITIES

**1.26** University respondents identified a number of barriers to greater collaboration. A number of institutions commented that some business, charity and government departments were unwilling to pay for the overheads of research projects. Respondents noted that some businesses felt that, having paid their taxes, there was no reason why business should pay for research overheads. One university respondent said, *“The university has worked hard to ensure that industrially-funded research is properly costed. However, industry is generally unwilling to pay the full economic costs of research, on the inappropriate assumption that quality related funding is available to fund these costs.”*

**1.27** A large number of universities identified the significant difficulties and costs that they face in trying to reach out to SMEs.

**1.28** Lengthy and complex negotiations over IP ownership and valuation were identified as a barrier by many universities. Some felt that industry had got a good deal in the past when universities tended to undervalue their IP, and that as a result some businesses had unrealistic expectations about the fair valuation of IP.

**1.29** Universities commented that changes in business strategies could make partnership difficult. We were told of cases where courses had been designed to suit a business’s requirements, and had then been made redundant when the business changed direction. Changes in strategy or boardroom leadership can also undermine partnerships. It is clear that successful collaborations take much more than an initial agreement between the vice-chancellor and the chief executive: they require hard work and consistent management by both sides.

**1.30** Finally many university respondents, whilst welcoming the infrastructure that the third stream funding has encouraged, felt that there was a real problem with the short-

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term and uncertain nature of the funding which left them unable to make long-term strategic plans and made it difficult to retain high quality knowledge transfer staff.

**1.31** The rest of this paper reports on the issues that were raised by consultation respondents in greater detail and identifies the six main areas where the review team intends to conduct further work:

- Knowledge Transfer;
- Intellectual Property and Technology Transfer;
- Funding and Incentives;
- Management and Governance;
- Skills; and
- Regional Issues.

# 2 KNOWLEDGE TRANSFER

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## INTRODUCTION

**2.1** Knowledge transfer is the term used for the transfer of knowledge between universities and industry in either direction. This chapter reports the respondents' views on "softer" aspects of knowledge transfer – such as informal networks, staff exchanges, university reach out activity and collaborative research or joint ventures. The next chapter deals with the "harder" edge of commercialisation activity such as licensing or spinout activity, where university research or technologies are formally transferred to the market.

## PERSONAL INTERACTIONS

**2.2** Many responses commented on the importance of personal interactions in transferring knowledge between the two sectors. A number of respondents noted that knowledge transfer is increasingly a non-linear process involving many players – including not just members of the university and business community but also involving students, business angels, venture capitalists, RDAs, trade organisations and other networks. These connections are important in enabling knowledge transfer and many universities are increasingly involved in organising conferences and seminar events to bring these groups together.

## STAFF SECONDMENTS

**2.3** A few respondents reported university staff seconded into industry or vice versa – but generally this form of collaboration was not widespread. A large number of respondents commented that greater movement of staff between industry and academia would be an effective way to promote knowledge transfer.

## SPONSORED CHAIRS AND STUDENTS

**2.4** Some businesses reported sponsoring professorial chairs or individual undergraduate or postgraduate students.

## UNIVERSITY REACH OUT ACTIVITY

**2.5** Most university respondents said that reaching out to their local businesses and the wider community was part of their mission. The degree of importance attached to this activity as compared to research and teaching varies from institution to institution.

**2.6** Some businesses highlighted the difficulties that they face in trying to access the right people within an institution or to find out what research, consultancy or other business support work was available to them. A number of universities have put in place "one-stop-shop" industrial liaison offices – single first ports of call that businesses can access if they require advice on whom to contact within a university. Where they had experienced this approach, businesses generally saw this as a positive development.

## 2 KNOWLEDGE TRANSFER

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**2.7** Many universities commented on the difficulties and associated costs of reaching out to SMEs. It was felt that such companies were unlikely to come to universities of their own accord either because they had no points of contact or because they were faced with short-term business pressures. A number of universities emphasised the need for continued government funding for reach out activity because a large proportion of the benefits accrue outside of the university.

### COLLABORATIVE AND CONTRACT RESEARCH

**2.8** Many businesses and universities reported extensive collaborative research projects, often through the LINK or European Framework Programme 6<sup>1</sup>. A continued unwillingness from some funders of research to fund overhead costs was the main issue raised by universities in relation to collaborative and contract research. This issue is dealt with in greater detail in the funding and incentives chapters.

**2.9** University and business respondents both stressed the need to identify and agree at the outset of any collaborative or contract research projects the assignment of any subsequent IP rights that might arise from the research.

**2.10** A number of university respondents commented on the importance for universities to have clear policies for managing conflicts of interest in relation to externally sponsored research.

**2.11** In general it was felt that the process for applying for European Framework Programme 6 funds was extremely bureaucratic. LINK was generally perceived in a more positive light.

### CONSULTANCY WORK

**2.12** There has been an increase in the amount of consultancy work undertaken by universities on behalf of business. Universities reported that academic consultancy work could lead to larger collaborative or contract research agreements with business.

### JOINT VENTURES

**2.13** The review highlighted a trend amongst large multinational companies away from relationships with many universities towards more strategic and long-term relationships with fewer institutions. Most of the universities involved in these strategic partnerships felt that they were beneficial because they provided stable, longer-term funding and enabled researchers to work on challenging problems often alongside industry researchers, with access to industry's latest technology and equipment.

**2.14** Businesses involved in these partnerships generally felt that they offered greater value than the previous more ad hoc arrangements. One business respondent noted that long-term partnerships, *"Have proved substantially and demonstrably more effective than the company's previous approach of a more ad hoc less focussed approach to*

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<sup>1</sup> LINK is one of the Government's knowledge transfer schemes to promote collaborative research projects between universities and business. The European Framework Programme 6 is the European Community Programme for Research, Technological Development and Demonstration, which provides funding for collaborative cross-border research involving business and universities in the EU.

*relationships with academia.”*

### **EMERGING ISSUES**

The review will consider the following issues:

- encouraging more SMEs to engage with universities on knowledge transfer activities;
- encouraging non collaborating medium sized businesses to collaborate with universities where they could benefit significantly from knowledge transfer; and
- what more universities can do to reach out to businesses in general, and SMEs in particular.

# 3 TECHNOLOGY TRANSFER AND INTELLECTUAL PROPERTY

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**3.1** Technology transfer is the formal commercialisation of intellectual property (IP) developed in university research, through selling or licensing to industry or creating new spinouts<sup>1</sup>. The need to build on and improve the existing processes for technology transfer in universities and industry was a strong theme in the responses. Both sectors saw this as important to support higher levels of research collaboration, and increase the economic impact of university research.

**3.2** University control of technology transfer is still relatively new in the UK – most universities did not start commercialisation activities until the mid-1990s. There is clear evidence that over the last five years significant progress has been made in terms of the number of patent applications, licence deals and spinouts formed by universities. But the UK still lags behind the US in many aspects of technology transfer, and the consultation identified a number of barriers that continue to hold back industry involvement, or to frustrate universities' efforts.

## INTELLECTUAL PROPERTY

**3.3** There is widespread agreement that uncertainty about IP ownership is one of the main barriers to effective technology transfer and research collaboration. This particularly applies when industry contributes funding to a university research project. Before either party is willing to commit funds to the collaboration, they need to agree clear terms and conditions for any resulting IP. But both clearly felt that negotiations over ownership rights for IP were made extremely difficult by lack of clarity at the outset. This uncertainty in negotiations had a substantial time and resource cost to all involved, and had reduced the overall level of research collaboration in the UK. One business response said, *"We have been dismayed at the excessive waste of time, imagination and money spent in arguing over the fine details of formal agreements and ownership of IP."*

**3.4** Businesses often argued that universities overvalued their IP, and did not appreciate the development costs involved in bringing IP to market. Some sectors of industry, particularly large established firms from the pharmaceutical and other high-tech sectors, felt strongly that several higher research-intensive universities were being too aggressive in negotiating terms over IP. They suggest that this had jeopardised research collaborations. One business response said, *"We have walked away from some university research contracts in the UK because the demands on IP were both unreasonable and unrealistic."*

**3.5** We have been given conflicting views on the US system for IP ownership. This provided clarity by legislating – in the 1980 Bayh-Dole Act – that US universities own any IP arising from publicly-funded research, even if it was jointly funded by industry. Critics, often from the larger companies, claim that the Bayh-Dole Act has held back

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<sup>1</sup> 'Spinout' refers to a company that was dependent on licensing or assignment of a university's IP for its initiation. Other reports use 'spin-offs', 'start-ups' or 'spin-ins' with slightly different meanings. The review has found that this lack of consistency complicates the use of metrics in this area.

university-industry relations in the US, and argue that businesses are better equipped to manage IP than universities. One business response said, *“Industry regards IP protection as its bread and butter, where most universities have little experience.”* However, other respondents believed that the clarity in the US system had played a big part in building business/university collaboration.

**3.6** Several universities commented that problems over IP ownership and valuation came from unrealistic expectations from businesses. *“Many [UK companies] expect that they can pay under the odds for the research yet acquire ownership of all the results.”* There was some support for a legislative approach from UK universities, and the consultation broadly showed that universities prefer keeping ownership of IP if this is not a barrier to securing research collaborations with industry. This was to ensure both that external stakeholders do not hold back future research and publications and that the IP is actually commercialised.

**3.7** The Patent Office published guidelines<sup>2</sup> on IP management in universities in 2002. These provide strategic advice to universities about how to protect and manage IP, including from industry-funded research. But it is clear from the consultation that ownership and valuation of IP remain a thorny issue and that there is no consensus on whether a legislative approach should be taken. Some responses commented that more use could be made of model contracts or agreements to improve clarity in negotiations, and not all universities were aware of the 2002 guidelines. There is also a lack of clarity in some universities about how revenues from IP are distributed between researchers, departments and the university. Business responses questioned how well universities understood the patent system, and whether features of the system itself held back collaboration.

**3.8** Another more specific issue was raised about IP ownership at the University of Cambridge. Almost all other universities own all the IP arising from publicly-funded research<sup>3</sup>. But at Cambridge, the university only owns IP that is tied to a specific public grant funded project – researchers own anything else arising in the course of their normal duties. Some responses argued that this arrangement helped, and others that it hindered technology transfer. But it also raises a question of public interest: whether individuals should receive all revenues from the results of publicly funded research.

#### LICENSING VERSUS SPINOUTS

**3.9** The number of spinouts in the UK has been increasing rapidly in the last five years, and is now higher than in both the US and Canada, as a proportion of research expenditure. The University Challenge Funds (which provided seedcorn capital for the creation of businesses built around research ideas) were seen as significant drivers of this increase in spinout activity. However, several consultation responses questioned whether the UK was now producing too many spinouts and how many of these companies were sustainable. One response said, *“Current statistics suggest that a very high number of the companies being created will be unsustainable in the long-term.”*

**3.10** Several responses from both sectors argue that the UK should give the same importance to licensing as to spinouts. Spinning out a company costs more, is higher risk, takes longer and involves more people than standard licensing deals, and apart from

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<sup>2</sup> *Managing Intellectual Property - A guide to strategic decision-making in universities*, Patent Office, AURIL, UUK, 2002. This is available online at: <http://www.patent.gov.uk/about/notices/manip>

<sup>3</sup> The only other exception is UMIST, which is currently renegotiating its IP policy in the course of its merger with the University of Manchester.

### 3 TECHNOLOGY TRANSFER AND INTELLECTUAL PROPERTY

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a few exceptional cases it is not clear that the rewards are greater. According to one business response, *“The use of licensing by universities is likely to be a more efficient means of implementing knowledge.”* And a university observed, *“There is probably too much emphasis on spinout at the expense of licensing opportunities.”* Many successful university technology transfer offices in the US, including Columbia, Wisconsin and the Massachusetts Institute Of Technology (MIT), have a much greater focus on licensing than spinouts.

**3.11** The sustainability of existing spinout companies was a common concern. Lack of adequate management skills was seen as one factor. Another was the availability of venture capital. Meetings with venture capitalists indicated that whilst there is no shortage of private equity available, a range of structural and cultural barriers made it unlikely that many firms would invest in early stage university spinouts. Various approaches have been suggested to bridge the gap – ranging from targeted support for proof of concept funding to greater flexibility in third stream funding. A number of universities commented that spinout funding is also affected by EU State Aid rules, which prevent university owned companies from applying for Government funds aimed at promoting technology transfer, e.g. SMART awards.

#### TECHNOLOGY TRANSFER – MISSIONS AND PRACTICE

**3.12** The consultation revealed that many universities see revenue generation as one of the main objectives of technology transfer. This is despite clear evidence from the US that even the most successful universities only earn small sums from such activities<sup>4</sup>, while many do not manage to break even. Several US universities explained that their main goal was to move technology to the private sector, while revenue generation was seen as a secondary objective.

**3.13** Responses also showed that practice differs widely in the internal management of technology transfer in universities. There are different approaches to budgets, with levels that often seem ad hoc, and to legal status. Some commercialisation offices are incorporated companies owned by the university, others are part of the university’s administrative centre, and some are even outsourced to the private sector. While there seems to be no clear optimal model, there is significant variation in quality between the universities.

#### REGIONAL DIMENSION TO TECHNOLOGY TRANSFER

**3.14** Responses showed real differences in the level of commercialisation activity across the university sector. While some universities had large technology transfer offices managing a rapid deal flow, others had fewer specialist employees and more regionally focussed operations. Around 20% of universities had no dedicated technology transfer staff.<sup>5</sup> Several responses suggested that there were economies of scale in building experience and links with industry and venture capital firms, which depended on having a critical mass of research. One response said, *“Many universities do not have sufficient funds or staff expertise to realize the full potential of marketable ideas or products.”* Some RDAs have recognised a role for themselves in meeting this challenge, by supporting technology transfer at a regional level between universities and industry, but performance is still variable.

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<sup>4</sup> For example, MIT only earns around 3% of its revenues from licence income and fees

<sup>5</sup> Source: UNICO-NUBS survey on university commercialisation activities - financial year 2001

### TECHNOLOGY TRANSFER – RECRUITMENT AND TRAINING

**3.15** Many responses saw the shortage of skills in technology transfer offices as a barrier to effective technology transfer. Industry claims it has difficulty finding contacts in the organisation with the right experience. Academics are concerned that technology transfer officers have to cover too broad a range of disciplines, and are not able fully to understand their specific areas of expertise. There was general support for the PRAXIS training course offered by the Cambridge-MIT Institute, but it is not seen as large enough to meet the skills gap by itself. One business said, *“Though there are some bright spots, and we work with some excellent development offices, there is currently a considerable shortage of university people who understand what it takes to run a business.”*

**3.16** The most successful technology transfer offices in the US place strong emphasis on recruiting staff with substantial industry experience, considering the negotiation and deal-making skills learnt in industry the hardest to teach new staff. Responses indicate that the UK is not as successful at recruiting people with industry experience to similar posts.

#### EMERGING ISSUES

The review will consider a number of issues including:

- clarity in intellectual property ownership and valuation; how well current guidelines are understood and adopted; what scope there is for model contracts/agreements; whether the UK should adopt a legislative approach;
- the role of the UK patent system in enabling effective collaborations;
- the balance between licensing and spinouts; the incentives from existing policies to spinout versus licensing, and the likely economic effectiveness in the medium term;
- good practice models of organising a technology transfer office;
- regional technology transfer hubs for the less research-intensive institutions; and
- skills and expertise in technology transfer offices.

# 4 FUNDING AND INCENTIVES

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**4.1** The review asked respondents whether the current university financial arrangements helped or hindered business-university collaboration. Responses focussed on the role of the Research Assessment Exercise (RAE), the distribution of research money, the costs and benefits of conducting research funded by business, the availability and amount of third stream funding, and the effectiveness and coherence of the DTI's schemes to promote knowledge transfer<sup>1</sup>.

## RESEARCH FUNDING

**4.2** The availability of research funding is a critical incentive for academics. While teaching and third stream funding are normally tied to specific uses, academics see research funding as relatively free – resources they can use to pursue their interests. The incentives in the research funding mechanisms are, therefore, crucially important.

**4.3** Responses to the review identified problems with the incentive structure the RAE creates for collaboration with industry. One university cited the example of a department with strong, profitable relationships with industry, which were deliberately sacrificed when the department attempted to improve its RAE score. One business respondent said, *“The metrics used in successive research assessment exercises take very limited account of industrial collaboration; with publication quality and international reputation among peers dominating.”*

**4.4** A substantial amount of research resources are tied to departmental performance in the RAE. The RAE framework flows down to the incentives operating on individual academics and a number of respondents commented that successful collaboration with industry currently plays little part in academics' tenure and promotion and prospects.

**4.5** Against the backdrop of these problems one business response welcomed Sir Gareth Roberts review of the RAE for the UK higher education funding bodies<sup>2</sup> and expressed the hope that, *“The new criteria will encourage and support collaborations with industry and multi-disciplinary, multi-institutional activities and expertise.”*

## CONCENTRATION OF RESEARCH FUNDING

**4.6** Concentration of research resources on the top institutions will reinforce their claim to international excellence. Many responses to the review, notably from the winners under the existing system, have highlighted the strengths of this arrangement and made the case for the *status quo*.

**4.7** Less research-intensive universities, intermediary organisations, and some businesses have argued the opposite case. They have pointed out that successful innovations do not only flow from world-class research departments and argued that

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<sup>1</sup> Distinctive approaches to funding knowledge transfer are already being taken in different parts of the UK. Some comments on the detail of 'third stream' funding regimes may therefore not be applicable in Scotland, Wales or Northern Ireland.

<sup>2</sup> Sir Gareth Roberts RAE review is available at <http://www.rareview.ac.uk/>

research funding could still be concentrated on excellence without being confined to the “golden triangle” of Oxford, Cambridge and London.

### RESEARCH COUNCIL FUNDING

**4.8** Some businesses and universities questioned the progress that the Research Councils have made in promoting collaboration between different disciplines – and between universities and business. Clearly some progress has been made, with collaboration between different Research Councils on basic technology, genomics, and other cross-disciplinary areas. But business responses have pointed out that as an overall proportion of Research Council funding the amount going into multi-disciplinary and emerging areas of research is relatively small, and suggested that there is scope to do more.

**4.9** International comparisons reveal that different structures for distributing research funding – for example a unified research funding organisation or resources earmarked for match funding certain types of research – might be better able to promote multi-disciplinary and collaborative applied, strategic, and basic research.

### INDUSTRY FUNDED RESEARCH

**4.10** Finance from industry for contract or collaborative research has increased over time as a percentage of universities’ total income. Responses to the review have reiterated well-understood problems with the relationship – centred on the recovery of full economic cost for the conduct of research.

**4.11** Business responses ranged from the assertion that, “*We have paid our tax to fund the universities and now they want us to pay again,*” to the suggestion of different charging structures for contract research – where full economic cost is appropriate – and collaborative research – where, “*They should want to do the work anyway,*” and costs should be shared. Following the Transparency Review and development of TRAC<sup>3</sup>, work is now underway on universities’ accounting systems and on the Dual Support mechanism<sup>4</sup> to address these issues.

### THIRD STREAM FUNDING

**4.12** University responses to the review have stated clearly that the third stream funding provided by the Government for knowledge transfer under the umbrella of the Higher Education Innovation Fund and predecessor schemes has been welcome, that it has helped to build capacity, and has brought about a cultural change within the higher education sector.

**4.13** Problems have also been identified. Responses highlighted concern about the short-term nature of commitments, gaps in funding, the total amount of third stream funds available, and the manner in which they are distributed.

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<sup>3</sup> Transparent Approach to Costing, a methodology established in the higher education sector by the Transparency Review to estimate accurately the full economic costs of institutions’ activities.

<sup>4</sup> Dual Support refers to the two main streams of funding for university research, one from the HE funding councils, based on RAE scores, the other from the research councils.

**4.14** A number of university responses commented on problems caused by short-term funding allocations. One frequently cited example was the difficulty of retaining university reach-out staff employed on short-term contracts. One respondent said, *“Unfortunately we tend to lose our [reach-out] staff just as they are becoming valuable to us, because we cannot give them the assurances they need about their future position.”*

**4.15** Gaps in the funding available have also been highlighted. A number of respondents identified a funding gap at the “proof of concept” stage and made various suggestions for bridging the “equity gap” for university spinouts. A number of responses called for an increase in the total amount available for third stream funding. One post-1992 university commented that, *“We receive a few hundred thousand pounds in third stream funding, we are an organisation with thousands of staff and tens of thousands of students – it is going to take a bit more than that to turn heads.”*

**4.16** The manner in which third stream funds are distributed has also been criticised. University respondents have commented on the suggestion that third stream funds for knowledge transfer should be directed to the less research-intensive universities. Many respondents, particularly from research-intensive universities, argued that it is not possible or appropriate to separate the creation of knowledge from the transfer of knowledge.

**4.17** Questions were also asked about the complexity of the different funding streams and the competitive bidding process, originally a powerful driver of cultural change but now, some universities claim, a source of unnecessary costs, uncertainty, and inflexibility. One business respondent said, *“The level of bureaucracy and management activity associated with the utilisation of many funding sources is burdensome to university academics.”* Some have suggested a move towards a formula-based approach for allocating the funds.

**4.18** Universities felt that taken together these problems rendered third stream funding insufficient, unresponsive and unpredictable, making it difficult for universities to adapt to opportunities presented in fast-moving markets, and denying them the chance to realise the potential in innovative ideas.

### DTI SCHEMES

**4.19** The DTI sponsors a number of different schemes whose aim is to promote knowledge transfer. TCS, STEP, LINK, and Faraday Partnerships all exist to support knowledge transfer. DTI business support products are currently subject to review, as part of the DTI's broader review of its activities. In addition, the current DTI Innovation Review is assessing how best the DTI can focus its resources to enable UK business to improve its innovation performance.

**4.20** One message that emerged from the responses was that whilst many of the individual schemes were welcome, taken together the overall picture was extremely complex and that rationalisation and greater coherence would be welcome. Several respondents cited the recent re-branding of the popular and well-known TCS scheme to the Knowledge Transfer Partnership, as an example of an activity that added to confusion without bringing tangible benefits.

### EMERGING ISSUES

The review will consider a number of issues including:

- research funding – support for applied, collaborative, multi-disciplinary research, and the concentration of research funding;
- the incentives created for business-university collaboration by the current mechanisms for assessing and rewarding research quality; and
- third stream funding – are there gaps; how much is ‘enough’; how should it be distributed; is there a case for moving towards a metrics based approach for allocating funds.

# 5 GOVERNANCE, MANAGEMENT AND LEADERSHIP

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**5.1** The Government White Paper, *The Future of Higher Education*, announced that this review would ask business for its views on, “The present governance, management and leadership arrangements of higher education institutions and their effectiveness in supporting good research and knowledge transfer and providing relevant skills for the economy.”

**5.2** In reviewing the governance arrangements at universities, we have divided the sector into three: Oxford and Cambridge, pre-1992 universities and post-1992 universities. Oxford and Cambridge, in particular, have a unique set of issues and will be discussed separately at the end of this chapter.

## GOVERNANCE AND MANAGEMENT

**5.3** Universities have historically been run as communities of scholars. Their governance and management structures were collegial and committee-based, the Senate and the Council were representative and, therefore, large. The vice-chancellor was a consensual leader, not a chief executive officer. Decision-making, as a result, was slow and naturally conservative.

**5.4** The emergence of a competitive mass market and global higher education market brought this model of governance and management into question. The modern university has flourished over the last few decades, frequently developing into the most important economic entity in its city. A significant employer, a university also supplies the graduates to local businesses, collaborates on local R&D, and creates economic value through the national transfer of knowledge into the public and private sector. If we are to have a dynamic relationship between the university and its many constituents, then the universities themselves will need to transform into more dynamic institutions.

**5.5** The vice-chancellors and senior staff that we have spoken to are well aware of this and there is evidence of modernisation in the sector in the last 20 years. Decision-making by committee is being replaced in many institutions by executively-run organisations, with transparent governance, professional and accredited management and modern IT systems. But our review highlights that performance is patchy and some institutions have a long way to go to match best practice.

**5.6** Our consultations revealed some of industry’s frustrations in doing business with the higher education sector. The perception is often of a sector that is slow-moving and bureaucratic, difficult to navigate around and risk-averse. “*[The project] took three years to get off the ground and required old style influencing and persuading to bring all the necessary university people to agreement. While this was just possible for a company of our size, it would have been impossible for SMEs.*” Another business leader argued that, “*The higher education system in the UK is in general bureaucratic, slow and producer focussed. In many ways, it is like the old nationalised industries – the institutions look to their funder and develop behaviours that are acceptable to it. The governance of the sector is mired in an outdated framework, which involves the Privy Council, the Senate and Council split, security of tenure and the Court. There is a strong case for dragging*

*the governance framework into the 21<sup>st</sup> Century – especially if we are to develop a commercial customer facing culture in our academic institutions.”*

**5.7** The trend towards a more executive model was accelerated by creation of the post-1992 universities<sup>1</sup> with their small boards dominated by lay members and the clear ‘chief executive officer’ mandate of the vice-chancellors. Dearing<sup>2</sup> sought to encourage this shift among the pre-1992 universities, concluding that “*governance needs to be vested in a body whose size is conducive to effective decision-making ...and the proper exercise of individual and collective responsibility*”. Our consultation has found many who favour Dearing’s conclusions: according to one registrar, “*members of smaller governing bodies feel a much greater sense of shared responsibility and accountability*”. Others have been more forceful. One lay member of a governing body described his Council as, “*A waste of time. There are around 50 people in the room - governing council plus official observers, all of whom feel they have to say something. It meets 4/5 times a year and is an absolute talking shop, incapable of making decisions and lacks any form of accountability.*”

**5.8** Some claim that there is too much emphasis on reforming the governing body, which is only one piece of the governance and management puzzle. The role and responsibility of the senate remains critical to the collegial nature of university management, yet many senates remain large and unwieldy institutions. And while good governance provides the framework of accountability and responsibility in a university, it is good management that actually delivers academic, financial and other objectives. Many effective institutions have been created by working around existing governance structures, through strong executive structures, with clean lines of responsibility, delegated authority, and cohesive management teams of academics and administrators. As one registrar put it, “*Individuals and teams, not committees, do things. Effective institutions need to be executively run.*”

**5.9** Critical to the effectiveness of universities are the administrative staff that underpin the management and academic activities. Our consultations reveal that good universities have been investing significantly in training and sharing of best practice, as well as recruiting more professionally accredited staff. The result is a new level of respect and status for the “administrative” or “professional services” functions. A number of organisations (e.g. Higher Education Staff Development Agency and Higher Education Senior Managers Forum) contribute to the training of staff and the spreading of best practice, and new initiatives such as the Leadership Foundation and the higher education MBA at the Institute of Education in London are signs of the growing recognition of the need to train and develop leadership and core skills across the ranks of university staff.

### ACCOUNTABILITY

**5.10** A side effect of a modern university’s far-reaching role and breadth of activities is the increased number of stakeholders who hold the institution to account. These include students and staff, regional and national government departments, government agencies (from funding councils to quality assurance agencies), and collaboration partners including the NHS, charities and business. Our consultation has revealed sector-wide concerns about the accountability burden. “*We are over-audited. It is a multi-*

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<sup>1</sup> Education Reform Act 1988 and the Further and Higher Education Act 1992

<sup>2</sup> *Higher Education in the learning society*, Report of the National Committee, Dearing, July 1997

*layered and complex burden that inhibits risk taking, encourages game play and costs too much.*” But this burden is about more than bureaucracy. We have found a sector that feels over-scrutinised and distrusted, and is consequently edgy and defensive.

**5.11** There seems to be broad agreement that the accountability burden on universities can be reduced. In 2000, HEFCE commissioned a review of the sector’s accountability burden<sup>3</sup> and found that universities incur £250m annual accountability related costs, much of which was unnecessary. In 2002, the Better Regulation Task Force<sup>4</sup> noted, “A number of Government Departments and Agencies have a stake in higher education, but each seeks to meet its objectives in relative isolation. This has led to multiple accountability requirements imposed on HEIs today...[and] a disinclination from these bodies to accept data, particularly quality review information, collected by other bodies.” The report concludes that many of these requirements have been imposed as a result of numerous and uncoordinated initiatives accumulated over many years and without any overarching rationale.

**5.12** While the accountability burden is widely recognised, this has not slowed the introduction of new funding initiatives to drive central policy<sup>5</sup>. Universities are all undercapitalised, and operate on a very narrow margin between economic success and failure. Their funding is increasingly earmarked by the funders for specific initiatives, leading to complaints about micro-management from the centre.

**5.13** Respondents have indicated some improvements being undertaken by the sector. Recognising that audit and measurement are most needed where the risks are highest, HEFCE and others are working on initiatives to reduce and shift parts of the accountability burden. The Government has created a review group, headed by Professor David VandeLinde, to take an overarching view and give the sector direction and leadership in tackling bureaucracy. Our consultation revealed that many in the sector are pinning their hopes on the VandeLinde Group to achieve this goal, although many believe the sector needs more than incremental change.

### OXFORD AND CAMBRIDGE

**5.14** Oxford and Cambridge are both world-class universities, comparing with the best in terms of research and teaching. They play a vital role in the UK economy, as a supplier of high-quality graduates and postgraduates and as centres of research excellence in a wide range of disciplines. The team has visited both universities and responses have confirmed that they have hosted some of the most successful and innovative business-university collaborations to be found in Europe.

**5.15** Responses to the review have however, also shown a general sense of unease about the direction of both universities. Despite its successes, there is a view that Cambridge, for example, could have done even more to build dynamic industry partnerships if it had been better organised. While it is agreed that universities should not be regarded as businesses, there is a view that both Oxford and Cambridge would benefit from being more business-like in the way that they run their affairs.

**5.16** Oxford has made significant progress towards reforming its organisation in

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<sup>3</sup> *Better Accountability for Higher Education*, PA Consulting Group, August 2000

<sup>4</sup> *Higher Education: Easing the Burden*, Better Regulation Task Force, July 2002

<sup>5</sup> In July 2002 there were 27 separate funding initiatives administered by HEFCE and the DTI.

recent years. The university has organised itself into five separate divisions with delegated responsibilities; it has opened its governing council to independent outsiders; it has succeeded in introducing a clear and well-understood regime of IP ownership; it has built what is widely regarded as one of the best technology transfer offices in the country. However, its financial management systems are inadequate. And like Cambridge, it faces critical and unresolved questions about its future strategy.

**5.17** Cambridge has strengthened its intellectual leadership of the UK university system in recent years, but it has been much less successful in modernising its internal organisation, which remains closed and inward looking. Despite important partnership with companies like Microsoft, BP and Intel, it has been slow off the mark in creating a technology transfer office, which has yet to win the full trust of the academic community, and it is still struggling to develop an agreed structure of IP ownership within the university. The well-publicised teething problems of the Cambridge-MIT Institute may now have been resolved, but they have contributed to a general sense of malaise.

**5.18** The challenge for Oxford and Cambridge, and perhaps more particularly for Cambridge, is this: how far can they modernise the way they run themselves without threatening the culture that has contributed to their success? If they do not modernise, will they remain world-class institutions? Both universities are about to have new vice-chancellors. They face a leadership challenge of the highest order, and the outcome is a matter of public interest that stretches well beyond the confines of the two universities.

### GOVERNANCE AND TRUST

**5.19** Universities across the country have strengthened their systems of management and governance over the past decade. The question is whether they have reformed far and fast enough to reflect their much-increased size and their increasing funding requirements.

**5.20** The central question appears to come down to a matter of trust. The Government does not seem to have enough confidence in the way that universities run themselves to give them extra funding without strings attached. Yet if our universities are to become more creative, to play their full part in the regional and national economies, to open their doors to a business sector which lags behind in innovation and R&D against international competitors, then ways will have to be found of giving them a little more room to take entrepreneurial risks.

### EMERGING ISSUES

The review will undertake a number of case studies of UK universities (a mix of post and pre-1992 institutions) and consider a number of issues including:

- best practice in governance and management structures, including the appropriate roles, responsibilities and accountability mechanisms for members of the governing body, academic body and university administration, and the use of IT and management information;
- comparison with international models of management and governance structures;
- quality of managerial skills, barriers to recruiting sufficiently qualified staff and use of training organisations and associations;
- reducing the accountability burden, and whether greater freedom could be granted in return for good management, governance and overall performance; and
- the challenges for Oxford and Cambridge. Are these best left to the two universities to resolve themselves?

## 6 SKILLS

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**6.1** Many business respondents commented that their most important interaction with universities was in the recruitment of skilled undergraduates and postgraduates. The main themes emerging from the responses have been summarised into three broad categories; the match between the skills produced by universities and the needs of business; business influence over universities' courses and teaching; recruitment and retention of the best talent.

### THE MATCH BETWEEN THE SKILLS PRODUCED BY UNIVERSITIES AND THE NEEDS OF BUSINESSES

**6.2** The responses highlighted a clear difference between the skill needs of employers recruiting staff for R&D-intensive roles, and those for other roles. Recruiters for R&D roles mentioned the importance of excellence in the scientific disciplines, stressing that although non-technical skills were useful, they must not be at the expense of the core scientific skills. Many R&D employers felt that declining standards in courses had resulted in graduates lacking deep technical understanding. This was in contrast to the needs of employers in most non-R&D areas, who were more interested in looking for generic skills, which included both "soft" skills such as communication and team working, and business awareness. A few of these employers felt that universities could do more to develop these skills further.

**6.3** A shortage of quality chemistry graduates was the most common skill shortage mentioned by R&D employers, although other Science, Engineering and Technology (SET) areas were also mentioned. A few engineering employers reported skill shortages, most commonly in electrical engineering, IT and civil engineering.

**6.4** Most of the large multinationals employing non-R&D graduates were quite satisfied with the quality of their recruits, with one mentioning that, *"Today's graduates are more determined and career focussed than their predecessors."* However, this was often qualified by a statement saying that they were able to recruit the best graduates and that many of the graduates that they rejected had significant deficiencies in these areas. In addition, a common concern voiced by the larger employers was a variability in the quality of graduates between what they perceived to be the best and the worst institutions. One respondent mentioned that, *"There are probably too many graduates with less valuable degrees from poor quality universities, and not enough technicians and craftspeople that industry requires."* A number of employers also felt that standards of literacy and numeracy had fallen.

**6.5** PhD graduates were an important area of recruitment for R&D employers. A common concern related to the level of transferable R&D skills of UK PhD recruits, which was an issue raised in the Roberts' review of science, engineering and technology skills<sup>1</sup>. One respondent said that, *"Well qualified US PhDs have spent three months every year in either a research assistant role, or a project at a university, or doing an*

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<sup>1</sup> SET for success: The supply of people with science, technology, engineering and mathematics skills, April 2002

*internship at an industrial lab - most importantly not working on their PhD. This brings breadth and an appreciation of industrial research that is very rarely evident in UK PhDs.*" However, many respondents were very positive about CASE studentships<sup>2</sup> as a way of obtaining industry-focussed placements. The 4-year engineering doctorate (EngD) programme, in which PhD students work on live industrial R&D projects, was also highly regarded.

**6.6** Work experience was universally regarded as an important way of developing employability skills and business awareness. One respondent noticed, *"A step change in the awareness of graduates with previous work experience to the political sensitivities of the workplace, and a greater willingness to take responsibility for their own development."* However, concerns were expressed about the variability in the quality of work experience and the value of more mundane work, with some suggesting a need for some form of accreditation.

**6.7** A number of organisations made use of universities to develop the professional skills of their staff, with some of the larger organisations sponsoring bespoke part-time masters courses in specific areas of science and engineering. Flexibility in the qualifications framework was highlighted by some as an important facilitator of this type of professional development.

### **BUSINESS INFLUENCE OVER UNIVERSITIES' COURSES AND TEACHING**

**6.8** The most common mechanism used by businesses to influence universities' courses and curricula was through links with individual departments in response to specific business needs. Many employers felt that this was an effective solution, because it was simple and allowed bespoke solutions to be made. However this type of approach was limited to the larger companies, and most of the links tended to focus on short-term solutions to current business needs rather than in anticipation of longer-term skill requirements. Some businesses also participated in industrial advisory boards.

**6.9** Some companies operating in specialised fields created an element of strategic planning in their links, by concentrating their research in a small number of universities, and funding them on a longer-term basis. This would provide them with a supply of skilled personnel to meet their current and future needs. However, this type of long-term relationship was relatively rare. One respondent from industry summed up the situation by saying that, *"An effective mechanism for industry and academia to identify future skill requirements remains to be discovered."*

**6.10** Professional bodies influence course curricula and design in certain disciplines such as engineering, architecture and medicine. The fact that few engineering companies expressed serious problems with the skills of their graduates suggests that this process may be useful. However, some respondents expressed concern that the professional bodies were stifling innovation through their stringent accreditation requirements, with one engineering firm mentioning that, *"Professional bodies tend to be backward looking in specifying their academic requirements for course content."*

**6.11** Very few respondents mentioned the newly formed Sector Skills Councils

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<sup>2</sup> Cooperative Awards in Science and Engineering – these are awards provided by the funding councils towards PhD projects defined by industry and jointly supervised by industry and academia.

(SSCs) or their predecessors, the National Training Organisations. SSCs form an important part of the Government's recently announced Skills Strategy White Paper<sup>3</sup>, and their purpose is to provide business sectors with the opportunity to assess strategically their current and future skill requirements, and voice them to providers and the Government. They are currently at an early stage of development – only two sectors have fully licensed SSCs and another five have been established as trailblazers. The DfES has made available £1m per SSC to set up a further 17 Councils by summer 2004. It remains to be seen how many business sectors will take up this offer.

**6.12** There needs to be effective mechanisms for SSCs to interact with the structures for meeting regional skill needs, which are based around the FRESAs (Framework for Regional Employment and Skills Action). These are plans drawn up by RDAs and key partners, to meet regional skills needs. Although they were recently finalised for all RDAs, it is worth noting that not a single business mentioned these in their submissions or interviews.

**6.13** A number of respondents expressed concern that the system for funding undergraduate courses was not responsive to the needs of employers. One respondent commented that *“We do not feel HEFCE understands industry's needs in encouraging universities to start new undergraduate courses for future needs,”* whilst another expressed concern about the proliferation of courses in media-based subjects, many of which would not be useful to a student choosing to embark on a career in the sector. The Welsh Higher Education Funding Council's approach of ring fencing a portion of the teaching funding budget explicitly for developing employability skills and providing work experience was quoted as a positive example.

**6.14** Foundation degrees are intermediate level vocational higher education qualifications that aim to address the skills gap at the associate professional and higher technician level. They are designed to provide specialist technical knowledge, employability skills and broader understanding to meet employers' needs. Although the focus of this review is primarily on undergraduate and postgraduate skills, foundation degrees could provide a useful model for employer engagement in university courses.

**6.15** A number of university respondents commented that business was generally not good at identifying and articulating its future skill requirements in any meaningful way, and that frequent changes in business strategy meant that there was little consistency to businesses' stated skill needs. A number of universities also reported difficulties in finding business representatives willing to sit on university course advisory groups. There were a few notable exceptions, particularly where universities had successfully developed bespoke courses tailored to the needs of particular companies or industries.

**6.16** Respondents expressed concern at the suggestion in the Higher Education White Paper that business people would be required to gain accreditation before being allowed to take part in university teaching programmes. This could cut off a valuable source of interaction between businesses and universities.

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<sup>3</sup> *21<sup>st</sup> Century Skills: Realising Our Potential*, Department for Education and Skills, July 2003 - available at <http://www.dfes.gov.uk/skillsstrategy/>

### RECRUITMENT AND RETENTION OF THE BEST TALENT

**6.17** Employers requiring R&D staff tended to recruit through individual links with specific departments, or through schemes such as the Teaching Company Scheme (TCS). For non-R&D graduates, larger companies often used their own recruitment schemes, which were often linked to specific career services. Concern was expressed that SMEs were not seen as a destination of choice for graduates, with one representative organisation quoting one of their members as saying, “*Graduates seem only to want to go into large multinationals.*” This was consistent with the view from some regions, which were also experiencing difficulties in retaining graduates to meet their local needs.

**6.18** It is clear that career services play an important part in matching the skills needs of businesses with the supply of graduates, and also in helping graduates make informed career choices. However, it appears that larger companies are more able to make full use of these services than their smaller counterparts, through participation in career advisory boards and marketing.

**6.19** Some businesses had concerns around the recruitment and retention of the best graduates. The Roberts' review of SET skills identified this as a particular issue for the science and engineering professions, due to a lack of attractive career paths.

**6.20** In order to retain skilled scientists and engineers who wish to pursue careers in R&D, some respondents mentioned the importance of providing a “dual career ladder” that would allow scientists to rise to an equivalent level in the company as staff in sales and marketing. For engineers, the importance of providing a career path that developed a blend of technical and managerial competencies was stressed. Early responsibility coupled with opportunities for progression was mentioned as a key aspect of retaining graduates more generally. Competitive salaries were also important, particularly for scientists and engineers.

**6.21** The review agrees with the Roberts' review that providing attractive career paths for SET graduates is primarily the responsibility of businesses, and will look at providing examples of best practice in this area.

#### EMERGING ISSUES

The review will consider the following issues:

- the extent and effectiveness of current mechanisms by which university course design, teaching and provision is influenced by the needs of business;
- what incentives could be introduced within the teaching funding system to encourage greater business collaboration in university curricula and teaching; and
- recruitment and retention of the best talent, particularly in science and engineering (following on from the Roberts' review of SET skills).

# 7 REGIONAL ISSUES

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**7.1** Regional development is an important and emerging area of interest for the higher education sector. It is clear from responses to the consultation process that many universities are moving towards the centre of the regional development process and that the RDAs<sup>1</sup>, and their older cousins in Wales, Scotland, and Northern Ireland, see universities as important players in their innovation and regional economic strategies.

**7.2** Responses to the consultation have set out a range of regional activities. Science and Industry Councils are being established as high-level contact groups for industry, regional agencies, and universities. There has been significant investment by RDAs in science parks, incubator and pre-incubator space for university spinouts, clusters tied into university expertise and other types of infrastructure. Regional networking events are being held to promote interaction between SMEs and universities. Information services to guide business towards relevant university expertise are being established. RDAs are promoting local employment opportunities to final-year students, hoping to improve the level of graduate retention in their region. “Star” professors are speaking at international trade fairs and helping their regions attract inward investment, and development agencies are helping local business source international academic expertise.

**7.3** The pattern of activity varies across the country according to the level of funding available, the characteristics of the university sector, regional differences in private sector R&D, regional priorities and the experience and expertise of RDA staff. Responses to the consultation identify two broad areas where alignment of regional agencies can add value to the relationship between universities and businesses:

- RDAs bringing together public, private, and university partners to create regional hubs, generate economies of scale and develop a coherent regional strategy.
- Work with SMEs to enable them to access university expertise.

## **REGIONAL HUBS, ECONOMIES OF SCALE AND A COHERENT APPROACH TO INNOVATION**

**7.4** The expansion of the capacity that underpins universities’ business engagement has been impressive. Responses to the review have celebrated this rapid progress but, at the same time, many have highlighted the importance of critical mass in developing the experience of staff, in attracting the interest of venture capital and legal advice and in securing the requisite investment. For many universities thinking about establishing or enhancing a technology transfer office and for virtually all universities thinking about more substantial projects, collaboration has been identified as a sensible way forward.

**7.5** Responses to the review have highlighted successful projects that RDAs have supported to bring together universities, local authorities, further education colleges, charities and the private sector, in various combinations, to invest in incubators, science parks, seed funds, and other aspects of the physical and financial infrastructure necessary

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<sup>1</sup> In this section the term “RDAs” is used as a generic term to mean all of the regional and national development agencies – including Wales, Scotland and Northern Ireland.

to support business collaboration.

**7.6** This co-operation becomes increasingly important in areas like Northern Ireland, Wales, Scotland and the North East, where responses to the consultation have indicated that demand from the private sector for the kind of expertise that universities have to offer is weak and universities are important actors in what is, essentially, a supply side, public sector driven, innovation strategy.

**7.7** Responses have highlighted a number of strengths in the existing institutional arrangements. It is not uncommon for university vice-chancellors to sit on development agency boards, universities to come together into regional groups to engage with local authorities and RDAs and promote regional development, and Science and Industry Councils – as they emerge and grow in importance – to bring together key players from private, public, and higher education sectors. In addition, in England RDAs now have a greater role in determining funding from the Higher Education Innovation Fund, and Research Councils have begun a dialogue on areas of common interest.

**7.8** Areas of weakness and tension have also been highlighted – within regions, between them, and in the split between regional and national competencies. Business and universities have both stated that the quality of RDA engagement has been mixed – with some excellent strategies driven by experienced, well-resourced, highly motivated staff, and some RDAs giving a lower priority to innovation policy and to engagement with the higher education sector. In extreme cases relationships between some RDAs and some universities appear to be hostile. Anecdotal evidence has suggested that local authorities are not always aligned with the economic strategy pursued by the RDAs and universities, and in some cases important developments and investments appear to have been blocked for years.

**7.9** There is said to be insufficient collaboration between the RDAs and no developed understanding of what is best dealt with at a regional level, where collaboration between RDAs is necessary, and where a national strategy is the best way forward. One US firm, for example, reported that, *“We got approached by all the RDAs in turn, each claiming to be the best place in the UK for biotech research.”*

### SMALL AND MEDIUM SIZE ENTERPRISES

**7.10** Responses to the review have highlighted both the problems encountered by SMEs in collaborating with universities and the potential benefits to them of doing so. Small companies face well-known problems in securing the human and capital infrastructure to assimilate innovations – but where these problems can be overcome they frequently demonstrate high levels of growth. One response to the review indicated that medium sized, medium technology enterprises with the relevant production infrastructure already in place, could act as a flywheel to disseminate innovative ideas and carry them to market more quickly than small companies. SMEs that have engaged with the university sector through the Teaching Company Scheme, for example, have reported positive experiences: increased turnover, increased profit, and the intention to maintain relations with the university partner.

**7.11** Several submissions identified the main barriers to collaboration between SMEs and universities as, *“Access – no obvious central point of contact; ignorance of services; perceived high cost; and lack of clarity around business benefits.”* These are problems that can be overcome with time and resources but these are often in short supply in an SME and, as one RDA representative said, *“Getting the wrong research result for a multinational means nothing, getting it wrong for an SME can mean the difference*

*between staying afloat or going under.”*

**7.12** There is an existing infrastructure of support for small business – including the RDAs, the Business Links network, and the various trade organisations. Responses to the consultation have, on the one hand, accused universities of attempting to “*reinvent the wheel*” in their relationship with business by bypassing these services and the network of contacts they have to offer and, on the other hand, suggested that Business Links do not have the scientific expertise, the interest, or the capacity to act as an effective intermediary.

### EMERGING ISSUES

The review will consider the following issues:

- economies of scale and regional hubs for technology transfer;
- collaboration between public, private and university sector at a regional level and the role for RDAs in brokering these relationships;
- regional and national competencies in innovation policy; and
- support for SMEs and the scope for better collaboration between universities and the existing business support infrastructure.

### CONCLUSION

**7.13** As this summary suggests, our final report will cover a wide range of themes and ideas. At least as important as our recommendations will be the examples we plan to give of the many creative and productive partnerships which are now underway across the country between universities and the business sector. We hope that the report will play a useful part in taking the discussion forward and in helping business to understand the real benefits that are there to be accrued from collaboration with an increasingly dynamic and diverse university system.



**Richard Lambert**