

# Supporting growth in innovation: enhancing the R&D tax credit

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July 2005



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# Supporting growth in innovation: enhancing the R&D tax credit

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ISBN: 1-84532-102-2

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# FOREWORD

Far-reaching and fundamental changes in technology, production and trading patterns are shifting the balance of global economic activity, and supporting the rise of fast-growing emerging economies, notably China and India. The combination of rapid technological change and policy liberalisation is bringing increased specialisation, fragmentation and dispersal of economic activity across continents.

The opportunities and challenges presented by these global trends demand policy responses that support the key drivers of economic growth - employment and productivity. The most successful economies will be those that are able to respond quickly to rapid technological and market changes, promote enterprise, productivity and innovation, and thus move up the value chain. Economies must take advantage of the increasing rewards from innovation as both global competition and the speed of technological change increase.

In this environment, the UK needs to build on its historic strength in scientific research to exploit new technology-driven and high value-added areas to secure its long-term prosperity. Creating the right climate for enterprise and innovation, supporting R&D, will help to meet these challenges. The lesson from other countries, particularly the US, is that high levels of innovation and R&D are crucial factors in maintaining high and stable growth.

We have committed to ensuring that the UK remains a centre of world-class research, with a sustainable and responsive science base, and as part of this have set an ambitious target to raise the overall level of R&D investment to 2.5 per cent of Gross Domestic Product (GDP) by 2014. Meeting this challenge requires a strong partnership between Government, business and academic institutions, which is supported by increases in both Government investment in the public science based and industry-funded R&D.

The stable macroeconomic framework in the UK has created a strong climate for investment and innovation. R&D tax credits were introduced as a further incentive for firms to increase their R&D investment and they have already had a significant impact. But we believe we can do more. The changing patterns of business R&D investment present an opportunity to foster a new group of world leading innovative firms. We can seize this opportunity by enhancing the R&D tax credit to support the emergence of these firms.

We are pleased to publish this discussion document, which we hope will mark the next stage in the successful dialogue between business and Government on these issues. A high level of consultation has already strengthened the design and operation of the R&D tax credit. At this stage, as in the past, the views of the business community will have an important bearing on the shape of future Government policy in this area.



**Rt Hon Gordon Brown MP**  
Chancellor of the Exchequer



**Lord Sainsbury of Turville**



# INTRODUCTION AND SUMMARY

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**1.1** Science and innovation are vital to ensure the UK's long-term competitiveness in an increasingly knowledge-driven global economy. In all countries, economic activity is shifting towards innovation and knowledge-driven industries, with emerging economies challenging the predominance of the advanced economies. In this environment, the UK needs to build on its historic strength in scientific research to exploit new technology-driven and high value-added areas to secure its long-term prosperity.

**1.2** Research and Development (R&D) is one of the key drivers of productivity growth. International evidence suggests that high levels of R&D support strong and stable growth. However, the UK's investment in R&D has, since the late 1980s, been low compared with other major developed countries. The Government has therefore set a challenging goal to raise overall levels of R&D in the economy from the current level of 1.9 per cent to 2.5 per cent of Gross Domestic Product (GDP), by 2014. Raising UK business R&D is a Government priority; the target will only be met if private sector investment in R&D matches growth in Government investment.

**1.3** R&D tax credits form part of a wider package of measures, outlined in Chapter 2, to increase innovation in the UK. This discussion paper, published alongside the *10-Year Science and Innovation Investment Framework: Annual Report 2005*, continues the Government's policy of consulting with business at each stage in the development of the credits. It opens a dialogue with business on how best to build on the successful early years of R&D tax credits. In the past, business organisations, trade bodies, academics, accountancy and finance professionals and others have all contributed views and have influenced both the design of the credits and the definition of R&D for tax purposes.

## THE UK R&D TAX CREDIT

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**1.4** Chapter 3 reviews some of the key features of the R&D tax credit and compares the UK's system with similar incentives in other countries. The economic evidence from several OECD countries is that fiscal incentives are an effective way of generating additional R&D, although the full effects may not be felt immediately. Strong take-up figures, particularly for the small and medium enterprise (SME) credit, suggest that R&D tax credits are already having a significant impact on business R&D.

**1.5** A number of studies have attempted to make comparisons of the relative generosity of support provided by different national fiscal incentives for R&D. The UK's R&D tax credits compare well on these measures, but the wide variation in results across different studies reveal the significant difficulties in reliably comparing schemes across countries.

**1.6** Above all, the UK tax credits were designed to be simple and predictable. The straightforward system in the UK compares well with more complex systems in other countries where, for example, there are lengthy pre-filing arrangements, caps on qualifying expenditure or variable rates of relief. The UK system also stands out for a number of other features, not least, the 'payable' credit for small and medium companies not in profit and the availability of the credit for large companies funding 'independent research' in universities and for SMEs' subcontracted R&D.

## IMPROVING THE EXPERIENCE OF COMPANIES CLAIMING THE CREDIT

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**1.7** In the early years since the introduction of the R&D tax credit, there have been unintended difficulties for both companies making a claim and HM Revenue & Customs (HMRC) inspectors. Throughout this bedding down period, the Government has attempted to address these issues as they have arisen. Continuing the process of operational improvements and further improving the experience of companies claiming the credit is a Government priority.

**1.8** Eligible companies must be able to access the credit with the minimum administrative burden. The Government's strategy for the delivery of the R&D tax credit continues to be shaped by three principles, which reflect the principles used for the design of the credit's structure: **simplicity, consistency** and **certainty**.

**1.9** Chapter 4 outlines the steps the Government has taken to ensure that the claims process remains as simple as possible, including through better guidance for SMEs and legislative simplification. It also seeks the views of business on whether the application of the tax credit rules has resulted in any unintended distortions in commercial activity.

**1.10** The Government has made a number of changes to improve consistency. These have included updated guidance for HMRC inspectors, available to companies and advisers, and working closely with tax advisers, for example through the 'Working Together' programme. HMRC is also considering publication of a note, similar to the note issued for large companies, on its approach to handling claims for SMEs.

**1.11** The third strand to facilitate access to the R&D tax credit is certainty. In 2004, the Government improved the definition of R&D for tax purposes to remove some of the ambiguity around qualifying R&D at the 'development' end of the R&D spectrum, improving certainty for companies claiming the credit. Chapter 4 invites comments on how payments might be made more quickly and on whether there is a role for experts in the claims process.

## ENHANCING THE CREDIT

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**1.12** Chapter 5 presents economic evidence on the changing business R&D environment in the UK, as a basis for discussion over future enhancements to the tax credit. The evidence shows how the pattern of R&D investment is changing, with the emergence of pockets of R&D intensity in new and overlapping sectors and groups – often outside the traditionally innovative industries.

**1.13** In the UK, in common with other OECD countries, there has recently been significant growth in R&D in the service sector. This will be an important driver of growth in the UK's R&D intensity in the future. Furthermore, R&D in technology-based firms, such as information technology, software and electronics is also giving an important boost to UK R&D. The evidence shows that a growing number of firms in these sectors are now amongst the UK's biggest R&D spenders. There is also a wider successful story for smaller R&D-intensive firms. In recent years, the largest increases in R&D have been in smaller companies.

**1.14** The UK still lacks large firms in a number of key sectors, but there is an expanding pool of innovative small and mid-sized firms. Encouraging the creation and growth of new large R&D-intensive firms from this pool will be essential if the UK is to achieve its ambitious targets for growth in R&D. The dynamic story of how innovative firms grow over time is key to understanding many of the issues that impact on R&D investment in the UK.

**1.15** This discussion paper sets out the Government's desire to support the emergence of future R&D winners, whilst preserving the integrity of the system. These 'emerging winners' are firms that have demonstrated recent growth in their R&D intensity and have potential for greater growth still, which could lead them to be amongst the large, R&D intensive firms that will help to deliver the Government's targets for business R&D. It launches a dialogue with business on whether the Government is correct to focus attention on the emerging firms at this stage in the development of the tax credit and asks for more information on the characteristics of these firms and the issues they face.



## SCIENCE, INNOVATION AND PRODUCTIVITY

**2.1** Productivity growth is central to long-term economic performance and rising living standards. One of its key drivers is science and innovation, as value is increasingly derived not from raw materials and physical production but from creating and exploiting knowledge. International evidence suggests that high levels of research and development (R&D) support strong and stable growth. The benefits of R&D spill over across the whole economy – R&D supports innovation and opens up new markets through the creation of improved products, services and processes.

**2.2** *Long-term global economic challenges and opportunities for the UK*<sup>1</sup> emphasised the importance of science and innovation in ensuring the UK's long-term competitiveness in an increasingly knowledge-driven economy. In all countries, economic activity is shifting towards innovation and knowledge-driven industries, with emerging economies challenging the predominance of the advanced economies. In this environment, the UK needs to build on its historical strength in scientific research to exploit new technology driven and high value-added areas and secure long-term prosperity.

**2.3** The Government has a long-term goal for the UK to achieve a faster rate of productivity growth than its major competitors. Linked to this is a Government ambition that overall levels of R&D in the economy should reach 2.5 per cent of GDP from a current level of 1.9 per cent<sup>2</sup>.

## THE SCIENCE AND INNOVATION STRATEGY

**2.4** The Government's strategy for promoting science and innovation involves:

- increased business investment in R&D, and increased business engagement in the UK science base. The R&D tax credit is a key policy lever for this strand of the strategy. Further details on the Government's role in supporting business investment in R&D are provided later in this chapter;
- investing in world class research at the UK's strongest centres of excellence and supporting sustainable and financially robust universities and public laboratories. World-class research is critical to the stock of knowledge on which many businesses rely. The 2004 Spending Review announced additional resources of over £1 billion for the UK science base by 2007-08 compared with 2004-05, equivalent to annual growth in funding through the DTI and DfES of 5.8 per cent in real terms;
- greater responsiveness of the publicly-funded research base to the needs of the economy and business. There is an economic imperative to make sure that scientific knowledge is used by business to create wealth. The Government supports knowledge transfer out of the science base and into business, for example through the Higher Education Innovation Fund, funding for which will rise to £110 million a year by 2007-08;

<sup>1</sup> 'Long-term global economic challenges and opportunities for the UK', HM Treasury, November 2004.

<sup>2</sup> 'Science and innovation investment framework 2004-2014', HM Treasury, DTI and DfES, July 2004.

- a strong supply of scientists, engineers and technologists. Key to business innovation is ensuring a more responsive supply of science, engineering and technology skills. The Government has clear ambitions to achieve a step change in: the quality of science teachers and lecturers in every school, college and university; the results for students studying science at GCSE level; the numbers choosing SET subjects in post-16 education and in higher education; and the proportion of better qualified students pursuing R&D careers; and
- increased public engagement in science. The Government is implementing a range of measures designed to promote public understanding of the science base, stressing the need for regulatory and ethical issues to be considered at the emerging stages of new science, when action can be taken to address them head-on.

**2.5** A report on the science and innovation framework has been published alongside this discussion paper providing a summary of progress made since July 2004 and outlining next steps.

## BUSINESS R&D IN THE UK

**2.6** The Government's target for aggregate investment in R&D to reach 2.5 per cent of GDP in 2014 is challenging and can only be met if the private sector and charitable funding at least match growth in Government investment. The indicative scenario presented in the ten-year science and innovation framework suggested business investment in R&D would need to increase at a real annual growth rate of close to 6 per cent.

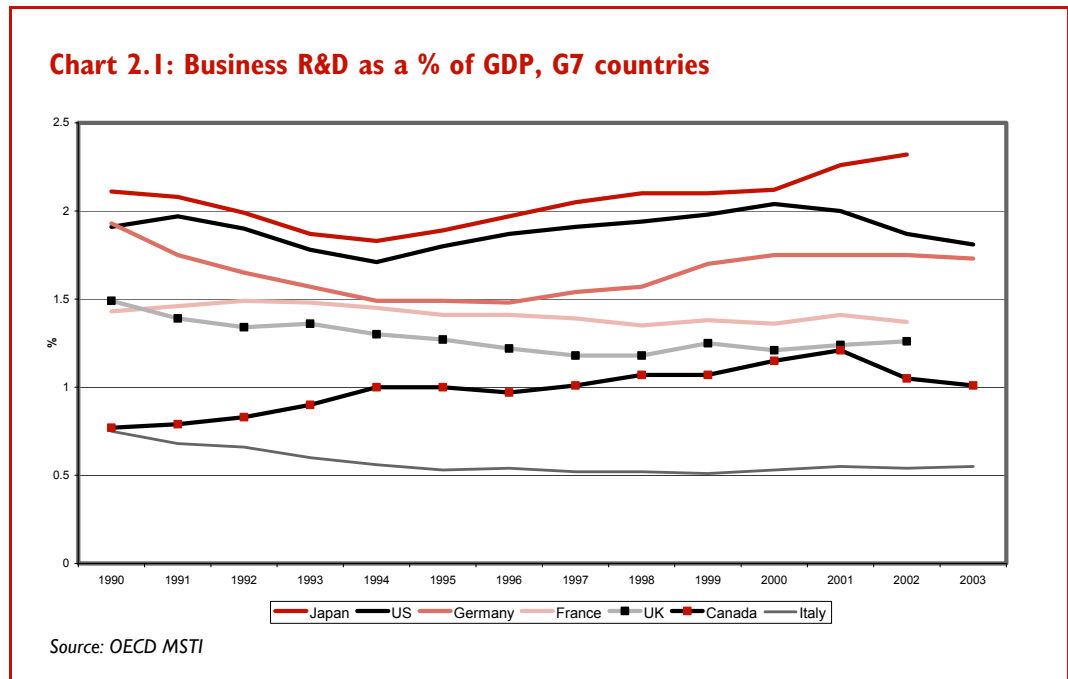
**2.7** The Government is committed to working with business to increase investment in R&D and to promote closer collaboration between industry and the science base. As chart 2.1 shows, UK business R&D is relatively low. To understand better the challenges facing business, DTI and HM Treasury published a joint paper at Budget 2005 on the UK's business R&D performance<sup>3</sup>. The paper found that:

- overall, there was no strong evidence that UK R&D performers have a lower R&D intensity than their international competitors, *in sectors where they are active*;
- however, within each sector, the UK has fewer firms, in particular large<sup>4</sup> firms, that perform any R&D. With the exception of certain sectors, such as pharmaceuticals and aerospace, large UK-owned firms are more likely to be located in sectors with a low R&D intensity;
- major foreign-owned investors in the UK tend to get their R&D from facilities abroad. However, the internationalisation of R&D may represent an opportunity for the UK, as investors seek to benefit from the UK's reputation for scientific excellence and relative cost-effectiveness; and

<sup>3</sup> 'R&D intensive businesses in the UK', DTI Economics paper no 11, March 2005, available at [http://www.dti.gov.uk/economics/economics\\_paper11.pdf](http://www.dti.gov.uk/economics/economics_paper11.pdf)

<sup>4</sup> For the purposes of R&D tax credits, large companies are all companies falling outside of the EU definition of an SME. SMEs are companies with fewer than 250 employees, and either annual turnover not exceeding €50M or a balance sheet totalling €43M. Companies below these limits may also be classed as being large if they are part of a larger enterprise.

- on several indicators, the number of R&D-intensive SMEs is growing in the UK, including in sectors where the UK has traditionally fared less well (for example IT).



## GOVERNMENT INTERVENTION TO PROMOTE BUSINESS R&D

**2.8** Investment in R&D is driven by the desire to improve performance and compete in an increasingly competitive global economy. Investment in business R&D generates substantial private returns: generally around 10-15 per cent, although they can be as high as 30 per cent. R&D can also provide a basis for future growth – what is profitable now may not be in 10 years time and current profitability does not guarantee profits in the future.

**2.9** Despite the potential for growth provided by R&D investment, there are a number of reasons why firms may under-invest in R&D. The private returns to business R&D are dwarfed by the wider spillover effects to society. Research has shown that the social rate of return can reach 100 per cent. This leads to a market failure where companies may under invest in R&D because the public returns exceed the gain to the company itself.

### The R&D tax credit

**2.10** The R&D tax credit is a key part of the Government’s strategy to boost business R&D. Following extensive consultation with business, it was introduced in 2000 for SMEs and extended to large companies in 2002. R&D tax credits reduce the real cost of companies’ investment in R&D and raise the firm’s private return towards the higher rate of return to the economy as a whole. There is strong evidence that tax incentives can have a positive effect on R&D investment. Studies have shown that they can increase R&D spending by an amount at least equal to the loss in tax revenue<sup>5</sup>. The subsequent chapters summarise progress on this policy to date and set out the next steps.

<sup>5</sup> Bloom, Griffith and Van Reenen, ‘Do R&D tax credits work? Evidence from an international panel of countries 1979-1994’, IFS, Working paper 99/8, 1999.

**Long-term stability** **2.11** The Government has also set in place a macroeconomic framework to maintain long-term economic stability. Stability allows businesses to plan more effectively for the long term, improving the quality and quantity of investment in physical and human capital and helping to raise productivity. Within the context of macroeconomic stability and in addition to the R&D tax credit and the wider strategy on science and innovation the Government has implemented other microeconomic reforms to remove the barriers that prevent markets from functioning efficiently and effectively and thus facilitate investment in R&D. For example:

- improving competition to put downward pressure on costs and prices, drive innovation and business efficiency and deliver a better deal for consumers; and
- promoting enterprise, for example the Government makes interventions in venture capital markets to help small innovative firms which would otherwise have difficulty raising risk capital.

**Industry and research base partnership** **2.12** The Government also directly funds research partnerships between UK industry and the research base; business to business collaborations; and nearer market research through the collaborative R&D element of the Technology Strategy. Recent calls were worth £100m in April 2005 and £80m in November 2004.

**2.13** The Technology Strategy was launched in 2004 and provides a business-driven framework for identifying and supporting emerging technologies which will have a significant impact on sectors where the UK has the potential to exploit such technology and the research capacity to maintain a leading global position, as well as deriving wider economic, social or environmental benefits. By focusing on medium to long-term developments in selected technologies, the strategy is most likely to address the market failures inherent in the UK innovation system.

**R&D in the regions** **2.14** R&D is performed in UK businesses across all countries and regions in the UK. National Statistics show that expenditure on R&D in UK businesses was £13.7 billion in 2003. A quarter of this total was performed in each of the South East and Eastern regions, a further tenth in each of the North West & Merseyside and the South West, with the other regions and countries accounting for between and 1 and 7 per cent each.

**Regional Development Agencies** **2.15** The Regional Development Agencies (RDAs) have an important role to play in improving the overall innovation performance of the UK economy and in supporting business R&D. The RDAs have been increasing their investment in science and innovation, and recently announced plans to spend £360 million in this area in 2005-06, a 50 per cent rise compared to 2003. In line with the recommendations of the Lambert Review, RDAs have been given an enhanced role in strengthening business-university links, and have set specific targets for the number of regional collaborations they will facilitate between businesses and the research base. All RDAs have set up, or are in the final stages of establishing, Science and Industry Councils: these regional bodies strengthen relationships between businesses and researchers, promote innovation, and provide strategic advice on regional science and technology.

**2.16** RDAs also lead on the development of Regional Economic Strategies (RESs), which set out the long-term economic growth priorities for each region, putting innovation activities alongside other drivers of regional growth, including enterprise, employment and skills. Six regions are reviewing their RESs this year.

# 3

## THE UK R&D TAX CREDIT

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### DEVELOPING THE R&D TAX CREDIT

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**3.1** The Government recognised that steps had to be taken to reverse the decline in R&D in the UK throughout the late 80s and early 90s. After examining the options to raise business R&D to address the problem, the UK introduced fiscal incentives to support business R&D. An R&D tax credit for SMEs was introduced in 2000, and a large company credit in 2002.

**3.2** As set out in chapter 2, R&D tax credits are an important part of the Government's wider strategy to promote science and innovation and ensure the UK's long-term competitiveness in the global economy. They are primarily intended to address the key market failure that causes firms to under-invest in R&D because the private returns to the firm are dwarfed by the wider spillover benefits. R&D tax credits reduce the real cost of companies' investment in R&D. In economic terms, this raises the firm's private return towards the higher rate of return to the economy as a whole, thus increasing R&D levels over time towards the optimum level for society.

### The dialogue with business

**3.3** The Government involved business early in the introduction and subsequent development of the R&D tax credit. The dialogue with business has influenced not only the design of the credits, but also a revised, clearer definition of R&D for tax purposes, guidance to tax inspectors, and forthcoming guidance to SMEs about the credits. Major business organisations, trade bodies, academics, accountancy and finance professionals and others have all contributed views to these processes, on top of day-to-day dealings with officials.

**3.4** The UK example of ongoing consultation with business on R&D tax credits has been internationally recognised<sup>1</sup> as a model of best practice in developing such fiscal measures. This discussion paper continues that dialogue.

### THE SUCCESS OF R&D TAX CREDITS

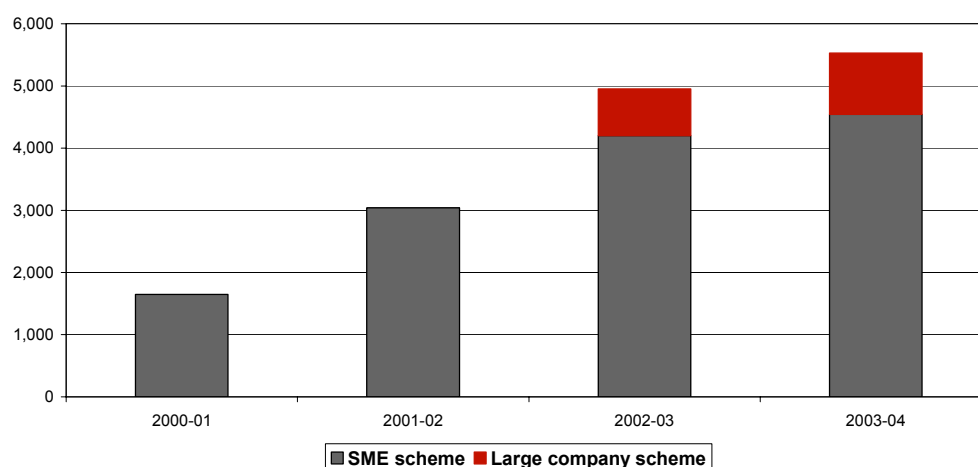
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**3.5** R&D tax credits are a crucial part of the package of measures to deliver the Government's ambitious commitment to raise UK R&D, complementing other forms of business support and regulatory intervention. Their introduction has been warmly welcomed by business. To date, over 17,000 claims have been made for R&D tax credits since they were introduced and over £1.3bn of support has been claimed through the scheme. In 2003-04, the last year in which data is broadly complete, over 5,500 companies claimed the credit – approximately 4,500 SME companies and almost 1,000 large companies. In 2003-04, just under £550m of support was claimed through R&D tax credits. These costs are rising in line with forecasts.

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<sup>1</sup> Expert Group on Fiscal Measures for Research, 'Report submitted to CREST in the context of the Open Method of Co-ordination', The Hague, 15 June 2004.

**Chart 3.1: Number of companies making a claim for R&D tax credits, 2000-01 to 2003-04**



**3.6** Evidence from several OECD countries is that R&D tax credits are effective in generating additional R&D<sup>2</sup>, although the full effects are not felt immediately. Strong take-up figures, particularly for the SME credit, suggest the R&D tax credit has now begun to have a significant impact in the UK. However, the economic evidence suggests that the full positive effect from fiscal measures to increase innovation will only be seen in the long run. It is too early, therefore, to assess the full impact of the credit. However, the Government has a full evaluation programme in place to assess the impact of the R&D tax credit on an ongoing basis.

### International competitiveness

**3.7** To achieve a significant rise in R&D in the UK, the UK's 10 year science and innovation framework set out that it will be important to continue to attract more investment into the UK from multinationals in an already highly international system. The recent DTI/HM Treasury economics paper<sup>3</sup> also stressed the importance of this.

**3.8** Global decisions on where to place R&D investment are based on a number of factors. Of overriding importance is the strong science base in the UK – particularly for the 'pure' sciences. The Government has also delivered a stable macro-economic climate to encourage R&D investment – both domestic and foreign. Other issues, including the skills base and public attitudes to sciences are also very relevant.

**3.9** The R&D tax credit is an additional attraction for multinational investment. The credit encourages multinational corporations to get more of their R&D input from the UK, both by helping to retain and grow existing multinational R&D investment and by attracting new multinationals to the UK.

<sup>2</sup> These positive findings are reported in a number of papers; an example is Bloom, Griffith and Van Reenen, 'Do R&D tax credits work? Evidence from an international panel of countries 1979-1994', IFS, Working paper 99/8, 1999.

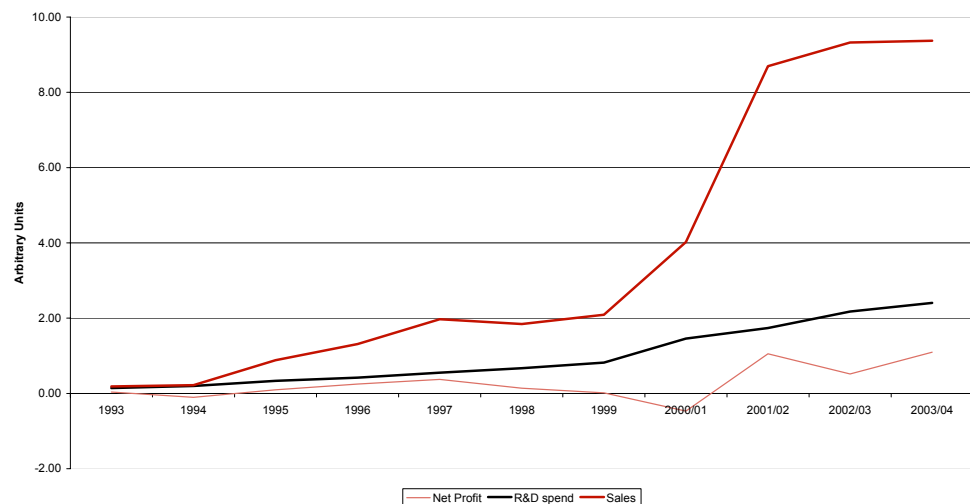
<sup>3</sup> 'R&D Intensive Businesses in the UK', <sup>3</sup> DTI Economics paper no. 11, March 2005.

**Case study: Nonlinear Dynamics**

Newcastle-based Nonlinear Dynamics is a leading global provider of bioinformatics software, serving an international market from North-East England. Bioinformatics – managing and analyzing biological data using advanced computing techniques – is one of the most promising and important technologies for the drug discovery, clinical diagnostics and medical research industries, and hence is of growing importance to life science firms.

Founded in 1989, Nonlinear Dynamics’ business model relies on quality products and excellent service. R&D investment at well above industry average levels (20% of sales in 2001/02, growing to 26% of sales in 2003/04) has led to healthy profits and sales growth in the fast-evolving and turbulent software and biotechnology markets, as the chart below shows. The company has grown from 3 staff in 1993 to 62 workers in March 2005, and annual sales now amount to several million pounds.

**Chart 3.2: Non-linear Dynamics**



Nonlinear has taken advantage of R&D tax credits since their inception. Will Dracup, Nonlinear's CEO, said, 'The credits system has been a highly effective way to incentivise research and development for our business. Maintaining investment into constant product improvement has been essential to our long term growth. To be encouraged in this way helps us to stretch that investment even further.'

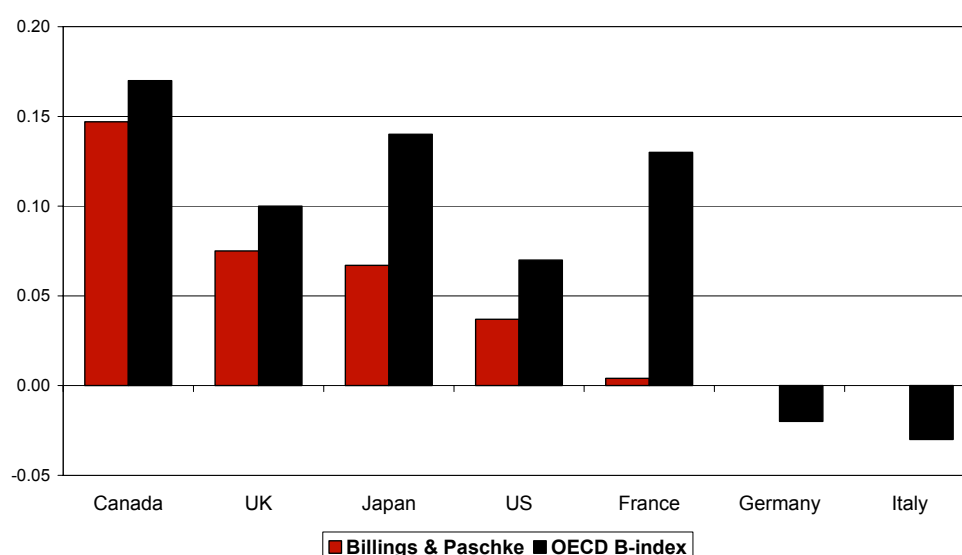
Duncan Barrie, Finance Director, added, 'For the first time this year, we capitalised a portion of our R&D expenditure, moving in line early with the International Accounting Standards requirements. Unfortunately in this year's accounts, we were not able to claim credits on this portion of expenditure. However, we understand that we will be able to take full advantage of tax credits on such capitalised expenditure in future.' (It's possible to do so for accounting periods starting on or after 1 January 2005.)

## DISTINGUISHING THE UK R&D TAX CREDIT

**Relative generosity** **3.10** A number of studies have compared the various fiscal incentives for R&D across the world. Recent research by Deloitte<sup>4</sup> assessed the UK R&D tax credits as amongst the world's most attractive regimes. Other quantitative studies have also made comparisons. The diversity of designs and tax regimes make it particularly difficult to compare the relative generosity of support provided by different national tax schemes. One study<sup>5</sup> simulated the effective rates of R&D tax incentives in seven countries for a panel of 20 large US companies. This found that the UK tax credit was more generous than not only the US scheme but also the R&D tax incentives in France and Japan.

**3.11** The OECD compares different fiscal R&D incentives using the 'B-index'<sup>6</sup>. The UK's R&D tax credits compare reasonably well on this measure, despite the fact it does not take into account the restrictive features of some other countries schemes that potentially limit relief for large R&D spenders.

**Chart 3.3: Generosity of R&D tax incentives for large firms in G7 countries (Billings & Paschke, 1998-2000, and OECD B-index, 2004)**



**Simplicity and predictability** **3.12** The wide variation in these results clearly demonstrates the difficulties of finding a reliable comparison of fiscal incentives across countries. As box 3.1 demonstrates, however, a major criticism of these studies is that they ignore some of the most important features of the UK's system – most notably, its simplicity and predictability.

<sup>4</sup> 'The ball's in our court: The UK technology sector at a critical juncture', Deloitte, July 2005

<sup>5</sup> Billings and Paschke, *Tax Notes International* 31(5), p487, 2003.

<sup>6</sup> Warda, 'Measuring the value of R&D Tax Treatment in OECD Countries', STI Review No. 27, OECD, 2001.

**Box 3.1 International evidence: The competitiveness of UK R&D tax credits**

Several countries and the EU have set targets for R&D expenditure, including business spending on R&D, and a growing number of countries (including 18 OECD members) use tax incentives to promote business R&D activities. This reflects the strength of international evidence that R&D benefits society as well as its originator and that well-designed tax incentives can encourage a higher level of R&D by business. Econometric studies suggest that a 1% change in the user cost of R&D will lead to a 1% change in R&D expenditure in the long run.

This long timescale, and the diversity of R&D tax incentives used by OECD countries, complicates judgements on which measures are most effective. However, it is generally accepted that effective tax incentives need to be simple, visible and transparent to influence business R&D: firms must be able to understand, calculate and claim the support easily and with certainty, and the value of it must be sufficient to influence decisions.

On simplicity, 'volume-based' systems like the UK's that incentivise total R&D spending have clear advantages over 'incremental' systems (as in the US) where incentives are given for additional R&D spending by companies. Incremental schemes typically provide a much stronger incentive for additional R&D spending, but have other disadvantages. International evidence on effectiveness is broadly neutral between the two.

Predictability is also important. Some tax incentives provide very different levels of support to companies depending on factors such as previous R&D spending and their financial situation. R&D investments generally involve long-term commitments and, as such, are likely to be highly sensitive to uncertainty arising either from a scheme that is temporary or constantly changing or from a scheme providing support that is unpredictably variable. Evidence<sup>7</sup> shows that the more volatile a R&D tax incentive, the less effective it is.

**3.13** The UK system was designed to be as straightforward as possible; a claim is made alongside other claims for tax relief on the corporation tax return, rather than by separate multi-page forms, as required in some countries. The UK also chose not to introduce the lengthy pre-filing process conducted in other countries, with the aim of reducing the level of technical input needed to make a claim and getting the benefits of R&D tax credits to companies more quickly.

**3.14** Moreover, there is no cap on the amount of credit available under the UK R&D tax credit scheme. In other countries, such as the Netherlands, the rate of R&D tax credit varies from year to year based on forecast spending, as a fixed sum of money is distributed between claimants.

**3.15** The UK R&D tax credit allows companies to set 125% of eligible R&D against taxable profits (or 150% for SME companies), thus reducing the corporation tax bill and in effect reducing the overall cost of R&D carried out. It covers the direct costs of R&D: staff costs, materials, computer software, water, fuel and power. Capital expenditure on R&D, including buildings, also attracts a generous 100% first year allowance. Furthermore, the UK credits extend from the smallest R&D companies (the minimum spend is £10,000 a year) to the largest, unlike many countries' reliefs, which are subject to a maximum 'cap' (such as the Netherlands). They also apply to the cost of 'independent research' funded by large companies and carried out by charities, universities or scientific research organisations.

<sup>7</sup> Guellec and Van Pottelsberghe, 'The impact of public R&D expenditure on Business R&D', 2001.

**3.16** A problem with many tax incentives is that a company must have taxable profits for the support to have any value. The UK tax credit has been designed to minimise this problem. For SMEs not in profit, the UK credit also allows them to sacrifice the tax loss from R&D in exchange for a cash payment of 24p per £1 of qualifying expenditure. 90% of support for SMEs is claimed through this mechanism. This is of significant value to growing innovative companies, where income streams are restricted in the early years of business. UK companies may also carry forward their enhanced losses from year to year indefinitely, to set against future profits.

**3.17** To address the issues that firms face as they grow and make the transition from SME to large company, there is a 'grace period', allowing a company to continue claiming the SME credit until it has two successive accounting periods as a non-SME.

**Vaccine Research Relief** **3.18** The Government recognises that many less-developed nations lack the ability to prevent or treat deadly diseases. It therefore introduced Vaccines Research Relief (VRR), targeted on R&D focused on:

- the development of vaccines or medicines for the prevention or treatment of tuberculosis, malaria and AIDS in the developing world; or
- the development of vaccines for the prevention of HIV infection.

**3.19** VRR allows a company to set an additional 50% of its eligible R&D expenditure on such vaccines against tax, on top of R&D tax credits, and also applies to funding of independent research carried out by charities, universities or scientific research organisations.

## **BUILDING ON SUCCESS**

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**3.20** R&D tax credits are already successfully giving substantial support for industry-funded R&D within a simple and predictable system. However, through dialogue with business, the system can be improved still further. The successful early years of the tax credit provide a stable platform from which to build further success in the future. The remainder of this paper outlines the Government's strategy.

**3.21** There are two strands to the ongoing development of R&D tax credits: improving the experience of companies claiming the credit further and enhancing the existing tax credit system to support the emerging R&D intensive firms in the UK.

# 4

## IMPROVING THE EXPERIENCE OF COMPANIES CLAIMING THE CREDIT

To be an effective encouragement for commercial R&D, the R&D tax credit must be simple, consistent and certain to claim, as well as being visible to all eligible companies. The Government is committed to ensuring the credit is delivered effectively and that all eligible businesses claim their R&D tax credit entitlement.

In the early years since the introduction of the R&D tax credit, there have been unintended difficulties for both companies making a claim and HMRC inspectors. Throughout this bedding down period, the Government has attempted to address these issues as they have arisen. Improvements to the scheme, coupled with a greater comprehension of the rules amongst eligible companies and advisers, mean that the tax credit is now operating better. The Government attaches high importance to continuing the process of operational improvements and further improving the experience of companies claiming the credit.

### THE PRINCIPLES OF GOOD DELIVERY

**4.1** To achieve the Government's policy objectives for the R&D tax credit, eligible companies must be able to access the credit with the minimum administrative burden. There are three qualities that facilitate access to the R&D tax credit: simplicity, consistency and certainty.

- A **simple** system so the credit's value is not eroded by excessive compliance costs.
- The **consistent application** of the system across the whole of HMRC's network of offices, so the administrative burden reduces year on year as familiarity with the system increases.
- A **certain** system so companies can build the value of the credit into their R&D investment appraisal.

**4.2** Delivery of the R&D tax credit is a co-operative process, relying on the efforts of companies, their tax advisers and HMRC inspectors. During the early years following the introduction of the SME scheme in 2000, all three groups were learning how the scheme operated. Drawing on those experiences, HMRC, with the support of DTI, SBS and HM Treasury, has taken and will continue to take steps to improve the delivery of the R&D tax credit, thereby improving the experience of companies making a claim.

### A SIMPLE CLAIMS PROCESS

**4.3** The dialogue with companies and their representatives has been a defining feature of the development of R&D tax credits. Business has made it clear that, particularly where SMEs are making their first claim, more could be done to simplify the claims process. The Government is keen to ensure any disincentives to SMEs claiming their entitlements are addressed.

**Guidance for SMEs** **4.4** Some businesses have expressed concerns that despite improvements to HMRC's R&D guidance, smaller SMEs would still benefit from additional guidance. To address this concern, HMRC has worked closely with SBS to develop simple, introductory guidance for SMEs claiming the R&D tax credit. This guidance will help

SMEs to compile the necessary information needed to support a claim, as well as enabling them to provide the information in a form that will allow HMRC to process claims more efficiently. The guidance has been piloted with SME representatives and other professional bodies to ensure it addresses the concerns of business and will be released later this year, once their views have been considered.

**Legislative simplification** 4.5 Another area in which companies and their representatives have alerted Government to potential simplifications is the legislation itself. The ‘80/20 rule’, for example, was originally used to determine qualifying staff expenditure. It was replaced by a straight apportionment in response to feedback from companies that it was unfair and overly complex. The Government has also acted in response to criticisms of the definition of materials in the original legislation to implement a more easily understandable definition.

**Common dates for changes** 4.6 The SME scheme and vaccines research relief are notified State aids. The European Commission must therefore approve changes prior to their implementation. An unwanted side-effect of this process, which led to greater complexity, was differing commencement dates for some measures across the three schemes (SME, large company and vaccines). The Government was keen to remove any unnecessary complexity. At Budget 2004, it was able to work within State aid rules to implement a common commencement date for changes to all the schemes, thus making the schemes simpler and more consistent. It is the Government’s intention, whenever possible, to continue to use common commencement dates for changes to the SME scheme, large company scheme and vaccines research relief.

**Unintended distortions in commercial activity** 4.7 At the time of their introduction, the Government consulted widely on the R&D tax credit schemes and their interaction. A key aim was to keep the schemes simple while not distorting commercial decisions on R&D matters. Companies have now had experience of claiming the tax credit over a number of years. **The Government would therefore welcome views and evidence on whether the tax credit rules have introduced any unintended distortions, for example by favouring one type of expenditure over another, or by causing companies to alter their relationships with third parties.**

## CONSISTENT APPLICATION OF THE SYSTEM

4.8 R&D tax credit claims are administered through Corporation Tax Self Assessment (CTSA). CTSA returns are dealt with across HMRC’s network, in many different offices. As with any tax matter, consistency of treatment is something HMRC strives to deliver. However, it is also important that the other groups with vital roles in the delivery of the credit, the companies making a claim and their advisers, approach the credit in a consistent manner. As well as internal measures which encourage consistency, the Government has also taken a number of steps to help other parties in delivering consistency.

**Updated guidance for HMRC inspectors** 4.9 Guidance for HMRC inspectors, clarifying and explaining HMRC’s interpretation of the legislation, has been an important part of the Government’s delivery agenda. The Corporate Intangibles and Research and Development (CIRD) manual was updated in November 2004. The guidance is aimed at HMRC inspectors, but it is also a useful resource for tax professionals and companies when preparing their claims. It allows for a consistent interpretation of the legislation across HMRC’s network and, by being available to companies, advisers and inspectors alike, promotes greater understanding of HRMC’s approach among all three groups. The reception of

this updated guidance by representative bodies and tax professionals has been positive and the Government will continue to build on it as the credit evolves.

**Statement of practice for large business claims** **4.10** The tax affairs of the largest companies are handled by HMRC's Large Business Service (LBS). LBS has issued a note outlining its approach to claims for R&D tax credit. The statement underlines HMRC's commitment to give companies support and early certainty in making their R&D tax credit claim. Consideration is being given to publication of a corresponding note, which would cover the great majority of companies whose tax affairs are dealt with outside the LBS.

**Evaluating companies' experiences of claiming** **4.11** Assessing the experience of companies claiming the credit is an important part of the Government's ongoing evaluation of the R&D tax credits. In-depth customer research into companies' experiences of claiming the credit, commissioned by HMRC, is currently underway. The results of this survey will help provide an insight into the key concerns businesses have about consistency, and will inform and shape further improvement to the delivery of R&D tax credits. It will also help the Government to monitor companies' awareness of the credit and the levels of take-up. Although levels of take-up are currently exceeding expectations, the Government is committed to ensuring that all eligible companies take full advantage of their entitlement.

**Working with tax professionals** **4.12** In partnership with Government, professional advisers play a key role in delivering the R&D tax credit effectively. It is vital that they are able to make eligible companies aware of the scheme, understand its detail and apply the rules in practice. The Government highly values the contribution that good advisers make; the face-to-face contact between adviser and client is often the most important step towards awareness that the tax credit is an effective boost for a company's R&D. We are therefore committed to supporting tax professionals in their work; helping them to apply consistently the rules for the credit when helping their clients submit a claim.

**4.13** The 'Working Together' programme provides a forum for tax advisers and HMRC officials to meet in local tax offices and discuss issues around the R&D tax credit. The programme also allows HMRC to give updates on the administration of the scheme directly to tax professionals. A recent update went to around 40,000 tax advisers.

## CERTAINTY FOR COMPANIES MAKING A CLAIM

**4.14** A simple and consistent claims process helps to deliver certainty to companies claiming the credit. Simplicity means companies can understand the likely reduction in the cost of R&D at the time they are planning it. And consistency means companies can be more certain from year to year, or between offices, that their claim is correct.

### Definition of R&D for tax purposes

**4.15** The Government's intention is to incentivise all R&D activity equally across the spectrum, from basic research to experimental development. However, at the 'development' end of the spectrum it is often difficult to distinguish between activity that is R&D for tax purposes and activity that is not, creating some ambiguity. Responses to the 'Defining Innovation' consultation of 2003<sup>1</sup> suggested that the early R&D definition for tax purposes could be improved in this respect. A new definition of R&D, which HMRC also apply for prior periods, was introduced in March 2004. It was intended to clarify, rather than alter the scope of the definition of R&D.

**4.16** The new definition has been warmly welcomed as a substantial improvement. It now appears to be working well in practice, supporting all three of the Government's delivery principles, particularly certainty, and standing as a record of the value of consultation with business.

### Scientific experts

**4.17** The UK R&D tax credit scheme relies on companies to self assess whether they are doing R&D. R&D is judged by 'a competent professional working in the field', who will usually be the company's own scientific or technological specialist. Self-assessment is a fundamental feature of the scheme, placing control over R&D investment decisions in the hands of the company, not Government.

**4.18** Nevertheless, some have suggested that the UK should adopt a system similar to that of other countries, such as Canada, for judging whether R&D is being undertaken. Under this system, the UK would employ experts in science and technology to work alongside tax inspectors, or an external panel of experts would judge whether R&D is being done in difficult cases. The Government has taken some steps to improve communication with business in this area. R&D guidelines were revised in March 2004 and the revised CIRD manual and new small business guidance are also significant improvements. **The Government will consider over the coming period what more can be done on this issue, but it welcomes views from business at this time.**

### Improving the repayable credit

**4.19** The Government recognises the importance of ensuring that R&D tax credits are paid to SMEs as promptly as possible. However, where a claim results in an enquiry, payment may not be made until the enquiry has been completed. Companies in this position can access earlier payments, by way of interim payments, and HMRC inspectors are encouraged to make such payments wherever appropriate. **The Government will continue to seek ways of ensuring the timely payment of the repayable credit to eligible companies and welcomes views from business.**

### Continuing the dialogue with business

**4.20** Improving the delivery of the R&D tax credit will be an ongoing process. It will evolve based on the experience of inspectors, advisers and eligible companies. Further enhancements to the credit will also affect its delivery, as inspectors, advisers and eligible companies adjust to the changes. Continuation of the strong dialogue between HMRC and businesses is therefore essential to ensure that delivery continues to improve and the claims process remains simple, consistent and certain.

<sup>1</sup> 'Defining innovation: a consultation on the definition of R&D for tax purposes', HM Treasury, DTI and Inland Revenue, July 2003.

The Government has continued to monitor R&D tax credits since their introduction in 2000. In that time, as they have become an accepted and valuable incentive for business R&D, the business environment has evolved, with more R&D taking place outside established industries. The Government wishes to make value for money enhancements that build on the successful early years of the scheme, encouraging the growth of the newest innovators whilst maintaining support for the UK's established world-leading R&D performers. This chapter opens the dialogue on how it can achieve these aims.

### BACKGROUND

**5.1** The UK has a strong tradition of innovation. Today, world-leading firms, particularly in the pharmaceuticals and aerospace & defence sectors, are the UK's major R&D performers. These sectors alone account for around £5bn of annual R&D investment – roughly 35% of all business R&D investment in the UK. Cutting-edge research, drawing on the strong UK science and research base, makes many UK firms amongst the most successful in their field. To continue to compete in the global economy, the UK must succeed in bringing through new large R&D-intensive firms to join the existing performers.

**5.2** To better understand the challenges faced by business, DTI and HM Treasury published a joint paper at Budget 2005 on the UK's business R&D performance<sup>1</sup>. The paper provided an in-depth analysis of sectors and global trends, bringing together a number of data sources for the first time. The findings of this analysis support the broad strategy for improving the UK's business R&D performance, set out in the ten-year Science and Innovation Investment framework. This strategy provides a framework against which to consider enhancement of the R&D tax credit to deliver increased growth in R&D intensity by:

1. maintaining or growing R&D in sectors where the UK is strong;
2. attracting investment into the UK from multinationals in an already highly international system;
3. increasing R&D intensity in firms or sectors that are lagging behind their peers; and
4. developing new R&D intensive sectors and the creation of R&D intensive SMEs.

**5.3** This chapter presents economic evidence on the changing patterns of R&D investment, as a basis for discussion about future enhancements to the R&D tax credit, within the framework above. It details the emergence of pockets of new R&D intensity – often outside the traditionally innovative industries. These pockets do not occur in distinct groups; instead they are overlapping and interdependent. There is therefore an emergent group of firms, the 'emerging winners', whose growth presents an opportunity for the UK to develop a new group of world-leading R&D-intensive firms and raise significantly overall R&D intensity in the UK.

<sup>1</sup> 'R&D Intensive Businesses in the UK', DTI Economics paper no. 11, March 2005.

**5.4** The economic evidence highlights the dual challenges facing the UK over the coming years: maintaining the success of our largest innovative firms, whilst nurturing the growth of our future R&D performers. This discussion paper opens a dialogue about where best to target further support.

## THE ECONOMIC EVIDENCE – THE EMERGING WINNERS

### Service sector R&D

**5.5** Over time, the UK economy has developed to become concentrated in sectors that are not traditionally R&D intensive and therefore lag behind their peers. The Government's recent economics paper<sup>1</sup> identified this as one of the main reasons for the relatively low R&D intensity in the UK economy as a whole. Outside pharmaceuticals and aerospace & defence, the UK economy is relatively less concentrated in sectors such as manufacturing, where R&D has traditionally taken place, and more concentrated in service sectors.

**5.6** However, there are signs that the business R&D environment is changing for these sectors. The global challenges presented by the increasingly knowledge-driven economy are reflected in the recent growth in R&D in services. With around 60% of the UK economy, increasing the R&D intensity of firms in the service sector will be an important driver of growth in the UK's R&D intensity.

**5.7** The Institute for Fiscal Studies<sup>2</sup>, amongst others, has highlighted the importance of the service sector in closing the productivity gap with the US. Recently, in common with other OECD countries, the proportion of total R&D in services in the UK has been steadily increasing, rising by 23% between 1998 and 2003<sup>3</sup>. There are three main reasons for this trend. Firstly, it is driven by organic growth in in-house R&D amongst service sector firms, for example in software. Secondly, it reflects a wider trend for innovation to become a more distributed process, with more demand for out-sourced R&D, often supplied by smaller, more specialised firms. Thirdly, the rise in service sector R&D is partly due to the re-classification of some R&D, as firms shift their focus towards services. The UK is ideally placed to benefit from these developments.

### Technology-based firms

**5.8** The emergence of R&D in technology-based firms, such as IT, software and electronics, is also an important boost to UK R&D. The DTI's R&D Scoreboard<sup>4</sup> contains information on the largest R&D spenders in the UK and globally. The latest Scoreboard, from 2004, clearly shows the importance of R&D in these sectors. Software & computer services firms are the best-represented sector on the Scoreboard, accounting for 101 of the 700 companies. There are also 51 electronics companies and 43 IT companies. Taken together, these sectors represent a significant share of R&D activity in the UK and their importance is growing. Maintaining and growing R&D in these sectors also offers opportunities for raising the UK's R&D intensity.

**5.9** All firms listed on the R&D Scoreboard are able to couple high investment in R&D with commercial success from their innovation. Between 1999 and 2004, more than a third of the growth in the number of UK-owned firms on the Scoreboard with

<sup>2</sup> Griffith, Redding and Simpson, 'Foreign ownership and productivity: New evidence from the service sector and the R&D lab', IFS Working Paper No. WP04/22, August 2004.

<sup>3</sup> Comparisons of service sector R&D between countries are difficult because it is not consistently measured throughout the world. For example, where a manufacturer out-sources R&D to a service firm, the R&D may be recorded as service sector R&D in one country or as manufacturing R&D in another.

<sup>4</sup> [www.innovation.gov.uk/finance](http://www.innovation.gov.uk/finance)

sales of more than £25m and R&D intensity of more than 4%<sup>5</sup> was from software companies alone.

**Box 5.1 Case study – Pelikon Ltd.**

Pelikon Limited is a young British company making light emitting displays for the home appliance and home entertainment markets. Pelikon's printed segmented electroluminescent display (SEL™) technology, developed in Cambridge and manufactured in Caerphilly, is being evaluated and adopted by the main players in these markets. Remote controls by UEI (Pelikon's first customer into production) are sold across Europe, the United States and the Far East and sales have exceeded \$60m. By the end of 2005 Pelikon expects to have exported over 2 million SEL™ displays.

Set up in August 2000 with 14 staff as a manufacturer of electroluminescent backlights for mobile phones, in 2001 Pelikon acquired the advanced displays team from Cambridge Consultants Ltd. (CCL). This brought significant technical and marketing benefits to Pelikon, and enabled the firm to develop a new inorganic phosphor-based segmented display. Developing small, multi-segment displays required additional technical breakthroughs; R&D investment in 2001 was £77,000.

Today Pelikon has 44 staff, and, supported by R&D tax credits, it reinvests a significant proportion of its sales in R&D: £480,000 in 2003 (14% of sales). It is extending the performance of its technology working with a variety of industrial and academic partners, including the University of Greenwich and the University of Cambridge; DTI collaborative research funding has supported this work with academia.

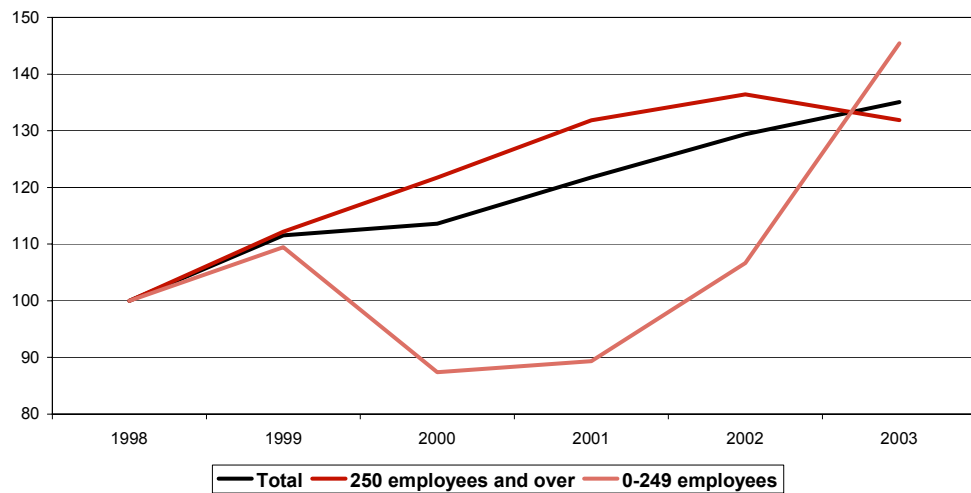
Pelikon's market position depends on the rapid development and production of new displays and ensuring complementary technology is also available to minimise the engineering workload and commercial risk for its customers.

Pelikon attributes its success to matching its touch sensitive SEL™ display technology with the emerging market demand for simpler ways for end users to operate increasingly complex everyday equipment. It is working on an increasing number of home appliance product launches in 2006. Its display production process is also attracting interest from major display providers.

**Smaller-firm innovation** **5.10** Technology-based firms are part of a wider successful story for smaller R&D-intensive firms on the Scoreboard, emerging from a pool of R&D-intensive companies just beneath the largest spenders. Recent years have seen large increases in R&D spending in smaller companies. Overall, business R&D has risen since 2000, with the largest increases in R&D amongst firms with fewer than 250 employees, from £2.3bn to £3.5bn. A fall in investment amongst these firms between 1999 and 2000 probably reflects the realignment of expectations in new technologies at that time. Since 2000, their share of total business R&D has also risen, from 18% in 2000 to 25% in 2003.

<sup>5</sup> Defined in the DTI R&D scoreboard as 'R&D vigorous'.

**Chart 5.1: R&D expenditure performed in UK businesses, 1998 to 2003  
(1998=100)**



**5.11** A healthy pool of small innovative companies provides competition for larger firms and stimulates further R&D investment. Analysis of R&D-intensive sectors on the 2004 R&D Scoreboard suggests that, although they are often dominated by a handful of large firms, there are also likely to be a large number of smaller innovative firms present. In the pharmaceutical sector, for example, the Scoreboard shows that, while the two largest firms together account for 72% of the R&D recorded in the sector, they are accompanied by a large population of smaller R&D-intensive pharmaceutical firms. Further developing new R&D intensive SMEs, such as these, will provide a sound basis on which to deliver further growth in R&D intensity.

**Box 5.2 Case Study Renishaw**

Renishaw is a world leader in automated industrial metrology and spectroscopy; its products deliver productivity improvements in manufacturing and research. The original company was formed in 1973 by David McMurtry (now Sir), Chairman and Chief Executive, Renishaw plc and John Deer, Deputy Chairman, and became a full member of the London Stock Exchange in 1984. The Group's headquarters is located in Wotton-under-Edge, Gloucestershire, with additional manufacturing facilities in Woodchester, Gloucestershire and Dublin, Ireland. Currently, the Group has over 1,800 employees around the globe (1,400 UK).

Renishaw has traditionally exported some 90% of its products annually, with sales for the financial year ending 30th June 2004 totalling £127.7m – a 3000% growth in sales since 1981. The company has been honoured internationally, including ten Queen's Awards.

R&D has been at the heart of Renishaw from the very beginning. Its first product used, under licence, technology developed by David McMurtry while at Rolls-Royce. The first prototype was made in David's garage and the earliest production was at the home of co-founder John Deer. Innovative products allow Renishaw to generate strong profits, which continue to be ploughed back into expanding sales, marketing and manufacturing facilities as well as into developing new technologies. This recycling of revenue from successful products into R&D continues: 2003-04 R&D was £15.5m, 12.1% of sales, and Renishaw benefits from the UK's R&D tax credits.

International expansion has been a key part of Renishaw's growth. Subsidiary companies, providing sales and technical support for the Group's innovative products, have been established in 20 major countries across the world, together with support offices in The People's Republic of China, Singapore and Taiwan. A network of distributors and agents provide support in other key countries worldwide.

Renishaw continues to expand its Gloucestershire facilities for engineering, R&D and manufacturing, having recently acquired a fourth site there, where its machine shop and finishing services will be relocated early in 2006. Unusually, it manufactures as much as possible in-house, both to control the quality of products and to reduce costs through process improvements – a topic also important to its customers.

Renishaw's philosophy of combining innovation in both product and process with superior customer service and growth through developing new markets has clearly brought success. The company cites many factors that have made a difference, from a unique initial product to vigorous defence of its patents, but says its greatest current asset is its ability – through its people, culture and knowledge – to produce future innovations.

Renishaw urges its customers to 'apply innovation' and use its cutting-edge technology to give their business a competitive edge. R&D investment, supported by R&D tax credits, underpins its ability to deliver this – and continues to increase year on year.

**The dynamic story of UK R&D**

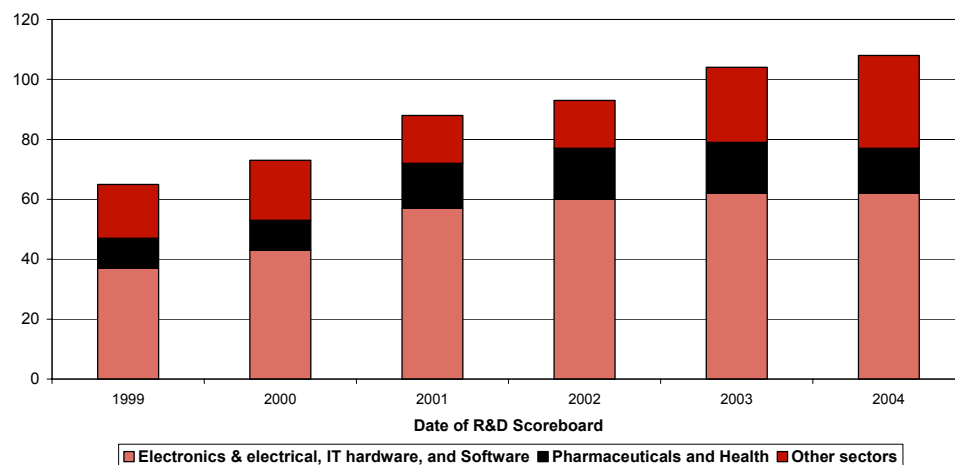
**5.12** Encouraging the creation and growth of new large R&D intensive firms will be essential if the UK is to achieve its ambitious targets; the R&D intensity of the economy as a whole is primarily determined by the activity of its large firms. Many of the recent successes for UK R&D have been amongst SME and mid-sized firms, particularly in some high-tech sectors such as electronics and IT hardware. The dynamic story of how these firms evolve and grow over time is key to understanding many of the issues that potentially impact on R&D investment in the UK.

**Multinational investment** **5.13** A key part in the story of the growth of successful smaller innovative firms is the significant role played by multinationals. Growth in R&D investment can come through organic growth in investment – in both domestic firms and multinationals with UK operations – and through investment in the form of acquisitions and mergers. Multinationals provide vital R&D investment, often through the takeover of an existing production facility in the UK<sup>6</sup>. Foreign acquisition of UK firms also potentially brings additional benefits in the form of technology transfers from the foreign parent to the UK. Recent OECD analysis<sup>7</sup> also indicates the sizeable contributions made by multinationals to productivity growth, in both home and host countries.

**5.14** The growing pool of innovative small and mid-sized firms is making the UK an even more attractive location for inward investment from larger multinationals. Attracting investment into the UK from multinationals is an important aspect increasing overall R&D intensity, particularly in an already highly international system. As these smaller UK firms are acquired, it will also be important that the UK can continue to enjoy the benefits of the R&D, in the face of pressure to relocate to the parent company's home.

**Large firm dynamics** **5.15** It is essential that the UK's largest firms remain competitive in the global market and are supplemented by the emergence of new large R&D companies. Analysis of the R&D Scoreboard reveals that the number of larger innovative firms is growing. In 1999, the Scoreboard listed 64 'R&D-vigorous' companies (R&D intensity of more than 4% and sales of over £25m). By 2004, this number had risen to 108. The data also indicate that the number of firms joining the largest R&D spenders in the UK has grown sharply recently. Two-thirds of 'vigorous' firms in 2004 have become so in the last five years. In particular, mid-range companies in high tech sectors such as IT hardware and software have shown the strongest signs of increased vigour.

**Chart 5.2: Number of UK-owned R&D vigorous companies, 1999 to 2004 (R&D vigorous companies are those with R&D intensity >4% and sales >£25 million)**



<sup>6</sup> Griffith, Redding and Simpson, 'Foreign ownership and productivity: New evidence from the service sector and the R&D lab', IFS Working Paper No. WP04/22, August 2004.

<sup>7</sup> OECD Science, Technology and Industry Outlook, OECD, 2004.

**5.16** In the main, the recent evidence also shows that the UK has been successful in retaining its largest, most innovative firms. Of the 64 vigorous companies on the 1999 list, 40 still remain in 2004. Only 7 firms were acquired by foreign multinationals, underlining the importance of domestic growth in R&D along side foreign investment.

## **ENHANCING THE CREDIT TO RAISE UK R&D PERFORMANCE**

**5.17** The strongest feature of the R&D tax credit is that it is market-based. It allows delivery of Government support for R&D where the market judges it to be most productive. In enhancing the R&D tax credit, the Government believes that this basic market-driven premise should not be compromised. Nevertheless, there may be ways that the tax credit can be enhanced to support the emergence of future R&D winners. This presents a challenge – how best to enhance the credit, whilst maintaining the integrity of the system.

**5.18** The Government’s view remains that the R&D tax credit should incentivise activities as close as possible to true R&D, where the positive R&D spillovers are greatest. It consulted on the definition of R&D for tax purposes in 2003<sup>8</sup> and introduced a revised definition on 1 April 2004. The Government wishes to allow time for this new definition to bed down. At this time, therefore, broadening the scope of R&D tax credits is not specifically being considered.

**5.19** As outlined in Chapter 3, the UK R&D tax credit compares well with fiscal incentives in other countries. At this stage, so soon after the introduction of the large company R&D tax credit, the Government is not considering changes to the large company rate. The potentially large fiscal cost of such a change would have to be justified on a more complete assessment of the positive effect of the present system. The ongoing evaluation of the effectiveness of the large company tax credit will require a longer period before it can deliver these results.

**5.20** Whilst the Government is not considering an increase in the large company rate, large firms in the strongest sectors, such as pharmaceuticals and aerospace & defence, will continue to benefit from the volume-based tax credit, with its associated benefits of simplicity and predictability. In addition, the Government is committed to maintaining a business environment in which firms in these sectors can continue to flourish, building on the 10-year science and innovation framework.

**5.21** The Government also recognises the sizeable contributions made to UK R&D by multinationals. To attract multinational investment, the R&D tax credit will continue to offer a competitive rate of relief for large companies – complemented by the range of measures to strengthen the supply of innovation, outlined in Chapter 2.

**5.22** The Government’s view is that, based on the evidence set out above, the strongest immediate case is for giving additional support to growing innovative firms, focusing at this point on the third and fourth dimensions of the Government’s strategy, increasing R&D intensity in existing sectors and developing new R&D intensive sectors and SMEs.

### **Increasing R&D intensity**

**5.23** R&D intensity in the UK overall is strongly dictated by two factors. Firstly, the UK economy is concentrated in sectors that have not traditionally carried out a great deal of R&D. Secondly, although the evidence shows that UK based R&D performers have a similar R&D intensity to their foreign competitors, the UK lacks depth – it does

<sup>8</sup> ‘Defining innovation: a consultation on the definition of R&D for tax purposes’, DTI/Inland Revenue/HM Treasury, July 2003

not have large firms in every sector of the economy, to drive up the overall level of R&D intensity.

**5.24** There are therefore significant opportunities to increase the UK's overall R&D intensity by encouraging the growth of R&D intensive firms. In the main, this will be achieved by supporting R&D in firms which are able to take advantage of new and emerging technology and by encouraging smaller, more innovative firms to challenge larger companies in sectors where they under perform.

**Developing  
new R&D  
intensive  
sectors**

**5.25** Seizing the opportunities presented by the changing business R&D environment will allow the UK to achieve its targets for growth in business R&D. The evidence points to the growing importance of business R&D outside of the traditionally innovative sectors.

**5.26** There is therefore an opportunity for the UK to develop a new group of world-leading R&D-intensive large firms. The available evidence indicates that additional support for SMEs will best support this aim, but it also highlights the importance of supporting firms as they grow and cross the boundary from SME to large firm.

### **Taking forward development of the R&D tax credit**

**5.27** The Government is seeking a dialogue with business to understand these issues in more detail. This dialogue aims to build a consensus around where best to target support to raise the UK's future R&D performance.

**5.28** In this chapter, the Government has set out evidence on the emergence of R&D in new groups and sectors. The growth of successful firms in these groups – the emerging winners – will be important if the UK is to raise its R&D intensity in the future. **The Government seeks the views of the business community on whether the emerging firms are the most effective target group for enhancements to the R&D tax credit.**

**5.29** If so, the Government would like to have a fuller understanding of the issues facing the emerging firms and the characteristics of these firms that are relevant for the R&D tax credit. For example:

- their size and the point in their growth at which they are likely to come into profit;
- whether the R&D tax credit fully supports the growth of firms from SME to large;
- the issues that might affect the acquisition and potential relocation abroad of UK R&D intensive firms.

**5.30** Over the coming months the Government will consider options in the light of this evidence. **At this stage the Government invites early views on whether it is possible to target effectively additional support to the emerging firms within the tax credit system, without compromising the basic market-driven premise.** As a tax-based incentive, there are difficulties in targeting support to a small number of firms. Furthermore, the Government is keen that any changes should not introduce unnecessary complexity to the system. A broader approach, perhaps targeting the SME population generally for example, may therefore be preferable.

**5.31** Finally, whilst the Government believes that the R&D tax credit is the correct tool to address these issues, **it welcomes views on whether the questions raised in this paper might be better addressed with measures other than the R&D tax credit.**

# 6

## INVITATION FOR COMMENTS

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### Summary of requests for comment

**6.1** The Government has asked for comments with respect to two of the themes of this discussion document, improving the experience of companies claiming the credit and enhancing the credit.

**6.2** The Government would welcome views and evidence on improving the experience of companies claiming the credit. Specifically, on:

- whether the tax credit rules have introduced any unintended distortions, for example by favouring one type of expenditure over another, or by causing companies to alter their relationships with third parties;
- the use of scientific experts in the claims process; and
- whether there are other ways of ensuring the timely payment of the repayable credit to eligible companies.

**6.3** The Government would welcome views and evidence on enhancing the R&D tax credit. Specifically, on:

- whether the emerging firms presented in the paper are the most effective target group for enhancements to the R&D tax credit;
- whether business can help to provide a fuller picture of the issues facing the emerging firms and the characteristics of these firms that are relevant for the R&D tax credit;
- whether it is possible to target effectively additional support to the emerging firms within the tax credit system, without compromising the basic market-driven premise; and
- whether the questions raised in this paper might be better addressed with measures other than the R&D tax credit.

### Regulatory Impact Assessment

**6.4** This paper seeks respondents' views on high-level issues surrounding R&D tax credits, seeking evidence rather than putting forward policy proposals at this stage. Therefore no Regulatory Impact Assessment (RIA) is being published with it. An RIA will be published if and when the Government consults on any options that may emerge.

### Contact details

**6.5** Comments should be sent to the following postal or e-mail address by 12 October 2005:

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ISBN 1-84532-102-2



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