

# ECONOMICS

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**DTI ECONOMICS PAPER NO.15**

Creativity, Design and Business  
Performance

NOVEMBER 2005



The DTI drives our ambition of 'prosperity for all' by working to create the best environment for business success in the UK. We help people and companies become more productive by promoting enterprise, innovation and creativity.

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# Foreword

This report sets out the current state of knowledge on the economics of creativity and design and their role in driving business performance and productivity. It was commissioned by the Chancellor in his 2005 Budget. The Department of Trade and Industry undertook to carry out a study into the 'value and productivity impact of creativity and design in businesses, helping firms to identify how creativity can improve their performance'. At the same time, Sir George Cox was asked to review how best to support and develop the creativity of small and medium sized enterprises in the UK.<sup>1</sup>

Over recent years we have made considerable progress towards understanding what drives innovation and how Government can help businesses develop innovative products and services. Through work like the Innovation Report 2003 and the Lambert Review of University and Business Collaboration 2003, the Department and others across Government have recognised the central role of technology and science in innovation and the UK's long-term economic growth. Two notable policy responses have been the 10 Year Science and Innovation Framework and the Tax Credit for Research and Development.

This analysis brings an additional perspective to our understanding of innovation and firm performance by focusing in particular on the roles of creativity and design. UK scientists are highly creative, leading the world in citations and papers per head of population. The creative industries account for 8 per cent of the UK economy and a rising share of exports. We need to ensure all businesses across all sectors are thinking more creatively about the challenges they face and making more effective use of design.

We see this report as a starting point for debate on how best to promote greater creativity and design across UK businesses and Government. More work is needed on definition and measurement, including internationally, if we are to track the UK's progress in these important areas in the future. Given the novelty and complexity of the issues involved, we have drawn heavily on five specially commissioned papers by leading academics in this field.

We are grateful to colleagues from HM Treasury, the Department for Culture, Media and Sport and the Design Council for contributing to our report.



**Vicky Pryce**

Chief Economic Adviser and Director General, Economics. DTI

1 Further details can be found at: [http://www.hm-treasury.gov.uk/media/AA7/1F/bud05\\_chap03\\_229.pdf](http://www.hm-treasury.gov.uk/media/AA7/1F/bud05_chap03_229.pdf)

# Executive summary

Creativity is vital for every part of the economy. The ability to generate a diverse set of business options through new ideas is a central feature of innovation in all firms and, as such, is central to sustained economic growth. Design, as a structured creative process, is an important competitive tool for firms in many sectors, although design activities can take many forms across those different sectors.

The UK led the world in recognising the significance of creativity and design. The Design Council was set up in 1944. Nonetheless, intensifying cross border competition, rapid changes in technology and changing customer demands are placing new urgency on the need for innovation. At the same time the UK faces the challenge of raising productivity levels to those of major competitors. The UK's underlying creative strength and body of design expertise are now seen as a possibly under-utilised source of competitive advantage.

## Creativity and design in the business context

**Creativity is defined in this report as the production of new ideas that are fit for a particular business purpose.** This sees creativity as the first stage in innovation. Creativity has a role in enhancing all aspects of business performance – from the design of new products and services to their production, marketing and distribution. It is not unusual to link creativity to certain industries such as film, music or design. But the challenge, as noted by the Chancellor, is *'not just to encourage creative industries, our priority is to encourage all industries to be creative'*.<sup>2</sup>

**Design is a structured creative process.** Design is readily associated with industrial product design for manufactured products – specifically the 'look' of a product. However, the application of design is much broader, for example designing for function; for aesthetic appeal; for ease of manufacture; for sustainability; and designing for reliability or quality and business processes themselves. Service design affects how customers will experience the delivery of a service, such as a bank or a fast food restaurant. Elements of design, particularly graphic design, will form part of product, service and company branding and advertising strategy.

2 Speech by The Rt Hon Gordon Brown MP, Chancellor of the Exchequer at Advancing Enterprise 2005 [http://www.hm-treasury.gov.uk/newsroom\\_and\\_speeches/press/2005/press\\_15\\_05.cfm](http://www.hm-treasury.gov.uk/newsroom_and_speeches/press/2005/press_15_05.cfm)

**There are clear links between creativity, design and research and development (R&D).** Design and R&D are both ways of channelling creativity for commercial advantage, and aspects of design form part of R&D. However, design is also an important form of innovation in industries that tend to invest less in R&D such as furniture and clothing. Creativity and design may be particularly important for innovation in the UK's growing services firms.

## Creativity and design in the UK

**The UK has an internationally competitive design consultancy sector and a strong design education base.** Nonetheless, survey evidence shows only 41 per cent of manufacturers and 6 per cent of businesses in trade and leisure services see design as integral to their business. Over half of UK firms say design has no role or only a limited role to play in their business. This suggests that there may be potential for greater links between the UK design sector and firms in other sectors.

**There are only limited measures of 'creativity' in the UK although various measures can be used to assess creative potential.** The UK has a developed and growing creative industries sector worth around 8 per cent of the UK economy and leads the world on some indicators of scientific excellence. However, when considering some of the economic outcomes that creativity supports, our performance on innovation lags our major competitors. Recent research suggests UK firms are trying to capture and channel the creative input of their employees, although this differs widely by sector.

## Creativity, design and firm performance

Although creativity is recognised as vital to business success, it is the more formal channels of creative input, such as R&D, that have received more attention in the economic literature. In part, this reflects the nature of creativity, which is difficult to identify and quantify.

**Creativity and design, used effectively, are important competitive tools for firms.** Design can be used to determine a variety of non-price characteristics of products and services, such as style, durability or waiting times. These characteristics can be more important than price in generating demand and increasingly so in the international markets where the UK operates. Creativity and design activities are also important for marketing, company image and helping create brand loyalty. They can reduce production costs, for example, through choice of materials for manufacturing and process design can raise the efficiency of production or consumption of a service, improving productivity.

**A variety of evidence supports the role of design in enhancing firm performance.** New research undertaken for this study also shows that firms with higher design intensity have a greater probability of carrying out product innovation and that design expenditure has a positive association with firm productivity growth. Nonetheless, the multifaceted nature of design makes it difficult to isolate from more traditional factors affecting performance, such as market conditions or investment. Research is also hampered by the lack of commonly agreed statistical measures.

**As well as boosting firm competitiveness, there is scope for creativity and design to generate wider economic gains.** Consumers can benefit from greater variety and improved products and services. Ideas can be adopted or adapted to improve the performance of other firms.

## Fostering creativity

**Successful companies will look not only to R&D or design as specific creative inputs, but seek to promote creativity in all parts of the organisation.** Management practice and behaviour have a strong influence on creativity and the effective integration of design. Creativity and design aligned with strategy tends to generate more successful outcomes. Technology drives creativity by making it easier to collaborate and to acquire knowledge, and through supporting design prototyping.

**The extent to which a firm develops effective networks will influence its ability to collaborate and to be creative.** Networks can embrace users as well as suppliers, with some exciting innovation coming from closer involvement of customers in the process. Firms also benefit from other creative firms through knowledge spillovers if they have the capacity to absorb and exploit this knowledge.

**Factors that influence creativity beyond a firm's direct control include culture and place, formal education, and competition and regulation.** The ability of firms to protect their investments in creativity and design is important to ensuring they have the right incentives to innovate. Recent years have also seen a new emphasis on the role of culture in attracting a creative workforce.

## The role of Government

The Government can play an important role in enabling all industries to be creative. It can do this through:

- **correction of market failures**, providing support where the benefits of creativity and design are wider than those for the firm itself or where there are gaps in the efficient supply of finance by the market. There may be an important role for the Government in facilitating networks between creative services such as design and other sectors. The Cox Review focuses on the needs of smaller businesses, which appear to face particular challenges in finding the time and resources to support creative work.
- **the formal education system**, enhancing the supply of creativity and design skills, and management and business skills more generally. This study and supporting research have emphasised that management plays a key role in providing the right environment for creativity to flourish and for successful integration of design. The Cox Review emphasises the importance of interdisciplinary teaching in universities.
- **ensuring appropriate framework conditions**. These include a variety of factors outside the direct control of firms such as the regulatory framework, intellectual property rights and the competitive environment. The Government plays an important role in the cultural environment through its support for the Design Council, the Arts Council and museums, helping facilitate the creation of a pool of knowledge and expertise. The Government also has a role to play as a purchaser and consumer of goods and services.

## Looking ahead:

The DTI would like to use this study as a catalyst for further discussions about the role of creativity and design with business, other Government departments and Regional Development Agencies, Research Councils and the wider community. The results of this study and subsequent feedback will be used by the DTI and HM Treasury in developing the evidence base for innovation policy.

A recurrent theme in the study is measurement and statistics to support analysis. In particular, international comparisons are extremely difficult and there is a case for extending or supplementing the international frameworks for data collection in the area of innovation. The DTI will explore the possibility of doing so.

The Cox Review,<sup>3</sup> run in parallel to this study, has identified a number of policy recommendations including:

- Raising business understanding of the contribution of creativity and design, including by making the Design for Business programme available to SMEs throughout the UK.
- Improving the effectiveness of Government support and incentives in relation to creativity and design, including further development of the R&D Tax Credits system.
- Equipping tomorrow's business leaders, technologists, engineers and creative specialists, through higher education, with a greater appreciation of the context in which their different skills will be applied.
- Government using the power of public procurement to demand creative solutions to its problems.
- Raising the profile of the UK's creative capabilities by way of a network of centres of creativity and innovation across the UK.

The Cox Review also stresses that although the Government plays an important role in setting the right environment, business have to lead the way in making best use of creativity and design.

The Department for Culture, Media and Sport (DCMS) is to undertake a study of the contribution the creative industries currently make to the UK economy and what their potential contribution may be in the future.

3 See 'Cox Review of Creativity in Business: Building on the UK's strengths', [www.hm-treasury.gov.uk/cox](http://www.hm-treasury.gov.uk/cox)

# Introduction

*'Human creativity is the ultimate economic resource. The ability to come up with new ideas and better ways of doing things is ultimately what raises productivity and thus living standards.'*

Richard Florida (2002)

*'Design is the purposive application of creativity to all the activities necessary to bring ideas into use either as product (service) or process innovations.'*

Bessant, Whyte and Neely (2005)<sup>4</sup>

This report sets out the current state of knowledge on the economics of creativity and design and their role in driving business performance and productivity. It reviews the existing economic and management literature on creativity and design, and draws on five specifically commissioned papers by experts in the field.

The report seeks to answer five key questions:

- What are the economics of creativity and design in a business context?
- What are the UK's strengths and weaknesses in creativity and design?
- How can creativity and design enhance value and productivity in firms?
- How can businesses develop and use creativity and design?
- What role can Government play in fostering creativity and design?

The importance of creativity and design to the UK has been recognised for some time. The so-called Creative Industries sector grew more rapidly than the economy as a whole throughout the nineties, and after a slower start to the new millennium, now accounts for 8 per cent of the UK economy.<sup>5</sup> The Design Council was founded over sixty years ago and has been championing the importance of design throughout that period. What has changed recently to thrust creativity and design into the public policy spotlight?

The past decade has seen the rise of low cost competition to UK manufacturing from China, India and Eastern Europe. Some major businesses in the emerging economies are also investing in higher technology manufacturing and in design based innovation and skills. UK manufacturers know they cannot compete simply on cost and efficiency; they have to innovate. A recent EEF survey of manufacturers showed two thirds had increased their focus on innovation, and 45 per cent were developing niche markets or customising their products.<sup>6</sup> This shift from mass production to smaller, differentiated product runs demands greater innovation.

4 John Bessant, Jennifer Whyte and Andrew Neely, DTI Think Piece 2005, 'Management of creativity and design within the firm,' Advanced Institute for Management (AIM) and Imperial College, subsequently referred to as Bessant *et al* (2005).

5 DCMS (2005).

6 EEF (2004).

Market demands and opportunities are also changing. The past ten years have seen rapid technological change, including the take-up of the Internet, mobile and broadband technologies and the arrival of digital television and radio. These have created new outlets for creative production, as well as transforming the way we work and share knowledge. The ageing population of the developed world is creating new opportunities for inclusive design and more generally consumers are demanding differentiated, customised goods and especially services – even wanting to be part of the creation process itself. Finally, while low cost nations are competition, they also form large and growing consumer markets with varied tastes and rising incomes.

The UK's underlying creative strength and body of design expertise is now seen as an important and possibly under-utilised source of sustainable competitive advantage. As well as the value generated in the creative sector itself, creativity and design could help UK manufacturers as they move up the value chain, and UK service businesses as they innovate.

## Analytical approach

This study considers how creativity and design impact on business performance. There are significant challenges to developing a conceptual framework that adequately explains the contribution creativity and design make to firm performance and productivity:

- Creativity and design are elusive and overlapping concepts. This in part explains why their treatment in analysis and policy is less developed than that of more tangible issues, like capital investment. Although creativity is recognised as vital to business success it is the more science and technology based channels of creative input, such as R&D, that have received more attention in economic literature.
- There are few official statistics to support analysis of creativity and design. In part, this reflects the nature of creativity, which is difficult to identify and quantify. In this study we have had to rely on innovation survey material designed for other purposes and the bespoke studies carried out by agencies such as the Design Council. Although providing good data, they only cover some of the many and varied issues that arise. In particular, international comparisons are extremely difficult.<sup>7</sup>

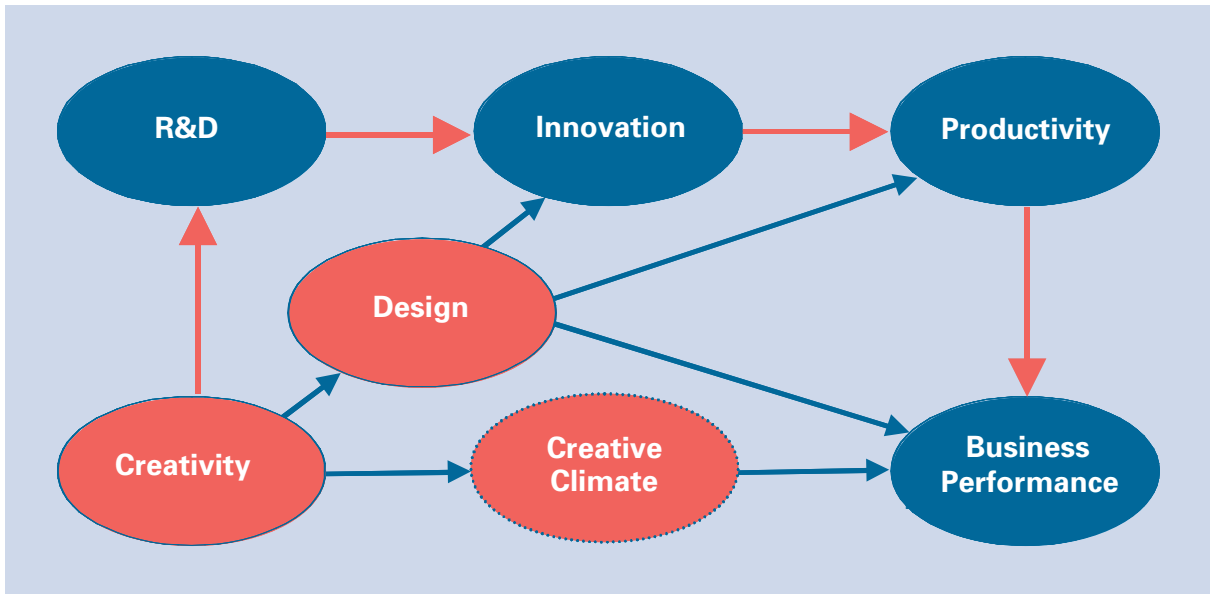
The model in Figure 1.1, developed by Swann and Birke (2005)<sup>8</sup> for this study shows one possible mapping of the channels of impact of creativity and design on business. Creativity and design play a role as an input to innovation and R&D

7 The Frascati Manual (OECD, 2002) and OECD Oslo Manual (2005) have some coverage of design investment.

8 Peter Swann, Daniel Birke, DTI Think Piece (2005) 'How do Creativity and Design Enhance Business Performance? A Framework for Interpreting the Evidence', Nottingham University Business School, subsequently referred to as Swann and Birke (2005).

– indeed parts of design are included in R&D. They can also have a separate and direct effect on productivity and business performance, through process design, branding and marketing. A creative climate or culture can play a key role in enhancing innovation in all elements of business outside more formal channels.

**Figure 1.1**  
**Linking creativity and design to business performance**



Source: Swann and Birke (2005). To note: elements of design are included in R&D.

Understanding these links requires looking at a range of evidence from different sources. There is a fairly extensive economic literature on the role of R&D and innovation in firm performance and productivity. There is also a growing body of evidence on how design affects firm performance. Creativity has been looked at from many different perspectives, particularly in the management literature, and there are also proxies – such as the creative industries – to assess national performance.

The following analytical approach has been developed to draw together this diverse body of economic and management evidence:

- Measuring the extent to which creativity and design are used by UK firms and the level of relevant expertise in the UK;
- Determining the channels through which creativity and design can enhance value and productivity in firms, and supporting evidence; and
- Identifying the internal and external factors that stimulate or discourage creativity and design in firms.

The analytical approach allows consideration of both the impact of creativity and design on firm performance and also the available evidence on how businesses can develop and use them effectively. The assessment of firm level use of creativity and design in UK firms and the relevant base of expertise informs discussion of the UK's relative strengths and weaknesses in these areas. Finally,

considering the conditions that encourage or discourage creativity and design provides a basis on which to consider the role of Government, in particular in areas such as education and regulation.

## Understanding creativity and design

The remainder of this introduction explores what is meant by the terms creativity and design. It looks at various definitions that have been put forward for these two concepts and shows how they are linked to innovation and research and development.

### WHAT IS CREATIVITY?

Creativity and design may be elusive and overlapping concepts, but it is possible to clarify to some extent what they mean and how they differ. Creativity itself has been defined in many different ways over the years. Three particular definitions seem relevant to the economics of creativity in a business context:

*'Seeing what everyone else has seen, and thinking what no one else has thought.'*

Einstein, Feynman (both attributed)<sup>9</sup>

*'Imaginative activity fashioned so as to produce outcomes that are both original and of value.'*

NACCCE<sup>10</sup> (1999)

*'Creativity is ... the production of novel, appropriate ideas in any realm of human activity from science, to the arts, to education, to business or to everyday life.'*

Amabile (1997)

The first of these definitions provides some insight into what it takes to be creative (see Box 1). The second and third descriptions share a sense of imagination fashioned and re-fashioned until something valuable emerges. For the purposes of this report, creativity as the production of new ideas that are fit for a particular business purpose provides a useful basis for analysis. It sees creativity as the first stage in innovation, which is the successful exploitation of new ideas.

9 Swann and Birke (2005).

10 National Advisory Committee on Creative and Cultural Education.

**Box 1: The creative process**

The creative process is sensitive to context. Research suggests three factors may determine an individual's creativity in any situation:

**Expertise** is 'the foundation of all creative work'. It provides an individual with the cognitive pathways required for solving complex problems and the knowledge to identify the important elements of any particular problem.

**Creative thinking techniques** – Some personality traits are useful – such as independence, risk-taking orientation and tolerance for ambiguity – but anyone can learn some useful techniques – e.g. 'make the familiar strange', 'try something counter-intuitive'.

**Task motivation** – Self-motivation (intrinsic) derived from the pleasure of doing the job is the best motivator for creativity. External motivating factors can encourage one to greater heights, e.g. reward and recognition, but too clearly defined goals and too much external control can hinder creativity.

From Amabile (1997)

A further question is *who* can be creative. Some argue that only rarely are people truly creative and that creativity involves unusual talents. It is more common to link creativity to the creative industries and people who work within them – advertising, design, music, publishing etc. This report falls back on this sectoral definition some of the time because it offers the best source of robust data. However, the remit of the study is to look at the role of creativity and design across all businesses, and as such take a more democratic view of creativity.<sup>11</sup>

All people are capable of creative achievement in some area of activity provided the conditions are right and they have the relevant knowledge and skills. The potential for creativity is also not limited to any particular role or process within the firm, although it might be valued more highly in some areas than others.

**WHAT IS DESIGN?**

The term design is also open to varied interpretations – reflected in the wide range of definitions that have been offered and applied (see Box 2). This report does not try to resolve the different perspectives, but to use some of the variety to understand the contexts in which design functions in the UK economy. These definitions, along with the Bessant *et al* quote that opened this chapter, hint at how creativity and design are linked. They show the differing ways in which the term design can be used – applying both to processes and outcomes. They also point to the breadth of activity involved in good design. Design covers a wide range of aspects: designing for function; for aesthetic appeal; for ease of manufacture; for sustainability; and designing for reliability or quality.

11 A Michelin starred chef would still be considered creative even though his or her output falls under catering statistics rather than a Creative Industry.

## Box 2: Definitions of design

*Design adds the extra dimension to any product.*

John Harvey Jones

*The configuration of materials, elements and components that give a product its particular attributes of performance, appearance, ease of use, method of manufacture.*

Walsh *et al*

*Design is crucial to innovation in that it is the domain of creativity where ideas are devised but also where the 'coupling' occurs between technical possibilities and market demands or opportunities.*

Freeman, cited in Walsh

*What will make a product stand out is the quality of the way it matches the purpose, skills and personality of the user, of the visual communication which goes with it, of the environment in which it is sold and of the image of its maker. All of these are created by design.*

Bernsen

*An activity that translates an idea into a blueprint for something useful whether it's a car, a building, a graphic, a service or a process.*

Design Council

Sources: The John Harvey Jones and Bernsen quotes are both from Swann and Birke (2005); others from Walsh *et al* (1992); Walsh (1996); Design Council website, "What is design?".

All products and services are, in effect, 'designed' even if not by a professional designer. Much design implicitly takes place outside of a formal design function and is not done by a professional designer. This is often known as 'silent design'.<sup>12</sup> However, because silent design is rarely measured, this study largely works with a manageable concept of design, the active application of design skills and processes. As Tether (2005) reasons, *'If design has an economic impact, then we should expect to find it is most marked amongst those who are most expert in the application of design knowledge'*.<sup>13</sup>

Design often involves visualising something that has not existed before, so design is very much part of creativity. Design goes much beyond the 'look' of a product (its physical appearance). Good design will also shape the product for ease of use, reliability and costs of production and maintenance. Decisions made during the design phase will affect the quality and ease of manufacture of the

12 Silent design is discussed in Gorb and Dumas (1987).

13 Bruce Tether, DTI Think Piece (2005) 'The Role of Design in Business Performance,' CRIC, University of Manchester, subsequently referred to as Tether (2005).

product. For services, design can also affect how customers will experience a service, such as a bank or a fast food restaurant, including their experience in the queue. Elements of design, particularly graphic design, will form part of product, service and company branding and advertising strategy.

UK firms consider design to mean a variety of things. In the Design Council's National Survey of Firms,<sup>14</sup> 75 per cent of firms agreed that in their company design is used 'to develop new products and services' and 74 per cent agreed that design was 'about how products look'. A large proportion of firms also considered design to be 'about products working to meet client needs' (64 per cent) and used to produce something that will 'sell' (47 per cent). Nonetheless, over one half of firms say design has no role or only a limited role to play in their business. A theme that runs through this report is that there may be scope for greater synergies between the UK design sector and UK firms in other sectors.

Design can help invent something new or it can enhance something that already exists. Most innovation involves finding new and better variations to existing themes. As Bessant, Whyte, and Neely (2005) point out, even the wheel can be re-invented to good effect when allowing for incremental creativity and design. In increasingly global markets such innovation may be necessary, simply to compete effectively.

## The linkages between design, innovation and R&D

This study has used the DTI Innovation Report's (2003) definition of innovation as 'the successful exploitation of new ideas'. Creativity is seen as providing the ideas which innovation then successfully implements. Design can help transform other inputs such as scientific knowledge or new technology into a usable end product, effectively acting as a 'bridge' between a new technology and the user.

R&D is a creative process, involving the development of ideas fit for implementation by a business. R&D is an important input to innovation in many, but not all, sectors and businesses. The linkage to design is more complex. Many firms consider design to be part of their R&D process, some even calling it RD&D.<sup>15</sup> But design and creativity can also add value beyond any technological innovation.<sup>16</sup> For example, a new car design or a toaster may embody no fundamental change in technology but the change comes via new design.

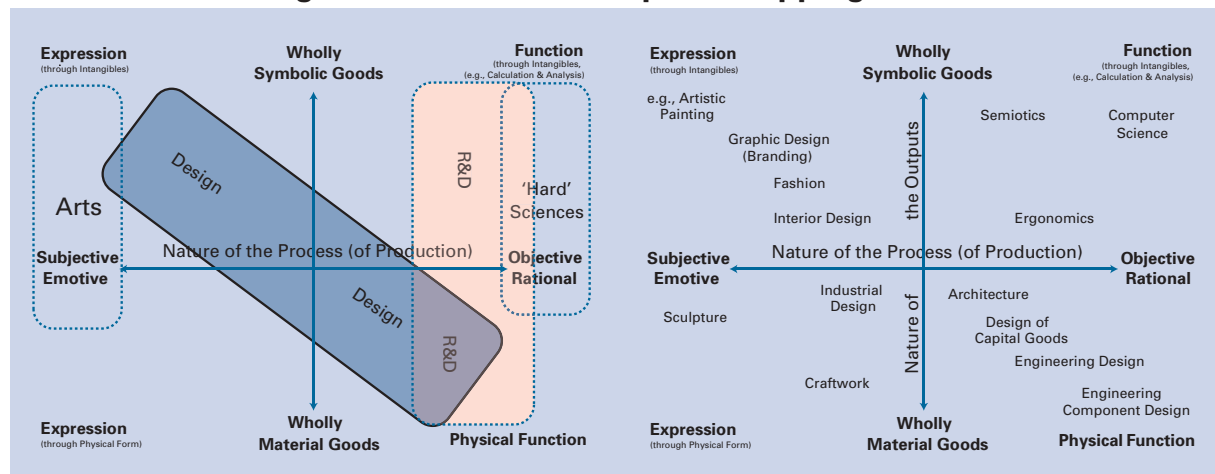
14 Design Council (2005a).

15 The Frascati Manual (OECD, 2002) suggests an overlap between design and R&D.

16 Walsh (1996, pg 525) notes: '*design is an activity that overlaps with both R&D and with technological innovation but can also make a contribution to the business of the firm outside either*'.

Figure 1.2, from Tether (2005) suggests why certain activities might overlap with traditional R&D activities – some design disciplines such as engineering design are closer to traditional hard sciences while others such as fashion design are arguably closer to the arts. Accordingly, some R&D falls outside design competences and some design falls outside R&D (left of Figure 1.2). The figure on the right suggests where different design professions might fall in this conceptual mapping.

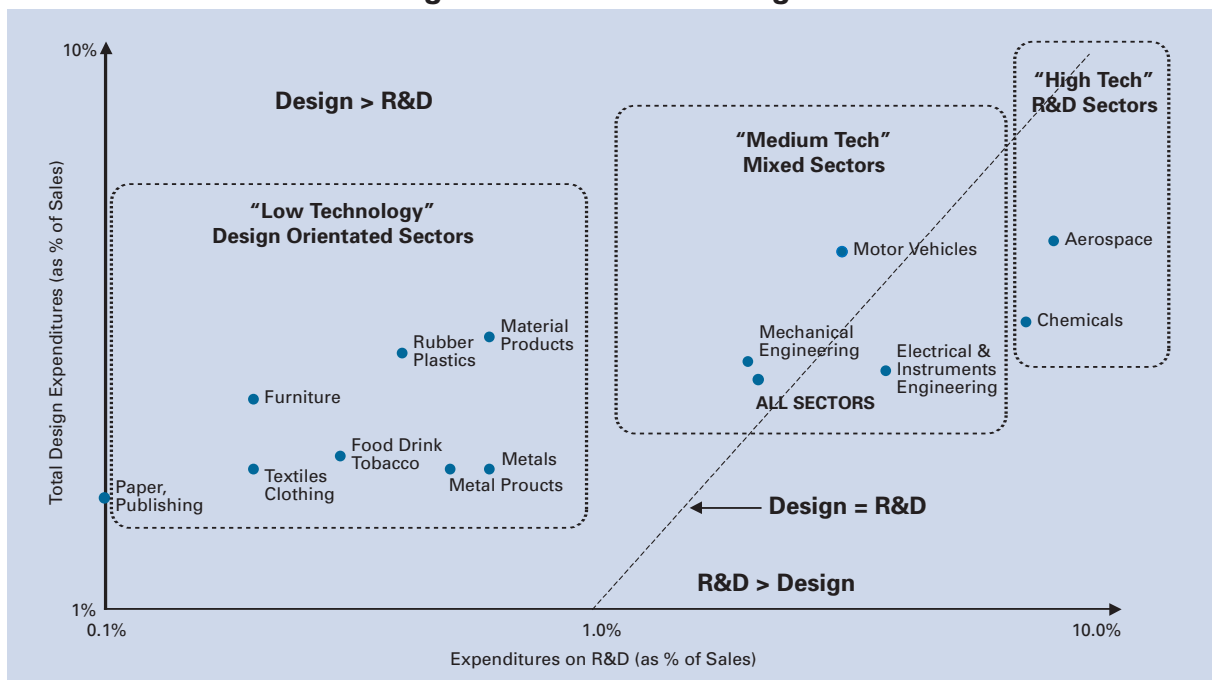
**Figure 1.2:**  
**Arts, Science, Design and R&D – A Conceptual Mapping**



Source: Tether (2005)

The wide scope of design activities is apparent in the industries that make use of design. Design expenditure is high in industries that also have high R&D such as aerospace. However, design can also be prevalent in industries that have relatively low R&D such as furniture and clothing. For these industries design may be the key way to maintain innovation and allow differentiation in the marketplace (see Figure 1.3, from Tether (2005)).

**Figure 1.3:**  
**Investments in R&D & Design in UK Manufacturing**



Source: Tether (2005)

This introduction has set out the background to the study, and provided an introduction to the concepts of creativity and design, and where they fit with the more familiar concepts of innovation and R&D. The remainder of this report is structured as follows:

- **Chapter 2. Creativity and design in the UK** – what is known about the extent of creativity in the UK and of design activities, including business take-up.
- **Chapter 3. Creativity, design and firm performance** – how creativity and design can raise firm performance, and the supporting evidence.
- **Chapter 4. Fostering creativity** – the means open to business and others to raise levels of creativity, e.g. through management, technology, or education.
- **Chapter 5. The role of Government** – how Government can foster increased levels and quality of creativity and design.

# Creativity and Design in the UK

## Chapter Summary

The UK has an internationally competitive design consultancy sector and a strong design education base. Nonetheless, only 41 per cent of manufacturers and 6 per cent of businesses in trade and leisure services see design as integral to their business. Over half of firms say design has no role or only a limited role to play in their business. There may be potential for strengthening the links between the UK design sector and firms in other sectors.

There are no official measures of 'creativity' in the UK, although various measures can be used to assess creative potential. The UK has a developed and growing creative industries sector worth around 8 per cent of the economy and leads the world on some indicators of scientific excellence. However, when considering some of the economic outcomes that creativity supports, our performance on innovation lags behind our major competitors. Recent research suggests UK firms are trying to capture and channel the creative input of their employees, although this differs widely by sector.

This chapter provides a descriptive overview of creativity and design in the UK economy, and tries to identify strengths and weaknesses, both in a domestic and international context. It begins by considering the use of creativity and design at the firm level and then goes on to assess their direct contribution to the UK economy. As stated in Chapter 1, the term creativity can be defined in many ways. This chapter examines how well our creative sector is performing in terms of value-added, exports and employment, alongside other outcome measures such as innovation and enterprise performance.

## Creativity and design at the firm level

This section draws on evidence and data from specialised business research and the third large-scale Community Innovation Survey<sup>17</sup> (CIS3) to gain an overview of UK firms' perceptions and use of design. Recent research provides some idea

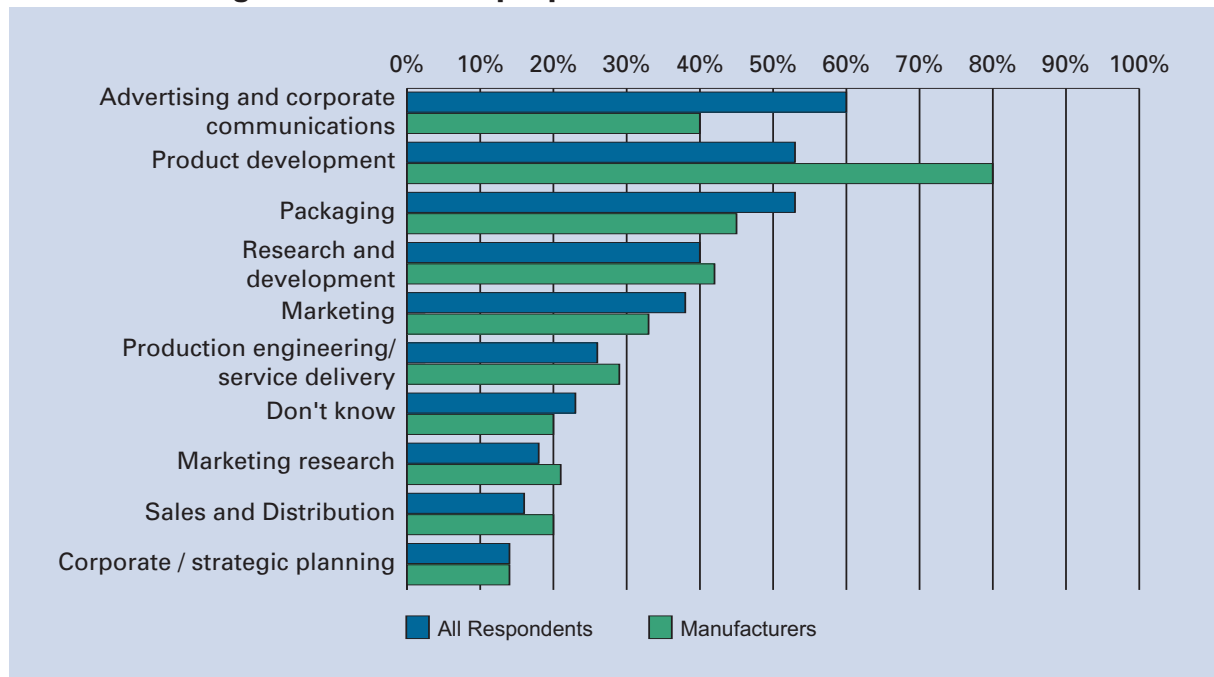
17 The Community Innovation Survey (2001, CIS3) is a survey of innovation in UK businesses undertaken once every four years – see <http://www.dti.gov.uk/iese/cis.htm>

of how different sectors encourage creativity, although there are few *direct* measures of firm creativity available.

## USE OF DESIGN IN UK BUSINESSES

The usage and perceptions of design vary widely across UK firms and industries. According to the Design Council's National Survey,<sup>18</sup> the majority of firms see design as part of advertising and communications, product development and packaging (see Figure 2.1). Relative to all firms, manufacturers were more likely to see design as part of product development (80 per cent) and were less likely to see it as part of advertising and corporate communications (40 per cent). Only 14 per cent of firms saw a role for design in corporate or strategic planning.

**Figure 2.1:**  
**Who uses design, and for what purpose?**



Source: Tether (2005), Design Council (2005a)

Perspectives also vary on the relative *importance* of design. Using the survey of firms referred to above, Tether (2005) shows 41 per cent of manufacturers see design as integral to their business compared to only 6 per cent in trade and leisure services<sup>19</sup> and 15 per cent in financial and business services. This may relate to a perception that design is about the production of tangible goods. Design Council (2005a) research suggests over half of firms say design has no role or only a limited role to play in their business.

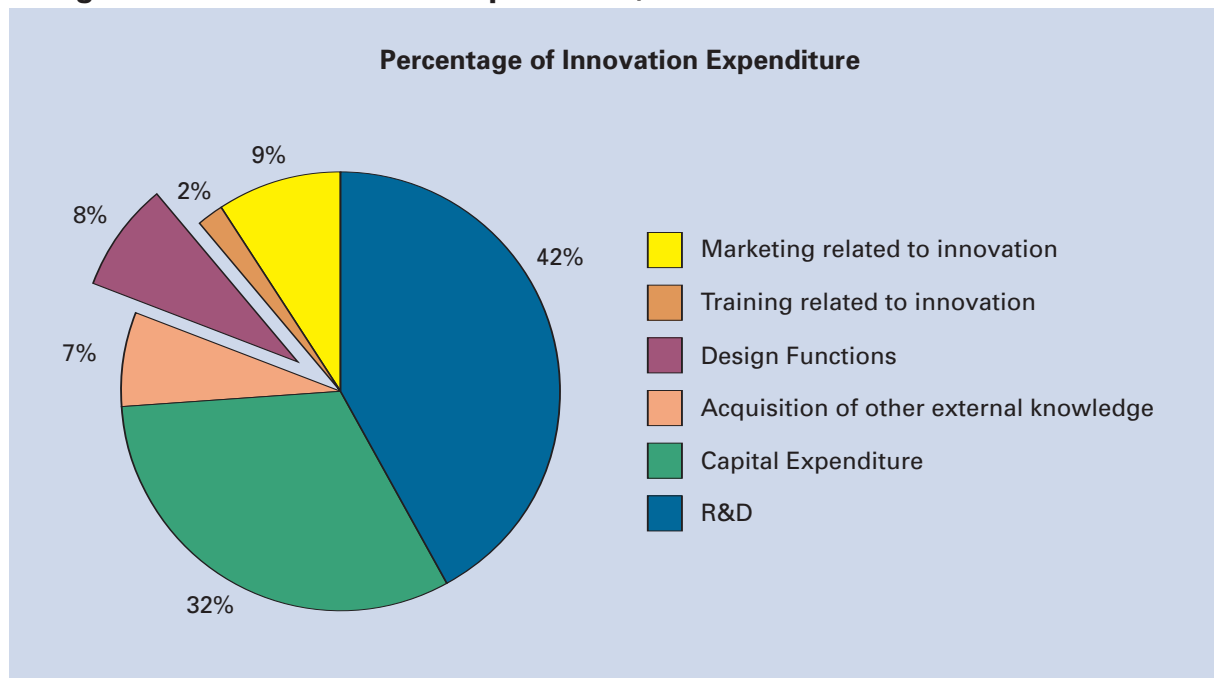
18 Design Council (2005a). The National Survey of firms is based on 1500 telephone interviews.

19 The Design Council referred to this category as 'retail, wholesale and leisure services' which includes wholesale and retail trade, hotels and restaurants, and other community services such as social and personal service activities.

International comparisons are difficult, but the country review undertaken by Bruce and Daly (2005) suggests that other countries are actively using or considering using design to enhance competitiveness. A Swedish survey of 1000 firms suggests that 72 per cent of firms saw demand for design growing and evidence from Germany suggested that around 60 per cent of firms were using design to differentiate themselves from the competition.<sup>20</sup>

Data from CIS3 suggests that in the UK, 8 per cent of business expenditure on innovation is spent on design functions (see Figure 2.2), similar in size to the amount spent on marketing the results of innovation, but substantially below the proportion spent on R&D.<sup>21</sup> This is likely to underestimate the amount of design as some design functions are included in R&D spending, and others, particularly graphic design, may be included in marketing.<sup>22</sup>

**Figure 2.2:**  
**Design's share of innovation expenditure, 2000**



Source: Community Innovation Survey 3

The proportion of innovation expenditure spent on design by sector is highest in the manufacture of electrical and optical equipment and transport equipment. These sectors are characterised by precision engineering and high R&D spend (see Figure 2.3). Tether (2004), notes that businesses in many industries, for example clothing and textiles, may spend relatively more on design than they do on R&D (see also Figure 1.3).

20 Margaret Bruce and Lucy Daly, 'International Evidence on Design,' Manchester Business School Report for the DTI on Creativity and Design, 2005.

21 While informative, it is important to note that this particular question has the poorest response rate of the CIS questions.

22 Although the CIS is an EU wide survey some questions differ by country and unfortunately it is not possible to compare these data with those of other countries.

**Figure 2.3:**  
**Design as a percentage of innovation expenditure, 2000**

Industry sector	Design share of total innovation expenditure (per cent)
Manufacture of transport equipment	21
Manufacture of electrical and optical equipment	18
Manufacture not elsewhere classified	12
Financial intermediation	10
Manufacture of fuels, chemicals, plastics metals & minerals	10
Mining and quarrying	9
Manufacture of food, clothing, wood, paper, publishing and printing	6
Wholesale & commission trade	5
Real estate, renting and business activities	4
Construction	4
Transport, storage and communications	2
Electricity, gas and water	0

Source: Community Innovation Survey 3

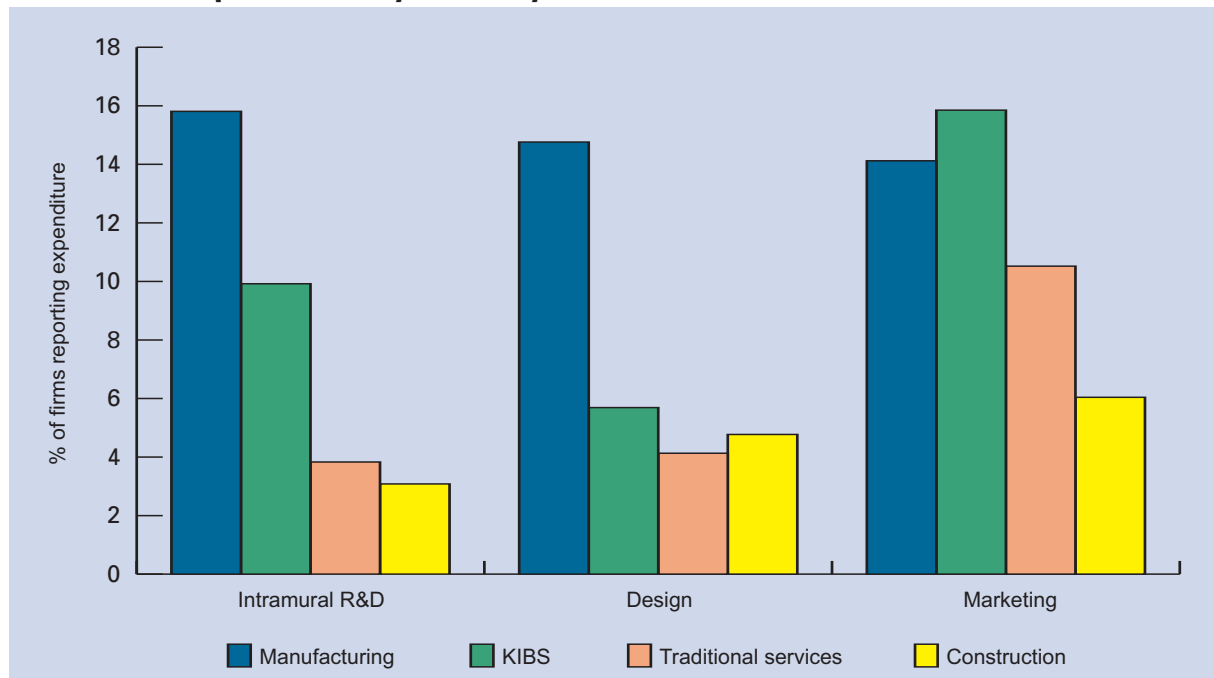
Design is more extensively recognised as a means to innovation in manufacturing than in other sectors. Some two thirds of reported design spending occurs in manufacturing, and the design share of total innovation expenditure is 11 per cent in manufacturing as against 6 per cent in services.

Using the same dataset Haskel *et al* (2005)<sup>23</sup> analyse the behaviour of firms in four groups – manufacturers, knowledge intensive business services (KIBS),<sup>24</sup> traditional services and construction. Of these, manufacturers reported the highest number of firms that engaged in some expenditure on R&D and design (see Figure 2.4). The exception was marketing expenditure, where KIBS firms reported more spending. Traditional service sector firms appear to be the least likely to have expenditure on design, and are also, with construction, less likely to spend on R&D.

23 Haskel, J., Cereda, M., Crespi, G., Criscuolo, C. DTI Think Piece 2005, 'Creativity and Design Study for DTI using the Community Innovation Survey', Queen Mary, University of London, AIM, University of Sussex, OECD, subsequently referred to as Haskel *et al* (2005).

24 Knowledge intensive business services include computer and related activities, real estate, renting and business activities, and telecommunications. Traditional services cover wholesale trade, transport, storage and communications and financial intermediation.

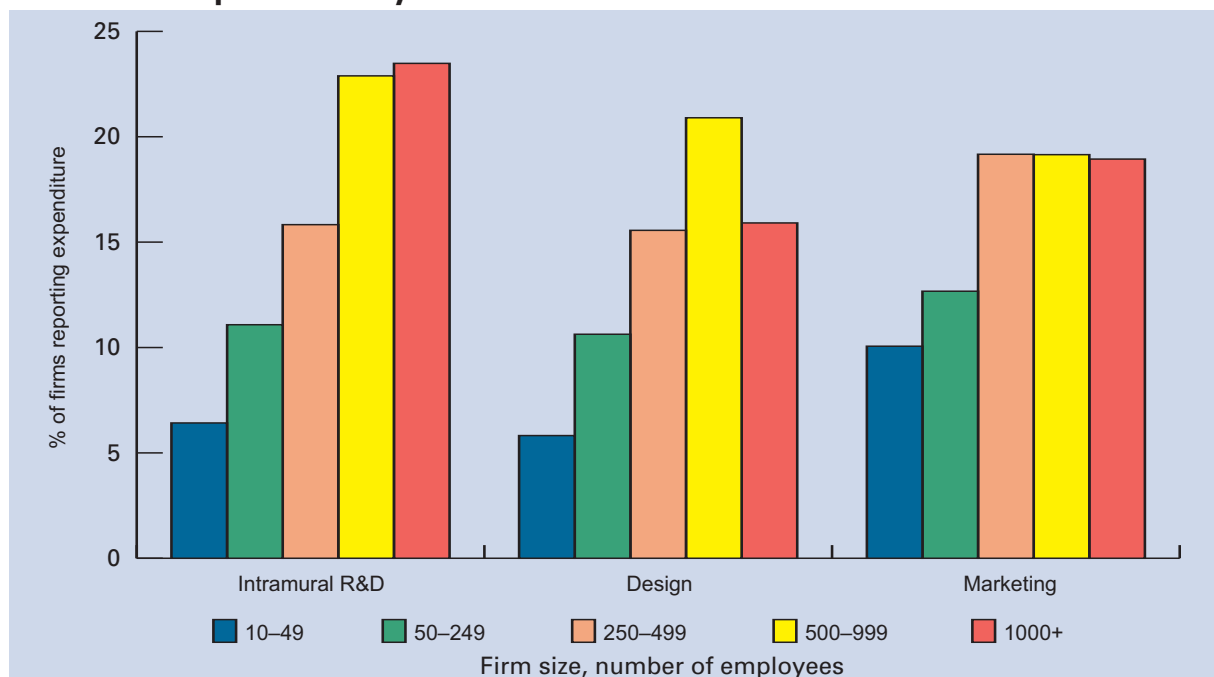
**Figure 2.4:**  
**Innovative expenditure by industry**



Source: Haskel *et al* (2005) Community Innovation Survey 3. Intramural R&D is effectively in-house R&D.

The CIS also allows analysis by firm size. This suggests that, generally, larger firms are more likely to spend on innovative activities than smaller firms (see Figure 2.5). For design, firms with 500-999 employees were most likely to record expenditure on design. Firms of all size categories were more likely to have some spending on marketing than on design, with the exception of the 500-999 employee group.

**Figure 2.5:**  
**Innovative expenditure by firm size**



Source: Haskel *et al* (2005) Community Innovation Survey 3

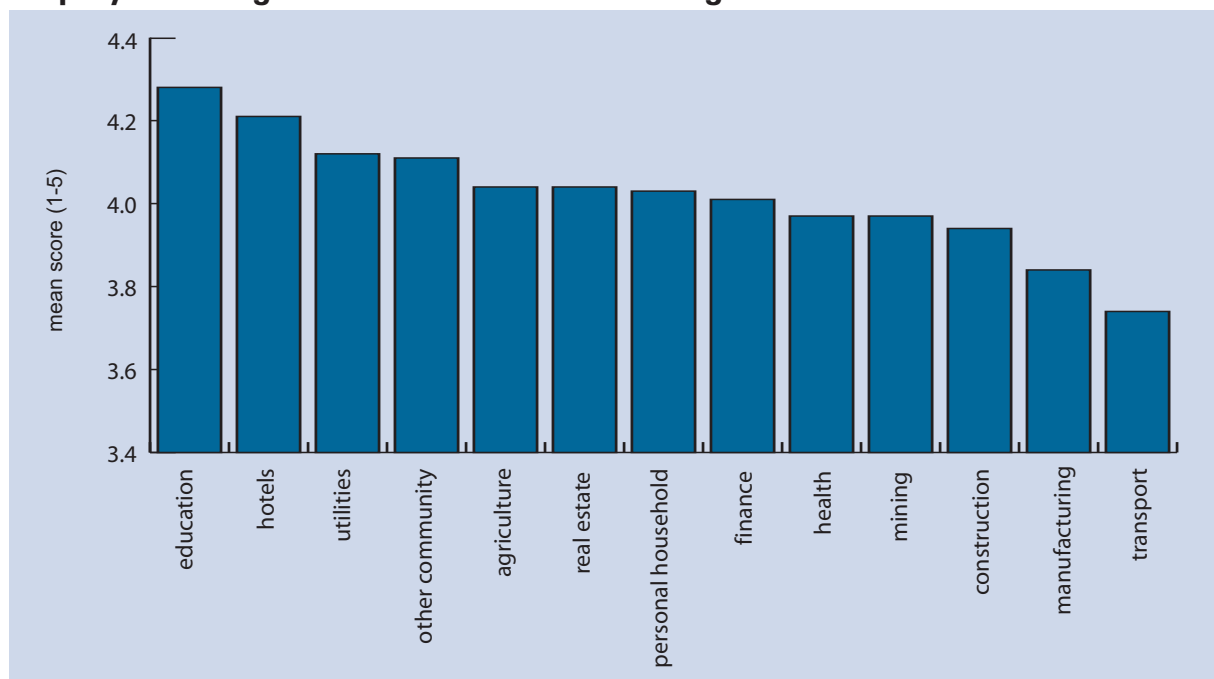
Haskel *et al* also considered whether spending on design and other innovation inputs differed by a firm's largest market (local, regional, national or international). The data show that only a small number of firms operate in international markets but that these firms are the most innovative. Around 21 per cent of firms serving international markets have some spending on design compared to only 2.5 per cent for those serving local markets. This might suggest that firms in more competitive markets have the most pressure to innovate.

## FIRM LEVEL CREATIVITY

There is a growing body of literature on how to measure firm level creativity by looking at what motivates creative individuals and firms. Annex A provides an overview of one such measure and Chapter 4 draws on this theory when discussing how to foster creativity. There is relatively little research available that looks directly at firms' attitudes to creativity across the UK.

One piece of recent research by the Work Foundation<sup>25</sup> suggests that employees in the manufacturing and transport sector are least likely to be rewarded for their creativity (see Figure 2.6). The sectors most likely to reward creativity include education and hotels. While differences in recognition and reward may relate to different jobs, the Work Foundation suggest that lack of recognition may act as a barrier to creativity as employees are not incentivised to think and act beyond their formal job specification.

**Figure 2.6:**  
**Employees recognised and rewarded for being creative**



Source: Work Foundation (2005b). Firms were asked if their employees were recognised and rewarded for being creative. A 1 indicates strong disagreement and 5 indicates strong agreement. The mean score lies between 1 and 5.

25 Work Foundation (2005b).

The same survey also tested whether firms had an effective way of channelling creativity through effective suggestion schemes. The results showed that 62 per cent of businesses had a mechanism through which employees could pass on innovative suggestions; manufacturing was relatively less likely to have an effective suggestion scheme although it was above 50 per cent.

## Contribution of creativity and design to the economy

This section considers various measures that might be linked to a country's design and creative potential, such as the design sector and design education, the creative industries and innovation performance. Together, these indicators provide a picture of UK strengths and weaknesses in creativity and design.

### THE DESIGN CONSULTANCY SECTOR AND DESIGN EDUCATION

The competitiveness of the UK design sector and the quality of creative skills will influence the ability of UK firms to use creativity and design successfully. The UK has an internationally competitive design industry. According to Design Council research in 2005,<sup>26</sup> there are around 12,450 design consultancies in the UK with a turnover of around £5.1 billion in 2004/2005. There are a further 47,400 self-employed, freelance and non-employing designers, with a turnover of approximately £2.0 billion in 2004/2005.<sup>27</sup> While there are design firms across Britain the largest concentration of design consultancies is in London (24 per cent) and the South East (18 per cent).

The design sector performs well internationally, generating around £630 million of exports in 2003.<sup>28</sup> The DCMS (2001) note that the UK is the top exporter of design worldwide, with many design industries gaining a significant proportion of their design income offshore. Design Council research (2005b) shows around one third of large consultancies have overseas clients. Small firms (less than 250 people) have 16 per cent of clients offshore.

The ability of the UK to sustain and make use of design starts with developing and learning good design skills. The UK has a strong culture of design education. It was the first country in the world to set up a Design Council and the first to have design and technology in the National Curriculum.<sup>29</sup>

The number of undergraduate and postgraduate students taking UK design courses has risen in recent years. There are 14,239 Higher Education qualifications in design issued per year and first year design students have increased by 35 per cent over the period 1994/95 to 2001/02.<sup>30</sup> Students studying

26 Design Council (2005b) – all data in paragraph.

27 In 2004/2005, in-house design teams in the UK had an approximate budget of £5.5 billion.

28 DCMS (2005).

29 Jacqui Smith 12 April 2000, cited in DCMS Creative Industries Mapping Document (2001) see <http://www.culture.gov.uk/NR/rdonlyres/67360921-9A73-49E4-B186-77EC376C3C58/0/Design.pdf>

30 Design Council (2003).

for degrees in the creative arts and design (6.2 per cent of all graduates) are now similar to those studying for engineering and technology (6 per cent).<sup>31</sup> Nonetheless, as noted by Bruce and Daly (2005) other countries are also experiencing substantial rises in the number of students studying design.

The quality of design education matters. This is difficult to assess but there are signs that suggest quality is high in the UK. For example, the number of overseas students coming to study design in Britain is high and has increased rapidly in recent years – 150 per cent from 1994/95 to 2001/02.<sup>32</sup> British design education is well recognized all over the world. More than 80 per cent of people interviewed in a wide range of countries agreed that Britain has an excellent standard in this area.<sup>33</sup> Recent Design Council research suggests 90 per cent of UK design businesses are either completely or quite satisfied with the design graduates they have employed.<sup>34</sup>

The evidence on the UK design sector and education suggests comparative strengths in the UK. Nonetheless, as noted above, over one half of firms say design has no role or only a limited role to play in their business. The Cox Review identifies a lack of awareness as one of the key barriers to SMEs making greater use of creative skills. There may be potential for strengthening the links between the UK design sector and firms in other sectors.

## **THE CREATIVE INDUSTRIES IN THE UK<sup>35</sup>**

In 2003 the creative industries accounted for 8 per cent of UK Gross Value Added (GVA) – similar in size to the construction sector (around 6.5 per cent). Within the creative industries, advertising, publishing, software & computer games and electronic publishing, radio and television, and design contributed more than four-fifths of the sector's GVA; the remainder is made up of architecture, video, film and photography, music and the performing arts, and arts and antiques (see Figure 2.7).

The creative industries have also been a significant part of UK growth over the recent past, with output growing by an average of 6 per cent per annum in real terms between 1997 and 2003. This compares with the UK economy growth rate of just under 3 per cent per annum over that period.

31 Higher Education Statistics Agency, Table 2E, 2003/2004.

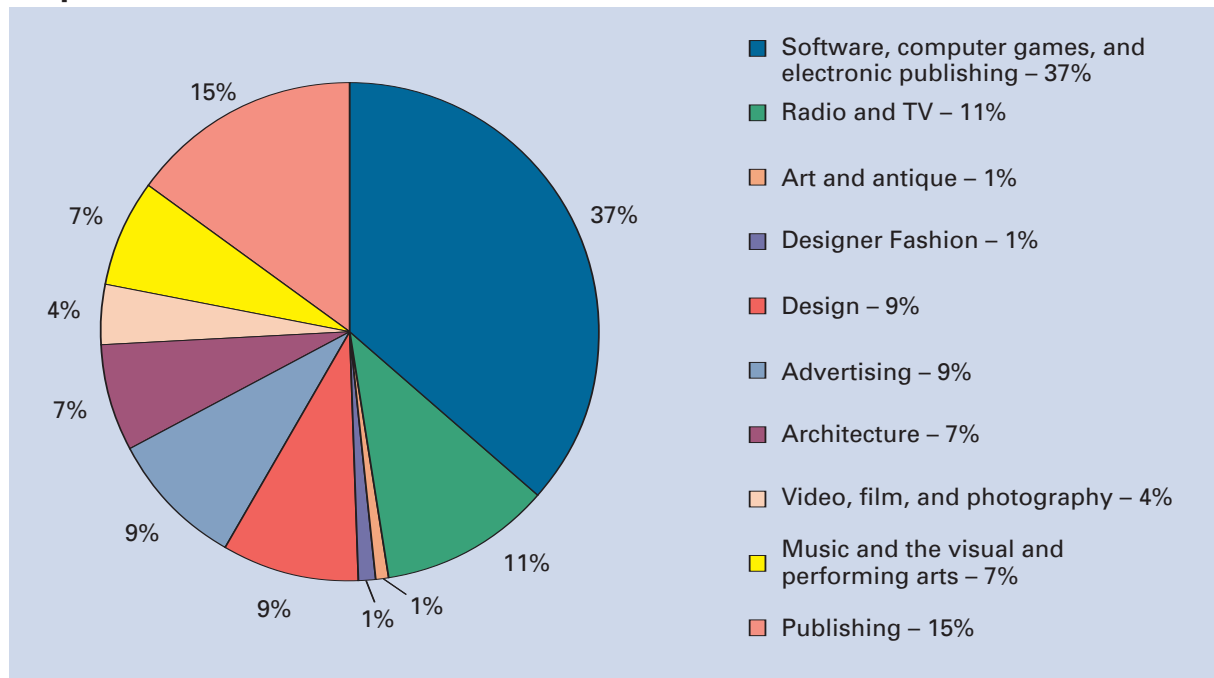
32 Design Council (2003).

33 DCMS Creative Industries Mapping Document (2001).

34 See Design Council (2005b).

35 Unless otherwise indicated, all figures in this section are from DCMS (2005), Creative Industries Economic Estimates Statistical Bulletin.

**Figure 2.7:**  
**Proportion each sector contributes to the creative industries**



The creative industries make an important contribution to UK trade. In 2003, creative industry exports were worth £11.6 billion – that is about 4.1 per cent of all UK exports of goods and services. Moreover, exports in these sectors have been growing fast relative to the rest of the economy. They grew at just under 12 per cent per annum over the period of 1997-2003, compared to around 3 per cent for all goods and services.

International comparisons of the performance of the creative industries are hampered by a lack of comparable data. Bruce and Daly (2005) highlight the differences in international classifications of design, making international comparisons problematic. Nevertheless, a number of illustrative examples suggest that these industries compete well internationally (see Box 3).

**Box 3: How creative is the UK?**

Many countries can point to substantial creative achievements, but the UK certainly outperforms its size in a range of creative activities. A speech by James Purnell MP, Minister for the Creative Industries and Tourism, in early 2005, gave several examples of British creativity:

- London is the third busiest filming centre in the world;
- the UK music industry accounts for as much as 15 per cent of global music and is second only to the USA as a source of repertoire;
- UK developers produce 16 per cent of all video games sold worldwide, accounting for one third of the UK and EU market and around 10 per cent of the US market; and
- British songwriters have written more hits than anyone other than the US, winning 6 out of 7 of the International Emmy Awards in 2004. UK talent regularly dominates US theatre's TONY awards and British plays jostle with each other for space on Broadway.

Speech to IPPR, 'Making Britain the World's Creative Hub' (2005) [http://www.culture.gov.uk/global/press\\_notices/archive\\_2005/purnell\\_creative\\_industry\\_speech.htm](http://www.culture.gov.uk/global/press_notices/archive_2005/purnell_creative_industry_speech.htm)

Creative industries also help to add value to goods and services produced elsewhere in the economy. The ONS,<sup>36</sup> using a slightly different definition of creative industries, show how creative products are distributed across the economy in terms of demand: over 55 per cent of creative products supplied to the UK economy are used as intermediate inputs to other industries (including other creative industries), 27 per cent are consumed directly by households and 12 per cent are exported. This suggests any analysis of the creative industries' contribution to the economy needs to consider the impact they can have on the performance of other UK industries.

**CREATIVE INDUSTRY EMPLOYMENT**

In 2004 just over 1 million people were employed directly in the creative industries in Great Britain.<sup>37</sup> Within the creative industries, 222,000 people are employed in the design sector: 37 per cent are graphic designers, 26 per cent are design and development engineers, 25 per cent are product, clothing and related designers, and the remaining 11 per cent are artists.<sup>38</sup>

36 See: [http://www.statistics.gov.uk/articles/economic\\_trends/Creative\\_Sector.pdf](http://www.statistics.gov.uk/articles/economic_trends/Creative_Sector.pdf). The ONS data are not directly comparable with DCMS data as they do not isolate activities within an industry or sub-class that are deemed as creative, eg. the ONS definition includes all clothing while the DCMS use designer fashion only.

37 DCMS (2005). DCMS estimates that a further 0.8 million people are employed in creative jobs within companies outside the creative industries.

38 DTI analysis of Labour Force Survey, September 2003 to August 2004, combining SOC codes for design and development engineers, artists, graphic designers, and product, clothing and related designers.

Between 1997 and 2004 employment growth in the creative industries averaged 3 per cent per year, compared with 1 per cent for the economy overall.<sup>39</sup> Software, design and film, video and photography all grew faster than other creative industries. Employment data shows that there is a high degree of regional concentration in the location of creative industries' employment. Of those employed in the Creative Industries, around 60 per cent were based in the Greater South East (South East and London) and around 40 per cent in London alone.<sup>40</sup>

## INNOVATIVE OUTPUTS

The evidence on innovation provides some indication of the UK's ability to exploit its creative resources.<sup>41</sup> The picture presented by measures of innovative input and output is fairly mixed.<sup>42</sup> The UK spends less on R&D as a share of GDP than its major benchmark countries. In 2003, France, Germany and the US R&D expenditure (business and government) as a share of GDP was 2.2 per cent, 2.6 per cent and 2.6 per cent, respectively, compared to just 1.9 per cent in the UK. The UK also produces fewer patents per head of population than these benchmark countries.

However, other measures of creativity and innovation show a different perspective. The UK leads its major competitors, including the United States on scientific papers and citations per head of population. Data on trademarks also suggest that the UK is an international leader in this area, accounting for around 12 per cent of the world total.<sup>43</sup> Overall, the entrepreneurial context in the UK is generally positive and barriers to enterprise appear to be relatively low. According to the Global Entrepreneurship Monitor, entrepreneurial activity in the UK is slightly higher than in France and Germany but lower than in the US.

## SUMMARY

This chapter has considered the evidence available to assess the UK's performance on creativity and design. The evidence on the UK design sector and education suggests comparative strengths in the UK. Nonetheless, over half of firms say design has no role or only a limited role to play in their business. This suggests that there may be scope for greater synergies between the capabilities of the UK design sector and use of design in firms. The following chapter looks at the linkages between creativity and design and business performance, and the supporting evidence.

39 DCMS (2005).

40 GLA Economics, London's Creative Sector: 2004 update, April 2004.

41 Data in these paragraphs from DTI 'The Government's new set of Competitiveness Indicators.' See DTI (2004)

42 Estimates suggest that differences in innovation performance explain a significant part of the productivity gap with our competitor countries, with differences in R&D investment alone accounting for quarter of the productivity gap with the US in 1999. See 'Competing in the Global Economy – The Innovation Challenge' (DTI Economics Paper No. 7) for a more detailed discussion of the UK's innovation performance.

43 Office for Harmonisation in the Internal Market (OHIM) Table SSC009.

# Creativity, Design and Firm Performance

## Chapter Summary

Creativity and design are important competitive tools for firms. They can alter a range of non-price characteristics such as style, durability, colour, reliability, texture, ergonomics and performance. These characteristics are increasingly important in the international markets where the UK operates. Creativity and design are also important marketing tools, enhancing company image and brand loyalty. Through its impact on product costs, design can influence the sale price, and process design can raise the efficiency of production or consumption of a service, improving productivity.

A variety of evidence supports the role of design in enhancing firm performance. New research undertaken for this study also shows that firms with higher design intensity have a greater probability of carrying out product innovation and that design expenditure has a positive association with firm productivity growth. Nonetheless, the multifaceted nature of design makes it difficult to isolate from more traditional factors affecting performance, such as market conditions or investment. Research is also hampered by the lack of commonly agreed statistical measures.

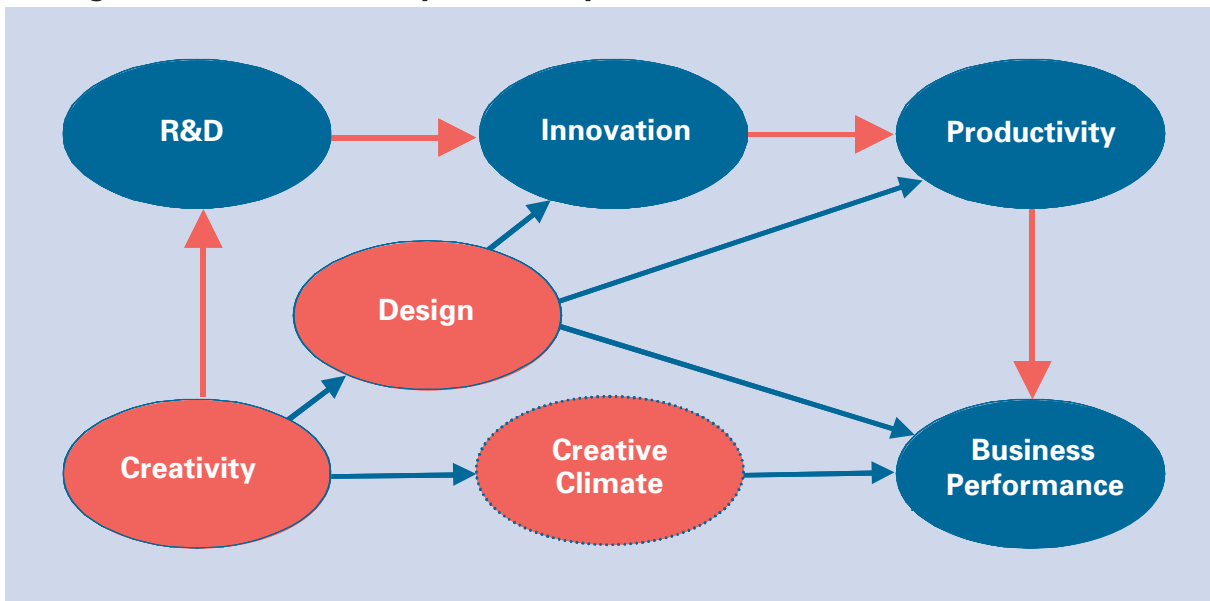
As well as boosting firm competitiveness, there is scope for creativity and design to generate wider economic gains. Consumers can benefit from greater variety and improved products and services. Ideas can be adopted or adapted to improve the performance of other firms.

Creativity has a role in enhancing all aspects of business performance – from the design of new products and services to their production, marketing and distribution. Creativity generates ideas that have the potential to be turned into successful innovation. However, creativity in itself is a necessary but clearly not sufficient condition for innovation. Creativity needs to be channelled the right way. Design and R&D can be seen as ways of channelling creativity for commercial advantage.

The model in Figure 3.1 provides an overview of the channels through which creativity and design can impact on business performance. The traditional link sees creativity channelled through R&D to innovation, which in turn enhances productivity and performance (illustrated by the red arrows). Design can also contribute directly to innovation. As discussed in the introduction, design overlaps with parts of R&D but can also be important for innovation in sectors without substantive R&D.

Design, in particular graphic design, has an important role to play in marketing products, services and company image. In part, this captures the direct link from design to company performance in Figure 3.1. Process design can also raise efficiency of production or consumption of a service, improving business productivity.

**Figure 3.1:**  
**Linkages between creativity and firm performance**



Source: Swann and Birke (2005). To note: elements of design are included in R&D.

Figure 3.1 also illustrates the less traditional channels through which creativity can affect business performance – in particular via ‘creative climate’. This introduces the idea that the generalised creative climate or culture helps enhance innovation and performance as well as specific or focussed creative efforts such as R&D and design.

This model provides the underlying structure for the remainder of this chapter. Although creativity is recognised as key to business success it is the more formal channels of creative input, such as R&D and innovation, that have received more attention in economic literature. This evidence is briefly summarised below, but is not the focus for this report. The chapter then looks in detail at the role of design and the evidence of its impact on business. A brief discussion of the role of a creative climate follows, and the chapter concludes by looking beyond Swann and Birke’s model at the role of creativity and design in macro-economic growth.

## LINKAGES BETWEEN R&D AND INNOVATION

Studies find that, in general, innovation has a positive and significant impact on productivity and firm performance.<sup>44</sup> But, even here, measurement problems

44 See DTI (2003b) (2003c) and (2005a).

exist. Only parts of innovation can be captured directly, for example through surveys of product and process introductions. Innovation is typically measured (or 'proxied') in productivity and growth studies by using inputs into innovation – namely, R&D and patents.

R&D intensity has been linked to better firm performance in a variety of studies. Moreover, R&D expenditure can have wider benefits, with research suggesting that the social returns to R&D investment are both positive and higher than private returns. Swann and Birke (2005) point out that R&D capacity may also influence how well firms can learn from other firms. Nonetheless, not all R&D activities will generate successful innovations. Nor do all industries, especially most service industries, rely on R&D.<sup>45</sup>

## The impact of design on productivity and performance

The potential impact of design on firm performance is wide-ranging. Design can support the development of new products and services, or innovation around existing products and services. Elements of design, particularly graphic design, will form part of a product, service and company branding and advertising strategy. Process design can also improve business efficiency. This section will draw on economic theory to consider why these factors are important for UK businesses and explore the supporting empirical evidence.

### DESIGN AND INNOVATION

Used effectively, design can play a key role in product and service innovation. Design can alter or add performance and user characteristics such as style, durability, colour, reliability, texture, ergonomics, and user interface with services. Each good or service represents some combination of these characteristics or properties and, as argued by Lancaster (1966), these attributes can be considered as determining consumer utility and satisfaction. Indeed, many such characteristics are commonly associated with product quality.

Innovation through design can help firms to avoid competing on price alone. While some consumers will always buy the cheapest product or service in the market, non-price attributes, such as quality can often be more important determinants of overall demand than price (see Box 4).<sup>46</sup> Swann (1998) argued that most of the markets in which the UK competes (i.e. non-commodity markets) are ones in which the broad range of quality factors, taken together, are likely to be more important determinants of international competitiveness than price.<sup>47</sup>

45 Understanding the link between innovation and productivity is further complicated by the fact that the productivity gains do not necessarily accrue to the innovating firm. Geroski (1991) finds that innovations can have a greater impact on innovation-using sectors than innovation-producing sectors.

46 Under price competition firms try to distinguish their products and services from those of competitors on the basis of cheap products whilst non-price competition involves distinguishing a product or service on the basis of characteristics such as appearance or quality.

47 For an overview of recent developments in the trade theory and the role of non-price competitiveness see ECB (2005).

**Box 4: The importance of non-price characteristics**

Various studies find empirical support for the importance of non-price characteristics. Survey evidence suggests that firms perceive product design as a more important determinant of competitive advantage than pricing (Hooley *et al*, 1988). Gayle (2004) finds that convenience and quality, can better explain passengers' choice behaviour amongst alternative airlines than price. Similarly, Clay *et al* (2002) find evidence that even in the online book industry – where information is readily available and the books being sold are identical – price differentials across firms persist. The authors argue that the substantial premium charged by some sellers was indirect evidence of product differentiation.

Non-price factors are important for international competitiveness. Swann (1998) argues that most of the markets in which the UK competes are ones in which the broad range of quality factors are likely to be more important determinants of international competitiveness than price. The importance of non-price factors is supported by international evidence, which finds links between quality (using various proxies) and trade performance – see Greenhalgh *et al* (1994); Landesmann and Snell (1990); Anderton and Schultz (1999); and Anderton (1999).

The increasing role for non-price characteristics makes design more important, but its impact can be complex. Some non-price characteristics can be ordered according to their objective quality, with consumers unanimously preferring, and subsequently demanding, certain versions (eg. those that are easier to use or more durable). But design will not always be this straightforward. As Johnson and Myatt (2004) note '*...a design change may appeal to some consumers, while displeasing others*'. Style and appearance are examples of characteristics for which tastes and preferences will vary according to the consumer. Some consumers are willing to pay more and others less.<sup>48</sup>

Design that increases diversity amongst products, even without necessarily making one product objectively 'better' than another, helps firms to create niche markets.<sup>49</sup> Where there are wide variations in taste and income it may make more sense to target a specific area of the market, potentially allowing firms to charge higher prices.<sup>50</sup> Consumers can also benefit from greater choice and variety. As noted in the introduction, UK manufacturers are already customising products and trying to develop niche markets.

48 Goods that can be ordered objectively, for example in terms of durability, are said to be vertically differentiated. Goods that are different but one cannot be said to be better than the other objectively are said to be horizontally differentiated. Tether (2005) notes that the perceived or symbolic value of goods and services is increasingly important to consumers and they are prepared to pay a considerable price premium for essentially the same products in terms of their functionality.

49 Niche markets limit the full effects of competition by allowing firms to enjoy some market power over these segments.

50 Johnson and Myatt (2004) show that monopoly firms may be more likely to target niche markets than mass markets when tastes (and incomes) are highly dispersed. In their model they show that this effectively causes a dispersion in the willingness to pay of consumers and the demand curve effectively rotates (some demand more; others less).

Design decisions will also have an effect on *price* competitiveness. Design choices can have an impact on production costs by influencing component configuration and the choice of materials for manufacture and assembly (Walsh *et al*, 1992). Design can also affect the life-cycle of a product. Where reliability is higher, service costs are likely to be lower, decreasing overall life costs. Process design can alter the way products are put together in the factory or the efficiency with which customers consume a service. Swann and Birke (2005) note that workplace design and layout can also enhance productivity.

## DESIGN DIRECT TO FIRM PERFORMANCE

Design, in particular graphic design, has an important role to play in marketing products, services and company image. This role, in part, captures the direct link between design and firm performance in the Swann and Birke framework above. Company image and brand loyalty can influence consumers' perception of quality, design and price. Nevo (1998) finds that the high price-cost margins in the ready-to eat cereal industry in the US were in part due to consumers' willingness to pay a premium for certain brands. Advertising and branding may be particularly important for services, which are 'experience goods' (i.e. quality is only known when consumed) as they can help signal such characteristics prior to consumption.

Economic theory suggests that advertising may enhance economic efficiency in some cases. By providing information – either about the existence of a product, prices, quality and location – it can improve decision making by consumers. Search costs associated with choosing a brand and gathering information are reduced. On the other hand, advertising may act as barrier to entry when prohibitively expensive for new firms. The extent to which advertising encourages or deters competition will depend on the sector and the type of good or service being advertised.<sup>51</sup>

## DESIGN, PRODUCTIVITY AND FIRM PERFORMANCE

As the above discussion makes clear, design can have an impact on firm performance and innovation through a variety of channels. Through product and process innovation it can influence both price and non-price attributes of products and services and production efficiency. To summarise, design can be used to:

- **Enhance product and service quality** – some objective measures of product or service quality can be altered such as speed or durability.
- **Differentiate products and services** – differentiating a firm's products and services from those of its competitors (even without improving quality as such).

51 For a discussion see Tirole (1989).

- **Market products and services, and enhance company image** – in particular graphic design, can be used to brand products and services.
- **Lower production costs and/or maintenance costs** – design decisions can affect production costs, potentially lowering prices or whole life costs. Process design can improve production efficiency.

Design may improve firm performance by changing the value of outputs (goods and services produced), costs of inputs (resources used in production), and the efficiency with which inputs are turned into outputs.

The efficiency with which inputs are turned into outputs defines productivity – usually measured as the ratio of outputs to inputs in terms of output per worker or hour worked. Raising productivity is a key objective of the UK Government as it remains below that of some key competitors, despite some improvement in recent years. Design and creativity can play a role in improving firm level productivity through their impact on production efficiency and innovation. Nonetheless, measuring changes in productivity is far from simple when products and services and their associated prices and quality change rapidly. Hedonic techniques go some way to adjusting output prices for quality improvements (see Box 5).

The extent to which firms benefit from creativity and design will depend on the nature of competition and market structure more generally. Swann and Birke (2005) point out that innovations that introduce new products or improve existing ones will not necessarily be fully reflected by higher prices or improved firm performance. This is because in competitive markets some of the value will be passed on to consumers. Similarly, employees may capture some of the benefits.

Where markets are highly competitive, companies have to innovate simply to survive – Swann and Birke (2005) refer to this as *'running just to stand still'*. Much of the discussion in this chapter has been about how to improve or differentiate products in order to stand out in the market place – effectively mechanisms to limit the direct impacts of competition, particularly price competition. As global competition and the speed of technological change increase, there will be increasing pressures on firms to make the best use of innovation – although, positively, HMT (2004) note that there will be increasing rewards to innovation too.

**Box 5: The hedonic technique: incorporating quality changes**

Productivity calculations require comparable measures of real output over time – where real output is the value of output deflated by price indices. Price indices are constructed by comparing prices of like for like products between two periods. However, rapid technological and quality changes render like for like comparison difficult – for example, a computer today is very different to a computer ten years ago. Design changes also have the potential to make marked changes to product quality.

Hedonic techniques attempt to establish the extent to which price changes are a result of quality changes, thereby allowing an estimation of the underlying price change. Regression analysis is used to estimate the relationship between the price of an item and measurable characteristics. Applying the hedonic technique to goods and services means that estimated prices will fall – even when nominal prices were generally rising – if the product improvement is estimated to be larger than the nominal price increase.

**EVIDENCE ON THE ROLE OF DESIGN**

Many studies have considered the relationship between design and success at the firm level. The strongest of these provide empirical evidence on the link between design and firm performance and can be summarised as follows:

- Gemser and Leenders (2001) study of Dutch firms found that integrating industrial design into new product development projects has significant and positive influence on company performance (profit, turnover and export sales);
- Bruce *et al* (1995) show that 60 per cent of 178 UK funded design projects could be defined as commercially successful (measured by positive financial returns on investment). Around one-half of all projects for which export information was obtained saw some international trade benefit;
- Around half of actual export sales made by winners of the 'Queens Award for Exports'<sup>52</sup> could be directly attributed to their investment in design – Whyte *et al* (2002);
- Sentance and Clark (1997) find that design intensive industries and firms are much more active in export markets. They use estimates to suggest that had UK manufacturing invested one-third less in in-house design the growth rate would have been 0.3 per cent less per year over the period 1986-1996; and
- Surveys of UK firms carried out for the Design Council (2005a) find that rapidly growing companies attach much greater weight to design than average growth companies. Of businesses where design is integral to strategy 70 per cent say that design has increased the quality of their

52 Queens Awards Winners are chosen for their reputation and performance in exports.

products and services and only 21 per cent of design-intensive firms are driven to compete primarily on price. Separate research for the Design Council (2005c) showed 63 design intensive companies outperformed the FTSE by more than 200 per cent over 1994-2004.

Bessant *et al* (2005) provide a broader overview of the evidence on design and business performance. Based on this, they argue that '*...there is clear evidence of the contribution and therefore potential for design to affect competitiveness*'. Although these studies suggest a strong correlation between design input and firm performance, establishing clear causality is difficult. The multifaceted nature of design makes it difficult to isolate from more traditional factors affecting performance, such as market conditions or investment. As Piirainen succinctly put it: '*design alone cannot be accredited for a product's success or failure*' (Piirainen, 2001). Research is also hampered by the lack of commonly agreed statistical measures (see Box 6).

New research undertaken for this study by Haskel *et al* (2005) assesses the impact that expenditure on design has on firm performance using the Community Innovation Survey.<sup>53</sup> Firms are grouped according to their productivity and turnover in order to assess whether more productive firms with higher growth tend to be more innovative or have higher expenditure on innovative activities, including design. They show that more innovative firms tend to have higher *growth* in turnover and productivity but there appears to be no simple (univariate) relationship between expenditure on design and firm performance.

Haskel *et al* also consider how expenditure on design affects the probability of innovating and productivity growth in a multivariate setting ie. controlling for other factors.<sup>54</sup> They find that firms with higher design intensity have a greater probability of carrying out product innovation, but are not more likely to carry out process innovation. Importantly, they find a positive association between design expenditure and firm productivity growth.<sup>55</sup> While difficult to prove that spending on design causes productivity increases, this finding lends support to previous research, much of which is based on case study analysis rather than statistical evidence.

The impact of design on performance may differ by sector. Gemser and Leenders (2001) found that the impact of design on company performance was much stronger in precision instruments, where design use was less mature, than in furniture where use of design was mature. They suggested this might be because technology developments in precision instruments had started to level out making it more imperative to find new ways for firms to differentiate. Whyte

53 See Chapter 2 for a discussion of the profile of design-using firms, based on CIS3.

54 The probability of innovating (process or product innovation) is modelled as a function of expenditure on design and non-design activities, information flows (from within and outside the firm), employment, and a dummy for industry – allowing for fixed industry effects – and other variables. They find that the effect of design on product innovation is small, *relative* to the effect of increased information flows.

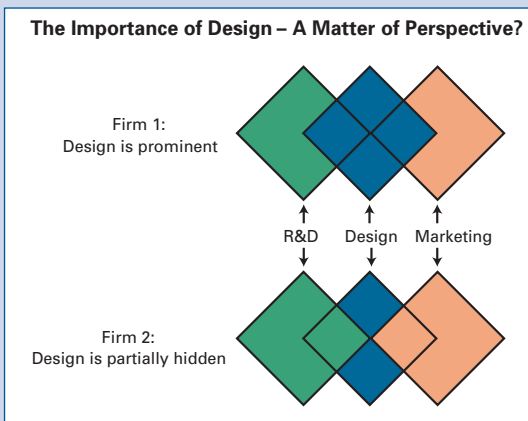
55 The research finds a marginal return of around 17 per cent to design expenditure on total factor productivity growth. Haskel *et al* state that this is a central estimate of return rates but likely an overestimate of the causal effect, as it can't control for all factors that affect both productivity growth and design expenditure.

*et al* (2002) found that design had a greater impact for manufacturing firms than for firms in the service sector and that manufacturers attributed more of their exports to design.<sup>56</sup>

### Box 6: Understanding the impact of design

There are various challenges to estimating the impact of design on firm performance. Establishing the direction of causality between design and firm performance is important. Finding that high performing firms spend more on design does not necessarily prove that design activities lead to success – it may simply be that higher performing firms can afford to spend more on activities related to design.

Many factors *other* than design influence firm performance (for example competitive conditions, investment in capital). In order to obtain an unbiased estimate of the impact of design, the effects from design need to be separated out from these other factors, for example using regression techniques as employed by Haskel *et al*. A further challenge is generalising results, particularly in case studies where sample sizes are small and the returns to investment in design may well depend on the industry in question.



Source: Tether (2005)

Measuring design input is challenging. Tether (2005) points out, some firms may record certain design activities under marketing or R&D (see Diagram on left). Both firms use an equal amount of 'design' input but it will be reported as less in firm 2. A bigger issue is the lack of commonly agreed statistical measures.

### WHEN DESIGN PROJECTS FAIL

Understanding why some design projects fail is important. Bruce *et al* (1995) found that around one fifth of design projects they assessed were commercial failures – making both a financial loss and no other indirect benefits. Key reasons identified for failure were:

- Lacked suitable design management skills (ill-defined objectives, poor briefs and poor budget planning);
- Quality of design work (one prototype fell to bits); and
- Other including lack of finance, strength of competition, market resistance.

<sup>56</sup> See Voss (1992) for a discussion of design performance in services.

The importance of managing design input is a recurrent theme in the literature. Whyte *et al* (2002) note that successful firms are differentiated by the care that management takes in drawing up a comprehensive brief to aid design at the start of any major product development project. This needs to be accompanied by adequate integration and coordination of the design input with other parts of the business.

Even where design is of a high quality, some projects will fail. Where the market for design is competitive, some failures are inevitable – it is part of the creative process. Good design cannot insulate firms from competition nor is it possible to determine how a market will react. Roy and Riedel (1997) find that in commercially successful product development projects more attention had been paid to genuine product improvements rather than just styling or costs. More evidence about which *channels* of design are most important and in what circumstances would be useful.

## Creativity and firm performance

The model developed by Swann and Birke (2005) emphasises the role of a creative workplace or climate in the workplace as an important driver of creativity and firm performance. The culture of an organisation has been defined as the shared assumptions or ways of doing things of people working in that organisation. This captures the idea that successful companies will look not only to R&D or design as creative inputs, but seek to promote creativity in all parts of the organisation.<sup>57</sup>

There is a growing understanding about what conditions will motivate individuals to be creative (See Annex A). Nonetheless, while creative culture is arguably very important, there are surprisingly few studies analysing the link between formal measures of creative climate and company performance. Recent research by the Work Foundation found that performance against certain measures of creativity had a statistically significant relationship with overall company performance across nearly 3,000 UK firms.<sup>58</sup> Similarly, a recent survey by the CBI<sup>59</sup> found that creativity and innovation was cited by 37 per cent of businesses as important to organisational competitiveness – the fourth highest response out of 15 possible factors.<sup>60</sup>

57 Swann and Birke (2005) notes that the culture of an organisation may also influence purchase decisions if consumers' purchase decisions are influenced by the image of the company.

58 Work Foundation (2005a).

59 See [http://www.cbi.org.uk/ndbs/press.nsf/0/d96b885377e31f118025701900415c7e/\\$FILE/RDA%20Final%20Report%202005a.pdf](http://www.cbi.org.uk/ndbs/press.nsf/0/d96b885377e31f118025701900415c7e/$FILE/RDA%20Final%20Report%202005a.pdf). The statistics on creativity and innovation are available from the CBI directly.

60 Recent research (SBS (2005)) also highlighted how innovating SMEs are more likely to be experiencing growth in their turnover and staffing levels than non-innovators.

## Creativity, design and economic growth

So far, this chapter has set out the possible links between creativity, design and firm performance. But what is the role of creativity and design in economic growth at a macroeconomic level?

Economies change all the time and the mix of products and services produced and consumed in advanced economies are in a constant state of evolution. The extent to which living standards can increase over time depends on the economy's ability to expand the value of goods and services it produces relative to the population. Growing economies therefore – like any evolving system – depend on the generation of a wide variety of ideas, from which potentially successful ones can emerge through some sort of selection process. Creativity, in all its forms, in the economy and especially in firms, is essential to generate such diversity.

Recent models of economic growth, creativity and the generation of ideas are seen as integral to growth. These ideas can be turned into new products, services and ways of working. This is emphasised in Romer (1993): *'Ideas include the innumerable insights about packaging, marketing, distribution, inventory control, payment systems, information systems, transactions processing, quality control, and worker motivation that are all used in the creation of economic value in a modern economy'*. He argues that the distinction between ideas – where there are no opportunity costs in reproduction – and objects is of fundamental importance for economic analysis.

Successful ideas can generate important benefits to society, far beyond the benefits that accrue to the originator of those ideas. Designs are ideas – once a design has been created, any factory can produce it, provided it has the instructions and competences to do so. Other firms or agents might be able to adopt or build on innovative ideas, or workers moving firms might be able to take knowledge with them.

### SUMMARY

Creativity is vital for every part of the economy. The ability to generate a diverse set of business options through new ideas is a central feature of innovation in all firms and, as such, is a key driver of economic growth. Design, as a structured creative process, is an important competitive tool for firms in many sectors, although design activities can take many forms across those different sectors. Design can enhance non-price characteristics, improving quality and creating niche markets. Creativity and, in many cases formal design activities are also important for marketing, company image and brand loyalty. They can also impact production costs and overall firm productivity. But the gains from creativity and design are not limited to firms – the economy as a whole can benefit. Consumers benefit from greater variety and improved products and services. The next chapter considers how firms can develop creativity and design.

# Fostering Creativity

## Chapter Summary

Successful companies will look not only to R&D or design as specific creative inputs, but seek to promote creativity in all parts of the organisation. Management practice and behaviour have a strong influence on creativity and the effective integration of design. More successful outcomes tend to be generated where creativity and design are aligned with strategy. Technology can support creativity by making it easier to collaborate and to acquire knowledge, and through supporting design prototyping.

The extent to which a firm develops effective networks will influence its ability to collaborate and to be creative. Networks can embrace users as well as suppliers, with some exciting innovation coming from closer involvement of customers in the process. Firms also benefit from other creative firms through knowledge spillovers if they have the capacity to absorb and exploit this knowledge.

Factors that influence creativity beyond a firm's direct control include culture and place, education, and competition and regulation. The ability of firms to protect their investments in creativity and design is important to ensuring they have the right incentives to innovate. Recent years have also seen new emphasis on the role of culture and diversity in attracting a creative workforce.

Creativity is a natural resource, but requires careful nurturing. The creativity of a firm's employees and its openness to design input are both sensitive to the way the firm is managed and the environment in which it operates. This chapter reviews the conditions that may hamper or encourage creativity and design at the firm level. Three sets of conditions are explored:

- factors internal to the firm, such as culture, skills and management;
- the interface of the firm and the environment in which it operates such as networks and spillovers; and,
- drivers arising from the external environment that are largely beyond the firm's control such as society's culture, education and competition.

This chapter helps illustrate the interdependency between firms and the wider economic environment in fostering use of creativity and design. The role of Government in supporting some of these drivers follows in Chapter 5.

## Creativity internal to the firm

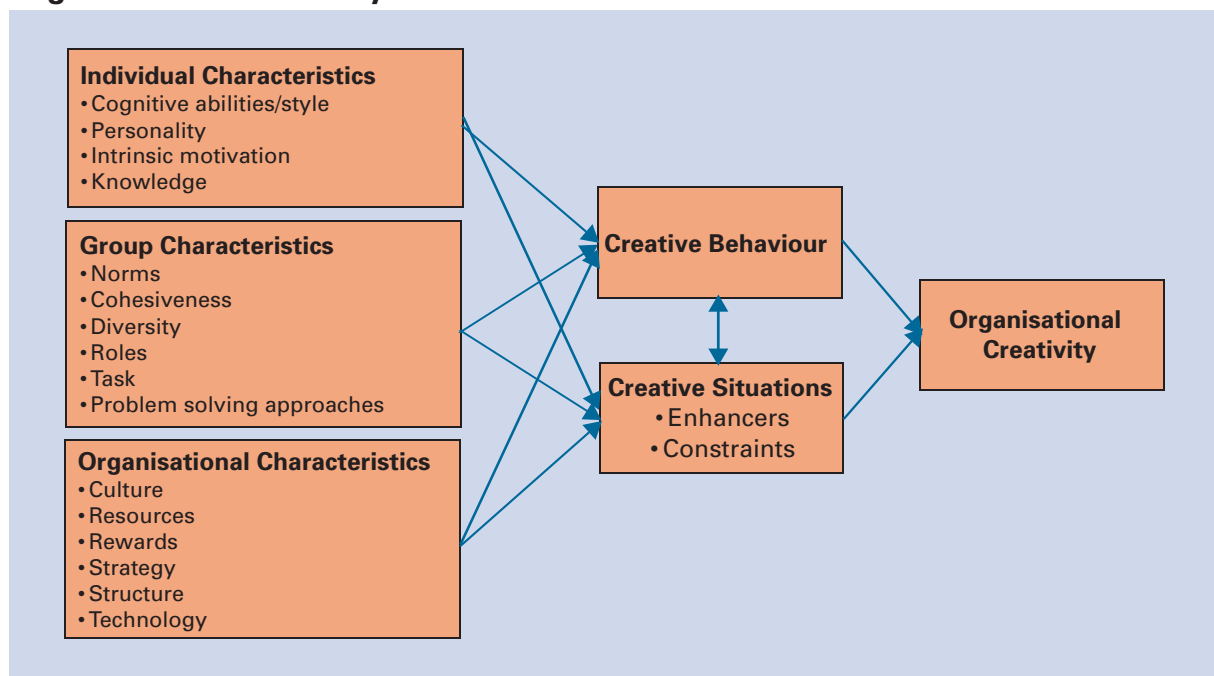
Many factors can support creativity within firms – this section overviews creative culture, skills, management, and technology. Many factors discussed also contribute to a firm’s absorptive capacity – that is its ability to turn knowledge (in this case creativity and design) into profitable goods and services.

### CREATIVE CULTURE

Swann and Birke (2005) emphasises the role of a creative workplace culture or climate. The culture of an organisation has been defined as the shared assumptions or ways of doing things of people working in that organisation. As noted in Chapter 3, this captures the idea that successful companies will seek to promote creativity in all parts of the organisation.

Figure 4.1 suggests factors that will contribute to organisational creativity. These range from individual skills, including motivation and knowledge, to group features, such as diversity and problem solving approaches. Organisational characteristics such as technology, strategy and rewards can also enhance or constrain creative behaviour.

**Figure 4.1:**  
**Organisational creativity**



Source: Woodman, Sawyer and Griffin (1993)

There has been only limited take-up of measurement for creativity by business although several creativity frameworks have been developed (See Annex A). Moreover, while creative culture is arguably very important, as discussed in Chapter 3 there are surprisingly few studies directly analysing the link between creative climate and company performance.

## SKILLS AND MANAGEMENT

Individual creativity skills are a key component of organisational creativity, as indicated in Figure 4.1. While this will cover role-specific skills, eg. those required of designers or R&D staff, it also covers creativity in individuals more generally. Three factors have been shown to determine the creativity of an individual when tackling a problem or reacting to an opportunity.<sup>61</sup> These are their level of expertise in the area generally, how motivated they are, and their knowledge of creativity techniques (see Box 1 in Introduction).

What motivates individual creativity and the organisational features needed to encourage it point strongly to the importance of management. Management decisions will determine many of the factors considered important to organisational creativity, eg. rewards for creativity, the autonomy and tasks given to workers, the strategy of the company and recruitment.

Managing design input highlights the challenge of making the most of a creative activity in the innovation process and doing so successfully on a repeated basis.<sup>62</sup> Bessant *et al* (2005) see strong evidence that obtaining the benefits of design depends on managing the process of its integration in a structured and systematic fashion.

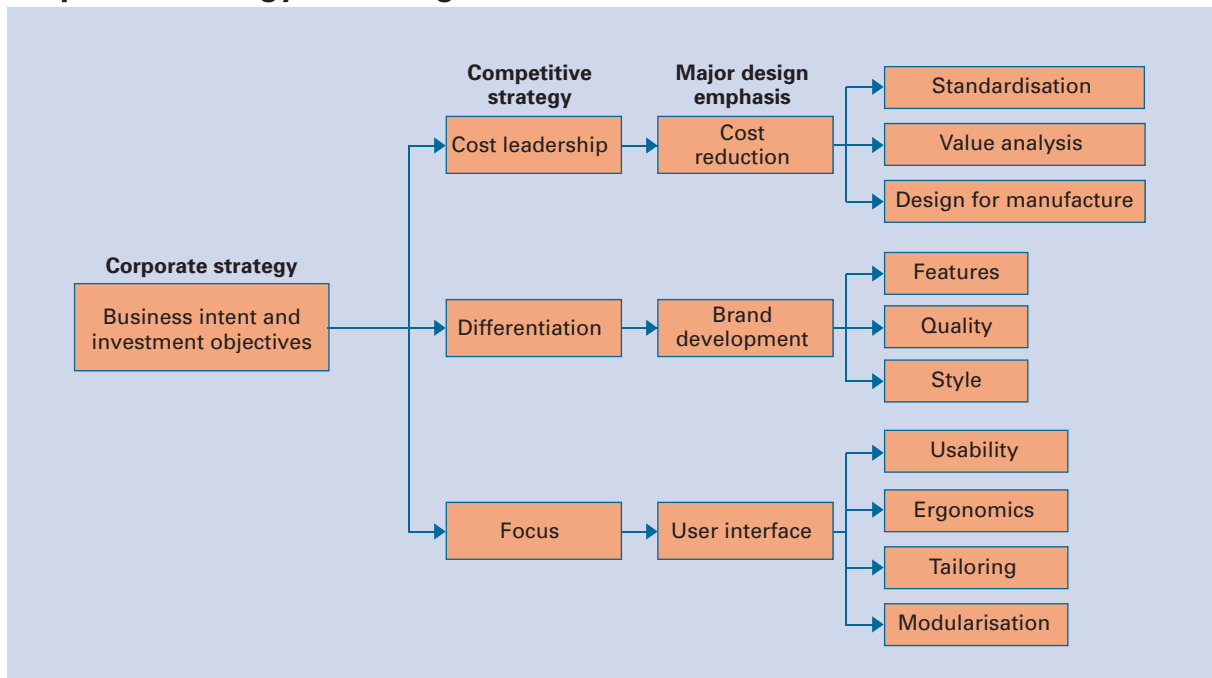
A further management challenge is to align creative efforts with the firm's strategic direction. The Work Foundation note that having a clear and well communicated strategy will help ensure that any creative ideas developed are appropriate.<sup>63</sup> Piirainen (2001) suggests how a competitive strategy will influence the major emphasis of design (Figure 4.2). Companies competing on cost (price competition) will make cost reduction a major emphasis in the design brief. In contrast, companies wishing to differentiate their products/services in the marketplace will focus on non-price characteristics such as features, quality and style.

61 Amabile (1997).

62 Sustained incremental improvement can have just as big an impact on both products and process design and consequent performance as more radical innovation. Bessant *et al* (2005) use the example of the evolution of the bicycle to show how ongoing design changes can lead to continuous product development. For a similar point see Walsh *et al* (1992).

63 Drewery (2005).

**Figure 4.2:**  
**Corporate strategy and design**



Source: Piirainen (2001)

The challenge of integrating creative activities within the organisation begs the question as to whether an activity such as design can be effectively outsourced. Bessant *et al* (2005) argue that it can, but that firms need to ensure the process is well managed (See Box 7).

The age and size of a firm may influence the ability of managers to develop and sustain a creative culture. Smaller 'organic' companies may have an advantage over larger, hierarchical and 'mechanistic' companies where well-defined division of labour and well-defined job descriptions dominate.<sup>64</sup> However, there are other areas where these characteristics may count against a small firm. Small firms are likely to be less diverse and have less access to resources, both of which have been identified as ingredients to the initial idea generation phase of the innovative process.

### **Box 7: Outsourcing design**

The rise of the specialist design consultancy has been a feature of recent years. These agencies take on much of the management of the innovation process, from initial concept through to prototype and beyond. Organisations such as IDEO and WIPRO have developed a global presence and considerable expertise in generic design and innovation. In this sense, for firms that can afford it, the availability of a strong design consultancy sector should support UK firms wishing to use design.

Design outsourcing has moved beyond the sub-contracting of key professional expertise to providing support to businesses across an increasingly large portion of the design and innovation process. Firms need to balance the benefits that can flow from outsourcing design against the need to integrate design into other business processes. Outsourcing will only drive greater creativity in firms that manage the outsourced relationship effectively. When firms outsource they also need to ensure knowledge and learning is retained in the business for future use.

From Bessant *et al* (2005).

## **TECHNOLOGY FOR CREATIVE COLLABORATION**

Technology has been shown to foster creativity generally and to support particular creative activities like design. It can do this by:

- Simplifying information movement around teams and distributed groups.<sup>65</sup>
- Making for more effective brainstorming.<sup>66</sup>
- Allowing for virtual teams.
- Allowing for the involvement of far larger numbers of people in the development of products.
- Allowing for rapid prototyping, virtual design and simulation.

Technologies such as computer simulation enable designers to speed up design iterations and also to reduce their costs. In the automotive industry for example, computer generated crash tests reduce development times by avoiding the need for as many prototypes in the design process. They also now provide better data than that derived from physical prototypes. A set of technologies such as high bandwidth Internet, modelling and simulation tools, virtual reality and rapid prototyping is emerging to enable, create and implement innovation. The

65 It has been argued the speed information moves around an organisation contributes more to competitiveness than the level of knowledge. Prahalad and Hamel (1990).

66 Technology can help by overcoming the weaknesses in traditional brainstorming: one person speaking at once, distraction of emerging ideas, fear of evaluation by others, 'social loafing' behaviour. Siau (1995).

emergence of these complementary technologies is leading to an intensification of the innovation process.

It is not clear that all innovation in IT and associated organisational developments will necessarily be good for creativity. While IT allows an organisation to extend its reach, it may lose its coherence. There may be too much information; access to poor information may rise at the same rate as access to information as a whole. Communication does not follow automatically just because of e-mail, and it will remain difficult to share or access 'soft' or tacit knowledge.<sup>67</sup>

## OTHER INTERNAL LEVERS

There are other internal levers that firms can use to raise levels of creativity. The architecture and design of the workplace may help or hinder productivity depending on its appropriateness to the focus of the organisation. The act of redesigning a workplace can serve as a catalyst for cultural change.<sup>68</sup>

## The interface with the environment

This section looks at how creativity in firms is influenced by interaction with their environment. The factors considered in this section are partly within the firm's control but also partly dependent on others, for example the availability of willing collaborators. Many of the factors discussed in the previous section will determine a firm's capacity to benefit from the environment.

## NETWORKS AND COLLABORATION

A network is a firm's relationship with other organisations including suppliers, customers, universities, and even competitors. AIM research suggests that UK firms have strong network relationships, although these networks can be intermittent and affected adversely by disparities between UK regions.<sup>69</sup>

The creativity of a firm can benefit from its closer integration into a number of networks and any collaborative efforts that result. Manufacturers have for some time worked closely with the supply chain on quality issues. They are now starting to look to suppliers to provide suggestions for product or process innovation. Such relationships are particularly important to firms making modular products because information will be diffused across several organisations, making interaction important for generating new ideas.

67 Dewett (2003).

68 Swann and Birke (2005) note that playing music in the workplace has also been shown to improve performance, satisfaction and reduce turnover for those engaged in routine work. It might be a distraction to more introverted individuals and to those performing more demanding tasks.

69 Pittaway *et al* (2004).

There is also increasing interest in the role of customers as an important source of creativity. Firms have even begun to create scope for users to innovate independently. Swann and Birke (2005) gives the example of STATA, a leading econometrics software firm, that enables users to develop their own routines that are then shared with other customers.

Von Hippel has carried out pioneering work on the role of the customer (or user) in successful innovation. He identifies an informational asymmetry between users and manufacturers that leads to productive collaboration. Users are better placed to develop innovations that are functionally novel to meet some specific customer need. Manufacturers tend to develop innovations that are improvements on well-known needs that draw on a rich understanding of their product.<sup>70</sup>

Users enjoy being involved in the innovation process. There is a parallel here with the Open Source movement, best exemplified by the development of the Linux operating system. Although operating largely outside the corporate framework, this showed the creative potential of networks and collaboration: a global community of software developers working on a voluntary basis to develop a sophisticated and robust end product.

Building up networks may be more difficult for small firms. Devins *et al* (2002) note the importance of learning through transactions and relationships as a means of stimulating innovation and creativity, while also illustrating how the characteristics of micro-businesses limit such learning opportunities. The Lambert Review also highlighted how SMEs and universities may fail to form effective links with each other, inhibiting creative ideas and knowledge transfer.

## **CLUSTERS AND KNOWLEDGE SPILLOVERS**

Innovation often generates benefits beyond the innovating firm – that is, it can create spillovers or externalities. For example, new ideas might serve as an inspiration to other firms even when protected by intellectual property rights. Similarly, staff moving between firms might take creative ideas with them or have developed greater capacity to think creatively.

These spillovers may be enhanced for firms that co-locate forming a geographically concentrated cluster. This might include a wide variety of companies, suppliers and services that find mutual advantage in being close to other firms in a network – even competitors. Chapter 2 suggested that some of the creative industries had a strong regional presence in the South East, which might suggest firms find mutual benefits in being close to one another, with a beneficial impact on performance. This could also have advantages for firms in that area but outside the creative industries wishing to use their services.

70 Von Hippel (2005); Swann and Birke (2005).

## DEMAND

Finally, a key driver of a firm's creativity will be demand for its products and services. Porter (1990) notes that the more demanding the customers in an economy, the greater the pressure facing firms to constantly improve their competitiveness via innovative products, through high quality, and so on. Evidence suggests demand will be a key driver of creativity in years to come. Bessant *et al* (2005) note that customers are becoming more discerning, increasingly seeing themselves as individuals – demanding customisation. This connects to the Von Hippel user-engagement argument above.<sup>71</sup>

## Environmental drivers of creativity

As the above discussion has highlighted, all firms operate within a wider environment that influences their ability and desire to be creative. This section explores certain factors that influence the firm but over which it has no, or very limited control.

## CULTURE AND PLACE

Culture and place potentially have an impact on many of the drivers of creativity for example, developing creative skills or attracting and maintaining clusters. Cultural investment can improve quality of place and it can help encourage design and creativity in individuals and firms by providing sources of inspiration through creativity and cataloguing of what has gone before. Individuals taking part in cultural and creative activities can foster self-expression and creativity, which can help unlock their creative potential.

From the 1980s onwards, cultural institutions have increasingly been asked to demonstrate the impact of their activities on economic regeneration, business success, social cohesion, and learning.<sup>72</sup> Despite this focus on 'outcomes' it is still challenging to link cultural investment with creative firm performance and increased productivity.

Many cities have chosen to invest in cultural or architecturally distinctive assets, hoping to develop a reputation for creativity and tolerance, attract investors and workers, and deliver sustainable local regeneration. Florida (2002) argues that open and tolerant communities will be best placed to access the largest pool of diverse talent (see Box 8).

71 This also links to the discussion in Chapter 3 around the importance of non-price factors in determining demand.

72 Demos, Capturing Cultural Value (2004).

### **Box 8: Tolerance – the key to creativity and innovation?**

As a generator of new ideas, creativity can be considered as a key ingredient for economic success. But what is it that stimulates creativity in the first place? In 'The Rise of the Creative Class', Florida argues that open and tolerant communities will be best placed to access the largest pool of diverse talent. By attracting individuals with creative potential, regions can develop 'creative centres', where invention and innovation agglomerate.

Florida uses measures of skills, innovation and diversity to construct his creativity index, in order to capture the underlying creative potential of a region. San Francisco topped Florida's list of cities with the highest scoring combination of tolerant attitudes and diversity, access to talent (skilled workers) and high-technology focus. In the UK, Demos have run a simplified analysis on UK cities, in which Manchester headed the list and London and Leicester came joint second. Florida argues that measures of creative potential are indicative of a region's long-term economic success.

Florida's ideas, which are difficult to support empirically, have attracted both support and criticism.

## **EDUCATION**

The supply of creativity and design skills in the labour force will be determined partly by the characteristics and performance of the UK education system. The UK education system will determine the availability and quality of design courses, as well as creative and cultural education. The National Advisory Committee on Creative and Cultural Education established in 1998 argued that creative and cultural education has a role to play in unlocking young people's potential and developing their capacities for generating new, original ideas (see Box 9).

The challenge for school education is to balance the demand by business for young people with greater numeracy and literacy skills with their desire to recruit confident, creative thinkers. Employers claim that often people arrive in the workplace untrained to think laterally or to search for alternative approaches to issues and need to be encouraged to develop these skills.<sup>73</sup> Creative Partnerships, the Government's flagship contribution to creativity in school education seeks to address this by involving creative organisations in projects that focus on developing literacy and numeracy skills but do so in a way that also engages and enhances children's creativity.<sup>74</sup>

73 Drewery (2003), a Work Foundation report.

74 Between May 2002 and July 2005, the Creative Partnership programme involved over 25,000 teachers and 318,000 students in events and linked some 4,300 schools with 3,200 creative organisations. (DCMS, [www.creative-partnerships.com/aboutcp/facts](http://www.creative-partnerships.com/aboutcp/facts)). See also Culture and Creativity: The next ten years, DCMS Green Paper 2000.

The education system can also help foster some of the skills in management and leadership that are important for managing and making the most of design input, discussed earlier in this chapter. The role of education, particularly at tertiary level, is discussed in more depth in the Cox Review. The Review stresses that creativity needs to be part of technological and scientific learning, and equally in management or business studies. It recommends that centres of excellence should be established for multidisciplinary courses and that higher education courses should better prepare students to work with and understand other specialists.

### **Box 9: Creativity in schools**

The National Advisory Committee on Creative and Cultural Education was established in 1998. The committee argued that education needed refocusing with greater emphasis on creativity, adaptability, communication and self-esteem. Its broad recommendations were:

- For creative and cultural education to be provided for in the school curriculum and its importance recognised;
- To ensure appropriate training for teachers that will help them develop young people’s creative abilities; and
- To promote partnerships between schools and outside agencies that can contribute to the creative and cultural education of young people.

Investing in a wide variety of cultural activities (spanning art, theatre, sport, dance etc.) provides a platform for self-expression. For young people in particular, this provides them with opportunities to explore and develop their creativity in a supported and “safe” environment.

Source: NACCCE (1999)

## **COMPETITION AND MARKET STRUCTURE**

Competition is central to the creative process. It is the mechanism by which the best ideas, which have the greatest potential to generate new or improved products, services and processes, are selected from a variety of ideas. Competition also has a role to play in incentivising firms to be creative and innovative. Where competition is high this may be necessary simply to survive. The degree of competition faced by individual firms will depend on the structure of their markets.

While competition in the traditional sense of many firms can be a force for more innovation, the links between market structure, competition and innovation are

not always straightforward. Strong competition between relatively few firms can be as effective as competition among many.<sup>75</sup> Innovation itself can be characterised as a search for monopoly positions with high returns, potentially making it more difficult for other firms to compete. Design is one means of this search. In their study of industrial design in Dutch firms Gemser and Leenders (2001) note that while design can enhance competitiveness regardless of industry evolution, companies can seize the benefits of industrial design early in industry evolution as a way to differentiate themselves and build a strong brand and corporate identity. Market power may also generate the rents needed to provide financial resources for innovative activities.<sup>76</sup>

The DTI Innovation Review (2003) provides an overview of evidence on competition in the UK. The review suggests that in the past innovation in the UK may have been affected by low levels of competition, although reforms to competition policy, such as the 1998 Competition Act and the 2002 Enterprise Act, are yet to fully feed through. On a number of indicators linked to the competitive environment, such as openness to trade and product market regulation, the UK performs relatively well (see DTI 2003a).

## REGULATION

Regulation can have an impact on levels of creativity in a number of ways. On the positive side, regulations set the direction in which a society wishes to move, for example through environmental limits or safety standards, and can therefore channel creativity towards socially desired goals. Regulation also protects private property, such as the intellectual property produced by creative individuals and firms (discussed further in Chapter 5).

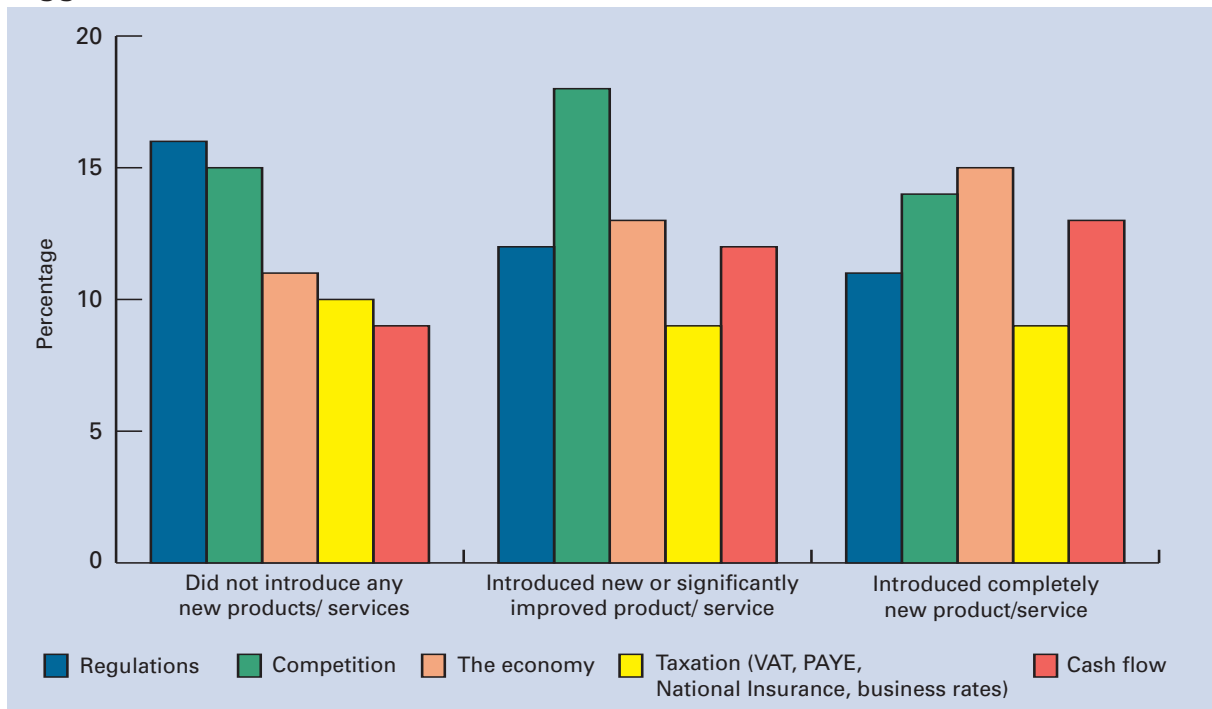
Regulations by their nature restrict autonomy, which is an important ingredient of much creative activity. Some forms of regulation, for example technical and service standards, can contribute to growth, innovation and productivity, largely by enabling innovators to economise on information about technological or market options. (See DTI 2005b). It follows that standards for the management and implementation of design and innovation, including in business processes, can also economise on information and enable firms to concentrate on their particular way of adding value.

75 Even in an industry dominated by one firm (a monopoly) there may be incentives to innovate in order to keep potential rivals at bay.

76 For a discussion of how market structure is in turn determined by various sunk costs, including advertising and R&D outlays, see Sutton (1991) *Sunk Costs and Market Structure*. In a study of UK industry Aghion *et al* (2002) found evidence that increasing competition from low levels increases innovation as the rewards from 'escaping' competition increase. However, in some industries, more competition may also reduce innovation as the 'laggard's' reward to catching up with the technological leader may fall.

According to the 2003 Annual Small Business Survey, regulation was perceived to be the biggest barrier to success for firms that had brought no new products to market. For firms that brought out a new or significantly improved product the biggest barrier to success was competition followed by the state of the economy.

**Figure 4.3:**  
**Biggest barriers to success for small firms**



Source: Annual Small Business Survey

## SUMMARY

This chapter has reviewed conditions that may hamper or encourage creativity and design at the firm level. The creativity of a firm's employees and its openness to design input are both sensitive to the way the firm is managed and the environment in which it operates. Management is a key internal driver of creativity levels and the effective integration of design. The extent to which a firm develops effective networks will influence its ability to collaborate and to be creative. Factors important for creativity but beyond a firm's direct control include culture and place, education, levels of competition and regulation. The role of Government in supporting a number of these drivers follows in Chapter 5.

# The Role of Government

## Chapter Summary

The Government can play an important role in enabling all industries to be creative. It can do this through:

- correction of market failures, providing support where the benefits of creativity and design are wider than those for the firm itself or where there are gaps in the efficient supply of finance by the market. There may be an important role for the Government in facilitating networks between creative services such as design and other sectors;
- the formal education system, enhancing the supply of creativity and design skills, and management and business skills more generally; and
- through broader framework conditions. These include a variety of factors outside the direct control of firms such as the regulatory framework, intellectual property rights and the competitive environment. The Government plays an important role in the cultural environment through its support for the Design Council, the Arts Council and museums, helping facilitate creation of a pool of knowledge and expertise. The Government is also a purchaser and consumer of goods and services.

*'... our challenge is not just to encourage creative industries, our priority is to encourage all industries to be creative. It is both about maintaining the entrepreneurship and creativity within established large businesses and about doing more to enable those who want to start up new businesses to turn their ideas and ambitions into reality.'*

The Rt Hon Gordon Brown MP, Chancellor of the Exchequer<sup>77</sup>

This chapter considers the role of Government in creativity and design. The Government plays a part in many of the drivers of creativity discussed in Chapter 4, particularly where there is reason to believe that Government intervention can generate more economic benefits than the market alone would provide. Accordingly, this chapter begins with a discussion of possible market failures and firms' use of creativity and design. It then considers the Government's role in the wider environment supporting creativity and design, covering formal education, regulation, cultural institutions and government procurement.

77 Speech by The Rt Hon Gordon Brown MP, Chancellor of the Exchequer at Advancing Enterprise 2005 [http://www.hm-treasury.gov.uk/newsroom\\_and\\_speeches/press/2005/press\\_15\\_05.cfm](http://www.hm-treasury.gov.uk/newsroom_and_speeches/press/2005/press_15_05.cfm)

The Cox Review, run in parallel with this study, focuses on the needs of smaller businesses, which appear to face particular challenges in finding the time and resources to support creative work. The recommendations of the Cox Review are discussed where relevant in this chapter.

## Market failures and creativity and design

A 'market failure' describes a situation where the market alone would not efficiently organise allocation of goods and services. There is a well-developed economic analysis underpinning market failures and the possible role that Government can play in correcting them.<sup>78</sup> Analysing specific market failures that might affect the use or supply of creativity and design is challenging. As noted several times, creativity and design are elusive and overlapping concepts with limited statistical measures. Consequently, the following discussion seeks to provide only a broad overview of the market failures that might affect the operations of markets and industries supplying or using design and creativity.

### **EXTERNALITIES AND SPILLOVERS**

Innovation often generates benefits beyond the innovating firm – that is, it creates spillovers or externalities. Other firms and agents might be able to adopt or build on innovative ideas, or workers moving between firms take knowledge with them. Creative ideas, when successfully implemented in any area of the economy, contribute to the knowledge stock and can spillover to other firms.<sup>79</sup> Similarly some designs, in particular those that improve or create new products, might be used or developed by other innovating firms.

Spillovers can generate inefficiencies. As firms don't capture all returns to their investment, they may invest less than would be optimal from an economy-wide perspective. In some cases the Government may provide support to ensure firms have incentives to undertake more of such investment. The case for Government incentives is not clear-cut though. Intervention depends not only on the presence of externalities, but also the nature and strength of competition and the mechanisms for protecting ideas, such as intellectual property rights.

The UK Government supports investment in more formalised creative activities such as R&D. The UK's R&D tax credit is available when a project seeks to achieve an advance in overall knowledge or capability in a field of science or technology, but not a company's own state of knowledge or capability alone. It

78 See DTI (2003a) Chapter V for a discussion.

79 Knowledge has public good characteristics. One person can use the knowledge without diminishing the ability of other people to use it and, in some cases, once the knowledge has been created it is not possible to prevent others from using it.

includes elements of design, where design forms part of the R&D process.<sup>80</sup> The Government also supports R&D through targeted expenditure and collaborative R&D programmes.

Creativity and design can contribute to innovation outside of formal R&D. There are many potential benefits to such investment for firms (discussed in Chapter 3), although there is a more limited evidence base on wider benefits. Widely used definitions of R&D activities enable greater data collection and analysis. Evidence suggests that the social returns to R&D investment are both positive and higher than private returns, with similar findings for the spillovers from science.<sup>81</sup> It may always be challenging to specify a sufficiently precise definition of design or creativity to allow the provision of a subsidy on the basis of externalities.

## ACCESS TO FINANCE

Developing creative ideas and enhancing design input at the firm level may require additional financial resources. This might involve employing a specialist designer or developing in-house design capacity. For creativity it might involve traditional channels, such as R&D, bringing in professional creative advice or fostering other innovation sources (eg. employees, customers). Funding such activities will often come from internal sources such as retained profits – a survey of small businesses undertaken in 2005 found that 87 per cent of innovating businesses finance innovation from accumulated earnings or profit.<sup>82</sup>

Where external finance is sought, investments in design or creativity, in common with other investments, may suffer from underinvestment due to imperfections in the market for finance. Acknowledged problems include asymmetric information, where the borrower knows more about the probability of project success than the lender, and moral hazard, whereby once funding is approved borrowers may take risky actions that the lender cannot monitor. These factors might affect the quantity and price of available finance. The question is whether these issues are more problematic for firms investing in creativity and design.

Like all projects, investments in design or creativity are subject to uncertainty. NESTA (2002) argues that one of the problems in creative industries funding is that lenders have limited access to 'high quality sectoral intelligence' (lack of information), as well as a perception that creative businesses are lifestyle-directed, rather than goal-focused. Both issues could contribute to information asymmetries, potentially creating a perception that similar projects are more risky. On the other hand, Walsh (1996) suggests that as design includes less technical uncertainty the risks should be lower.

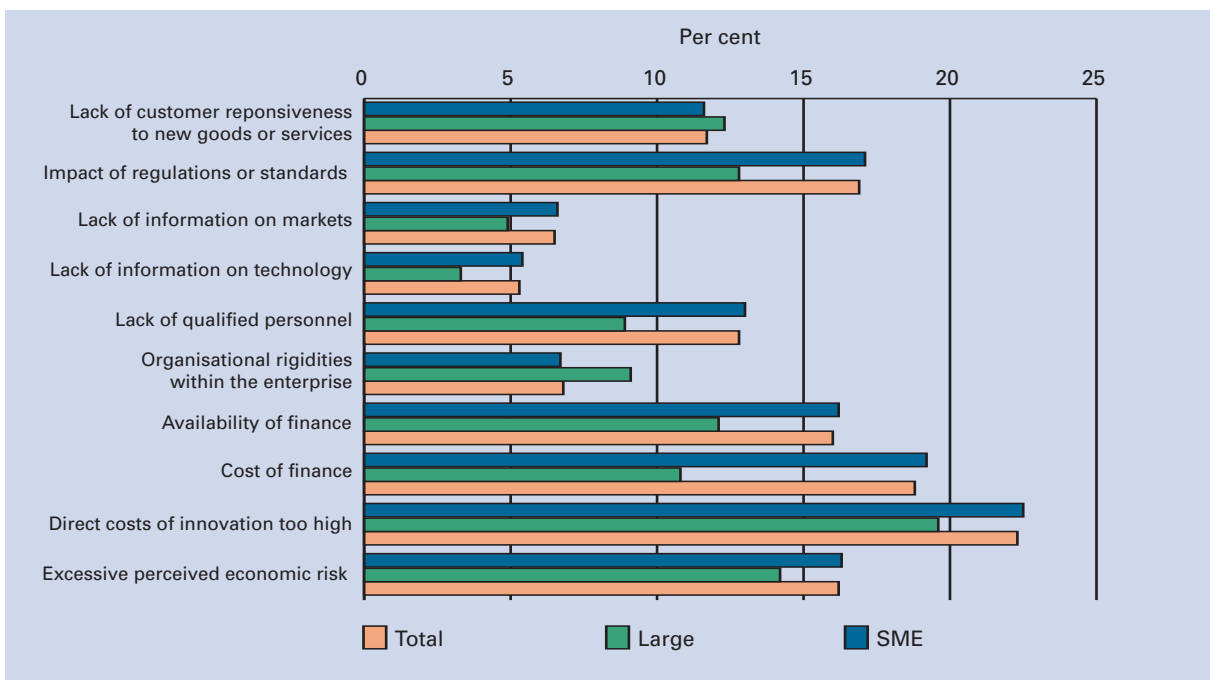
80 Definition of design for R&D tax credit purposes: When achieving design objectives requires the resolution of scientific or technological uncertainty within a project, work to do this will be R&D. Design activities which do not directly contribute to the resolution of scientific or technological uncertainty within a project are not R&D. See <http://www.hmrc.gov.uk/manuals/cirdmanual/CIRD81900.htm>

81 See DTI (2003a).

82 Small Business Service (SBS) (2005).

The DTI Innovation Review (2003) found that in general UK financial markets are well developed, although there are some gaps in early stage finance. A survey<sup>83</sup> of SMEs found that around 30 per cent cited lack of appropriate finance as a constraint to undertaking more innovation. Similarly, the CIS3 suggests that the cost of finance was an issue for close to 20 per cent of SMEs compared to just over 10 per cent of large firms (see Figure 5.1). The availability of finance and direct costs of innovation were also reported as barriers by a higher proportion of small firms. While these issues do not relate exclusively to creativity and design, they suggest financial constraints may be a greater barrier for innovation in small firms.

**Figure 5.1:**  
**Barriers to innovation**



Source: CIS3. Percentage of firms reporting constraints to be of high importance: 1998 – 2000

The Government plays an important role in financial markets, particularly in helping small firms. At the aggregate level, ensuring a stable macro environment has helped keep interest rates relatively low and stable over recent years. In the past macro instability may have accounted for some underinvestment in areas like R&D. At the business level, the Government is working in partnership with the private sector to ensure adequate funding is provided, for example by providing guarantees on loans or venture funding.<sup>84</sup>

83 Cosh and Hughes (2003). Cosh and Hughes define SMEs as firms with less than 500 employees. The DTI and SBS use a definition of SMEs of up to 250 employees.

84 For example the Small Firms Loan Guarantee.

## NETWORKS AND COORDINATION FAILURES

As discussed in Chapter 4, the role of networks in creativity and innovation is likely to be important particularly for ideas crossover and flows of new information. Networks usually form naturally, although in some cases coordination failures or other problems may prevent their formation. For instance, while networks are potentially beneficial for all parties there might be little incentive for one party to bear the start-up costs. New relationships may be difficult to forge and well-established networks can build up barriers to entry.

Where such coordination failures are present the Government may play a facilitating role in bringing together market participants. Evidence suggests that trust and diversity are both important to stimulating innovation within networks and the Government is well placed to act as a trusted intermediary. Success with schemes such as Faraday Partnerships, which fund networks between the science and engineering base and industry, show the potential role of Government in knowledge transfer.

In terms of creativity and design, fostering networks might mean bringing together groups for mutual advantage – for instance creative industries and manufacturers, or designers and other service industries. Bessant *et al* (2005) argue that despite considerable potential for design in services the concept is not always perceived as being relevant to service activity.

The Cox Review found that lack of awareness and not knowing where to turn for help were some of the main obstacles to SMEs making greater use of creative professionals. In order to raise awareness and demonstrate the benefits of activities such as design, the Cox Review recommends that the Design for Business programme be rolled out nationally. The Review also recommends setting up a network of 'Creativity and Innovation' centres throughout the UK, with a central hub in London. These centres would facilitate knowledge sharing and provide networking opportunities.

A firm's ability to benefit from being part of a network will depend on their absorptive capacity. At the firm level this will depend on many of the internal factors discussed in Chapter 4. Government can play a role in enhancing absorptive capacity through skills and education provision.

## The broader framework conditions

A number of factors could be considered to be ‘framework conditions’ which can support creativity and design but equally entrepreneurship and innovation more generally. A full discussion of each of these factors would be an economics study in itself – the following section draws out some key points.

### *Education and skills*

The Government plays an important role in supporting firms’ ability to use and foster creativity and design through delivering education and skills. This helps determine the quality of the workforce in terms of skills and management and the ability of a firm to tap into a ‘creative’ labour force. As discussed in Chapter 2, the UK has strengths in the provision of design education. It also has specific education programmes for fostering creativity in schools, as discussed in Chapter 4.

The importance of management to make the most of design input and developing creativity has been a consistent theme in the literature.<sup>85</sup> Developing management skills requires more than formal education systems alone. Much of the ability to manage design input is tacit knowledge gained through experience (something that cannot be codified or written down).<sup>86</sup> As discussed in Chapter 4, Bessant *et al* (2005) note that effective management of design needs an integrated approach, which links the specific contribution of design specialists with those of others throughout the organisation, and firm strategy.

The Cox Review makes a strong case for greater multidisciplinary cooperation between the specialisms of business, creativity and design and engineering and technology. Cox argues that the UK’s highly regarded creative arts courses could benefit significantly from more exposure to other disciplines, particularly working with business. Similarly, engineering courses need to ensure there is an element of creativity required and business education should cover how to use and manage both creativity and technology as vital elements of the innovation process.

85 Management has also been identified as a UK weakness in several reviews (see AIM (2004); DTI (2003a)).

86 Tether (2005) argues that highly effective exploitation of design depends on tacit knowledge which is difficult to acquire and use appropriately.

### *Competition Policy*

The UK Government plays an important role in enhancing competition which in turn helps stimulate innovative activities. By removing barriers to market entry and taking action to prevent unfair practices the Government can support fair and competitive markets. In recent years the UK Government has undertaken a wide-reaching reform of the competition regime including the introduction of the Competition Act (1998) and the Enterprise Act (2002). The UK competition authorities also have an important influence. The Office of Fair Trading aims to make markets work well for consumers, stressing that markets work well when fair-dealing businesses are in open and vigorous competition.<sup>87</sup>

### *Intellectual Property Rights*

The ability to ensure firms can protect their investments in creativity and design is important to ensuring they have the right incentives to innovate. James Purnell, Minister for Creative Industries and Tourism, recently described this as the 'bedrock' of the creative economy (see Box 10).

The need to protect ideas will also depend on competition and the mechanisms – both formal and informal – for preventing ideas from being copied and other tools such as speed of product to market. Tether (2005) stresses that elements of design can also be a complementary asset – supporting wider elements of the purchase decision that build an overall perception of the product, its reputation and credibility.

Tether (2005) also suggests that aspects of design may be particularly difficult to protect against imitation. This is particularly the case where design is based on established technologies and is fully revealed in the form of the product or service. Similarly, where creativity leads to process improvements that might improve productivity, they could be difficult to protect. A further difficulty is that technological progress places new pressure on protecting copyright. The Government is taking forward its manifesto commitment to ensure that intellectual property rights are appropriate for the digital age.

Small firms may find it more difficult to protect new innovations in general. Small firms are less likely to patent products – the CIS3 showed that only 4 per cent of SMEs applied for a patent against around 14 per cent of larger firms.

87 See: <http://www.of.gov.uk>

**Box 10: Intellectual property rights**

Intellectual property rights, such as patents, registered designs and copyright trademarks, offer limited monopoly exploitation rights as an incentive for investment in new knowledge generation and use. They allow the creators of knowledge to appropriate returns from innovation and therefore act as a spur to innovation. However, the incentives for creativity and innovation that intellectual property rights provide must be balanced against the impact of legitimate incremental innovation.

There are limits to the effectiveness of intellectual property rights as an incentive system. Evidence suggests that infringements of intellectual property rights are significant – the Counterfeiting Intelligence Bureau (CIB) finds that counterfeiting accounted for over 5 per cent of world trade in 1995 (Bosworth and Yang, 2002). In terms of goods, ‘designer products’, such as watches and sunglasses, are those that are most frequently infringed (Bosworth and Yang, 2002). Efforts to curtail infringements are costly, and disproportionately so for small firms.

*Cultural Environment*

The Government plays a role in the broader cultural environment by supporting various institutions, such as the Design Council and the Arts Council, helping facilitate the creation of a pool of knowledge and expertise in this area. Cultural investment, though hard to measure the direct impact on creativity, does have important potential spillover effects. The Department for Culture, Media and Sport lead the Government’s efforts to improve quality of life for all through cultural activities. The DCMS is responsible for Government policy on the arts, sport, libraries, museums and galleries, broadcasting, film, the music industry and the historic environment.

*Public Procurement*

Direct purchasing of goods and services by the public sector accounts for around 5 per cent of procurement.<sup>88</sup> The extent to which it accommodates and encourages creativity and innovation rather than simple cost minimisation is a potentially powerful instrument of policy. This potential has been recognised in many recent reviews, including the Gershon review, the Kelly report, Byatt and the Better Regulation Task Force reports. The DTI’s own innovation report highlighted the pro-innovation potential of public procurement.<sup>89</sup>

The definition of value for money in procurement has been widened. The joint Office of Government Commerce and National Audit Office guide to auditors

88 ‘A Study of the Benefits of Public Sector Procurement from Small Businesses’ published by NERA Economic Consulting (2005).

89 For further information on the various programmes see: <http://www.ogc.gov.uk/index.asp?id=1000984>

says that value for money can be gained by *'specifying the purchasing requirement in output terms so that suppliers can recommend cost-effective and innovative solutions to meet that need'* and *'optimising the cost of delivering a service or goods over the full life of the contract rather than minimising the initial price'*.<sup>90</sup> The Cox Review stresses the important role the Government can play in fostering creativity through procurement.

## **SUMMARY**

There is a role for Government in supporting creativity and design through the formal education system, broader framework conditions (such as intellectual property) and in more direct intervention where appropriate (for example in facilitating networks). The Cox Review, run in parallel with this study, has made a number of recommendations to the Government on how to enable SMEs to apply creativity and innovation to improve their performance and productivity. These include making the 'Design for Business programme' available to SMEs throughout the UK, greater multidisciplinary education at tertiary level and raising the profile of the UK's creative capabilities by way of a network of centres of creativity and innovation across the UK.

90 See [http://www.ogc.gov.uk/sdtoolkit/reference/ogc\\_library/procurement/vfmprocurementguide.pdf](http://www.ogc.gov.uk/sdtoolkit/reference/ogc_library/procurement/vfmprocurementguide.pdf)

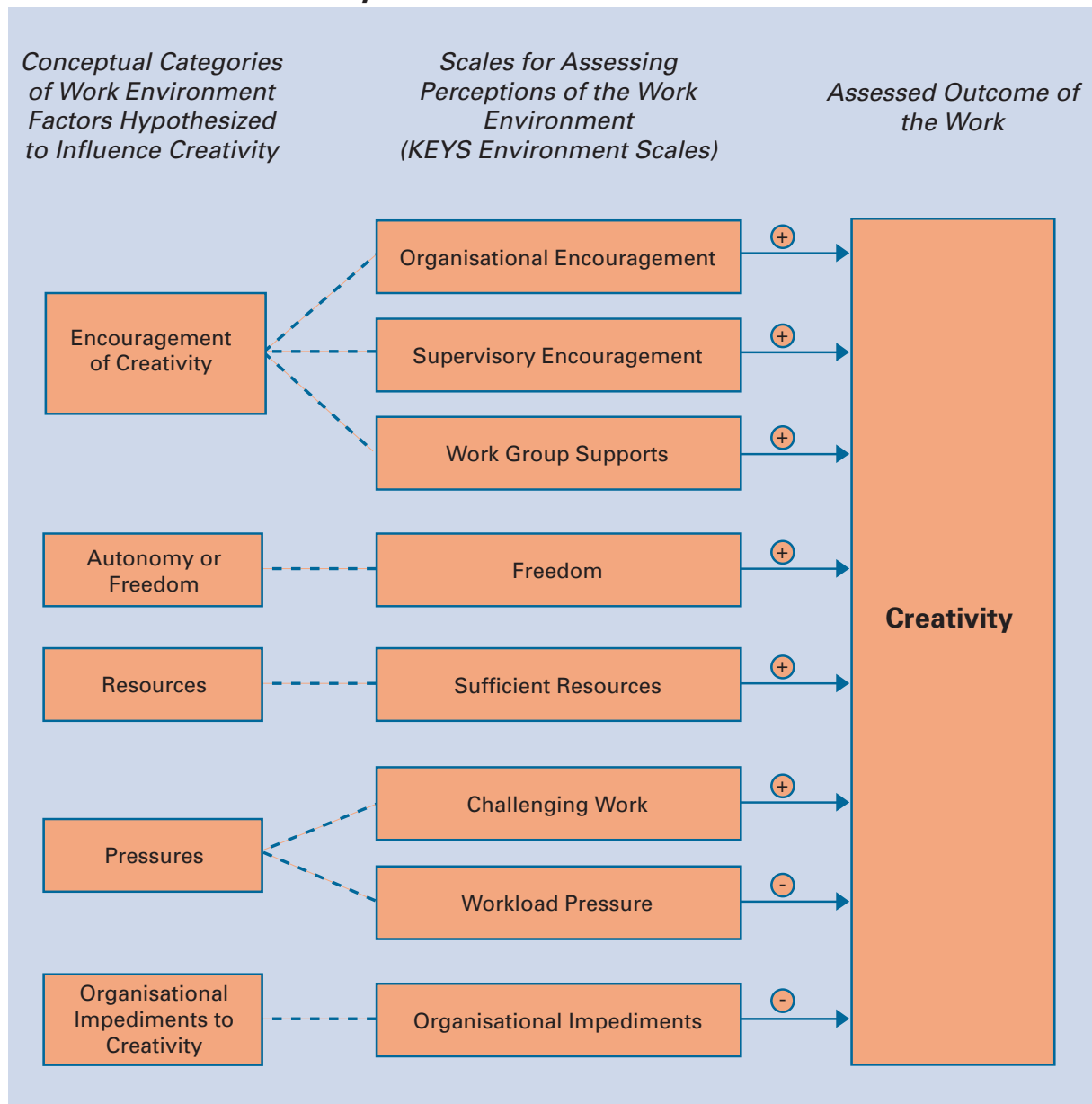
# Measuring the potential for creativity

There is now greater understanding of what it takes to have a creative environment in the workplace. It is possible to assess organisations against a range of criteria that have been shown to have an influence on creative performance. Such measures could be of interest to both business and government. Businesses would gain insight to their creative potential and any internal or external barriers to creativity. Government could track creative potential over time or for benchmarking purposes.

KEYS<sup>91</sup> is an example of such a measure. It is a form of employee survey and was developed as a possible framework for use by creativity researchers and individual organisations to assess the potential of the work environment for creativity. This instrument seeks to provide a psychological health-check of an organisation against an extensive range of criteria that have emerged over the years in the literature (see Figure A.1). KEYS was developed by some of the leading thinkers on creativity in the US. It has been reasonably widely cited since it was first developed nearly ten years ago, although it is less clear what the take up has been within the business community.

The initial work to develop KEYS suggested that challenge, organisational encouragement, work group supports, supervisory encouragement and organisational impediments all played an important role in contributing to the difference between high and low-creativity projects. Freedom and resources had less of an impact. As a diagnostic device, KEYS could be used to identify (for example) work groups within organisations that score less well on challenge. Managers could then focus on making sure their people were in the right roles to stretch them sufficiently.

**Figure A.1:**  
**Conceptual Model Underlying Assessment of Perception of the Work Environment for Creativity\***



\* The scales predicted to be positively related to creativity are referred to as “stimulant scales” and those predicted to be negatively related are referred to as “obstacle scales”.

Source: Amabile *et al* (1996)

Other frameworks exist to measure the potential for creativity within organisations, such as social network mapping. Social network mapping assumes that the number of conversations taking place within an organisation is a good proxy for creativeness (Drewery, 2003). Individual personality profiling can also be used on smaller teams. Bessant *et al* (2005) provide a list of other frameworks.

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