



# Entrepreneurship and innovation in the North

Paper 3 from the Northern Economic Agenda project

By Michael Johnson and Howard Reed

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Challenging ideas – Changing policy

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# About ippr north

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# Executive summary

This is a report from the Northern Economic Agenda project. This project takes a detailed look at the economic performance of the three northern regions of England – the North East, North West and Yorkshire and the Humber – and formulates policy solutions that will enable them to combine strong economic growth with a socially just distribution of the benefits of that growth, taking environmental issues into account at the same time.

The aims of this paper are threefold. First, it uses the latest economic theory and empirical evidence to examine the rationale for government intervention to promote entrepreneurship and innovation in the North, and elsewhere in the UK. Second, it assesses the performance of the northern regions in terms of the levels of entrepreneurship and innovation. Finally, it examines the effectiveness of existing policies to encourage entrepreneurship and innovation, particularly in the North.

## The case for entrepreneurship and innovation policy

There are two main arguments for government intervention to promote entrepreneurship:

1. To negate the effects of *constraints* on entrepreneurship that mean there are too few entrepreneurs in the economy, with economic growth suffering as a result. This is likely to be more of a problem in the North than in other English regions, because would-be entrepreneurs have fewer assets such as owned housing to draw on as an alternative to borrowing in order to start up businesses. There could also be differences in attitudes to risk between regions. Additionally, the fact that venture capital provision is heavily concentrated in London and the Greater South East could constrain finance availability in the North.
2. To encourage the positive *spillover* effects that entrepreneurship can possibly bring to the rest of the economy, which are not captured by individual entrepreneurs or firms. This is a much weaker reason for intervention than the point above, however. Many politicians talk about wanting to promote an ‘enterprise culture’, but it is hard to make the case that most entrepreneurship has positive spillover effects over and above the benefits to the entrepreneur.

There are two main arguments for government intervention to promote innovation:

1. To encourage positive *spillovers* to innovation that are not captured by private individuals or firms in their decision to pursue innovative activities, meaning that the extent of innovation in the economy is below the socially optimum level. There is good reason to think that the social returns to innovation exceed the private returns, and thus that, left to its own devices, the free market will under-innovate. The balance of empirical evidence suggests that this does happen, and hence there is a clear case for government intervention to promote innovation through the patent system and through subsidies to

research and development. There is a much stronger case for intervention to promote innovation based on spillovers than there is for intervention to promote entrepreneurship on the same basis.

2. Innovation can be below social optimum because of *coordination failures* and *information asymmetries*, which make it difficult for firms, research institutions or individuals to appropriate all the returns from their innovations. There is a role for Government to improve coordination through supporting the creation of *networks* of innovators.

Additionally there is an argument for combining innovation policy with environmental policy to secure a low-carbon economy in the future. So far in the UK, innovation policy has not attempted to provide explicit support for low-carbon technologies for fear of locking the UK into the ‘wrong technologies’ or ‘picking winners’. However, more activist strategies in countries like Denmark and Japan have increased these countries’ share of the market for environmental goods and services.

Enterprise and innovation are two of the UK Government’s ‘five drivers’ of productivity in the UK, along with skills, competition and investment. In terms of how this model fits with the latest economic theory, the links between skills and innovation, and investment and innovation are uncontentious. However, the model as it stands does not currently take into consideration the latest work by economists on the relationship between competition and innovation, and entrepreneurship and innovation.

Also, the model fails to consider possible feedbacks from productivity growth to the drivers themselves; for example, higher economic growth may actually increase the rate of innovation in an economy. We recommend that the ‘five drivers’ model should be updated in the light of the newest theoretical and empirical evidence.

The Regional Economic Strategies produced by the three northern Regional Development Agencies all highlight the need to create and attract more entrepreneurs and business start-ups and encourage more R&D spending, especially among small firms, and knowledge networks and collaborations between businesses and nearby higher education institutions. Similarly, encouraging innovation in the North is one of the Northern Way’s key strategic priorities.

## The performance of the North on entrepreneurship

Overall, the northern regions (and the North East especially) perform poorly on the key indicators of entrepreneurship, compared with other English regions.

The most commonly used measure is data from VAT registrations of businesses. All three northern English regions have below average stocks of VAT-registered businesses relative to their population size, the North East having the lowest. The disparity between the North and the Greater South East has widened since 1994, when consistent records began. The North also produces fewer *new* VAT

registrations (relative to population size) every year.

However, there has been a convergence in the level of net VAT registrations (that is, VAT registrations minus VAT de-registrations) across the North and the Greater South East. This implies that the level of business ‘churn’ is higher in the Greater South East – which could mean that the process of ‘creative destruction’, whereby inefficient firms go out of business and are replaced by more efficient firms, is more effective in the Greater South East than in the North.

Alternative evidence on entrepreneurship is available from the Household Survey of Entrepreneurship conducted by the Small Business Service. A regional breakdown of attitudes to entrepreneurship in 2005 suggests that the North East and North West are slightly less entrepreneurial than other English regions.

Evidence from the Global Entrepreneurship Monitor survey for 2006 suggests that the northern regions have lower proportions of their working-age population engaged in business start-ups than the UK average, but that between 2002 and 2006, the North East experienced a faster increase in this proportion than any other region.

There is very little recent empirical work on the determinants of entrepreneurship, and none with a regional breakdown. However, empirical work using UK data from the 1980s suggests that the rate of firm formation in a region – a key proxy for entrepreneurship – is positively related to high population growth within an area, high income per head and a high proportion of workers in non-manual occupations in the region, controlling for other factors. These factors may still be playing a role in the North, although the direction of causality is unclear; for example, low levels of entrepreneurship may lead to low levels of income per head in a region, rather than the other way round.

In addition, the lower levels of inherited wealth in the North compared with other regions (due to lower house prices) could result in a lack of start-up capital for would-be entrepreneurs. Relatively high levels of public sector wages relative to private sector wages in the North, and a shortage of high-skilled public sector jobs relative to other regions could also depress entrepreneurial activity.

Finally, analysis of the UK Family Resources Survey conducted by ippr suggests that households in the North East (but not in other northern regions) are significantly less likely to hold risky assets, such as stocks and shares, than in other English regions, controlling for household income and other factors. Thus it is possible that people in the North East are more ‘risk-averse’.

### **The performance of the North on innovation**

The northern regions’ performance on a range of innovation measures reveals a mixed picture. Data on Research and Development (R&D) spending shows that total R&D expenditure is very unevenly distributed throughout England, and all three northern regions have lower than average R&D expenditure per head. However, the North West is above average for business R&D. The North East performs worst of all. All three northern regions have very low government R&D expenditure, but receive approximately the average amount of higher education R&D expenditure per head.

An alternative source of evidence is the EU’s Community Innovation Survey (CIS) which measured the proportion of firms who were ‘innovation-active’ over 2002–04 – that is, who engaged in the introduction of new products or processes, undertook innovation projects that are not yet complete, or who made expenditures in areas related to innovation (such as training). The CIS data shows that larger firms are more likely to innovate than small firms and that, sectorally, manufacturing and knowledge-intensive service industry firms are most likely to innovate.

Regional differences in innovation activity in the CIS seem to be very small. The North East has the highest proportion of enterprises making major process innovations – bringing entirely *new* processes to industry – of any UK region, followed by Yorkshire and the Humber.

The CIS data on utilisation of knowledge networks gives mixed results. North East firms are more likely to exploit university contacts than firms in other regions, but less likely to use other networking opportunities. North East and Yorkshire and the Humber firms are more likely to enter into innovation collaborations with partners based in the same local region or area of the UK, whereas firms in the Greater South East are more likely to collaborate nationally or internationally.

CIS data suggests that Yorkshire and the Humber has the highest proportion of firms applying for patents (another commonly used proxy for innovative activity) of any UK region. The North West and North East are closer to the UK average.

### **Evaluating the performance of public policies to promote entrepreneurship**

Policies aiming to boost the number of entrepreneurs by *direct subsidy to individual entrepreneurs* were popular throughout the UK in the 1980s, and in Scotland in the 1990s, but have not played a major role in policy in the current decade.

Empirical work by Van Stel and Storey (2004) looking at the relationship between the growth rate of employment in different areas of the UK and the firm birth rate in the 1980s and 1990s concludes that policies that encouraged employment growth through new firm formation appear to have had, at best, no effect on employment, and, at worst, a *negative* effect. This seems to be because subsidies: target the disadvantaged, who are not necessarily well-suited to running businesses; mean new firms displace existing firms in the local market; and reduce the average quality of firms being created.

Overall, the evidence is that it would be a mistake for the Government to revert to a strategy of attempting to boost the level of entrepreneurial activity in the UK by subsidising individual entrepreneurs. Instead, policy should focus on reducing regional inequalities in the determinants of entrepreneurship – the distribution of wealth, workforce skills and the availability of loan finance to companies.

A second category of policies aims to increase the amount of business activity in particular areas rather than among particular groups of people. These include the Enterprise Zones of the 1980s, the recent ward-based Enterprise Areas scheme and the Local

Enterprise Growth Initiative (LEGI) where local authorities bid for funding for projects to stimulate economic activity through investment in enterprise.

Overall the effects of area-based policies seem to be mixed. Enterprise Zones were an expensive way to create extra jobs and caused substantial displacement from surrounding areas. Enterprise Areas appear to be at too small a scale to address economic development issues effectively. It is too soon for a full evaluation of the effectiveness of LEGI to take place as the scheme has only been running since 2005.

In terms of the effectiveness of entrepreneurship education, evidence from the Scottish Business Birth Rate Strategy of the 1990s suggests that, despite a greater focus on entrepreneurship in the Scottish media, there was no increase in the rate of business start-ups in Scotland during the life of the strategy. This could be because the strategy was ineffective, or perhaps because a longer time period is required for evaluation.

### **Evaluating the performance of public policies to promote innovation**

The main subsidy scheme for innovation in the UK is the R&D tax credit, which allows firms to offset a proportion of R&D spending against their corporation tax liabilities. Theoretically, subsidising innovation should increase the amount that takes place. Empirical research on the R&D tax credits confirms that it does increase, but the full effects can take up to a decade to emerge; in any case it looks like the size of the impact will not be large enough to close the gap between the UK R&D spend as a share of national income and those of its main competitors.

We support the credit, but it is not a complete policy solution on its own. The Government should undertake more evaluation of whether small firms' R&D is particularly responsive to tax credit increases,

using the increases in the credit announced in 2006 as a 'natural experiment'. If small firms are more responsive than large firms, it would make sense to increase the value of the small firms' credit; if not, it would make more sense to have a single rate for both small firms and large firms.

In addition to the R&D tax credit there are a number of smaller schemes designed to encourage business innovation through subsidy (for example, the Grant for Research and Development Scheme). It would probably make more sense to fold these into the R&D tax credit system, which would reduce administrative costs and enable more support to be targeted through a single, easily understood and publicised scheme.

A good mix of policy initiatives currently exists to encourage networking between UK businesses, higher education institutions and other research institutions, including Knowledge Transfer Partnerships, Knowledge Transfer Networks and the Higher Education Innovation Fund. But it is worth considering whether there should be an additional spatial policy focus, given that northern businesses tend to network with partners in the same region rather than nationally or internationally. The RDAs and the Department for Innovation, Universities and Skills should examine whether this puts the North at a competitive disadvantage relative to other regions.

Finally, our findings suggest that the North is well placed to spearhead environmental innovations in the UK, with three of the six Science Cities located in the northern regions, and CIS data showing that firms in the North East and Yorkshire and the Humber excel at introducing market-leading innovations in their sectors. Hence, the Technology Strategy Board and the Energy Technologies Institute should consider the business case for targeted investments in environmental innovations in the northern regions.

# Introduction

This is the third report from the Northern Economic Agenda project, which takes a detailed, penetrating look at the economic performance of the three Northern regions of England – the North East, North West and Yorkshire and the Humber. On the basis of the available evidence across a range of different policy areas, the project has formulated policy solutions aimed to enable the Northern regions to combine strong economic growth with a socially just distribution of the benefits from growth, in a manner that is consistent with environmental sustainability in general and the need to avert dangerous climate change over the twenty-first century in particular.

The report focuses on two of the crucial engines of economic growth – entrepreneurship and innovation – in the North of England. Other reports from this project look at the transport system in the North (Reed, forthcoming 2008) and the economic role of the public sector in the North (Mrinska 2007). Together with a background ‘audit’ report on economic, social and environmental trends in the northern regions relative to the rest of the UK (Johnson *et al* 2007a), the three main reports form the evidence base for the final report from this project (Johnson *et al* 2007b). The final report formulates an overarching progressive strategy for the revitalisation of the northern economies over the next decade and beyond.

## Structure of the report

There is general agreement among economists and policymakers alike that entrepreneurship and innovation are two of the main engines of long-run growth in any economy. But the exact

mechanisms through which innovative and entrepreneurial activity feed through to economic prosperity are still open to debate, despite decades of research.

Section 1 sets out in an accessible manner the main insights that modern economic theory has to offer regarding the importance of entrepreneurship and innovation to the economy, and the role that national and regional economic policy might play in encouraging and nurturing them. This section also looks at the conceptual framework that the Treasury and other government departments use when designing policies to encourage entrepreneurship and innovation. It concludes by setting out the main case for government intervention to promote entrepreneurship and innovation.

Section 2 looks at the performance of the North against key indicators on entrepreneurship and innovation from recent literature. The North performs poorly on many of these indicators, but, at the same time, many of the measures used are only crude proxies at best. We ask if the data is useful, and whether it points towards policy solutions that would improve the North’s business performance.

Section 3 looks in detail at the empirical evidence on the effectiveness of government policies to encourage entrepreneurship and innovation over the past 25 years, and asks what lessons have been learned.

The final section concludes with our policy recommendations to promote entrepreneurship and innovation in northern England.

# 1. The rationale for government support for entrepreneurship and innovation

We begin this section with a short survey of the relevant academic literature on entrepreneurship and innovation, focusing on the discipline of economics.

Sometimes academic work on business activity and innovation, particularly the economists' contribution, is criticised for being too abstract, obsessed with mathematical formalism, and of no particular relevance to policy debates (see, for example, Ormerod 1994). In some cases this is no doubt a valid criticism. But policy debate and discussion that is uninformed, or misinformed, about academic research in the relevant fields is likely to result in misconceived, badly designed or inappropriate policy.

This is rarely more evident than in commentary in the mainstream media on business issues and regional economic policy, where terms such as 'enterprise', 'agglomeration' and 'competitiveness' are bandied around loosely without being clearly defined. To avoid this problem, we define our use of the terms 'entrepreneurship' and 'innovation' and their relevance to modern economic performance.

## Entrepreneurship and innovation in neoclassical economics

What does an entrepreneur actually do that distinguishes him or her from other people? For some commentators, being an entrepreneur is synonymous with being self-employed – in other words, running one's own business. But a full treatment of entrepreneurship must encompass more than the single-person-business scenario. Larger companies, ranging from the smallest start-ups to the largest multinational corporation, can all exhibit entrepreneurial behaviour. Nonetheless, many commentators tend to focus on the self-employed, or small- and medium-sized enterprises (SMEs), when discussing entrepreneurship. (We shall return to the issue of size later on.)

Entrepreneurship is not the same thing as 'enterprise' in the way the term is commonly used (often as a synonym for 'business activity'). Nor is entrepreneurship precisely the same as innovation. Many entrepreneurs are innovative – but not all, by any means. For example, the decision to open a restaurant in an up-and-coming area – in which there seems to be a lot of disposable income around and a shortage of local outlets in which to spend it – is entrepreneurial, but is unlikely to involve substantial innovation (provided the menu is reasonably standard).

Conversely, a lot of scientific research in the higher education sector involves considerable innovation, but many researchers in such institutions would not dream of describing themselves as 'entrepreneurial'. What, then, are the defining characteristics of entrepreneurship?

Answers to this question in the economics literature vary. Neoclassical economics (the current dominant school of economic thought) emphasises the role of competitive markets, individual rationality, and forward-looking behaviour in determining the structure of production and the prices at which commodities are bought and sold in the economy. Broadly speaking, neoclassical economists would identify an entrepreneur as someone who identifies and exploits opportunities for profit by operating a productive business of some kind.

Entrepreneurs play a key role in the economic system by entering markets where competition is weak or absent, to drive down excess profits and increase economic efficiency. But, despite this fundamental role for entrepreneurs in neoclassical economics, the theory is remarkably silent on what determines the choice that an individual might make to become an entrepreneur, or not.

By comparison, there are numerous theories and empirical evidence looking at, for example, the decision to undertake education and training at various levels, or the determinants of individual saving and the choice over which assets to invest in. But there is very little theory or empirical evidence on the determinants of the decision to start a business.

An exception to this is a study by Blanchflower and Oswald (1998), who used data from a sample of US households to examine what factors led some individuals to start their own businesses. (This is, therefore, a study of factors determining the move from employment into self-employment, rather than entrepreneurship *per se*, but is nonetheless interesting.)

Blanchflower and Oswald suggest that the most important determinant of starting one's own business is inheritance or gifts from relatives. This seemed to be much more important than any particular psychological traits (such as a willingness to take risks).

A plausible interpretation of these results is that individuals find it difficult to get hold of the necessary capital to start a business. This is possibly because lenders are unable to secure a safe return on their investment, due to the uncertain prospects of many small business ventures (we look at the success and failure rates of small businesses in the North in the next section).

Likewise, the role of innovation in standard neoclassical theory is complex. Innovation is defined as any product or process that improves efficiency and extends the 'production possibility frontier' – making it possible to produce more output (or a new kind of output) with the same set of inputs, or the same amount of output using fewer inputs.

Starting with the pioneering work of Schumpeter (1934), innovation



theory draws a distinction between ‘product innovations’ (which are new goods, or types of good with new qualities) and ‘process innovations’ (which are methods of production). So, for example, the first LCD television was a product innovation, whereas the first instance of ‘hot-desking’ in the office was a process innovation.

In the 1980s, economists began to examine what the factors were affecting the rate of innovation and technical progress in developed economies. This led to the development of *endogenous growth theory*, which had been anticipated by the work of Arrow (1962), but was first outlined in modern times by Romer (1986).

Endogenous growth theory recognises that an innovation is fundamentally an advance in human knowledge, and, as such, has a ‘public good’ aspect. Public goods are non-rival to the extent that one person’s consumption of a particular good does not preclude other people’s consumption of the same good. If I eat an apple then it is not available for anyone else to eat; but if I become informed about an innovation, it does not preclude other people from becoming informed about that innovation also.<sup>1</sup>

The non-rival aspect of knowledge creates *positive spillovers* in the economy, because, once a firm has made an innovation, other firms can exploit that innovation in their production process without needing to make the innovation all over again. (If this were not the case, then the expression ‘reinventing the wheel’ would lose its derogatory connotations.) As we shall see in later sections, spillovers from innovation underpin a lot of the grounds for government intervention in the market for innovations.

Human capital – that is, the skills and knowledge of people in the labour market – is also a key component of the economic model of innovation. Knowledge is necessary in order to innovate effectively. Thus, skills policy and innovation policy are clearly complementary.

Beginning in the 1980s, a new school of economic thought has emerged, built around the notion that the economy *evolves* over time, and, therefore, its development can be modelled using some of the techniques that biologists use to model the development of organisms and ecologies over time.<sup>2</sup>

Like the ‘endogenous growth’ theories described above, evolutionary theories of innovation seek to explain innovative behaviour as the product of a particular system of economic organisation. However, evolutionary theories put additional emphasis on differences in the degree of innovation and entrepreneurship that may emerge in different markets, and in different spatial areas and regions, due to the individual economic and social environment in which the firm is operating.

### Market structure and innovation

Economics has turned recently to the question of what makes some firms more innovative than others. These advances have been made predominantly in the ‘industrial organisation’ literature that focuses on the effects of market structure on firm behaviour.

To summarise, the relationship between market structure and

innovation is complex, and, while the latest research suggests that too much or too little competition can be bad for innovation, the ‘state of the art’ in this field of research is evolving all the time, and future work might result in a different conclusion. Nonetheless, we can assert with some confidence that the view often expressed in the popular economics press (and, to a certain extent, in government publications) – that the more competitive a given market is, the more innovation will take place – is by no means necessarily true. This needs to be borne in mind as we go on to examine policies designed to promote innovation later in the section.

Early theoretical models suggested that increases in competition within a market *reduced* innovation (for example, Aghion and Howitt 1992, Caballero and Jaffe 1993). This was not borne out by subsequent empirical work, which found a positive relationship between product market competition and innovation (for example, Nickell 1996, Blundell, Griffith and Van Reenen 1999).

Still more recent work by Aghion *et al* (2005) finds an ‘inverted U-shape’ relationship between the extent of product market competition and the amount of innovation in a given industry, using data on UK firms’ patenting activity.

The rationale for this is that there are two, opposite effects of competition on innovation. One is a positive effect, whereby competition means that not innovating is costly to a given firm (because its profits get competed away by other firms which do innovate), and hence more competition encourages innovation. The other is a ‘Schumpeterian’ effect,<sup>3</sup> whereby innovation conveys monopoly power, and hence monopoly rents, but the incentive to innovate is dampened if those rents are competed away quickly by other rival firms. Therefore, there is little incentive to innovate. Hence the relationship between product market competition and innovation is ambiguous.

Aghion *et al* test their model on a dataset of UK firms’ patenting activity at the US patenting office, and the ‘inverted U relationship’ appears to fit the data well.

### Theoretical rationales for promoting entrepreneurship and innovation

In the light of the theoretical frameworks outlined above, it is useful to ask what the rationale is for government intervention to increase the supply of entrepreneurs, or innovations. What are the market failures that mean that too little entrepreneurship, and/or too little innovation, takes place?

This section also examines what scope there might be for using policies designed to encourage entrepreneurship and innovation to pursue other objectives – for example, social or environmental goals.

#### Promoting entrepreneurship

Economic arguments for government intervention to promote entrepreneurship focus on two different kinds of market failures:

(a) That there is some kind of constraint that prevents the supply of

1. Strictly speaking, public goods have two characteristics – non-rivalry and non-excludability. However, it is the non-rivalry of knowledge that is the key driver of the predictions of endogenous growth theory.

2. Important contributions to the evolutionary school of innovation models include Nelson and Winter (1982), Andersen (1994) and Fagerberg (2003).

3. Named after the economist Joseph Schumpeter (1883-1950), a pioneer of the analysis of innovation in economics in the 20th century.

entrepreneurs to the economy from reaching the socially optimum level.

(b) That there are positive spillover effects, or externalities, to entrepreneurship that are not captured by private individuals or firms in their decision to become entrepreneurs.

#### Constraints on entrepreneurship

Do people wishing to become entrepreneurs face constraints that could be overcome by government intervention? Would-be entrepreneurs often need to borrow to finance a business start-up, and so credit constraints could be a barrier to entrepreneurship. Theoretical models have suggested that the inherent uncertainty over the profitability and success of a putative business venture can give rise to 'credit rationing' (Stiglitz and Weiss 1981).

As for the empirical evidence, Blanchflower and Oswald (1998) see this as the most likely explanation of their finding that people are more likely to start a business when they have just received a family inheritance or other gift (which would obviate the need to borrow in the capital market).

How important are credit constraints as a barrier to entrepreneurship in the North? In the case of individual entrepreneurs, figures on family inheritances and gifts that might be usable as business start-up capital are not available broken down by region. However, given that housing is a large component of most inheritances, then, if credit constraints are important, regions with lower proportions of owner-occupied housing and/or lower house prices would be likely to see lower levels of entrepreneurial activity (in the absence of government policies to provide alternative sources of finance for individual entrepreneurs).

In the North East in 2004, 65 per cent of households were owner-occupiers, compared with an average of 71 per cent for England. Percentages in the North West and Yorkshire and the Humber were almost identical to the English average (ONS 2006a). At the same time, average house prices in the North England have been substantially lower than anywhere else in England over the last few years (see Fig 1.13 in Johnson *et al* 2007a). This indicates that, to the extent that credit constraints are a barrier, they will probably be more of a barrier in the North East than elsewhere.<sup>4</sup>

However, it is important to recognise that credit constraints are not the only possible explanation for differences in entrepreneurial activity between regions. Another possibility, which we will explore in Section 2, is that attitudes to risk differ between regions; people in less entrepreneurial regions are more inclined to 'play it safe', and do not want to take the risk of starting their own business.

The government policy response to differences in attitudes to risk between regions would need to be very different to its response to simple credit constraints. It would need to focus more on trying to develop a more entrepreneurial culture through entrepreneurship education, as, for example, the Scottish Business Birth Rate Strategy tried to do in Scotland in the 1990s (Scottish Enterprise 2000).

For larger-scale entrepreneurial initiatives, a wider range of finance options seems to be available, including government schemes (which we shall examine in detail in Section 3), bank finance and venture capital (which has been playing an increasing role in funding small business start-ups in the UK over the last two decades). Nonetheless, as we show in the next section, business start-up rates differ substantially across regions.

Simmie *et al* (2004) show that venture capital firms are heavily concentrated in London, the South East and the East of England. Martin *et al* (2003) suggest that, given that venture capital firms need regular contact with the businesses they are funding, they tend to invest more in firms that are nearer. Hence the skewed nature of venture capital provision across the UK may be an additional constraint on finance availability in the North.

Another possible constraint on entrepreneurial activity could be the Government itself. The legal framework in which businesses operate varies from country to country – in some countries it is much easier to start a business than others, and reporting requirements vary widely (see, for example, OECD 2007, World Economic Forum 2006). While regulation is an essential part of the capitalist economy, badly designed or unduly burdensome regulations can make it harder to start or grow a business. Likewise, excessive or inappropriate levels of taxation could blunt the financial incentive to engage in entrepreneurial behaviour. In situations where Government has been identified as the problem rather than the solution, it is important to draw on international best practice to improve regulatory and taxation regimes. In the UK this is more of a national than regional policy issue, as the legal framework for company incorporation and corporate taxation does not vary within regions.

#### Spillovers from entrepreneurship

Are there positive spillovers to entrepreneurial activity? In answering this question, one has to be careful to distinguish economic theory from rhetoric. Many government and opposition politicians (including, notably, Gordon Brown) frequently talk about wanting to promote an 'enterprise culture', to increase economic dynamism and replicate the success of the United States, which is seen as benefiting from high levels of entrepreneurship and a generally positive attitude to entrepreneurs. The key policy question is whether such a promotional stance should translate into government funding to promote entrepreneurship directly.

Measures to promote entrepreneurship are not cost-free; they require funding from tax or other sources, which reduces the amount that can be spent on other areas of public spending, or used to lower taxes. And, just because an activity is 'a good thing', does not mean that government should automatically subsidise it – the case for subsidy hinges on the benefits of entrepreneurship over and above the private benefits to the individual entrepreneur.

While there are good reasons to think that *innovation* has positive spillover effects, it is much harder to make the case that entrepreneurship has such spillover effects *per se*. Rather, entrepreneurship may be intimately linked to instances of

4. Although the higher costs associated with starting and running a business in the Greater South East (high business rents, and so on) could mean that the level of finance required to start a business in the South is higher than in the North, which would offset the lower level of wealth in the North East to an extent.

innovation – but it still makes more sense to subsidise innovation rather than entrepreneurship, unless there is a spillover benefit from entrepreneurship over and above the benefit from innovation.

At the present time we are unaware of any research that makes a rigorous case for positive spillovers from entrepreneurship in general. However, there is a specific type of entrepreneurship that attempts to create positive spillovers as one of its primary functions – *social enterprise*.

Social enterprises are businesses (usually at a small scale) run with social objectives in mind – for example, cooperatives, not-for-profit enterprises and businesses that employ people who, for various reasons, experience difficulties finding work in other sectors of the economy.

As Adams *et al* (2003) point out, policy to support social entrepreneurship is probably best regarded as part of community involvement and neighbourhood renewal policy, rather than part of the mainstream of enterprise policy *per se*. Hence we do not focus on it in this section, although we certainly acknowledge its importance and potential for reducing social exclusion and creating employment for groups who have otherwise been marginalised from the labour market.

### Promoting innovation

The economic case for government intervention to promote innovation rests on the existence of one (or more) of three possible market failures:

- a) *Positive spillovers* (externalities) to innovation that are not captured by private individuals or firms in their decision to pursue innovative activities (such as research and development). This means that the extent of innovation in the economy is below the socially optimum level.
- b) *Coordination failures*, which make it difficult for firms, research institutions or individuals to appropriate all the returns from their innovations, thus reducing their incentives to innovate.
- c) *Information asymmetries*. These arise when potential innovators are unaware of information that is available to others in the marketplace, which might help them innovate. An example would be if a firm is not aware of the existence of potential research partners, or of a particular technology that might make it possible to collaborate with those research partners.

### Spillovers from innovation

The case for government intervention to promote innovation on the grounds of spillovers is more straightforward than the case for promoting entrepreneurship on similar grounds. As described in the last section, the ‘public good’ status of knowledge is well known and understood. Hence, there is good reason to think that the social returns to innovation exceed the private returns, and thus that, left to its own devices, the free market will under-innovate.

The balance of empirical evidence suggests that this is the case. For

example, Bloom *et al* (2005) estimate, using US data, that the social returns to a dollar of R&D spending are around three and a half times higher than the private returns. Hence there is a clear case for government intervention to promote R&D.

This is done through two main routes in the UK. Firstly, there is the patent system, which confers a time-limited monopoly on the innovation to allow the innovator to capture the profits. However, not all innovations can be patented. For example, under current legislation, most process innovations, as well as products like software, cannot be patented.<sup>5</sup>

Because of the limitations of the patent system, there is also a role for the Government to subsidise innovators. Currently in the UK this is done through several policies, of which the largest, by volume of expenditure, is the R&D tax credit system. We return to the empirical evidence on the effectiveness of the R&D tax credit regime and similar policies in Section 4.

### Coordination and information issues

Innovation often requires collaboration between more than one economic agent – for example, between two or more businesses, between businesses and higher education institutions, between two or more higher education institutions, and so on. This is particularly the case when small businesses are involved, as they lack the resources to conduct large-scale product innovation on their own in many fields. Innovators attempt to get round these difficulties by building collaborative networks.

Network-based theories of innovation-led economic development are increasingly popular in economics (Huggins 2001, Bougrain and Haudeville 2002). In these models, small firms are seen as having certain ‘behavioural’ advantages over large firms (they are more flexible and less likely to suffer from internal management problems), but have the disadvantage of being too small to conduct effective innovation in many markets.

Networks of small firms may be able to preserve their behavioural advantages while mitigating their financial disadvantages. A possible role for Government in this process is to assist with identifying networking opportunities as a central ‘broker’ in the system, and indeed this is one of the stated functions of the Regional Development Agencies.

In the next section we examine statistical and empirical evidence on the use of networks in different regions in detail. In general, our findings suggest that firms in the North are at least as effective at building networks as firms in other regions, and more so in some cases. However, particularly in the North East, they are more likely to network locally rather than internationally.

Networks involving links between higher education institutions and businesses are also increasingly important in the UK and internationally, as was recognised in the Lambert Review of university-business links, commissioned by the Government in 2003 (HM Treasury 2003).

5. One response to these limitations would be to extend the patent system to cover other forms of innovative activity – such as software. However, previous work by ippr has recommended against this, as it would increase the power of incumbent software companies and discourage innovation by market entrants and the ‘open source’ software movement, which operates a completely different innovation model, based on extensive networking and sharing of information (Davies and Withers 2006).

The Lambert Review suggested that the Government increase the supply of ‘third stream’ funding to universities designed to promote knowledge transfer between universities and business, and that the Regional Development Agencies be given more responsibility for assisting with the building of business-university relationships at a regional level.

The Government has broadly implemented the recommendations of the Lambert Review in this area, with RDAs also being given responsibility for the Business Link scheme, which aims improve the flow of information available to firms on possible innovation collaborators and partners in their sectors. ‘Third stream’ funding has been expanded via an increase in the size of the Higher Education Innovation Fund. We examine the performance of schemes designed to promote university-business and business-business networks in detail in Section 3.

In summary, the case for government intervention to promote enterprise and innovation from economic theory rests on the following rationales:

- For **entrepreneurship**: the strongest argument for intervention to promote entrepreneurship is the existence of constraints that limit the number of entrepreneurs in the economy. The most likely constraints on entrepreneurship in a particular region are lack of availability of credit, and risk-averseness among people living in that region. The case for intervention to promote entrepreneurship on the basis of positive spillovers to entrepreneurship (that are not captured by the entrepreneurs or firms themselves) is much weaker.
- For **innovation**: the strongest argument for government support for innovation is the presence of positive spillovers to innovation that mean that the extent of innovation in the economy is below the optimum level. Coordination failures and information asymmetries also contribute to a shortage of innovative activity in the economy, by making it harder for firms to undertake innovative activities. Hence, there is also a role for Government to improve coordination and promote networking between firms and other innovators.

## The Government’s rationales for innovation and entrepreneurship policy

This subsection looks at the way in which entrepreneurship and innovation policy are viewed by central and regional government agencies. The first part looks at the overall framework that central government departments use to assess the role of entrepreneurship and innovation as a driver of economic performance, and the approach taken by the Regional Development Agencies in their Regional Economic Strategies, and by the Northern Way. The second part looks at the rationale for intervening in the market to ensure innovation promotes a ‘low-carbon’ economy in future decades.

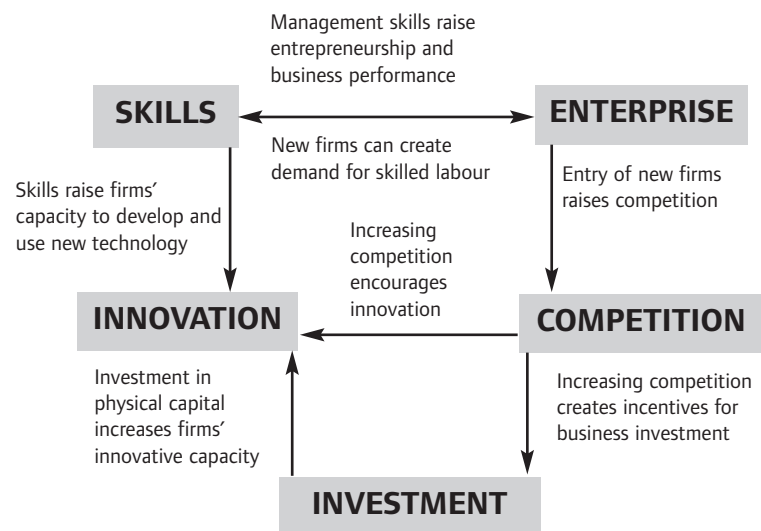
### The ‘five drivers’ framework

Entrepreneurship and innovation are two of the UK Government’s ‘five drivers’ of productivity in the UK. The ‘five driver’ model has been developed and refined by the Treasury since 1997. Figure 1.1, taken from the Treasury’s 2004 publication *Devolving decision making: 2 – Meeting the regional economic challenge, Increasing regional and local flexibility* (HM Treasury 2004), summarises the causal links thought to be operating in the ‘five drivers’ model.

How does this vision of the drivers of productivity square with the economic theories on entrepreneurship and innovation surveyed earlier? The links between skills and innovation and investment and innovation are uncontroversial, and fit with both neoclassical and evolutionary theories of the drivers of innovation. However, we would also argue that there is a potential two-way link between innovation and skills; innovations that give rise to more efficient production techniques can increase the demand for workers with higher levels of skills, or different kinds of skills, to take advantage of those techniques.

The Treasury argues that increased competition is unambiguously good for innovation, but, as explained earlier, Aghion *et al* (2005) suggest that there may be an ‘inverted U-shape’ relationship between competition and innovation; too little competition reduces innovation, but *too much* competition can also have this effect.

Figure 1.1. Important linkages between the drivers of productivity



Source: HM Treasury 2004

The two-way link between skills and enterprise is in line with the tenets of economic theory. Positing enterprise as a driver of competition also makes good sense, as a higher firm entry rate would normally increase the degree of competition in an industry – although incumbent firms can also be enterprising, and a successful incumbent in a market with increasing returns to scale or network externalities can gain monopoly power, which reduces competition (Microsoft, for example).

It is surprising, though, that there is no direct causal link between entrepreneurship and innovation. Being innovative is one of the primary channels through which entrepreneurs, whether in small or large businesses, can achieve success.

Finally, the ‘five drivers’ model fails to consider *feedback effects* from increases in aggregate productivity (and hence economic growth) to the drivers themselves. In the case of innovation, while there is plenty of evidence to support a causal link between innovation and economic growth (Griliches 1998, Evangelista 1999), Cainelli *et al* (2006) find some evidence that a high rate of economic growth actually increases the rate of innovation in an economy. This is largely because high growth increases the potential demand for new innovations and, hence, makes innovation less risky.

In principle the same argument might hold for entrepreneurship – there is more chance of being a successful entrepreneur in an expanding market (although the empirical evidence examined in Section 2 on the determinants of entrepreneurship did not find that aggregate demand growth was a significant explanatory factor, once other factors were controlled for).

In summary, the ‘five drivers’ model works reasonably well, but needs updating in the light of the newest theoretical and empirical evidence. The Treasury should address this as a priority, as it is vital that the theoretical rationale for microeconomic policy is as watertight as possible if the policies are to be credible and effective.

### **Regional economic institutions’ approach to innovation and entrepreneurship policy**

The three Regional Economic Strategy (RES) documents produced by the Northern RDAs make substantial mention of enterprise and entrepreneurship, innovation and R&D as drivers of economic growth. All highlight the need to create and attract more entrepreneurs and business start-ups (with higher survival rates), and encourage more R&D spending, especially among small firms, and knowledge networks and collaborations between businesses and nearby higher education institutions.

The RESs include a large number of specific initiatives to encourage enterprise. However, in line with the relatively small budget afforded the RDAs for programmes of this nature, the initiatives are all fairly small-scale. Examples include:

- Enterprise targets for new business formation (NW, Yorks)
- Focus on increasing the number of social enterprises (all three regions)
- Business Link schemes (all three regions)
- BBC Media Enterprise Zone (NW)

- Improving micro-finance for small businesses in the £0.5–£2m range (NW), Northern Enterprise Growth funds (NE)
- Educational initiatives, for example ‘Northern Enterprise in Education’ (NW), and ‘Education in Enterprise’ programme (Yorks)
- Working with the Regional Image Campaign to attract entrepreneurs (NE)
- UK Trade and Industry Global Entrepreneurs Programme (NE)
- Virtual Enterprise Networks (Yorks).

With regard to innovation, the RESs showcase the following schemes:

- Centres of Industrial Collaboration (Yorks)
- North East Productivity Alliance (NE).

(We review the performance of a selection of policies designed to encourage enterprise and innovation in more detail in the next section.)

When the Northern Way was originally set up in 2004 it featured 10 ‘workstreams’, of which two were particularly relevant to enterprise and innovation: C3, the Entrepreneurial North, and C2, the Knowledge Base and Innovation. As a result of a strategic review of the Northern Way’s activities in early 2007, the number of priorities was slimmed down to three: transport, innovation and encouraging private sector investment in the North. The retention of innovation as a key priority seems sensible, and, as discussed in Section 2, the reduction in the number of priorities is probably more commensurate, given the extent of funding available.

### **Innovation policy and the low-carbon economy**

An additional rationale for government intervention specifically to promote innovation comes from the area of environmental policy. The Government’s long-term response to climate change is encapsulated in the target of a cut in greenhouse gas (GHG) emissions of up to 60 per cent by 2050 in the forthcoming Climate Change Bill (Lockwood *et al* 2007).

The emissions target for the UK and other developed economies has to be at least this stringent for the world to stand any chance of limiting the rise in long-term mean temperatures to around two degrees Celsius, and thus reducing the likelihood of catastrophic impacts later in the 21st century (according to the latest forecasts). However, meeting such a tight target without imposing huge costs on many sectors of UK industry will require substantial innovations in low-carbon technologies, such as carbon capture and storage, biofuels, hydrogen fuel cell technology, and renewable power sources, such as solar, wind and hydro-electrics.

The scale of the challenge ahead raises the question of whether innovation policy should be combined with environmental policy in some way.

Traditionally in the UK, innovation policy has focused on subsidies for R&D, and providing information and networking support to firms (as explained above), whereas environmental policy has been based on a mixture of price-based instruments (such as taxes on fuel and the banding of Vehicle Excise Duty according to carbon emissions),

and quantity-based instruments (such as the EU Emissions Trading Scheme). Innovation policy has not attempted to provide explicit additional support for low-carbon technologies through additional subsidies or through national strategic planning, for fear of locking the UK into the ‘wrong’ technologies, in an echo of the 1970s industrial strategies of ‘picking winners’.

However, other countries, such as Denmark (where the government explicitly supported wind power) and Japan (where the government explicitly supported photo-voltaic cells), have pursued a more activist strategy, with good results insofar as the share of these countries’ firms in the global market for environmental goods and services has increased. Thus, the extent to which innovation policy and low-carbon policy should be intertwined in the UK is still very much an open question.

In 2003 the UK Government established the business-led Environmental Innovations Advisory Group (EIAG) to examine policy options for making the UK more successful at exploiting environmental technologies in the global market. The EIAG’s first report (DTI 2006c) found that, in environmental technology, as in many other markets, the UK had a very good record on research but a much poorer record on innovation. Two main market failures for environmental innovation in the UK were identified:

(a) There is a lack of *credible articulated demand* for environmental innovations, which limits the extent to which firms are able to secure funding to develop initial research into products that can be introduced into the marketplace. Demand for low-carbon products that have not yet appeared in the marketplace is difficult to define and measure, because of the uncertainty as to how consumers will respond to the new technologies. This makes it difficult for innovative firms to construct business plans that will convince financial institutions to lend them the money needed to bring the products to market.

(b) Government concentrates its support for innovation on early stage R&D, but there is insufficient support for firms seeking to build prototypes and scale up production. This is partly a result of EU state aid rules, which make it harder for the Government to provide financial support at this later stage, and partly it is a result of current public procurement practice, which is not sufficiently ‘forward-looking’.

The EIAG recommended that government procurement be used more extensively to encourage firms to bring environmentally innovative products to market, with a ‘forward commitment’ procurement mechanism. This would apply to the public sector the approach taken by the most innovative private sector firms. This involves using supply chain management to promote investment in new products, with government procurers clearly articulating their future needs, and providing a credible promise of future sales to

facilitate a more stable framework for environmental innovations to be brought to market.

The EIAG’s 2006 report was influential in the Government’s decision to expand the remit of the Technology Strategy Board (TSB), which was originally formed in 2004, and became a non-departmental public body in July 2007. The TSB is tasked with promoting and supporting research into science and technology across a range of sectors, working with the RDAs on technological developments and innovations of importance to UK industry, and advising the Government on how to remove barriers to the exploitation of new technologies.

Also in 2006, in its Energy Review (DTI 2006a), the Government announced plans to create a new Environmental Technologies Institute (ETI) as a 50:50 public-private partnership with leading energy companies, including E.ON UK, Shell, EDF Energy and BP.

The prospectus for the ETI (2006b) identifies five objectives for the Institute: increasing the level of funding devoted to energy R&D; facilitating the rapid commercial deployment of low-carbon energy technologies; providing better strategic focus for energy R&D; managing networks of scientists and engineers to deliver energy R&D; and building R&D capacity in the UK. To pursue its aims, the ETI will focus on ‘a small number of specific industrially relevant R&D projects’ from within a framework of seven general themes:

1. *Large-scale energy supply technologies* – improving the efficiency of power generation and reducing emissions from existing fossil fuel technologies.
2. *Energy security of supply* – developing energy technologies to increase security and diversity of supply (including nuclear power).
3. *Increasing efficiency of energy use.*
4. *Developing sustainable transport fuels and transport management technologies.*
5. *Small-scale energy supply technologies*, for example microgeneration and distributed energy supply options.
6. *Developing sustainable energy infrastructure and supply technologies.*
7. *Alleviating energy poverty* through developing technologies to provide secure, clean energy to the world’s poorest communities.

The Government is willing to provide up to £500 million of funding for the ETI over 10 years from 2008 (when the Institute is planned to be up and running), matching contributions from private industry one-for-one.

We examine the prospects for the TSB and the ETI, and their relevance for the promotion of innovation specifically in the North of England, in more detail at the end of Section 3.

## 2. The performance of the North on entrepreneurship and innovation

Before evaluating the performance of government policy to promote entrepreneurship and innovation, it is essential to have a clear picture of how entrepreneurial and innovative the North is, relative to other parts of the UK. In this section we draw on published statistics to produce regional breakdowns of the key indicators of entrepreneurship and innovation.

So far in this report, we have shown that the North performs poorly compared to the UK average on most economic indicators. In a nutshell, our analysis of entrepreneurship and innovation backs up this overall picture in some, but not all, cases. Moreover, many of the key indicators have significant drawbacks, which we point out as we go along, and we investigate alternatives where possible. Additionally we look at the reasons why regions differ in their propensity to innovate and be enterprising, and we examine the relationship between entrepreneurship and innovation in each region.

### Evidence on entrepreneurship from VAT registration data

Figures on VAT registrations are a widely used measure of entrepreneurial activity. In the UK, consistently defined annual data is available going back to 1994, and can be broken down both by industrial sector and by a variety of geographic classifications.

All businesses with an annual turnover of more than £64,000 are

required to register for VAT. Although very small businesses – including many sole traders – are therefore absent from the register, it is widely accepted that VAT-registered businesses are proportionately representative of overall business stocks.

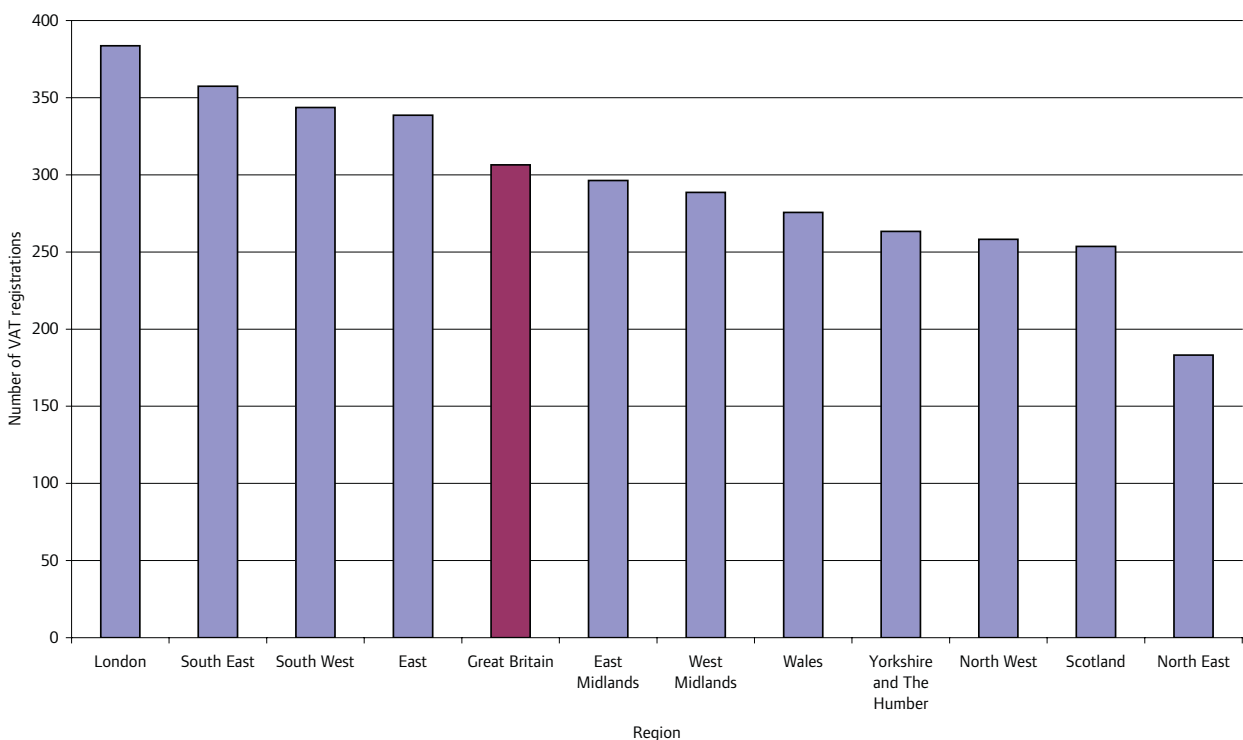
However, the level of VAT registrations remains a somewhat crude measure of entrepreneurial activity. It makes no allowance for the size of each registered firm, or the activities that the firms undertake. So, for example, a multinational corporation with a UK VAT registration counts for the same as a sole trader with a high enough turnover to be included on the register. Likewise, a merger between two registered companies would lead to a decline in entrepreneurial activity on this measure, and vice-versa for a de-merger.

Given the low annual net firm formation rates – fewer than six firms per 10,000 people, even in the best-performing regions – mergers and de-mergers can have a significant impact on the statistics. Additionally, the VAT registration threshold changes regularly, but not always in line with inflation.

However, given that there is no obvious alternative measure of entrepreneurship available from administrative records, we will rely on VAT registration data, subject to the above caveats.

Figure 2.1 gives a breakdown of the stock of VAT-registered businesses in a given area per 10,000 residents (thus controlling for

Figure 2.1. Stocks of VAT-registered businesses per 10,000 residents, 2005



Source: VAT registrations/de-registrations data, accessed through [www.nomisweb.co.uk](http://www.nomisweb.co.uk)

different population sizes in each region). The regions that constitute northern England, particularly the North East, all have stocks of VAT-registered businesses significantly below the British average. Stocks of VAT-registered firms in the North have remained between fifty and sixty firms per ten thousand residents below the national average since 1994. Furthermore, although the North had more VAT-registered businesses per 10,000 residents in 2005 than in 1994, the disparity between stocks in the North and the Greater South East widened between 1994 and 2005.

One drawback of using the total stocks of VAT-registered businesses as a barometer of entrepreneurship is that it tells us nothing about whether entrepreneurial activity is increasing or decreasing. To examine the direction of change we need to look instead at companies registering for VAT *for the first time* in a given year.

Figure 2.2 uses statistics on *new* VAT registrations per 10,000 residents for the North and the Greater South East, and for Britain as a whole, between 1994 and 2005. The data on new VAT registrations reinforces the view that the North is underperforming. While the North reflects the trend observed nationally and in the Greater South East between 1994 and 2005, it is clear that it produces fewer VAT-registered businesses every year. It is also worth remembering that the North starts with fewer VAT-registered businesses and fewer people, so the absolute business stocks of the Greater South East are accelerating away from the North year on year.

Data on *net* VAT registrations – VAT registrations minus VAT de-registrations – is also useful, as it enables us to assess the extent of ‘churn’ in the business stock. In the models of innovation and

market structure discussed in the previous section, a high rate of churn is, other things being equal, a good thing, as it is caused by the inefficient firms in a given industry being forced out and replaced by leaner, more industrious new firms in a process of ‘creative destruction’.

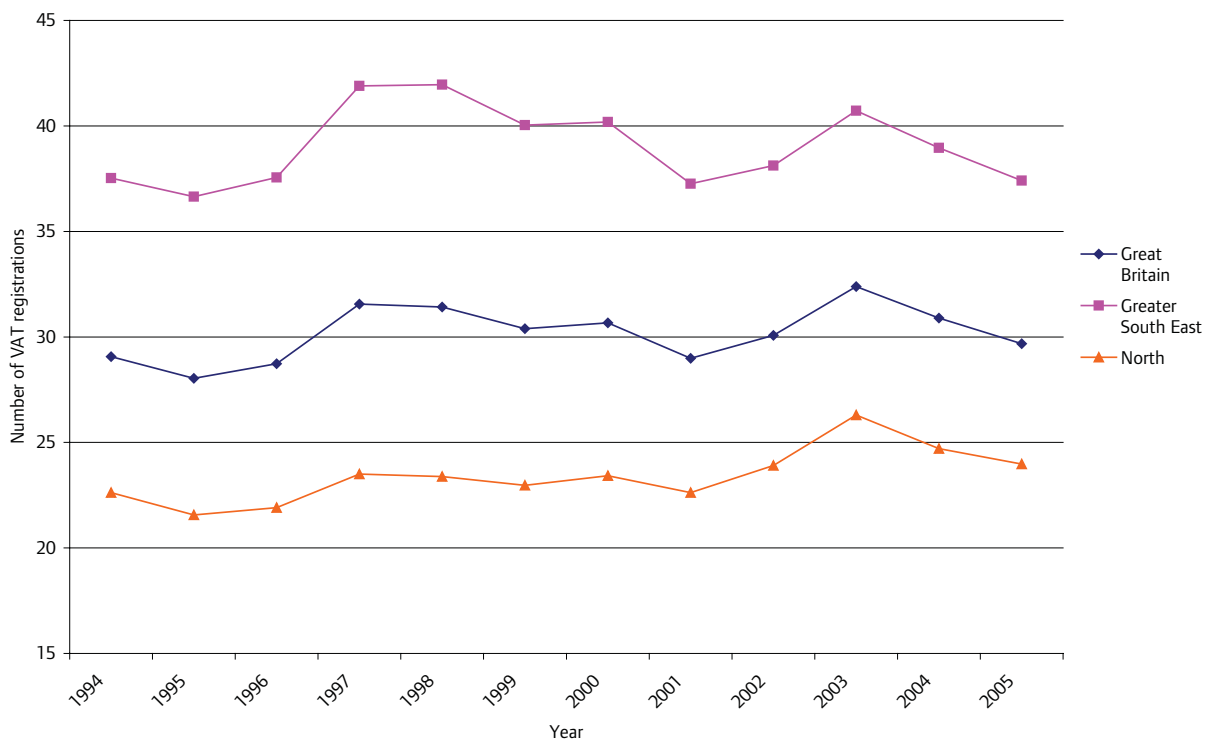
However, a high rate of churn can also be caused by economic instability (an increase in the firm failure rate is one of the first indicators of recession in the economy, for example). This means that it is important to ascertain the reasons why churn in the business stock is taking place, as well as examining the level of churn.

Figure 2.3 (next page) shows that there has been a convergence across regions in the level of net VAT registrations since 2002. Given that we know from Figure 2.2 that the level of VAT registrations was appreciably higher in the Greater South East between 2002 and 2005, it is clear that there was also a higher level of VAT de-registrations. This indicates a higher degree of business ‘churn’ in the Greater South East than in the North.

Looking back at the data on Gross Value Added (GVA) between 1990 and 2005 in different regions (shown in Table 1.1 in Johnson *et al* [2007]), there is no obvious evidence that the economic environment in the Greater South East was less stable than in the North. If anything, it is more likely that Schumpeterian ‘creative destruction’ processes were stronger in the Greater South East than in the North – which might contribute to a faster rate of growth of GVA in the Greater South East.<sup>6</sup>

Another popular barometer of business prosperity is the survival rate of firms. This measure monitors the proportion of firms that register

**Figure 2.2. New VAT registrations per 10,000 residents, 1994-2005**

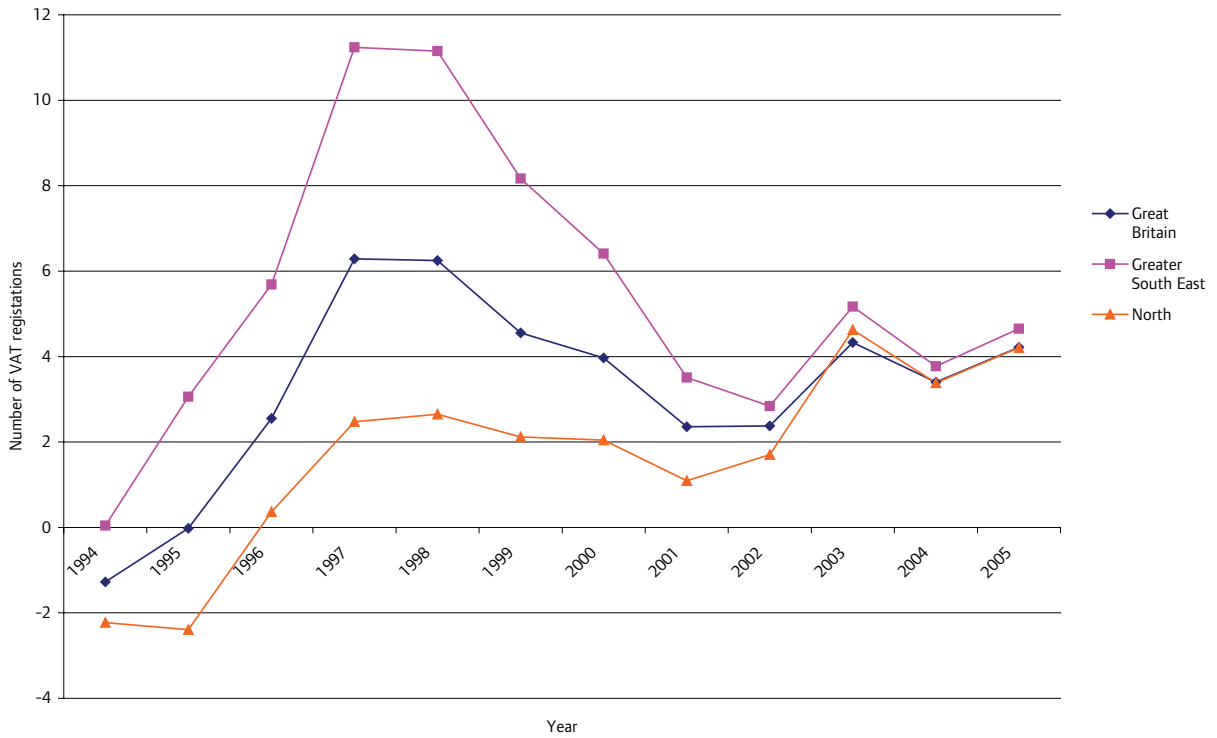


Source: VAT registrations/de-registrations data, accessed through [www.nomisweb.co.uk](http://www.nomisweb.co.uk)

6. Differences in the rate of creative destruction and churn between national economies have recently been advanced as a possible explanation for differences in growth rates between countries. See, for example, Brown *et al* (2006).

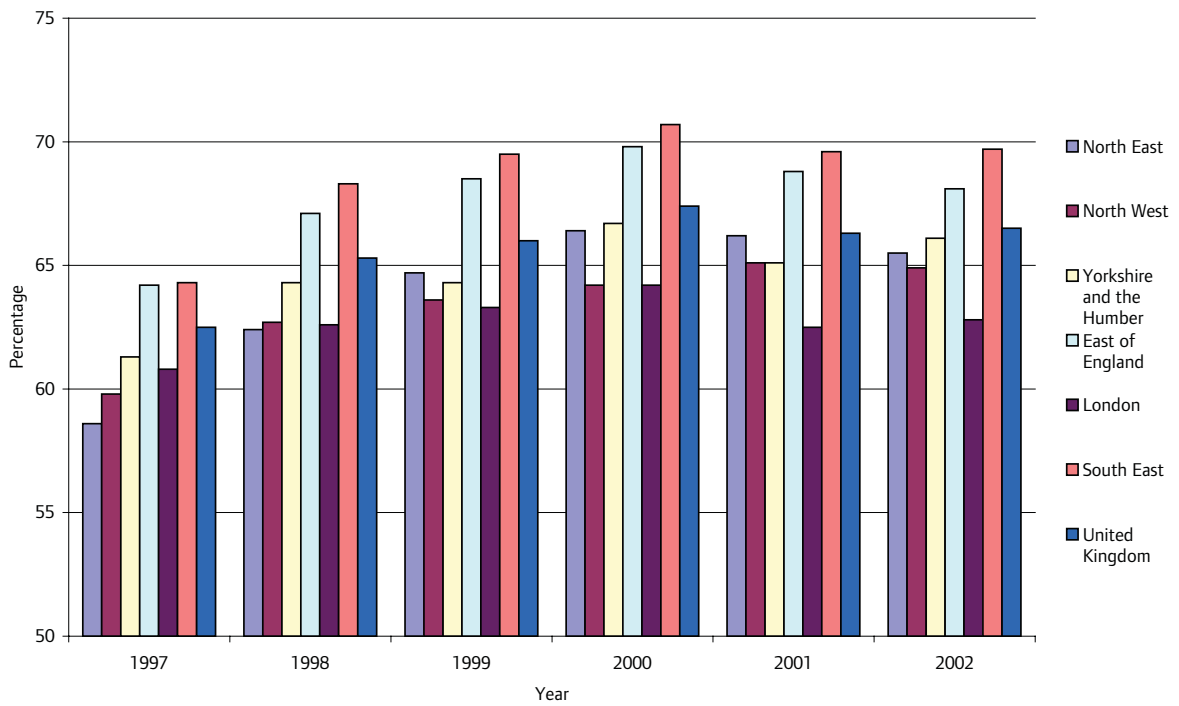


Figure 2.3. Net VAT registrations per 10,000 residents 1994–2005



Source: VAT registrations/de-registrations data, accessed through [www.nomisweb.co.uk](http://www.nomisweb.co.uk)

Figure 2.4. Survival rates of VAT registered firms<sup>7</sup>



Source: DTI 2006e

7. Firms that remain VAT registered three years after first having registered. Year denotes survival rate of those forming three years previously.

to pay VAT in a given year and remain registered to pay VAT three years later. The strength of this data is that it accurately represents the prosperity of individual firms, not just a summary of the overall situation. This data is shown by region in Figure 2.4 for the constituent regions of the North and the Greater South East.

It is clear that firms in the South East and the East of England outperform the UK in each and every year from 1997 to 2002. Equally, firms in London are less likely to survive than others over the same period. The experience of firms in the North is less clear-cut. All three northern English regions have, in each and every year from 1997 to 2002, remained below the UK average, which is a further sign of economic underperformance. However, the northern English regions – particularly the North East – have moved closer to the UK average over this five-year period.

**Alternative evidence on entrepreneurship**

VAT registration data has significant drawbacks as an indicator of entrepreneurship, as discussed above and in previous work by the Centre for Cities on entrepreneurship (Kornblatt and Troni 2006). However, few alternative robust indicators are available. In this section we present two of the best alternative measures.

The Department for Business, Enterprise and Regulatory Reform (BERR)’s Small Business Service (SBS) conducts its own Household Survey of Entrepreneurship on a periodic basis, most recently in 2005 (SBS 2007). Using the results from the survey, the population was divided into three categories:

- ‘Doers’ – those who were engaged at the time in entrepreneurial activity, either through running a business or by being self-employed.
- ‘Thinkers’ – those who had recently thought about starting their own business or buying into an existing business, or those who

had thought about becoming self-employed but were not actually self-employed at the present time.

- ‘Avoiders’ – the remainder of the population.

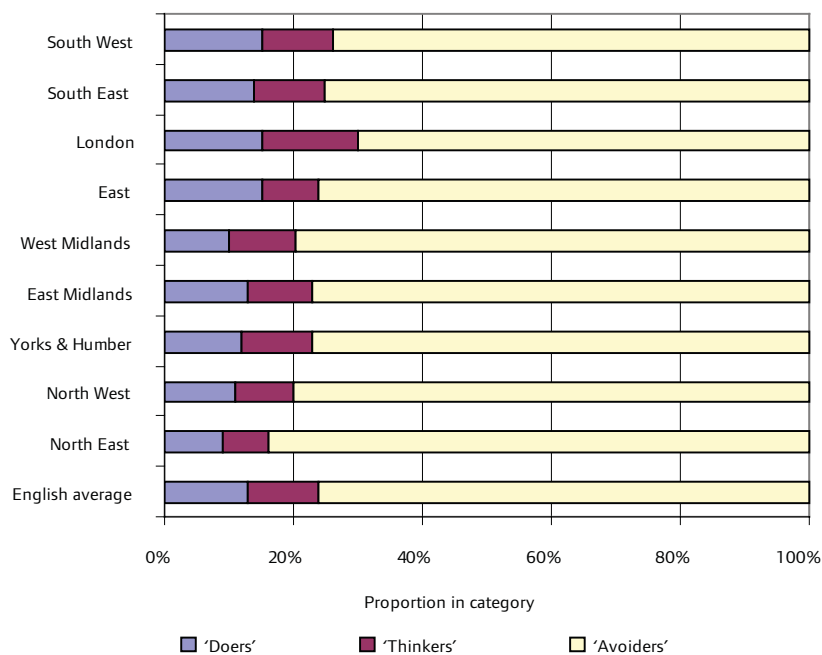
This is a self-reported measure, and so the responses, particularly for people describing themselves as ‘thinkers’, should be treated with some caution, as there is no way of verifying the accuracy of the responses to the survey independently. How much does someone have to be thinking about becoming an entrepreneur to classify themselves as a ‘thinker’, for example? And how likely is a ‘thinker’ to become a ‘doer’? Nonetheless, the SBS measure is probably the best alternative measure of entrepreneurship that is available with a regional breakdown.

Figure 2.5 shows a regional breakdown of the proportion of ‘doers’, ‘thinkers’ and ‘avoiders’ in the working age population. The sample size of the SBS survey is small, so only a few of the differences in proportions of ‘thinkers’ and ‘doers’ between regions were statistically significant. These were that the North East, North West and the West Midlands had fewer than average ‘thinkers’ and ‘doers’, while London had significantly more thinkers.

To the extent that these findings are robust, they reinforce the message from the VAT registrations analysis that the North East and North West are less entrepreneurial than the rest of England. Yorkshire and the Humber’s entrepreneurial activity is not significantly different from the rest of England on this measure.

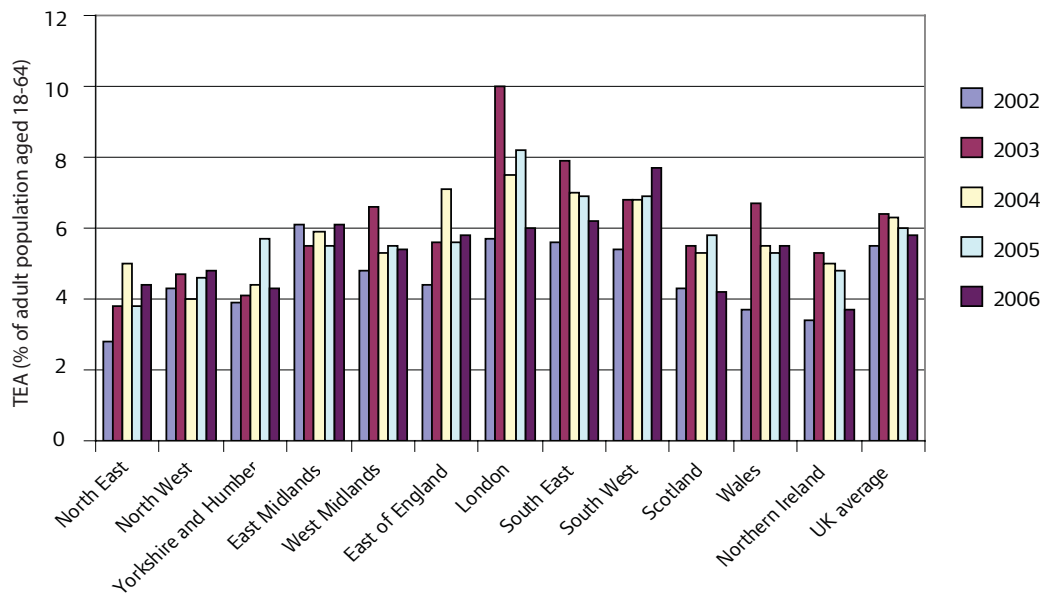
The final entrepreneurship measure we consider in this section is from the Global Entrepreneurship Monitor (GEM) organisation. GEM conducts an annual attitudinal survey that seeks to analyse people’s views on becoming self-employed, and the likelihood of them starting their own business (see Harding *et al* 2007 for the latest UK edition).

**Figure 2.5. Regional breakdown of results from SBS Entrepreneurship Survey, 2005**



Source: DTI 2006e

Figure 2.6. Those expecting to start a business in the next three years, by region



Source: Harding *et al* 2007: 32

Like the ‘thinkers’ measure in the SBS survey, the attitudinal GEM measures suffer from the characteristic weakness of attitudinal data in that it is reporting interviewees’ *intentions* to do something, rather than what they actually do. However, GEM also collects a measure of Total Entrepreneurial Activity (TEA) – defined as the proportion of survey respondents who were engaged in ‘early stage’ entrepreneurial activity, in other words starting their own businesses, during the previous 12 months.

Figure 2.6 shows a regional breakdown of TEA for the years 2002 to 2006. To some extent the GEM data backs up our earlier findings. All three Northern regions had levels of TEA that were below the UK average for each of the five years featured. However, the North East, which was a long way behind every other region in terms of its level of TEA in 2002, makes the biggest improvement of any region by 2006, and overtakes Northern Ireland and Scotland.

The North West and Yorkshire and the Humber also show increases in TEA between 2002 and 2006, although there are large fluctuations from year to year in some cases, perhaps because of small sample sizes in the GEM survey. By 2006 the South West had the greatest level of TEA per head of the working-age population, followed by the South East, the East Midlands and London.

#### Why is the North less entrepreneurial?

To our knowledge there has been no rigorous empirical study of the reasons why entrepreneurialism might differ between different UK regions. However, the recessions of the early 1980s and early 1990s motivated some empirical work on the determinants of firm formation across the UK.

Keeble and Walker (1994) examined this question using data from the 1980s.<sup>8</sup> Raw data on the rates of firm formation showed a clear divide between Northern and Southern England, if the rate of firm formation was measured as the number of people employed in new firms, with the North doing worse per head than the South. Regression analysis of the determinants of firm growth suggested that a relatively high population growth within an area, high income per head and a high proportion of workers in non-manual occupations were all positively related to firm growth in the 1980s.

For manufacturing firms, formation rates were higher where there was a high proportion of small firms in the area, but, for services, the converse was the case. There was also a positive relationship between firm birth rates and death rates, which was evidence of firm ‘churning.’ This backs up our findings on the net VAT registration rate for firms since 2002, shown in Figure 2.3.

Work by Garofoli (1993), looking specifically at the determinants of new firm formation in Italy, found that the size structure of existing firms and the occupational structure of employment were the most important determinants. Garofoli argues that markets where small firms predominate have the highest rates of firm formation. There is, however, an obvious question here of which way the causality runs – does the amount of entrepreneurship increase in a region because the market is populated by small firms, or do high levels of entrepreneurship create an economy where small firms are predominant?

Additionally, Garofoli explicitly encourages a focus on ‘investment to improve the local social and economic milieu’ via improving business services for small firms, and argues that focusing on

8. Obviously this empirical evidence is rather dated now, but this issue has not been addressed in any more recent research that we are aware of.

improving the capability of small firms is likely to be more effective than stimulating new firm formation. On occupational structure, Garofoli suggests that the share of self-employed workers in a region is itself a determinant of new firm formation (although this seems rather circular, as many self-employed people show up as new VAT registrations in the data). Also, as for Keeble and Walker (1994), areas with a higher proportion of non-manual workers have a higher firm formation rate.

To the extent that the factors identified in this 1990s work on the determinants of firm formation remain important in the current decade, they still play a role in explaining lower levels of entrepreneurship in the North. As discussed earlier in this section, the northern regions have a lower stock of small businesses per head (and indeed a lower stock of businesses in total) than the other English regions. In addition, the North has a higher proportion of its workforce in manual occupations and a lower proportion in non-manual occupations, and self-employment rates are lower in the North than elsewhere (ONS 2006).

There are also other factors that could be playing a role. If Blanchflower and Oswald (1998) are correct, availability of inherited wealth is one of the main determinants of individual entrepreneurship, and the analysis of house price differentials in the background audit report for this paper (Johnson *et al* 2007a) shows that the northern regions have had consistently lower house prices than the rest of England. This would tend to lead to smaller inheritances and, hence, a lower chance of starting a business, particularly if credit constraints are important.

Slower demand growth is also a possible explanatory factor for lower entrepreneurship, and the analysis of GVA growth in the audit showed that it has been slower than average in the northern regions over the last 15 years. However, the empirical work cited above suggests that aggregate demand changes do not play a key role in explaining firm formation, once other explanatory factors are controlled for.

Another difference between the North and rest of the UK, and one that is often pointed to as an explanation for low levels of entrepreneurship in the North, is the relatively large public sector, particularly in the North East. However, as discussed in an earlier report from this project (Midgley 2007), the public sector in the Northern regions is not especially large relative to population size. Rather, the main issue is that the private sector is smaller than average (particularly in the North East).

Additionally, there is little evidence that the public sector 'crowds out' private sector activity in the North. If anything, public sector spending and investment stops the gap between GVA per head in the North and the Greater South East being worse than it is at the moment. It is, however, possible that the relatively high level of public sector wages (including benefits) relative to private sector wages for medium-to-high skilled workers in the northern regions (as discussed in Mrinska 2007) could discourage public sector workers from moving into the private sector to undertake entrepreneurial activity.

However, it is important to note that the share of these jobs in the total available jobs in the Northern regions is less than in other regions. That is why lower supply might lead to the higher

competition and salary imbalances, and also why getting additional high-skilled and well-paid public sector jobs into the North might have a positive impact on regional entrepreneurial activity. It would increase the pool of skills and improve labour market competition. Thus, highly skilled specialists might decide to stay in the region to work for a private company or start their own business after a period of working in the public sector.

Unfortunately, lack of rigorous empirical panel data on wages makes it difficult to answer this question (the British Household Panel Study, which is the main source of UK panel data, is not large enough to examine regional differences in entrepreneurial activity with a sufficient degree of reliability).

### **Attitudes towards risk in the UK regions**

One potentially influential factor that Garofoli does not explore is differences in attitudes towards risk. Entrepreneurialism, by its very nature, involves risk. Could it be that people in the north of England are more risk-averse than their southern counterparts, and hence less entrepreneurial?

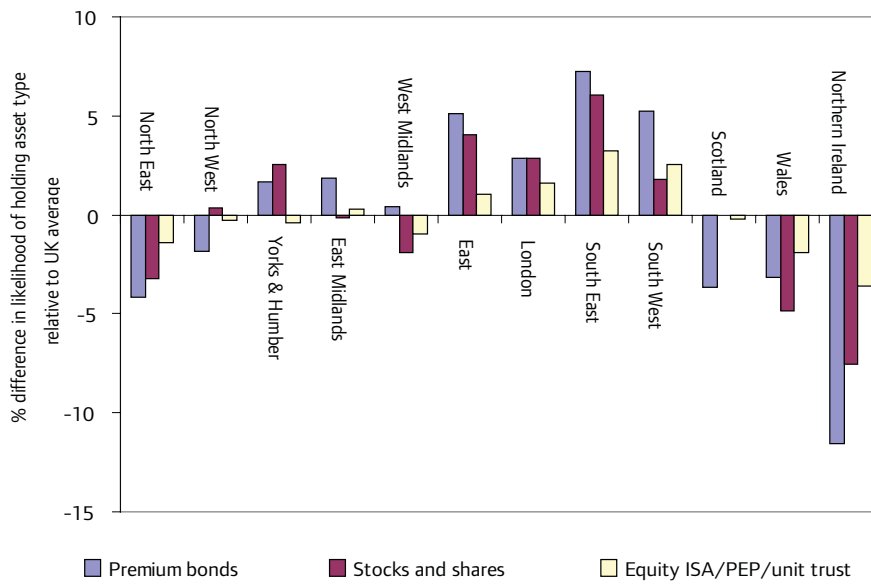
Attitudes to risk are difficult to measure using survey data. Economists generally believe that data on what people actually do is more useful than data on people's beliefs or attitudes, as there can be a wide discrepancy between the two – and people reveal their actual preferences through their behaviour. With this in mind, one potential way of classifying regional attitudes to risk might be to examine regional investment preferences. For example, investments with a variable return, such as equities (stocks and shares), are a more risky investment than variables with a fixed interest return, such as building society savings accounts or cash ISAs. Does the North have a preponderance of people who invest in less risky assets?

The UK Family Resources Survey (an annual cross-sectional survey of around 30,000 UK households) allows a regional comparison of investment in different types of financial asset. To test whether there were regional differences in preferences for risk, we regressed holdings of a selection of assets – stocks and shares, premium bonds, ISAs and other bank or building society accounts – against a set of household characteristics, including the age of the adults in the household, number of children, housing tenure, employment status and region. The Appendix shows the full set of results.

The main results that emerge from this analysis are shown in Figure 2.7 (next page). The North East, Wales and Northern Ireland are significantly less likely to hold premium bonds and stocks and shares than other regions, controlling for other factors. Differences in the holdings of equity ISAs, PEPs and unit trusts were less substantial than for the other two asset types, and only the Northern Irish were significantly less likely to hold them than people in any other region. Those in the South East were significantly *more* likely to hold all three types of asset.

This analysis suggests that people in the North East are more 'risk-averse', and so might be less entrepreneurial, even controlling for differences in household incomes, than people in most other UK regions. However, people in the North West or Yorkshire and the Humber are no less likely to hold risky assets than others.

Figure 2.7. Likelihood of holding various types of 'risky' asset by region, controlling for other factors, 2004–05



Source: Family Resources Survey 2004–05

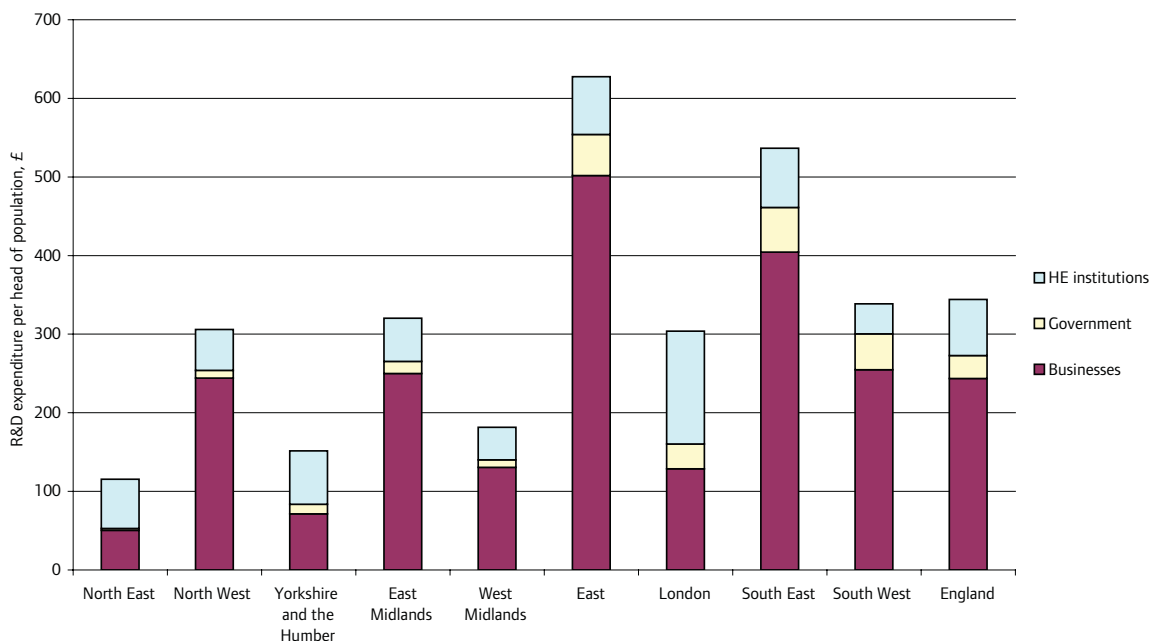
### Evidence on innovation from research and development data

As with entrepreneurship, innovation is difficult to measure accurately. The two most common measures used in the empirical literature are both proxies. One is research and development (R&D) spending, which, strictly speaking, is an activity conducted in order to produce innovations, rather than an innovation itself. There are also categories of innovation that do not occur through

R&D – as explained in Section 1, many ‘process’ innovations fall into this category.<sup>9</sup> Nonetheless, high quality data on R&D spending is available in all industrialised countries, and a detailed regional breakdown is available on an annual basis.

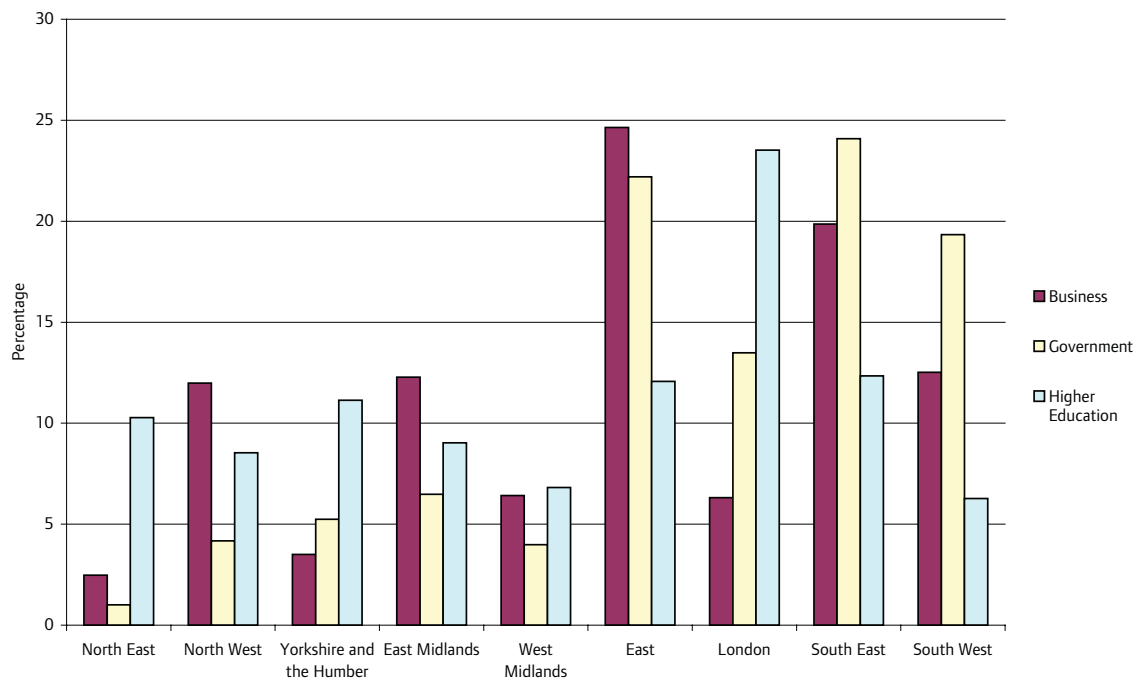
Figure 2.8 shows expenditure on R&D per head of population in each English region (to correct for the fact that some regions are much more populated than others). Total R&D expenditure is very

Figure 2.8. Expenditure on research and development by region, 2003, per head of population



Source: ONS 2006a

9. More detailed accounts of the relationship between R&D spending and innovation, and why the former is a poor proxy for the latter, are given in Athey *et al* (2007).

**Figure 2.9. Percentage shares of each English region in total R&D expenditure, controlling for population size, 2003**

Source: ONS (2006a); Mid-year population estimates accessed through [www.nomisweb.co.uk](http://www.nomisweb.co.uk)

unevenly distributed throughout England, and all three Northern regions have lower than average R&D expenditure per head. The North East performs worst of all, closely followed by Yorkshire and the Humber. The North West is much closer to the English average, and indeed is above the average for business expenditure. The East and South East have the highest business expenditure on R&D per head, while London is way out in front in terms of university expenditure per head.

Figure 2.9 presents the same information in a different way, to show in which category of R&D expenditure the northern regions perform the most badly. It shows percentage of spending in each of the three categories – business, direct government R&D expenditure and higher education – by region, controlling for population size. If R&D expenditure was distributed evenly around the country per head of population, then each bar on the chart would equal one-ninth (11.1 per cent).

In fact, as Figure 2.9 shows, every category of R&D spending is very unevenly distributed around the country, but the exact pattern varies for each category. Business R&D is done mostly in the East and the South East, where there is a preponderance of ‘high-tech’ R&D-intensive companies. The North East and Yorkshire and the Humber have exceptionally low business R&D spending. The North West is around average. Government R&D spending (around 10 per cent of overall UK R&D expenditure, and mainly for defence) is overwhelmingly focused on the East and South East, and, to a lesser extent, the South West and London. All three northern regions have very low Government R&D expenditure.

This lack of investment in the north is beginning to attract criticism, with the North East Economic Forum encouraging the Government to locate a major research centre in the North East (Diamond 2007). Higher education R&D is heavily focused on London. Outside of London, the distribution of higher education R&D spending around the country (relative to population size) is a lot more balanced, with all three northern regions receiving around the average.

An analysis of the main industrial categories of expenditure in R&D in the North, using statistics from ONS’s Business Monitor (ONS 2007), suggests that the breakdown by region is as follows:

- *North East*: chemicals and mechanical engineering
- *North West*: chemicals, electrical machinery, transport equipment
- *Yorkshire and the Humber*: chemicals, electrical machinery, transport equipment, and service industries.<sup>10</sup>

The major manufacturing category that does not feature as receiving significant R&D spending in the North is aerospace, which takes place predominantly in the South East and South West. In addition, the North West has a large proportion of R&D spending in ‘other manufacturing’.

### **Evidence on innovation from the Community Innovation Survey**

As with entrepreneurship, survey evidence with a regional breakdown is also available on innovation. The EU’s Community Innovation Survey (CIS) provides data on the innovative activities of a representative sample of firms in the UK and other EU countries,

10. Unfortunately, ONS (2007) does not disaggregate service industries into subgroups.

produced on an internationally consistent basis according to OECD guidelines (OECD 2006a). The CIS has, so far, been undertaken at four-yearly intervals; the most recent survey was CIS 4, released in 2005 and covering the period 2002-04.<sup>11</sup>

The CIS uses a broad definition of innovation, defining a business as 'innovation-active' if it is engaged in any of the following:

- Introduction of a new or significantly improved product (good or service) or process for making or supplying them.
- Innovation projects not yet complete (or even abandoned).
- Expenditure in areas such as internal R&D, training, acquisition of external knowledge, or machinery and equipment linked to innovation activities.

Although the CIS is subject to a wider margin of measurement error than R&D and administrative patent data, as it is a survey measure rather than a measure from administrative statistics, it is probably better at measuring innovation in the services sector – which has been growing faster than the manufacturing sector for several decades now. Cainelli *et al* (2006) and NESTA (2006) point out that R&D and patents are not as appropriate for measuring services innovation as they are for manufacturing, as service companies find it harder to classify innovative spending as R&D, and are less likely to file patents than manufacturing companies.

Table 2.1 shows data on the proportion of firms of different sizes

undertaking innovative activity of any kind. We have included this table because it illustrates in stark form the well-established fact that larger firms are more likely to be innovators than smaller firms: 72 per cent of firms with 250 or more employees were innovation-active on the CIS definition, compared with only 55 per cent of firms with fewer than 50 employees.

Within the subsample of innovation-active firms, larger firms were also more likely to be 'product innovators' developing new goods and services, and they were also more likely to be 'process innovators' introducing new production, management, distribution and marketing techniques. We will bear this in mind when examining the performance of the Government's R&D tax credit (which gives additional assistance to small- and medium-sized enterprises) in Section 3. However, comparison of the results from CIS 4 with CIS 3, which covered the period 1998-2000, suggests that there is a smaller gap between the proportion of innovative large firms and small firms in CIS 4 (DTI 2006d: Figure 1.1).

Table 2.2 shows how innovative activity breaks down by industrial sector in the CIS. Firms in manufacturing industry, and especially engineering-based manufacturing firms, are the most likely to innovate. However, firms in the knowledge-intensive service sector (which includes telecommunications, financial intermediation, computers and related activities, research in the arts, humanities and science, and technical consultancy) were almost as likely to be innovation-active as manufacturing firms. Knowledge-intensive

**Table 2.1. Innovative activity by firms of different sizes, 2002-04**

Percentage* of firms who were:	All, 10+ employees	10-49 employees	50-249 employees	250+ employees
Innovation-active	57	55	67	72
Of which:				
Product innovator:	25	23	33	39
Goods	16	14	24	28
Services	17	17	18	23
Process innovator	16	14	21	31

\* Note that subtotals in this and subsequent tables do not sum to 100 because there are other ways of being innovation-active which are not included here: firms that are (for example) investing in training in innovation-related activities would be counted as innovation-active but would not necessarily be either product or process innovators. Also, the categories in the subtotals are not mutually exclusive.

Source: Community Innovation Survey 4

**Table 2.2. UK Innovative activity by sector, 2002-04**

Percentage of firms who were:	Primary	Engineering-based manufacturing	Other manufacturing	Construction	Retail and distribution	Knowledge-intensive services	Other services
Innovation-active	54	73	70	44	52	69	47
Of which:							
Product innovator:	14	38	34	12	22	37	17
Goods	11	35	30	5	15	18	7
Services	9	16	14	9	14	31	16
Process innovator	19	24	24	6	10	28	11

Source: Community Innovation Survey 4

11. The tables in this section are edited versions of those given in DTI (2006).

**Table 2.3. Innovative activity, selective regions, 2002-04**

Percentage of firms who were:	North East	North West	Yorks & Humber	West Midlands	London	South East
Innovation-active	57	58	58	55	57	60
Of which:						
Product innovator:	25	24	25	24	27	28
Goods	16	16	17	18	14	18
Services	18	15	17	14	23	19
Process innovator	16	15	15	16	17	16

Source: Community Innovation Survey 4

service firms were more likely to be process innovators than manufacturing firms; they were about equally likely to be product innovators. The lowest rates of innovation activity were found in the construction sector.

Table 2.3 gives a regional breakdown of innovative activity for most of the English regions. Immediately, a very different pattern emerges compared with the R&D data examined above, which painted the North East and Yorkshire as innovation laggards. On the CIS measure, the North East's innovation activity is identical to the UK average of 57 per cent, and Yorkshire and the North West are one per cent above average. Indeed, regional differences in innovation seem to be very small. The only major discrepancy that emerges in Table 2.3 is that London has a particularly high percentage of product-innovating firms in service industries. In short, the North's innovation performance looks a lot better on this survey data than it does on the R&D data.

Further analysis of the regional breakdown in DTI (2006d) suggests that firms in the North East and Yorkshire tend to rely on acquiring external knowledge (that is, through collaboration with other firms and institutions that are undertaking R&D), whereas firms in other regions have a greater tendency to conduct R&D in-house.

As well as the overall number of firms undertaking any product or process innovation, the CIS also looks at those firms whose innovation is most ambitious – the firms who introduce entirely new products to market and entirely new processes to industry. These

firms are innovating pro-actively rather than reactively, keeping ahead of the competition rather than trying to catch up with the competition.

Encouragingly, the North East has the highest proportion of enterprises bringing new processes to industry of any region in the UK, followed by Yorkshire and the Humber. As process innovations tend to be more complex than product innovations, this shows that firms in these two regions have an important strength in their ability to introduce new methods and technologies to the production process effectively. The North West, by contrast, is below average on market-leading process innovations. All three northern regions are below average on the proportion of firms introducing market-leading *product* innovations.

As mentioned earlier in the section, the building up and utilisation of networks of knowledge and expertise is an important element in the innovation process, particularly for smaller firms. CIS also collects information on the proportion of firms who make use of information on innovation from a number of sources. Table 2.4 gives the proportion of firms in each of the northern regions (within the subsample of innovation-active firms only), compared with the South East (included because of its key position in the Greater South East) and Scotland (which has high scores on just about every network measure).

Looking at Table 2.4, the North East seems to be the main outlier on most measures. Innovative firms in the North East are more likely to

**Table 2.4. Utilisation of knowledge networks among innovation-active firms in the North**

Percentage of firms making use of source of information:	North East	North West	Yorks & Humber	South East	Scotland
Contacts within own enterprise/enterprise group	80	80	82	82	80
Suppliers	86	86	86	87	87
Clients or customers	84	84	88	87	89
Competitors	76	75	80	80	81
Consultants or private labs	47	45	47	49	52
Universities or other HEIs	34	28	27	28	34
Government or public research institutions	31	28	29	31	37
Conferences, trade fairs, exhibitions	57	62	65	67	70
Scientific, trade & technical publications	59	60	61	64	68
Professional & industry associations	62	65	65	68	70
Technical, industry or service standards	61	64	63	65	67

Source: Community Innovation Survey 4



exploit contacts with universities than the other English regions included here, but are less likely to use conferences, trade fairs and exhibitions, and professional and industry associations. It is possible that the location of the North East, the English region furthest geographically from London, contributes to an unwillingness to use conferences and trade fairs. However, this does not seem to be the case for Scotland, which has much higher proportions of firms using them.

Additional analysis of the CIS shows that firms in the North East, Yorkshire, the West Midlands, Scotland and (especially) Northern Ireland are most likely to enter into *innovation collaborations* with partners based in the same local area or region of the UK, whereas firms in the Greater South East are more likely to collaborate with firms based elsewhere in Europe or in the rest of the world. This may indicate that firms in the Greater South East are better at building international collaborative networks than firms in the rest of the UK.

Firms in the North West and Yorkshire, along with Wales and Northern Ireland, have a particularly low percentage of collaborators in the rest of the world outside Europe. Benneworth (2004) suggests that the North East has certain traditions of firm ownership and firm-to-firm networking, which tend to make it more insular and peripheral than other regions. This is an intriguing hypothesis, which Benneworth backs up with case study evidence. However, the model has not, so far, been tested on a representative sample of firms in the region (and the stringent data requirements that would be needed to estimate such a model make such a test unlikely in the near future). Hence it must be regarded as an unproven possibility for now.

### Evidence on innovation from patenting activity

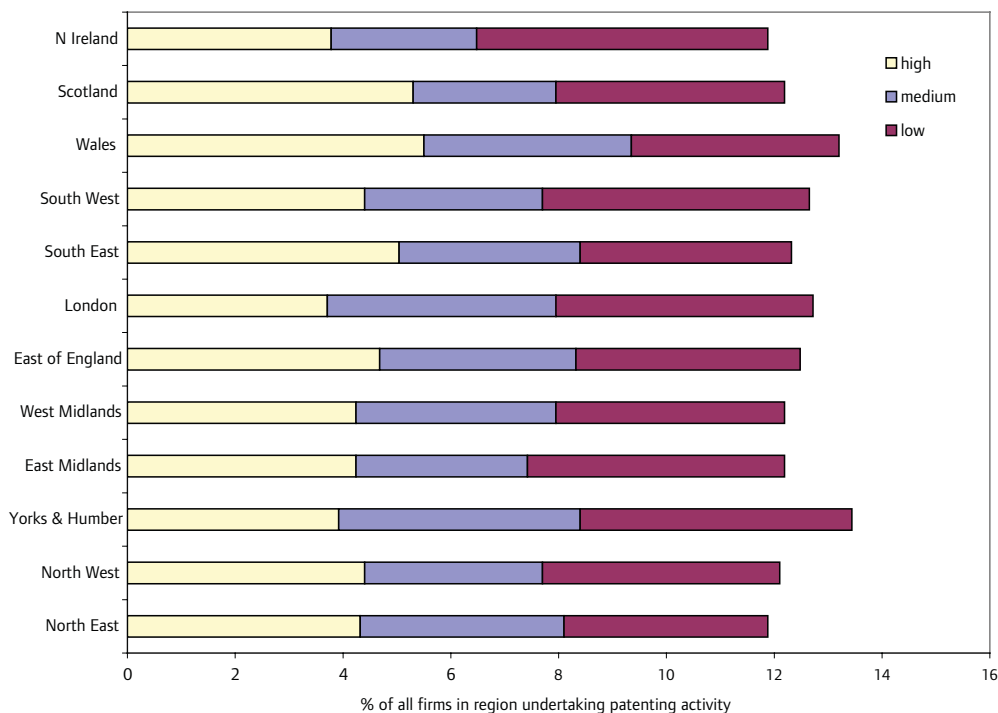
Together with data on R&D spending, patents are the other most commonly used measure of innovation activity in empirical literature on this topic. Although the Department for Innovation, Universities and Skills (DIUS) collects administrative data on the number of UK firms who register patents every year, no regional breakdown of this data is available. However, the CIS includes data on patenting.

There is a clear link between the number of patent applications filed by a firm and the amount of innovation that firm does, although patents only apply to a subset of innovations. They are more likely to be used for product innovations than process innovations, and some forms of product innovation cannot be patented under current legislation – software, for instance (at least, this is the case in the European Union).

Figure 2.10 presents data from the CIS on patenting activity by firms, broken down by region. Firms were asked whether their use of patents was ‘high’, ‘medium’ or ‘low’. The results show that Scotland, Wales and the South East have the highest proportion of firms with ‘high’ patenting activity. But the region with the highest proportion of firms doing any patenting at all is Yorkshire and the Humber.

In summary, the data on innovation suggests that the North East and Yorkshire and the Humber are well below the England average in terms of the amount spent on R&D by the private sector and by government. However, survey evidence from CIS 4 suggests that there is very little regional disparity in the proportion of firms undertaking innovative activities. The North East and Yorkshire and the Humber have the highest proportion of firms bringing entirely new processes to their industries. Regional variations in patenting activity seem to be fairly limited.

Figure 2.10. Regional patenting activity in the UK, 2002-04



Source: Community Innovation Survey 4

# 3. Evaluating the performance of public policy

In this section we look at evidence on the performance of current and previous policies aimed at encouraging entrepreneurship and innovation in the UK.

## Policies to promote entrepreneurship

Policies aimed at increasing the extent of entrepreneurship in the UK fall into three broad categories:

- (a) Policies that provide financial subsidies or tax concessions to entrepreneurial activity – normally defined as new start-ups for self-employed people.
- (b) Policies that provide support to existing businesses – whether financial or via information and advice.
- (c) Policies aimed at encouraging entrepreneurialism among people who do not currently undertake entrepreneurial activity, via entrepreneurship education or the provision of information to would-be entrepreneurs.

Our analysis of the effectiveness of policies to promote entrepreneurship is in four parts. First, we look at policies that subsidise individual entrepreneurs directly, which were particularly popular across the UK in the 1980s, and more recently in areas with particularly low rates of new firm formation, such as Scotland and Wales. Second, we discuss area-based initiatives to encourage entrepreneurialism. Third, we look at business support measures. Finally we discuss education and information policies.

### Subsidising individual entrepreneurs

Policies aiming to boost the number of entrepreneurs in the UK, or parts of the UK, by direct subsidy to individual start-ups have been popular at many points in the last 25 years.

#### The employment effect of increasing business start-ups

Throughout the 1980s, policymakers believed that increasing the rate of business start-ups within deprived regions and among the unemployed and economically inactive provided one of the best ways of encouraging economic growth, and, in particular, employment growth. This was the era of the Enterprise Allowance Scheme (EAS), which offered unemployed people financial assistance in starting their own businesses.

Since the early 1990s, direct subsidy to entrepreneurs has played a much smaller role in enterprise policy in the UK overall – the ‘self-employment option’ in the New Deal for Young People and the New Deal for Long Term Unemployed gives start-up assistance packages, but on a smaller scale than the EAS. However, in Scotland there has been a more recent emphasis on subsidising entrepreneurs; the 1990s saw the emergence of the Scottish Business Birth Rate Strategy (BBRS), a key plank of which was the promotion of new start-ups (Fraser Allander Institute 2001).

The current decade has seen the launch of the Entrepreneurial Action Plan in Wales, aiming to increase the number of sustainable

start-up businesses. HM Treasury’s 1999 Policy Action Team report on ‘Enterprise and Social Inclusion’ (HMT 1999) concluded that increasing the number of business start-ups was an important means of tackling economic disadvantages in England’s poorest communities. The BERR has a Public Service Agreement (PSA) target to generate more sustainable enterprise in the 20 per cent most disadvantaged local authority wards.

However, the assumption that increasing the rate of business start-ups is a good way to reduce unemployment has fallen increasingly into question among much of the academic community. Van Stel and Storey (2004) test the hypothesis that an increase in the number of start-ups in a region creates extra net jobs in the long run. They examine the relationship between the growth rate of employment in different NUTS3 regions of the UK and the firm birth rate over the 1980s and 1990s, controlling for wage levels, population density and business cycle effects.

The results show no significant relationship between the rate of firm birth and the rate of employment growth in the 1980s, but a positive relationship in the 1990s under the Major government (when the focus of government policy moved away from encouraging start-ups and towards providing the conditions and support for existing businesses to grow). However, for the North East of England in the 1980s, a *negative* relationship between firm birth and employment growth was found. This is one of the areas that was most deprived in the 1980s, and, thus, where we would have expected to find the strongest positive relationship between the two variables if the enterprise allowance scheme had worked as intended.

Furthermore, analysis for Scotland, which introduced its Business Birth Rate Strategy in the 1990s (also aiming to increase start-up rates as part of a broad package of policies to increase entrepreneurship), also found a negative relationship between firm birth and employment rates.

Van Stel and Storey conclude that policies that encourage employment growth through new firm formation appear to have, at best, no effect on employment, and, at worst, a negative effect. Their suggested rationale for the results is twofold. First, entrepreneurship subsidies to disadvantaged groups target a group of the population that is *least* suited to self-employment and running small businesses, and, thus, are a very inefficient use of resources. Second, time-limited subsidies to new firms result in the displacement of incumbent firms in a local market by subsidised firms, which have a cost advantage. Thus the subsidy just creates ‘churn’, rather than increasing aggregate employment.

In an assessment of the performance of enterprise policy in the Tees Valley in the North East, Greene *et al* (2004) argue that a related problem with policies to increase the rate of new firm formation is that they reduce the average *quality* of firms being created. That is,

the new firms created by the subsidy are less productive on average than would be the case in the absence of the subsidy. Founders of businesses in the Tees Valley in the 1980s, when the Enterprise Allowance scheme was in full swing, were significantly less educated on average than their counterparts in the 1970s or 1990s.

More recent academic work has explored the employment dynamics of business start-ups in more detail. Fritsch and Mueller (2004) carried out an analysis of firm formation in Germany and isolated three key phases (or time lags) as a firm established itself, with differing impacts on aggregate employment.

The first phase is the immediate impact of the firm formation, which typically has a positive impact on aggregate employment (the *direct effect*). The second phase sees competitors going out of business, which has a negative impact on aggregate employment (the *displacement effect*). The third phase sees the surviving firms stimulated into improving their own performance, therefore

expanding and creating employment opportunities (the *induced effect*). This experience is graphically represented in Figure 3.1.

Mueller *et al* (2007) recently carried out a similar piece of research looking at the experience in Great Britain. The broad conclusion of this paper is that increased VAT registrations tend to have a positive impact on aggregate employment. In other words, the combined impact of the *direct effect* and the *induced effect* outweigh the impact of the *displacement effect*.

However, this ignores important geographic distinctions; the most easily identifiable being that Mueller *et al* isolate Scotland and Wales as behaving differently. In the case of Scotland and Wales, they argue that the combined impact of the *direct effect* and the *induced effect* do not outweigh the impact of the *displacement effect* – the overall employment impact of new firm formation is negative.

Importantly for this analysis, Mueller *et al* go beyond just isolating Scotland and Wales as individual cases. Figure 3.2 shows that the impact of firm formations in regions with low levels of entrepreneurial activity (which includes the North on most definitions) bears more relation to Scotland and Wales than to the rest of England. The size of the negative impact on aggregate employment appears to clearly outweigh the positive impact.

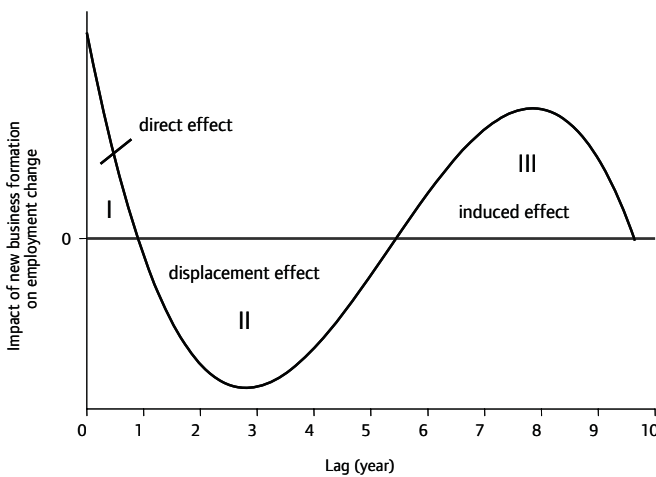
Using this evidence, we can conclude that, while increasing the levels of VAT-registered businesses is a valid strategy for regional bodies to pursue in order to raise productivity, there is at least a reasonable likelihood that it will have a negative impact on aggregate employment. If gains in productivity are cancelled out by a reduction in employment, then the level of GVA will remain more or less unchanged, and any publicly funded initiative that achieves such an outcome will surely find it difficult to claim that it delivers the best possible value for money.

An important conclusion that Mueller *et al* arrive at is that it is possible to differentiate between desirable and undesirable firms. Public policy needs, therefore, to be more discerning in the sort of enterprise it encourages and subsidises – for example, through subsidising firms that are more likely to innovate. The focus should be on quality, not quantity, of new firms. It might be that the low entrepreneurial regions just have a lower proportion of ‘high quality’ firms, and this causes this variation in impact upon aggregate employment.

In summary, it must be said that the evidence on the effectiveness of policies designed to encourage entrepreneurship through direct subsidy is pretty damning. It may be better to encourage entrepreneurship *indirectly*, through policies to encourage the other factors that influence the decision to become an entrepreneur. For example, by promoting a more equal distribution of wealth through extensions to initiatives like the Child Trust Fund, or reform to Inheritance Tax (Maxwell 2004). Another option would be to invest in enhancing skill levels in the North, as highly skilled people tend to be more entrepreneurial.

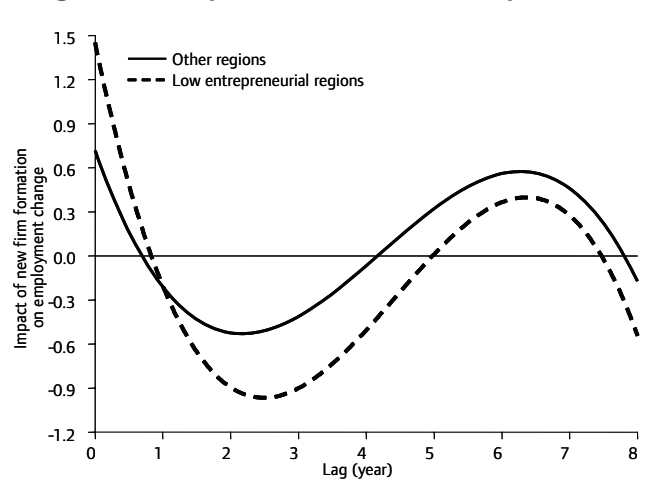
Fortunately (given the poor results we have documented above), recent government expenditure on direct subsidy to

**Figure 3.1: Schematic effects of new firm formation on employment change**



Source: Fritsch and Mueller 2004 cited in Mueller, van Stel and Storey 2007

**Figure 3.2: Impact of new firm formation on employment change in low entrepreneurial areas (below 25th percentile)**



Source: Mueller *et al* 2007

entrepreneurship is much lower than in the 1980s heyday of this kind of policy. For example, the Scottish Business Birth Rate Strategy only cost around £15 million per year over its lifetime, from 1993 to 2001 (Fraser Allander Institute 2001). Our main message here is to discourage policymakers from a return to direct subsidy of entrepreneurs as a policy option, precisely because the evidence shows that subsidy programmes of this kind do not work.

#### **Area-based subsidies and tax concessions**

There are a number of recent or current policies to encourage entrepreneurship that focus on increasing the amount of business activity in particular *areas* rather than among particular *groups* of people. Examples of these include:

- *Enterprise Zones* – set up in the early 1980s in ‘areas of economic and physical decay, where conventional economic policies [had] not succeeded in regenerating self-sustaining economic activity’ (Department of the Environment 1980).
- *Enterprise Areas* – a smaller, ward-based initiative set up in 2002, covering the 15 per cent of most deprived wards in England and Scotland (and the 42 per cent most deprived wards in Northern Ireland).
- *Local Enterprise Growth Initiative (LEGI)* – a pot of money that local authorities in deprived areas can bid for, to fund projects to stimulate economic activity through investment in enterprise.

The mix of incentives offered to firms starting up in, relocating to, or indeed already located in the areas covered by these schemes varies according to the scheme. Enterprise Zones offered generous tax breaks for the firms locating there, including 100 per cent capital allowances for construction of commercial property and exemption from business rates for occupiers.

Enterprise Areas initially included Stamp Duty exemption on property transactions, but this was scrapped in 2005 due to it being poorly targeted. The remaining package of measures in Enterprise Areas is rather limited, consisting mainly of business support, such as Community Investment Tax Relief. LEGI is a much more flexible, devolved programme, with the investment measures being decided by the successful local authorities.

Troni and Kornblatt (2006) review the evidence on the effectiveness of area-based enterprise policies, and conclude that, overall, the results are mixed. The final Enterprise Zones scheme ended in 2006; an evaluation found that the average ‘cost per job created’ in the scheme was £17,000 (ODPM 2003). Given that someone working at the minimum wage for a 40-hour week would earn around £11,000 per year, this does not look like very impressive value for money.

Furthermore, there was substantial displacement of economic activity from surrounding areas, which is a common problem with area-based schemes; around 35 per cent of employers locating in Enterprise Zones were relocations of existing businesses from less than 10 miles away (Potter and Moore 2000).

The empirical evidence on Enterprise Areas suggests that their

effectiveness is limited due to their spatial scale being too small to address economic development issues, and also because their toolkit of policy interventions is too small.

LEGI has only been running since 2005, hence it is too young for a full evaluation of its effectiveness to have taken place. But, in general, we would agree with Troni and Kornblatt (2006) that the focus on devolved design of investment proposals is a good thing, although there is a corresponding risk that some of the local authorities with the highest levels of deprivation will find themselves least able to make successful bids. More support from the RDAs to enhance the bidding capacity of business-deprived areas needs to be provided in subsequent LEGI rounds.<sup>12</sup>

#### **Business support policy**

An analysis commissioned by the Small Business Service calculated that, in 2003-04, the Government spent about £2.5 billion on schemes to support small businesses (PACEC 2005). This was not a straightforward calculation, because of the complex and fragmented nature of business support provision in the UK; in 2006 there were around 2,650 business grants and support schemes in England alone (Troni and Kornblatt 2006).

Business support policy in the UK currently suffers from three major problems: the support schemes are not well known or understood by businesses; there are too many of them; and they overlap. The Government recognised this in its 2006 Budget Statement, which committed to a ‘zero-based review’ of business support and a fundamental rationalisation of existing business support schemes. This is a very sensible measure, given that having multiple schemes that do the same thing cannot possibly be the most efficient way of delivering business support.

The extent to which business support exists to promote entrepreneurship as opposed to just assisting small businesses with their day-to-day operations is less clear, however. For this reason we do not focus on it in detail here.

#### **Encouraging entrepreneurship through education and information programmes**

All three northern Regional Development Agencies commit themselves to the stimulation of entrepreneurship through education programmes that encourage schoolchildren and university students to consider starting businesses after they leave full-time education, and parallel programmes to make adults already in work more aware of the potential of starting one’s own business.

Recently, the privately run (but partially government-funded) Enterprise Week initiative has held events over seven days in November each year aimed at making young people and adults more aware of enterprise, and creating a more dynamic ‘enterprise culture’. As yet there is little evidence of the effectiveness of these types of scheme in England. There is, however, some evidence from Scotland, where the Scottish BBRS (mentioned earlier in the context of entrepreneurship subsidies) focused on ‘persuading more people in Scotland to set up businesses – including building enterprise into the education at both school and university levels’. In addition, the

12. Assuming, of course, that there are any subsequent LEGI rounds; the 2007 Pre-Budget Report and Comprehensive Spending Review (HM Treasury 2007) makes no mention of LEGI at all, focusing instead on the continuation of neighbourhood renewal initiatives such as the New Deal for Communities.

mid-1990s saw the launch of education and information schemes similar to the ones being advanced by the English RDAs today (Scottish Enterprise 2000).

The results of Scottish Enterprise's evaluation of the Scottish BBRS show that the number of mentions of the words 'entrepreneur', 'entrepreneurial' and 'entrepreneurship' in the Scottish media increased from around 100 per year in 1993 to almost 2,000 per year in 1999 – a twenty-fold increase. There was also a marginal shift in attitudes towards starting a business among the population compared with England and Wales. However, none of this seemed to feed through to an increase in business start-ups – at least by 1999, when the evaluation came to an end.

Of course, there is more than one explanation for these results. One possibility is that the enterprise education and information programmes were ineffective. This could be because the programmes were not well designed.<sup>13</sup> On the other hand, it could be that a longer time period is needed to evaluate the success or failure of these schemes. For example, initiatives designed to improve entrepreneurship education for children currently at school and studying for GCSEs cannot be expected to bear fruit until several years later, given that many of the children will go on to A-levels and university degrees.

Also, as Adams et al (2003) point out, it is unusual for a young person to go straight into self-employment after leaving school – most entrepreneurs will have taken jobs as employees to get some hands-on experience of the labour market and business.

In summary, the evidence on the effectiveness of education and information programmes is thin, but it would be presumptuous to write such programmes off without more detailed and more sophisticated evaluations of their effects. This should be a priority for RDAs and BERR.

## Policies to promote innovation

### Subsidising innovation – the R&D tax credit and other smaller schemes

The main subsidy scheme for R&D in the UK is the *R&D tax credit*. This has operated since 2000 for small- and medium-sized enterprises (SMEs), and since 2002 for larger firms. The tax credit allows firms to offset a proportion of eligible spending against their corporation tax liabilities. In the 2007 Budget, the credit was made more generous, with the credit rising as a proportion of eligible R&D from 120 per cent to 130 per cent for large enterprises, and from 150 per cent to 175 per cent for SMEs. The credit also allows businesses not in profit to claim at a slightly lower rate – and hence the subsidy is not dependent on being in profit in a given year, which is especially important for start-up companies.

By 2008-09 the R&D tax credit is projected to cost the Exchequer approximately £600 million. It is by far the largest subsidy scheme for private sector innovation in the UK.

Theoretically, subsidising innovation should increase the amount of innovation that takes place, and research by Bloom *et al* (2002) on a panel of OECD countries finds that R&D tax credits do indeed have a positive impact on R&D. However, the full effects of introducing a credit can take up a decade to emerge. The Government plans to publish an evaluation of the UK R&D tax credit once sufficient time has elapsed from its introduction for the effects to be clear, but this has not occurred yet.

Additionally, the elasticities of R&D with respect to the size of the credit, as estimated by Bloom *et al*, imply that even a credit worth in the range of £600 million will only increase R&D spending as a percentage of national income by a few tenths of a percentage point at best. Between 1997 and 2004, UK R&D spending averaged around 1.2 per cent of national income, compared with 1.4 per cent for France, 1.7 per cent for Germany and around 1.8 per cent for the US (OECD 2006b). Certainly the tax credit does not appear to have transformed Britain's R&D performance, although, as explained above, it is unlikely that the full effects would have come through yet.

The UK's credit is quite generous by international standards, particularly for SMEs, and even more so after the 2007 reforms (Billings and Paschke 2003, OECD 2001). In short, the R&D tax credit is likely to be effective based on previous evaluations of similar policies, and we would certainly wish to see it retained and possibly even extended, but it is not going to be a large enough incentive to transform British innovation performance on its own.

The other key question regarding the R&D tax credit is whether it makes sense to have a more generous rate for SMEs. The Lambert Review (HMT 2003) thought that the preferential rate for SMEs was important because UK R&D performance among small businesses is worse, relative to other advanced industrialised countries, than for large businesses. However, there is only weak evidence that there is a specific market failure that prevents small firms (but not large firms) from being able to do R&D (see Abramovsky *et al* 2005 for a detailed review). It would be very useful for the Treasury to look at this issue in its forthcoming evaluation of the R&D tax credit.

The increases in the value of the credit announced in the 2006 Pre-Budget Report allow an opportunity to assess the responsiveness of small firms' R&D to changes in the credit, relative to large firms' R&D. If the evaluation evidence shows that small firms' R&D is highly responsive, then it would make more sense to increase the value of the small firms' credit as it would provide the most cost-effective mechanism for increasing the quantity of R&D (provided the extra R&D was of sufficient quality). On the other hand, if small firms are found to be no more responsive to increases in the tax credit than large firms (or even less responsive), it would make more sense to have a single rate for both small firms and large firms.<sup>14</sup>

In addition to the R&D tax credit, there are a number of smaller schemes (with much smaller overall budgets) designed to encourage business innovation through subsidy. These include:

13. Laukkanen (2000) suggests that designing entrepreneurship education programmes that are effective is far from straightforward, and is critical of several examples of such programmes in Nordic countries.

14. Given that the evidence surveyed in Section 2 suggests that northern regions have lower stocks of small firms than the UK average, a single rate of R&D tax credit across the board (set at a slightly higher rate than the current 'large firms' credit) may actually benefit them more than a higher rate for lower firms, as they have less small firms able to take advantage of the higher rate than other regions.

- The *Grant for Research and Development* scheme. This aims to help individuals and small- and medium-sized businesses research and develop technologically innovative products and processes. Grants of up to £500,000 are available. The scheme is administered by the RDAs, who are responsible for appraising applications and deciding which projects to support in their region.
- *Collaborative Research and Development*, a primary delivery mechanism of BERR's technology strategy. The scheme is designed to assist the industrial and research communities to work together on R&D projects in strategically important areas of science, engineering and technology. Regular funding competitions for collaborative R&D projects are held, focusing on five key technology areas – advanced manufacturing, advanced materials, bioscience, electronics and ICT.
- Schemes that subsidise the formation of R&D networks and partnerships, including *Knowledge Transfer Partnerships* and *Knowledge Transfer Networks*. We discuss these further in the section on 'encouraging networking' below.

The list of R&D support schemes is nowhere near as long as the list of business support schemes discussed earlier, but, as Abramovsky *et al* (2004) point out, there still seems to be a large number of schemes relative to the number of rationales. For example, the Grant for R&D scheme appears to have a rationale that is very similar to the rationale for the SMEs R&D tax credit. Hence, it would probably make more sense to fold the Grant for R&D into the R&D tax credit system, which would reduce administrative costs and enable more support to be targeted through a single, easily understood and publicised scheme.

#### **Area-based policies – the 'science city' initiative**

The Government's current initiative specifically designed to address low levels of innovation outside the Greater South East is the Science Cities programme. Building on the recommendations of the Lambert Review of Business–University Collaboration (HM Treasury 2003), the Government resolved to construct better institutions to cultivate the research expertise within leading universities, and increase the commercial awareness of this research.

Many of the UK's leading universities are located outside the Greater South East and, although attempts to better integrate the aspirations of the universities with the requirements of the local economy have sometimes been fractious, they are seen as major economic assets by local policymakers.

The Science Cities programme was first crystallised in the 2004 Pre-Budget Report. Following strong financial commitment for improved university-business collaborations from the three northern RDAs earlier in the year, Manchester, Newcastle and York were assigned Science City status. These three northern Science Cities were supplemented in the 2005 Budget by three more cities: Birmingham, Bristol and Nottingham, none of which is in the north, or in the Greater South East.

The Science Cities initiative is still in its embryonic stage, but a preliminary assessment clearly shows that each city is operating with different strategic priorities. This is, generally speaking, good news, as it demonstrates that all six Science Cities have had the freedom

to develop plans that satisfy the requirements of their local economy and integrate with the strengths of their local university. The disadvantage of this autonomy is that it makes measuring the developments against a nationally agreed framework difficult. ippr north is in the process of exploring the Science Cities concept in greater depth in a standalone research project, the results of which will be published in 2008.

#### **Encouraging networking**

Several policy initiatives exist to encourage networking between UK businesses, higher education institutions (HEIs) and other research institutions. The most important of these are as follows:

- *Knowledge Transfer Partnerships* (KTPs), a scheme that enables companies to partner with HEIs or other research and technology organisations in order to collaborate on preparing a proposal for a project or projects to enhance the business. The partners submit an application for funding to the Technology Strategy Board, which approves proposals. Government funding contributes towards the HEI or research organisation's cost of participation while the business pays the rest.
- *Knowledge Transfer Networks* (KTNs), which are national networks of technical experts designed to increase and accelerate the transfer of technology into UK businesses. The funding available includes grants for operating the partnership and additional grants from Research Councils or government departments for specific research projects. To date, 22 KTNs have been established, with around 13,000 people registered to receive information through their websites.
- The *Higher Education Innovation Fund* (HEIF), which was established in 2000 as an umbrella under which to consolidate policies pertaining to the improvement of higher education funding, industry-academia collaboration, and support for commercialisation of university research. The Lambert Review recommended that HEIF be expanded into a permanent 'third stream' of income for HEIs, focused on knowledge transfer to the private sector. This is now in the process of happening, and funding for HEIF has been expanded to £164 million in the 2006-07 academic year.
- As shown in the previous section, the Northern RDAs also administer several programmes designed to promote networking (for example, Yorkshire Forward's Virtual Enterprise Network scheme).

Overall, since 2000, there has been a lot of development in policies designed to encourage networking between business and HEIs, and the current framework seems to offer a good mix of policies to encourage universities to conduct business-relevant research (HEIF) and encourage companies to approach collaborative partners in HEIs (KTPs) and sector-specific networks (KTNs). However, in the context of the North it is worth thinking about whether there should be an additional *spatial* policy focus.

The evidence in Section 2 showed that northern businesses were as good at building networks and finding collaborators as those in any other region, but that they tend to network with partners in the same region, rather than nationally or internationally. Therefore, there may be a case for a policy initiative to make firms in the North

more aware of other firms they could partner with on a national, and maybe an international level. The RDAs, perhaps acting in concert across the UK, would be an obvious vehicle through which such a scheme could be channelled without requiring large-scale additional investment in delivery infrastructure.

#### **Growing low-carbon innovation in the North**

Given that three of the six Science Cities are located in the North, and that the CIS data suggests that firms in the North East and Yorkshire and the Humber are best at introducing market-leading innovations into their sectors, it is to be hoped that the Technology Strategy Board and Energy Technologies Institute will make targeted investment in environmental innovations in the Northern regions. This would dovetail neatly with RDA initiatives such as One NorthEast's New and Renewable Energy Centre and Centre for Process Innovation,<sup>15</sup> and Yorkshire Forward's Regional Energy

Infrastructure Strategy (Yorkshire Forward/GO for Yorkshire and the Humber/Yorkshire and Humber Assembly 2007).

Investments and policy initiatives to encourage the growth of environmental technologies that exploit the northern region's strengths in innovation should mean that the North will be in the vanguard of the drive towards new environmental technologies and the achievement of a 'low-carbon' Britain in the decades to come. However, given the undesirability of a 'command-and-control' approach to industrial policy, it is impossible to say *a priori* precisely where in the UK successful innovators in the environmental technology business might develop.

The TSB, ETI, Science Cities and RDAs can influence the development of new technological industries and clusters in the North but they cannot – and should not try to – guarantee that the future industrial development of the North should follow such a pattern.

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15. See [www.narec.co.uk](http://www.narec.co.uk) and [www.uk-cpi.com](http://www.uk-cpi.com)

## 4. Conclusions

Taking innovation first, the evidence in Section 2 shows that, while the overall level of R&D per head of the population in the northern regions is below the national average, there is, nonetheless, some ground for optimism. The North West has above-average *business* R&D spending per head, and regional differences in the wider measure of innovative activity from the Community Innovation Survey are very small. Firms in the North East and Yorkshire and the Humber are more likely to introduce entirely new processes into their industries than anywhere else in the UK. Firms and higher education institutions in the North seem to be as good at forming innovation networks as anywhere else in the UK, but there is some evidence that northern business networks tend to be more local and regional, and less national and/or international. With this in mind, it would be worth the Government introducing a stronger spatial component into policies designed to encourage networking.

The case for government intervention to subsidise and promote innovation is strong: both economic theory and empirical evidence suggest that, left to itself, the free market will provide less than the socially optimal level of innovation.

The R&D tax credit, which is the main subsidy mechanism for R&D, appears to work well, although, as it is paid at a single national rate, it is unlikely to reduce the gap in business R&D between the North East and the national average. Moreover, its effects are not large enough by themselves to eliminate the UK's deficit in R&D spending as a share of national income, compared with other advanced industrialised countries. Nonetheless, the R&D credit should be the main focus of the Government's drive to increase the level of innovative activity among businesses in the North and elsewhere, supplemented by carefully targeted support for environmental innovations from the Technology Strategy Board and Energy Technologies Institute.

Turning to entrepreneurship, the VAT statistics we have examined in this report suggest that the North is less entrepreneurial than other English regions on the whole, with fewer VAT-registered businesses per head of the population, and lower rates of firm formation than the Midlands and South. Evidence on attitudes to entrepreneurship singles out the North East as being particularly 'un-entrepreneurial', on average.

There are several possible reasons for the North East being less entrepreneurial than other regions. Our analysis of regional attitudes to risk in the UK Family Resources Survey provides one possible answer: households in the North East are less likely to invest in risky assets, controlling for income and other background factors. So it

may be that people in the North East are more averse to the idea of starting their own business. Alternatively, evidence from house prices and the extent of home ownership suggests that people in the North East are less likely to have access to wealth (at least in the form of housing capital or inheritances) to start a business with.

As entrepreneurs tend to be drawn disproportionately from the high-skilled section of the workforce, the relatively low level of average skills in the North East (as shown in Johnson *et al* 2007a) is another possible explanation.

These explanations are not mutually exclusive and all of them could have a role to play; isolating the main reason why the North East is less entrepreneurial should be a priority for future research, as we are unable to distinguish between these competing explanations based on the current evidence base. Nonetheless, we can draw conclusions regarding the efficacy of current policy measures to promote entrepreneurship based on our survey of the evidence in Section 4.

Direct subsidies to entrepreneurs – at least those schemes that have been tried in the last two decades – seem to be largely ineffective, as they encourage the formation of businesses that are not economically sustainable and that displace other (unsubsidised) businesses in the market. Similarly, area-based initiatives to encourage enterprise suffer from high displacement and a large 'deadweight' cost (that is, subsidising entrepreneurial activity which would have happened anyway).

Our conclusion from this is that it is better for the Government to focus on policies addressing regional inequalities in the factors that help determine the decision to become an entrepreneur (for example, policies to reduce inequalities in wealth and assets; to narrow the gaps in the skills base between different regions; and provide better loan finance availability in regions like the North, which are not as well served by the venture capital market as London) than to pursue the 'quick fix' of direct entrepreneurship subsidies.

Entrepreneurship education in schools is another aspect of policy that deserves more thought and evaluation. In particular, if the North East is suffering from a culture of aversion to entrepreneurship, education may be the only way to change the existing culture. But, again, it is not a quick solution, and there is, as yet, no strong evidence base that existing schemes actually work. More evaluation in this area is crucial.



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# Appendix

## Analysis of the likelihood of holding various types of 'risky' asset: Results from the Family Resources Survey

Table A.1 on the following two pages presents the results of an analysis of the likelihood of holding three different types of 'risky' asset, using data from the 2004-5 UK Family Resources Survey. The analysis uses a probit regression specification at the FRS benefit unit level. Three different sets of results are presented – in each case, a different asset type is used as the dependent variable:

Regression 1: dependent variable = benefit unit holds premium bonds.

Regression 2: dependent variable = benefit unit holds stocks and/or shares

Regression 3: dependent variable = benefit unit holds one or more equity Individual Savings Accounts (ISAs), Personal Equity Plans (PEPs), or unit trusts.

In each regression, the set of explanatory variables used is the same:

- (log of) Benefit unit income.
- Benefit income equal to or less than zero (this is only the case for benefit units with losses from self-employment income – excluding these benefit units makes no significance difference to the other results).
- Banded variable for age of head of benefit unit: 16-19, 20-24, 25-29, 30-34, 35-39 (base category), 40-44, 45-49, 50-54, 55-59, 60-64, 65-69, 70-74, 75-79, 80-84, 85 and over.
- Ethnic group of head of benefit unit: white (base category), mixed, Indian, Pakistani/Bangladeshi, black, other.
- Employment status of benefit unit: self employed, all adults working full time, one adult full time and one part time, one adult full time and one not in work, all adults working part time, workless benefit unit both aged 60 or over, unemployed benefit unit, inactive benefit unit (with at least one adult aged less than 60) (base category).
- Family type: pensioner couple, single pensioner, couple with children, couple without children, lone parent, single childless adult (base category).
- Age of youngest child: less than 5, 5-10, 11-15, 16-18 (base category).
- Housing tenure: local authority tenant (base category), housing association tenant, private tenant, mortgagee, owned without mortgage, other.
- Region: the 12 UK standard regions (these are highlighted in bold in the table). Base category = West Midlands.

**Table A.1. Regression analysis of the likelihood of holding risky assets, Family Resources Survey 2004-05**

Explanatory variables:	Dependent variable:					
	1: premium bonds		2: stocks/shares		3: ISA/PEP/unit trust	
	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.
<i>Income</i>						
Log income	.0643	18.59	.1102	31.66	.0807	33.51
Income <=0	.4050	9.20	.6944	12.87	.8028	13.74
<i>Age of head of benefit unit</i>						
16-19	-.0560	-3.85	-.1050	-7.20	-.0544	-4.74
20-24	-.0443	-4.09	-.0727	-7.48	-.0512	-7.03
25-29	-.0447	-4.32	-.0534	-5.79	-.0183	-2.59
30-34	-.0178	-1.84	-.0124	-1.40	-.0120	-1.88
40-44	.0202	2.10	.0135	1.53	.0222	3.28
45-49	.0522	4.99	.0150	1.62	.0264	3.69
50-54	.0811	7.23	.0206	2.11	.0341	4.50
55-59	.1126	9.41	.0409	3.93	.0602	7.21
60-64	.1161	7.86	.0420	3.24	.0681	6.57
65-69	.0975	4.42	.0146	0.76	.0387	2.70
70-74	.0944	4.19	.0163	0.83	.0303	2.12
75-79	.1082	4.65	.0159	0.79	.0196	1.40
80-84	.0705	3.09	-.0018	-0.09	-.0237	-2.00
85+	.0599	2.44	-.0163	-0.77	-.0252	-1.91
<i>Ethnicity of head of benefit unit</i>						
Mixed	.0840	3.41	.0109	0.43	.0081	0.44
Indian	-.0770	-2.59	-0.546	-2.10	-.0300	-1.63
Pakistani/Bangladeshi	-.0628	-1.73	-.0773	-2.78	-.0256	-1.16
Black	-.0250	-0.72	-.0713	-2.82	-.0248	-1.26
Other	.0010	0.03	-.0303	-1.07	-.0295	-1.55
<i>Employment status</i>						
Self-employed	-.0089	-0.80	-.0412	-3.97	-.0269	-3.87
All adults FT work	-.0246	-2.56	-.0464	-4.84	-.0440	-6.80
One FT, one PT	-.0247	-2.30	-.0190	-1.75	-.0274	-3.93
One FT, one not working	-.0236	-2.17	-.0496	-4.86	-.0294	-4.24
All adults PT	.0063	0.58	-.0043	-0.39	-.0008	-0.10
Not in work, both 60 or over	.0075	0.59	.0018	0.89	.0178	1.90
Unemployed work seeker(s)	.0544	2.79	.0276	1.27	.0542	3.03
<i>Family type</i>						
Pensioner couple	.0516	3.00	-.0141	-0.92	-.0234	-2.59
Pensioner single	-.0062	-0.41	-.0002	-0.02	-.0228	-2.58
Couple with children	.0321	2.73	.0214	1.95	-.0283	-4.23
Couple, no children	.0288	3.89	.0009	0.14	-.0273	-6.45
Lone parent	-.0413	-3.39	-.0651	-5.77	-.0429	-5.77
<i>Age of youngest child (if any)</i>						
0-4 years	-.0312	-3.27	-.0108	-1.18	-.0041	-0.61
5-10	-.0145	-1.79	-.0243	-3.28	-.0109	-2.04
11-15	-.0132	-1.47	-.0323	-3.97	-.0151	-2.62

Cont. next page

Explanatory variables:	Dependent variable:					
	1: premium bonds		2: stocks/shares		3: ISA/PEP/unit trust	
	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.
<i>Housing tenure</i>						
Housing association tenant	.0051	0.44	.0275	1.90	.0138	1.21
Private tenant	.0929	7.54	.1634	10.91	.0718	5.96
Owned with mortgage	.1348	14.76	.2139	19.22	.1252	13.79
Owned outright	.1818	19.74	.2920	24.82	.2062	20.03
other	.1272	5.47	.2622	9.71	.2280	9.49
<b>Region</b>						
North East	-.0463	-4.18	-.0133	-1.10	-.0038	0.45
North West	-.0234	-2.69	.0229	2.39	.0067	1.03
Yorkshire & Humber	.0129	1.28	.0448	4.12	.0059	0.81
East Midlands	.0136	1.32	.0184	1.74	.0129	1.73
London	.0241	2.41	.0479	4.57	.0256	3.47
East	.0469	4.63	.0600	5.67	.0199	2.76
South East	.0678	7.11	.0802	8.09	.0424	6.05
South West	.0479	4.68	.0373	3.60	.0347	4.57
Scotland	-.0406	-5.10	.0187	2.11	.0082	1.34
Wales	-.0358	-3.39	-.0294	-2.66	-.0094	-1.22
Northern Ireland	-.1198	-14.50	-.0565	-5.99	-.0260	-3.95
Number of observations	33202		33202		33202	
Pseudo-R <sup>2</sup>	.1541		.1812		.2031	
Note:  t stat  > 1.96 indicates statistical significance at the five per cent level.						