Department for **Innovation, Universities** & **Skills**

Persistence and change in UK innovation 2002-2006

2008

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Introduction

The importance of developing an innovative and competitive economy to succeed in a rapidly changing world was reinforced when the Department of Innovation, Universities and skills (DIUS) was created with a remit to 'accelerate the commercial exploitation of creativity and knowledge, through innovation and research, to create wealth, grow the economy, build successful businesses and improve quality of life'. To design effective policies and monitor and evaluate their impact it is important to have good indicators of innovation and its impacts. The regulalry conducted UK Innovation Survey is a major part of the indicator and innovation measurement framework.

This report presents results from the UK Innovation Survey 2007 (UK IS 2007) [1] and aims to be a useful reference for policy and research purposes providing some insights into the innovation process including: the factors that determine why firms innovate and how they innovate; the information sources and partners they use; the methods they use to protect their innovations; and the barriers they come across. Detailed statistical annexes can also be found on the department's website[2].

The importance of innovation and the benefits to businesses and the UK economy has been covered in previous publications and reports, not least the DIUS "Innovation Nation" White Paper, and will not be discussed further here[3].

Innovation Concepts.

Innovation surveys are carried out in the UK and in many other countries round the world follow general guidelines set out in an OECD publication known as the Oslo manual (OECD 2005)[4]. This offers suggestions on the conduct of innovation surveys, including statistical procedures and a review of the range of concepts that fall together under the umbrella term innovation. These include:

- product innovation - bringing to the market or into use by business, new and improved products, including both tangible goods and the provision of services. The degree of innovativeness is shown by the distinction between products new just to the business or which are also new to the market.
- process innovation, significant changes in the way that goods or services are produced or provided, again differentiating between processes new to the business only or also new to the industry.
- categories of innovation directed investment such as: R&D, capital

[1] The report follows up Occasional Paper 6 I, which summarised the result so the previous innovation survey, carried out in 2005; http://www.dti.gov.uk/innovation/innovation-statistics/cis/cis-ug05/page11849.html
[2] http://dius.ecgroup.net/files/52-08-S_on.xls
[3] The reader is directed to 'Innovation Nation' http://www.dius.gov.uk/publications/innovation-nation.html
[4] http://www.oecd.org/dataoecd/35/61/2367580.pdf

goods and software acquisition, design activity, for implementing current innovations or directed to future product or process changes
- management related changes, sometimes referred to as soft or wider innovation, in strategic changes to the organisation of business or its functions, in order to achieve gains in competitiveness through efficiency or service improvements.

The manual also summarises as a guide to survey principles, other elements of the innovation system, especially the ways that knowledge stocks and flows serve as vital innovation inputs. The UK and other European innovation surveys, known collectively as the Community Innovation Survey, take a broadly common form and ask mostly the same questions, enabling some degree of cross nation comparisons, within the limits of differing national systems, institutions and economic histories.

The UK surveys

This is the fifth of these surveys in the UK. These results, as with previous iterations, are a source for indicators used in the system of public service agreements (PSAs) that set objectives and means of tracking their achievement, across all Government Departments. The indicators are also applied in reporting on the Ten Year Framework for Science and Technology, that set longer term objectives, and are likely to feature in the Innovation Index currently being developed by NESTA. The survey data is a major resource for research into the nature and functioning of the innovation system and for policy formation. It is used widely across government, regions and by the research community. The UK Survey User Group, managed by the department, continues to grow and maximise the use of the data.

The Innovation Survey 2007

A brief selection of results from the latest UK survey were published in the *Economic and Labour Market Review* in April 2008[5]. As in Occasional Paper 6, this volume is mostly concerned to present factual material from the survey in a form that is accessible and useful to a range of stakeholders, policy analysts, researchers and business.

The 2007 survey was the first to be conducted on the new biennial survey cycle. As a result of the increased frequency nearly half of the achieved sample are common to both the 2007 and the 2005 surveys, referred to as the 'Panel'. Chapters 3 and 4 provide an analysis of this rich data set including direct comparisons over time.

This volume also includes some general comparisons between the results of the 2007 surveys and the previous iteration in 2005. The sectoral coverage of the 2007 remained broadly similar to the previous survey, with the exception of widening the coverage of the creative industries. Therefore, throughout the report, in order to make valid like-for-like comparisons requires that the

[5] http://www.statistics.gov.uk/elmr/04_08/downloads/ELMR_Apr08.pdf

additional sectors are excluded from the analysis. As a result the indicator values used in comparisons will not match other data published in this volume and existing publications. See the Technical Annex for more details.

The structure of the report is as follows.

Chapter 1 summarises a wide selection from the many variables and sets of relationships between them, concentrating on the shares of business in a range of industrial sectors, UK regions and size groups, who are engaged in innovation related activities including networking with external sources.

Chapter 2 takes a closer focus on 'innovation active' businesses or firms with some form of innovation outcomes or investment during the reference period 2004 to 2006, and attempts to identify patterns and relationships between its component parts.

Chapters 3 and 4 investigate properties of the panel as defined briefly above. The main indicators presented in Chapter 1 are revisited for the 7000 businesses that responded to both the 2007 and the previous 2005 survey and investigates the changes over time.

SECTION 1. INDICATORS

Chapter 1 – UK Innovation Survey 2007

Introduction

This Chapter provides summaries of the main survey results by means of a range of indicators, giving a broad picture of innovation in the UK. The results are presented mainly as shares of businesses grossed up to nationally representative levels by appropriate survey weights. (Details on the statistical properties of the survey, the weights used and other conventions applied in drawing-up the indicators are in the technical notes at Annex A.)

The survey sought information on the nature of the business activities involved in innovation as well as the effects of product and process innovation on market position, internal processes and costs. There is also some inquiry into the nature of demand for new and improved products and into the linkages through knowledge acquisition and co-operation, with other enterprises and institutions such as the research base.

An important definition used throughout the report is “innovation active”, defined as a business that has engaged in any of the following:

- Introduction of a new or significantly improved product (good or service) or process for making or supplying them.

- Innovation projects not yet complete, or abandoned.

- Expenditure in areas such as internal research and development, training, acquisition of external knowledge or machinery and equipment linked to innovation activities.

Changes over time – 2005 and 2007 surveys

From 2007, the survey frequency changed from a four yearly to a two yearly cycle. These results are the first of the biennial running of the survey. As noted above, the sectoral coverage of the surveys in 2005 and 2007 were slightly different. The comparisons between these two surveys are on the basis of the sectors included in both.

- On the definition above, some 64 per cent of UK enterprises were innovation active over the 2004-2006 period

- On a like-for-like comparison with the previous survey, this represent a solid increase when in 2005, 57 per cent of UK enterprises were innovation active.

Innovation activity

Innovation takes place through a wide variety of business practices and a range of indicators can be used to measure its level within the enterprise or in the economy as a whole. These include the levels of effort employed (measured through resources allocated to innovation) and of achievement (the introduction of new or improved products and processes). The survey also includes coverage of 'Strategic Innovation' – major changes in management practices, business structure, organisation or marketing strategy. The term 'Broader Innovator' is defined as enterprises that are either innovation active or strategic innovators or both. Table 1.1 shows the shares of businesses by size of enterprise that fall into these categories.

Table 1.1: Main indicators by enterprise size, percentage of all enterprises

		(Size of enterprise, employees)		
Per cent	All firms	10-49	50-249	250+
Innovation active	64	62	73	74
of which,				
Product innovator	22	22	26	30
Goods	14	14	17	20
Services	18	18	18	19
Process innovator	12	11	15	22
Ongoing or abandoned activities	10	9	14	18
Innovation-related expenditure	55	52	65	65
Strategic innovator	31	28	42	50
Broader innovator	66	64	77	79
Either product or process innovators	26	24	30	36
Both product and process innovators	9	8	11	16

- The majority of businesses are involved in some form of innovation directed actions, even if not bringing new products or processes into use over the three year survey period. Within this group, most are investing in the implementation or development of future products or processes.

- Product or process innovations have been implemented by around a quarter of enterprises.

- Around a third of businesses engaged in some form of strategic innovations.

- The share of enterprises who are innovation active increases with business size. Nearly 80 per cent of large firms are innovation active and half of all large firms have implemented some form of strategic innovation during the period. However, an introduction of a new service was fairly constant over the three size groups.

- As the propensity to innovation increases with enterprise size, a much higher share of economic activity and employment is in businesses who innovate.

- Enterprises may also be investing in preparing for future innovation or amending their organisational structures or strategies. Including these forms of innovative behaviour and change, 66 per cent of UK enterprises were broader innovators over the period.

Sector variations

The share of enterprises within broadly defined sectors (defined at Annex A) also varies by type of innovation activity. Table 1.2 shows the percentages under each of the innovation categories.

Table 1.2 Main indicators by sector, percentage of all enterprises

Per cent	Primary sector	Engineering-based manufacturing	Other manufacturing	Construction	Retail & distribution	Knowledge-intensive services	Other services
Innovation active	59	75	75	59	61	76	54
of which,							
Product innovator	17	34	33	11	20	32	17
Goods	14	33	32	9	14	15	6
Services	11	14	15	9	19	31	16
Process innovator	13	20	22	5	8	19	7
Ongoing or abandoned activities	12	21	18	2	7	19	5
Innovation-related expenditure	42	66	65	50	52	67	45
Strategic innovator	28	39	37	25	26	46	25
Broader innovator	60	77	77	63	64	77	57
Either product or process innovators	21	39	40	12	21	36	18
Both product and process innovators	8	15	15	4	6	15	5

- Knowledge intensive services record the largest share with current or future product or process innovation plans.

- Nearly half of all knowledge intensive services businesses revised their business structure or practices between 2004-2006.

- At 54 per cent, other services records the lowest share with innovative propensity.

- The sector that saw the largest increase in innovation activity between the 2007 and 2005 surveys was construction.

The regional dimension

These summary indicators can also be analysed to show the distribution of innovation across the countries and regions of the UK.

Table 1.3 Main indicators by region, percentage of all enterprises

Per cent	North East England	North West England	Yorks & the Humber	East Midlands	West Midlands	Eastern England	London	South East England	South West England	Wales	Scotland	Northern Ireland	UK Total
Innovation active	61	67	65	68	64	69	55	64	66	65	63	57	64
of which,													
Product innovator	22	23	20	25	24	27	20	23	25	21	20	20	22
Goods	15	15	13	19	17	18	11	14	14	14	12	13	14
Services	17	18	16	18	17	21	18	19	21	16	16	16	18
Process innovator	13	11	12	12	14	13	9	11	12	12	12	11	12
Ongoing or abandoned activities	8	10	8	11	12	13	10	11	11	8	7	6	10
Innovation-related expenditure	52	58	57	59	54	61	46	56	56	54	54	47	55
Strategic innovator	33	30	30	31	29	36	30	34	31	28	30	25	31
Broader innovator	66	70	67	71	65	72	58	66	68	68	65	61	66
Either product or process innovators	25	25	25	28	28	30	22	26	27	24	23	22	26
Both product and process innovators	10	9	8	9	10	9	7	9	9	9	9	8	9

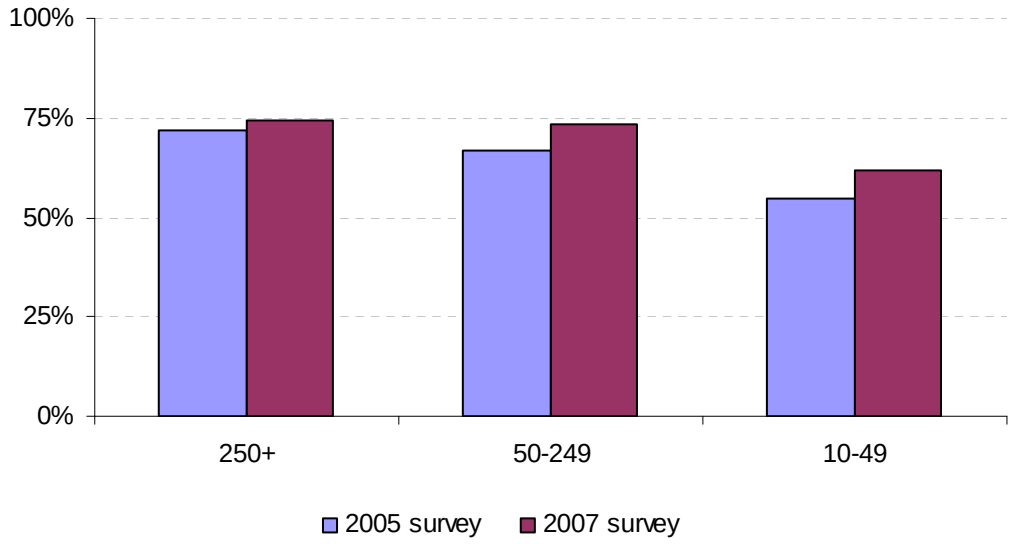
- Innovation activity ranges from 55 per cent of enterprises in London to 69 per cent in Eastern England, with the relative results for the ranges of indicators showing no constant pattern across the regions.

- Innovation related expenditure shows the greatest regional variation. London and Eastern England again at either end of the spectrum in similar proportions as above.

Changes over time – 2005 and 2007 surveys

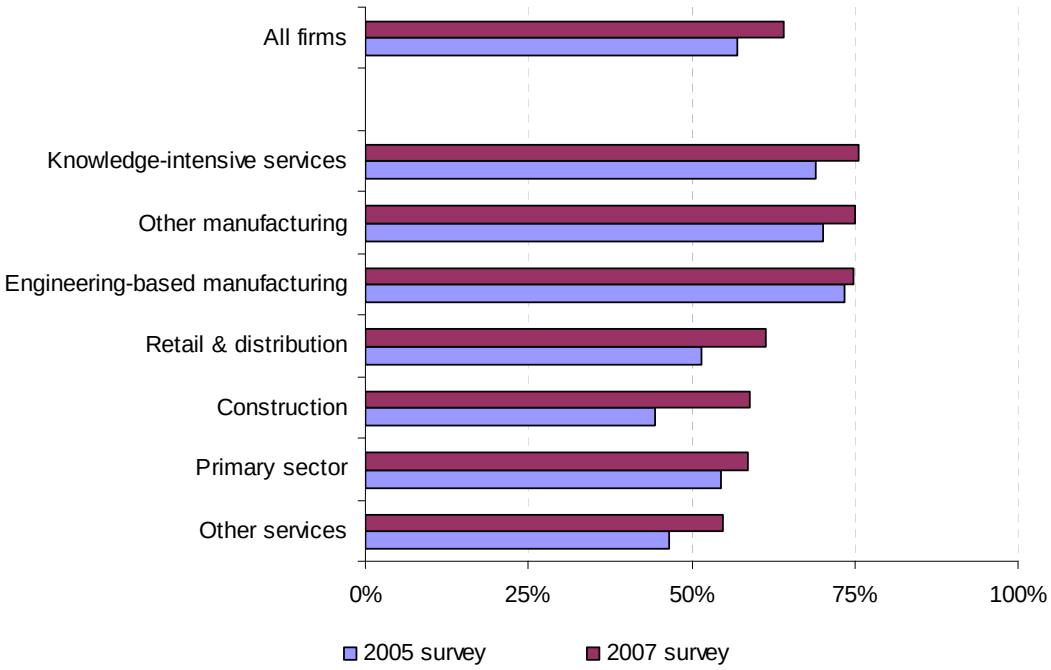
The following two figures show comparisons with the previous survey in 2005, covering innovation activities in 2002-2004.

Figure 1.1: Percentage of innovation active enterprises 2005 vs. 2007, percentage of all enterprises, by size group



- The fairly broad measure of innovation – the share of businesses who record innovation investment or outcomes, has increased across all enterprises, especially small firms (10-49 employees) where innovation active rates have risen by 7 percentage points.

Figure 1.2: Percentage of innovative enterprises, by sector



The increase in innovation activity applies in all sectors of the economy ranging from 2 per cent in engineering-based manufacturing to 15 per cent in construction. Interestingly, rather like the regional variability, between the 2001 and 2005 surveys, the rankings of these sectors were reversed, with construction seeing the smallest change in this result and engineering-based manufacturing seeing the largest. This may indicate that innovation patterns and cycles differ across sectors and therefore the sector mix across regions contributes importantly to the regional variability.

The 2005 survey identified the acquisition of advanced machinery, equipment and computer hardware or software, and the market introduction of innovations as recording particularly high shares of innovation directed investment. To investigate this further, the 2007 survey questionnaire was extended to ask about the individual elements in these investment categories. Figure 1.3 summarises the results of breaking down the questions in this way.

Figure 1.3: Innovation activities by type, percentage of respondents

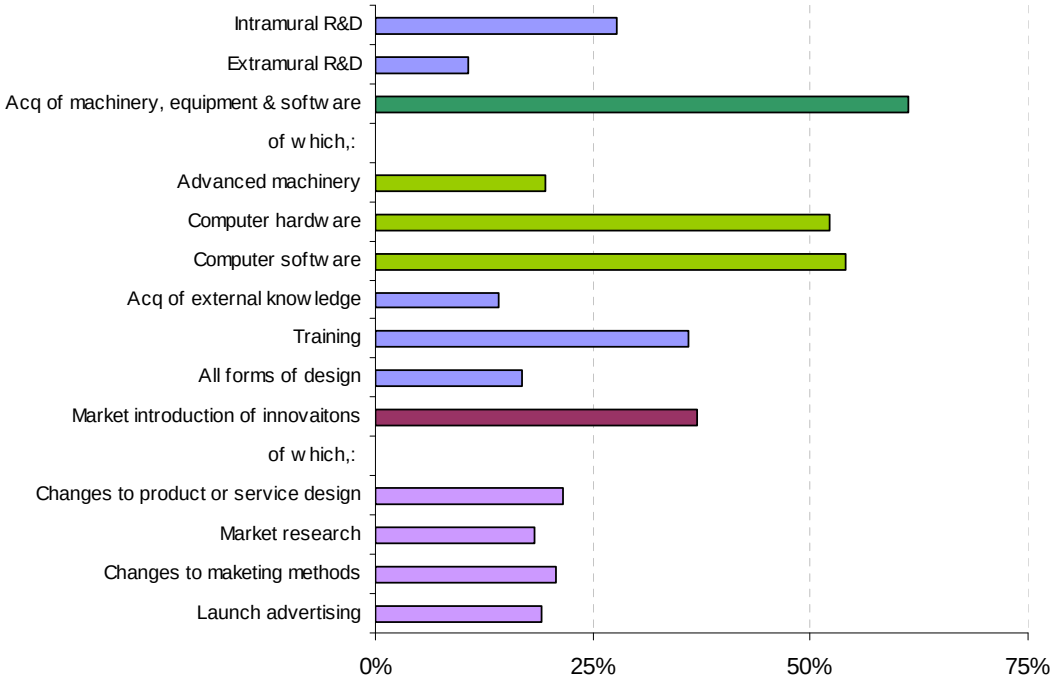


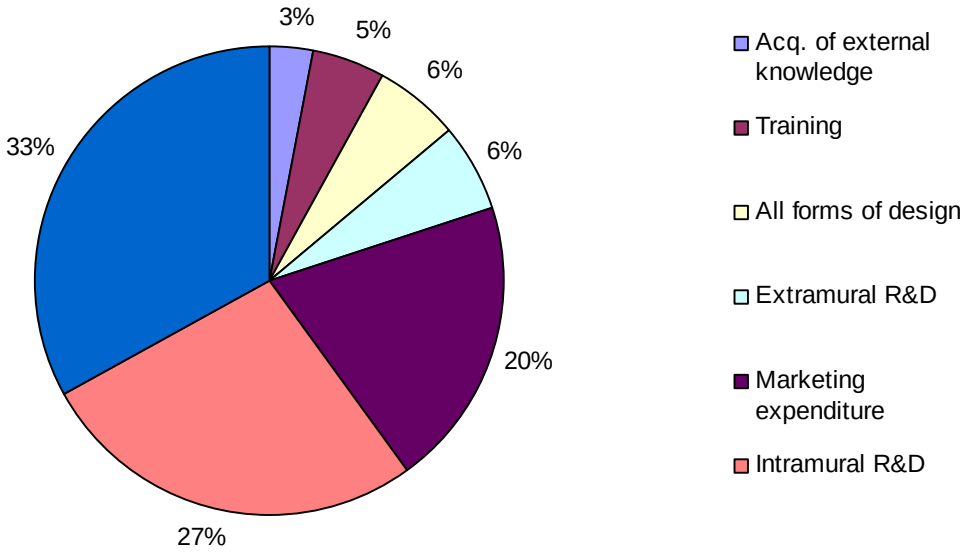
Figure 1.3 shows that the acquisition of machinery, equipment and software category is dominated by computer hardware and software , when measured as the number of business who undertake each type of investment. The market introduction of innovations category, however, shows a quite more even spread across the four sub-categories, although the more detailed breakdown reveals that more firms are active in applying design to the market introduction of their new and improved products and processes, than was evident previously. [6]

Figure 1.4 shows the breakdown of innovation directed investments by type of expenditure. Much analysis and a range of government policy initiatives are focused on R&D, because of the breadth and depth of new knowledge it entails. But intramural (within the firm) R&D is one part of the overall innovation investment picture, accounting for around one quarter of relevant expenditures. Extramural (contracted out) accounts for 6 per cent. Investment in capital goods, and equipment, including computers and software, is the largest proportion. This can be equated to acquiring embedded technology including information and communications technology developments and shows the importance to national innovation performance of the diffusion of

[6] One possible consequence of these extensions within the questionnaire is that the increased space and detail dedicated to this area may have increased the likelihood that enterprises gave positive responses. Indeed, compared to the other categories investigated, those that were expanded to capture greater detail saw greater increases compared to 2005. These sub-indicators form an important component of the headline innovation active indicator, which showed an increase in the 2007 survey compared to 2005. Part of this up-turn may, therefore, have been affected by this change in the questionnaire, rather than a real change in the behaviour of enterprises.

technical change. Expenditure on market preparation, in connection with innovation is the third largest component, showing the importance of effective marketing and distribution to achieve the commercial benefits of innovation in products and processes. Technology and knowledge need to be married to market preparation and promotion to be effective.

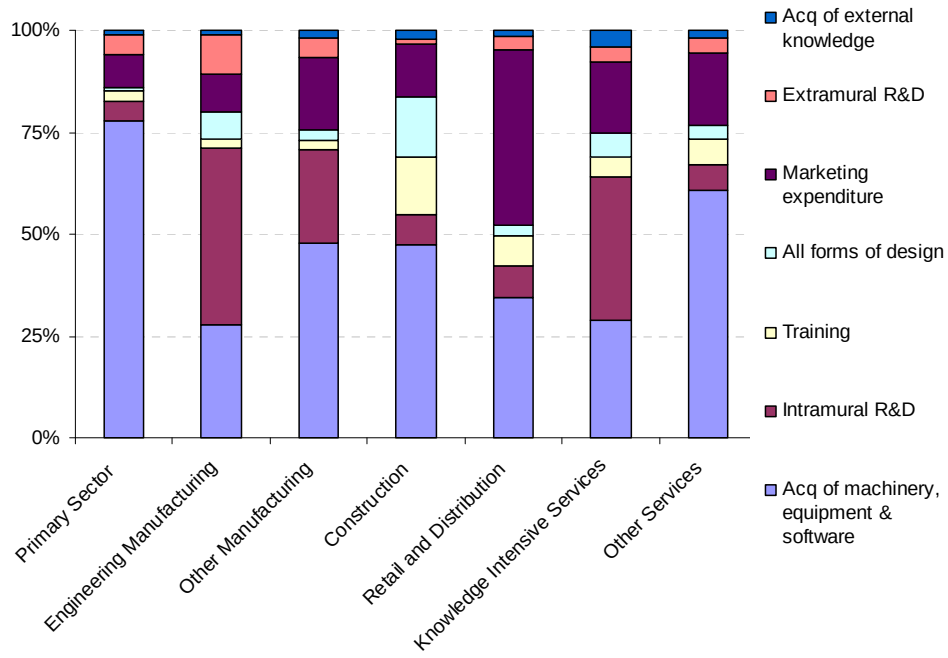
Figure 1.4: Innovation expenditure, all respondents



Developing staff skills specifically in connection with current and future innovation is a surprisingly low share of these expenditures.

This pattern shows some significant variation across broadly defined business sectors, as summarised in Figure 1.5.

Figure 1.5: Shares of innovation expenditure by sector



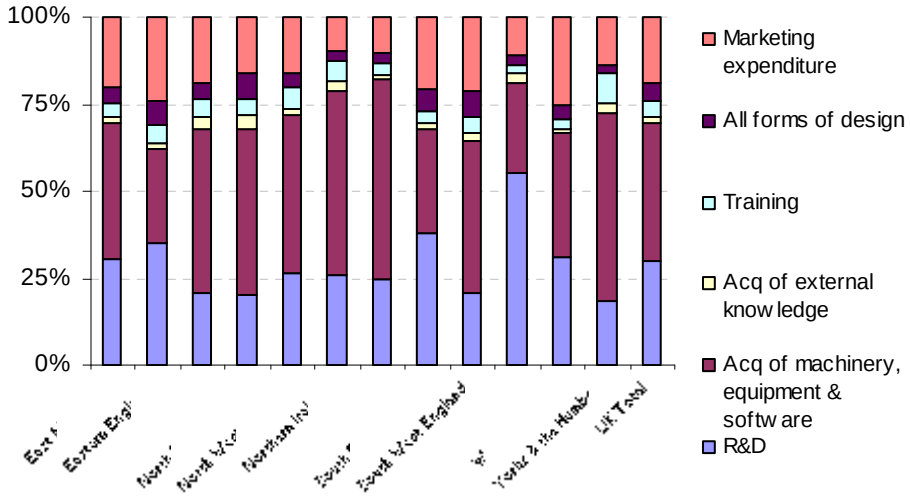
- It is notable that the construction sector puts a higher share of its innovation related development into training.

- Although business R&D expenditure is concentrated in manufacturing sectors, knowledge intensive services emerge as relatively R&D intensive with a relatively higher share of design expenditure.

The regional dimension

Figure 1.6 also shows some significant geographical variation in the distribution of innovation expenditure across the categories. In addition to R&D expenditure, already understood to be heavily skewed (DTI Economics Paper No.11, 2005) large variability appears in acquisition of equipment and machinery along with marketing expenditure.

Figure 1.6: Shares of innovation expenditure by region

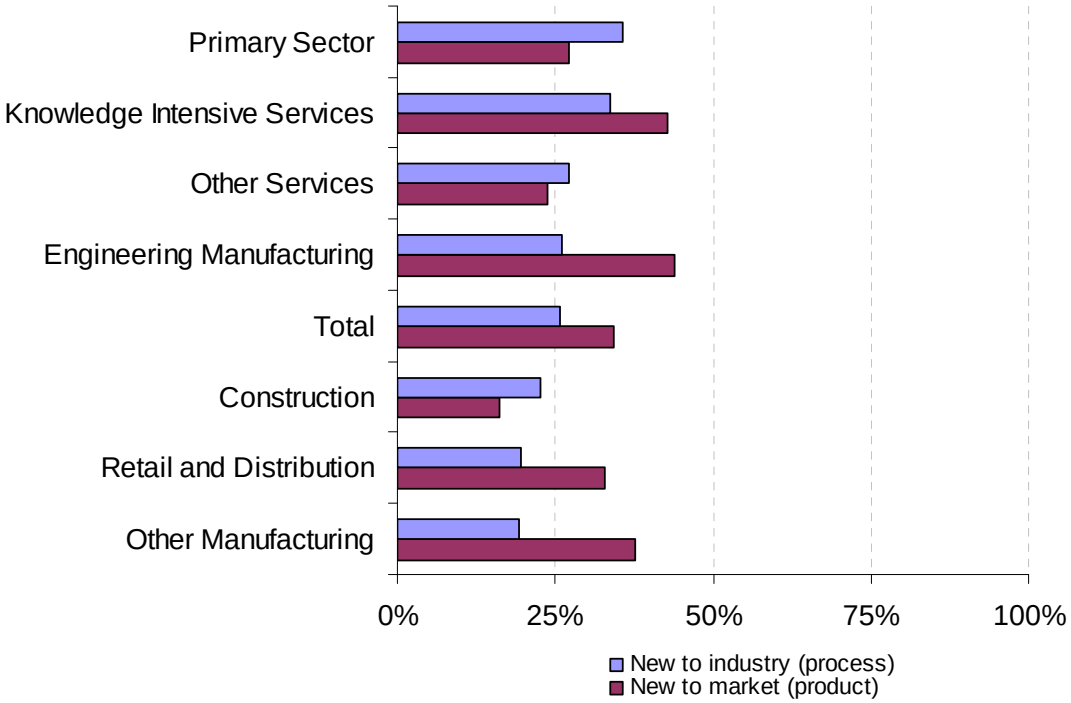


Product and process; novel innovation

- The intensity of product and process innovation also emerges from the survey. One indicator is the share of product and process innovations that are said to be new to the market or to the industry respectively.

- Figure 1.7 shows respectively the percentage of enterprises introducing new products to market and new processes to industry for the seven broadly defined industry groups.

Figure 1.7: Novel innovation, product/process innovative enterprises only



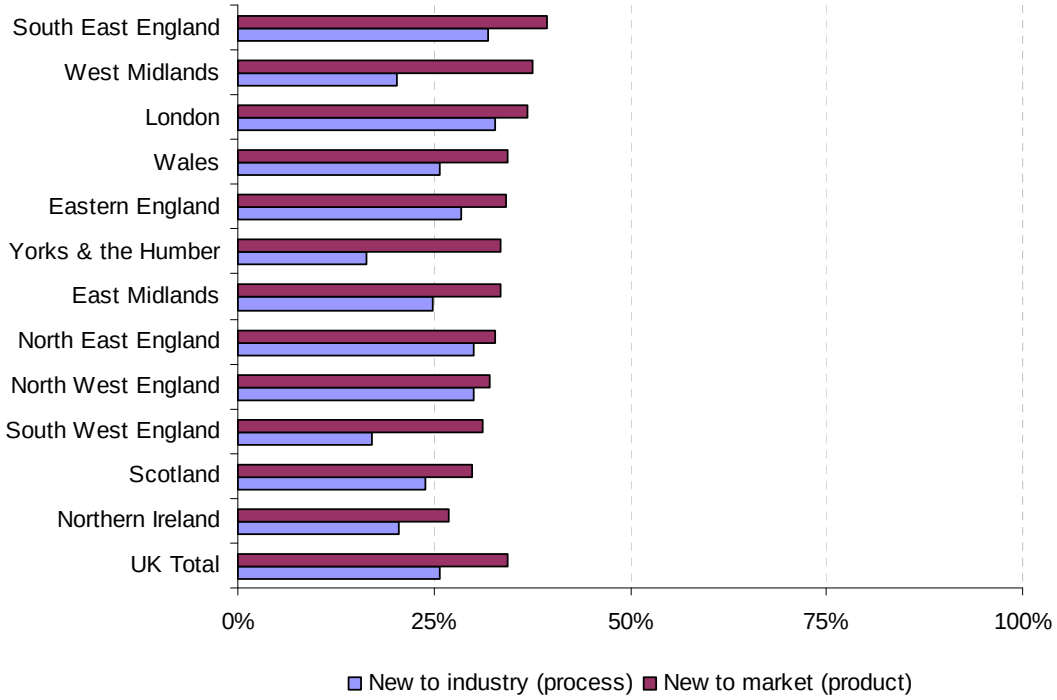
- It is interesting that, in most sectors, more than a third of product innovative enterprises are also novel product innovators, introducing goods or services new to their market, rather than follower innovators, trying to catch up with the competition, they are pro-actively keeping ahead of the competition.

- Process innovation is more complex and likely to involve more extensive change. On average, around a quarter of process innovative enterprises were novel process innovators.

The regional dimension

Figure 1.8 shows respectively the percentage of enterprises introducing new products to market and new processes to industry for the regions.

Figure 1.8: Percentage of new products to market/new processes to industry, product/process innovative enterprises only

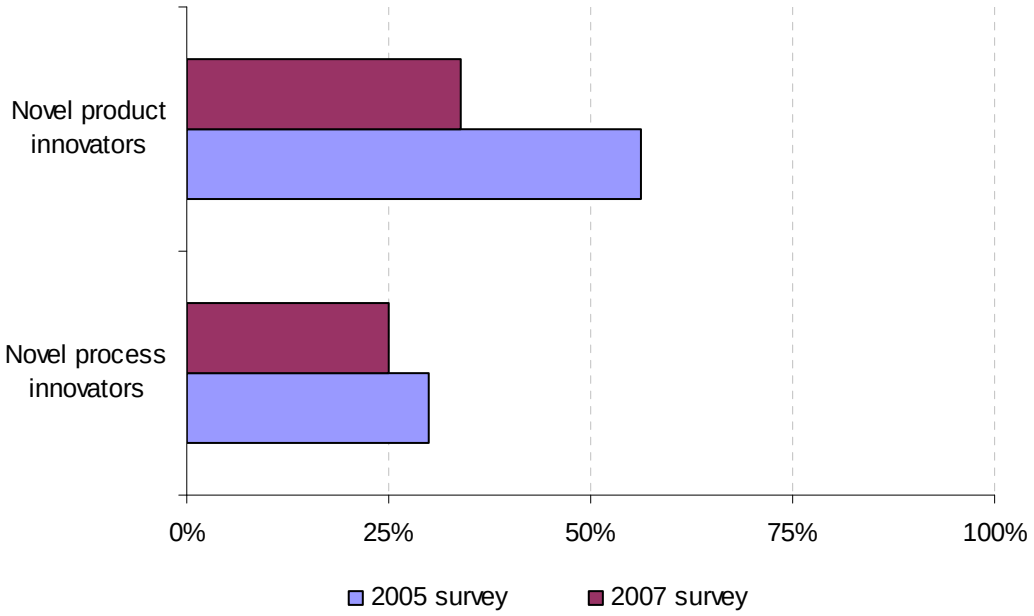


- Although there is a degree of regional variation, the overall pattern is similar to that of the sectoral breakdown seen previously. Within all areas the proportion of product innovators that introduced novel innovations within the period 2004-2006 was higher than the proportion of process innovations that were novel.

- Despite London showing the lowest proportion of innovation active enterprises (Table 1.3) the share whose process innovations were new to the industry was highest. The share of new to market products was also favourable compared to all but two of the other regions.

Changes over time – 2005 and 2007 surveys

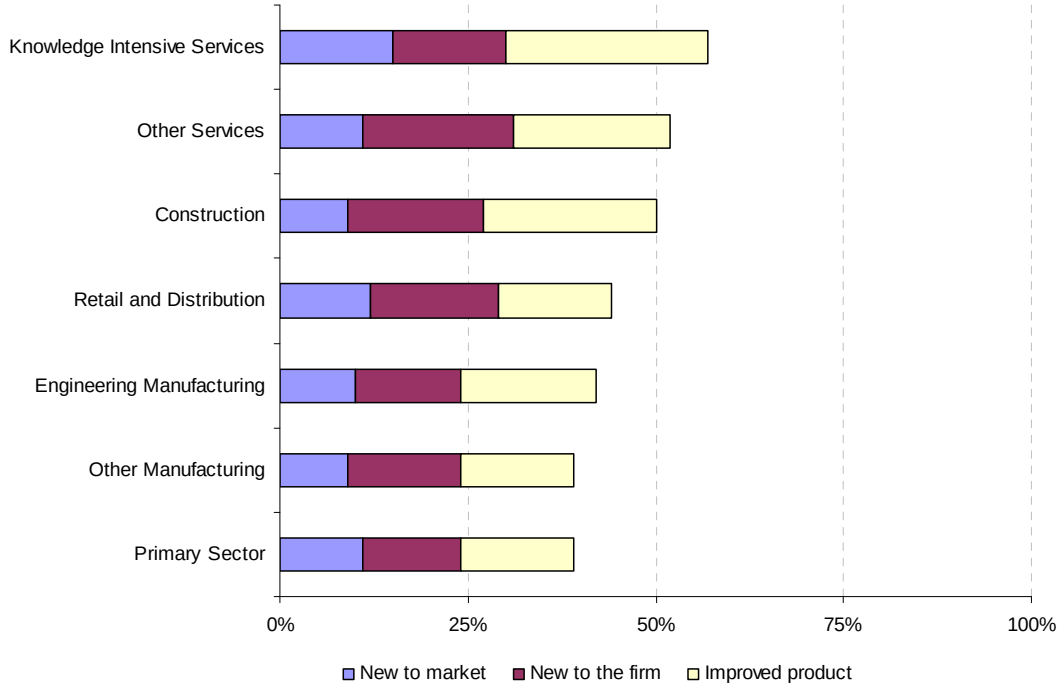
Figure 1.9: Novel innovators 2005 to 2007, product/process innovative enterprises only



- While the percentage of process innovators who introduced new processes to their industry remained relatively constant, the percentage of product innovators who introduced new products to their market decreased markedly. The 2007 proportion of novel product innovators is more comparable to that seen in the 2001 survey (DTI Occasional Paper No 6).

The intensity of innovation can also be measured through the shares of business turnover due to different degrees of product innovation.

Figure 1.10: Distribution of turnover from product innovation, product innovators only



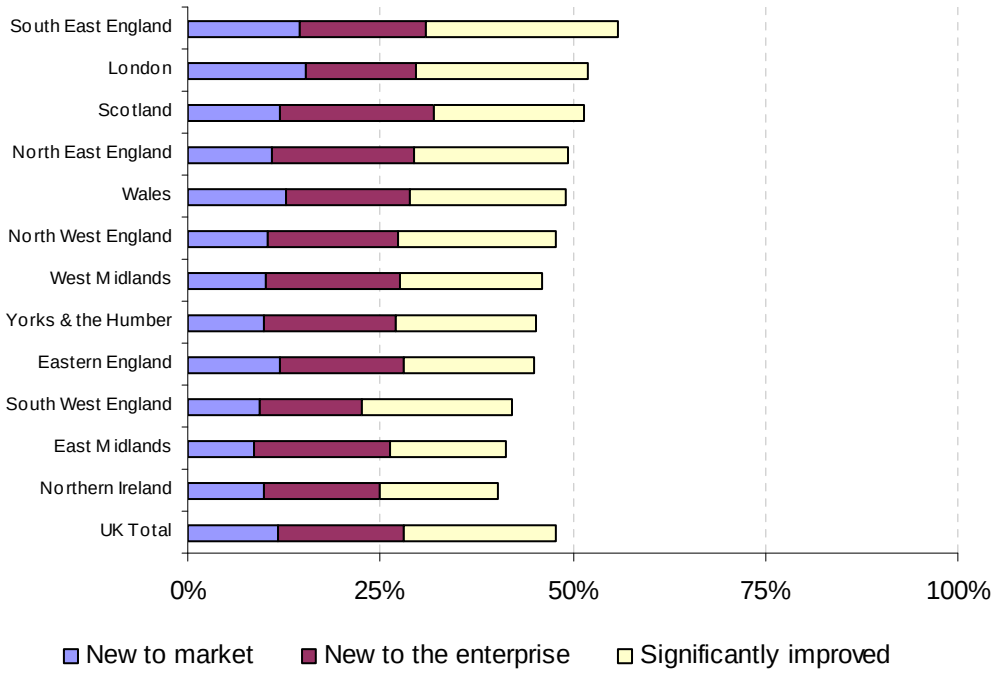
- Knowledge intensive services who introduced a product during 2004-06 benefited most from their product innovation, attributing nearly half of their 2006 turnover from new or significantly improved products and 15 per cent from new to market products.

- Although construction and other services report lower shares of innovating enterprises, their conversion of product innovations into share of sales was at a higher rate than the UK average of 48%.

- In most sectors, the improvement of products contributes a similar share of turnover to either new to the business or new to market products.

The regional dimension

Figure 1.11: Regional view: distribution of turnover from product innovation, product innovators only



- The London and South East England region, with a higher share of knowledge intensive services enterprises, recorded a higher share of sales in new and improved products than other regions in the UK. Businesses in Scotland showed a relatively high share of sales from novel products.

Skills and Innovation

Apart from investment in research, knowledge, equipment and software, the skills and capabilities of staff and managers are a vital ingredient in successful innovation. They are the source of ideas and the main elements in the absorptive capacity, that enterprises need to engage effectively with external sources of knowledge about opportunities and technologies. In the survey, graduate level employment is collected as an indicator of innovation related skills in business. Table 1.4 shows the shares of the employees with degree level qualifications in Science and Engineering and other disciplines.

Table 1.4: Average percentage of employees educated to degree level

Per cent	Engineering Manufacturing	Other Manufacturing	Primary & Construction	Retail and Distribution	Knowledge Intensive Services	Other Services
Innovation active						
SE subjects	9	4	3	5	25	3
Other subjects	7	11	10	13	27	16
Non-innovation active						
SE subjects	3	1	2	2	7	1
Other subjects	3	5	4	4	15	7

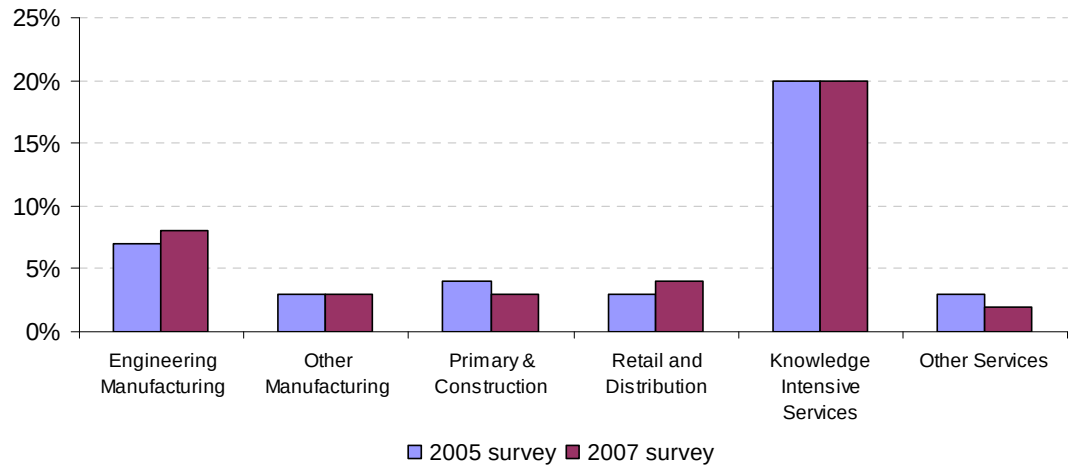
- Innovative active enterprises have more than double the share of employees educated at degree level than their non-innovative equivalents.

- Science and Engineering degrees have the largest share in engineering based manufacturing. Knowledge intensive services show the highest overall share of graduate employment. Other manufacturing relatively specialises in other academic disciplines.

- Over half the employees of innovative businesses in knowledge intensive services, are educated to at least degree level.

Changes over time – 2005 and 2007 surveys

Figure 1.12: Average percentage of employees educated to degree level in Science & Engineering subjects, all respondents



- Most sectors recorded very little change over time in the proportion of employees with graduate level qualifications in science and engineering.

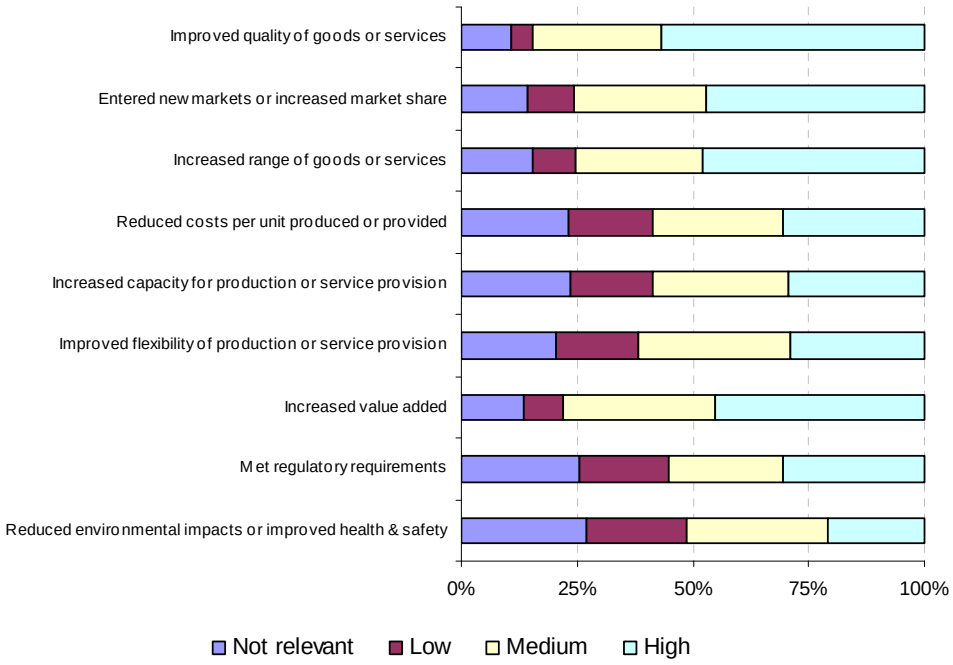
Determining factors for innovation

The need for and level of innovation for business enterprises derives from a variety of motives, including seeking competitive advantage or responding to competition, the need for efficiencies, improving customer satisfaction, or market re-positioning. The regulatory environment can also lead to a need for changes in products, processes or business practices. The survey investigates the ways that innovation affects the businesses themselves, both through financial indicators such as turnover impact, already covered above, and through a set of intermediate factors.

Determinants

Enterprises were asked to rate a number of motivations for innovating on a scale from no importance, through low, medium, and high. Figure 1.13 summarises these responses for all innovation active enterprises.

Figure 1.13: Determinants of innovation, innovative enterprises only



- Product orientated effects were significantly rated above process orientated factors with 'Improved quality of goods or services' the most frequently cited. Increasing value added was also relatively important, and is consistent with the significant contribution to turnover from improved products.

- Reducing environmental impacts or improving health and safety was the least frequently cited factor in influencing the decision to innovate.

There is some variation by broadly defined sector, set out in Table 1.5, considering innovation active businesses only and taking just the share citing these effects as of "high importance".

Table 1.5: Enterprises rating innovation determinants as 'high' importance by sector, innovative enterprises only

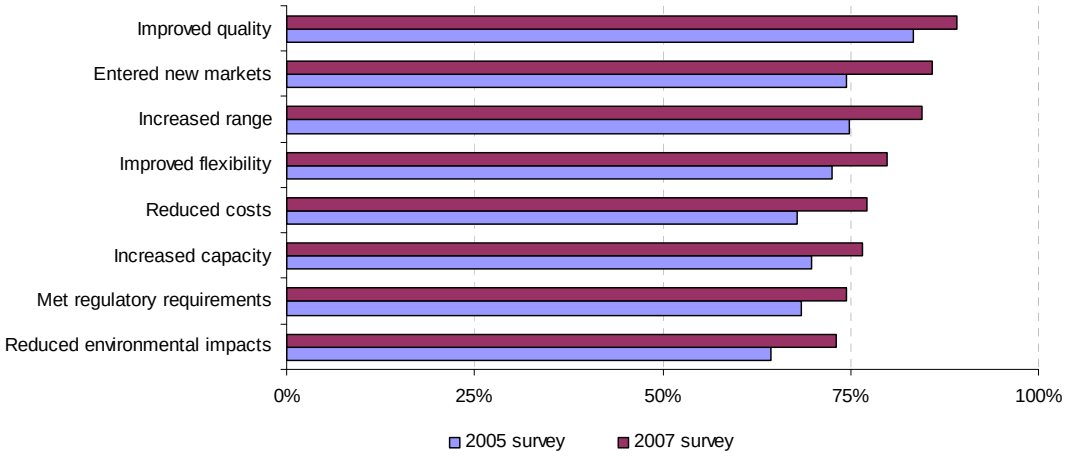
Per cent	Primary Sector	Engineering Manufacturing	Other Manufacturing	Construction	Retail and Distribution	Knowledge Intensive Services	Other Services
Product orientated effects							
Increased range of goods or services	30	51	51	16	58	46	41
Entered new markets or increased market share	51	53	54	30	39	55	41
Improved quality of goods or services	29	56	52	53	50	64	62
Process orientated effects							
Improved flexibility of production or service provision	25	32	34	27	23	31	27
Increased capacity for production or service provision	27	34	36	31	21	30	29
Reduced costs per unit produced or provided	50	44	41	20	29	21	27
Other effects							
Reduced environmental impacts or improved health & safety	49	21	27	45	20	12	23
Met regulatory requirements	34	30	25	47	32	29	33
Increased value added	35	46	47	45	40	51	42

- Across all sectors product oriented effects dominated. Manufacturing sectors cited 'Reduced costs per unit produced or provided' as the most important process orientated factor. As one would expect, the Service/ Knowledge Intensive service sectors rated process effects related to service provision the highest.

- Although most sectors rated 'increased value added as fairly important, within the primary sector and construction sectors, unlike the other sectors of industry, the other effects of meeting regulations and improving environmental impacts & health and safety improvements, held higher relative importance.

Changes over time – 2005 and 2007 surveys

Figure 1.14: Relevant effects/determinants of innovation, innovative enterprises only, percentage rating as of some importance



- As the 2007 innovation survey questionnaire was changed to ask respondents to reflect on the determinants of innovation rather than the effects of innovation, a direct comparison over time cannot be made. Figure 1.14 , although not directly comparable, still shows a very similar pattern between the different categories, but not surprisingly, respondents were better able to assess the determinants than the effects of innovation.

Strategic innovation

This chapter has so far brought out the findings of the survey on product and process innovation and the investments in research and knowledge application that enable them. It has long been accepted amongst analysts however, as well as by business people engaged in the marketplace, that strategic domains of innovation activity are essential for these traditional modes of innovation to be effective and profitable. Amendments to management practices, business strategies or organisation can also be the main mode of innovation, where market conditions do not require product or process change. These domains of changing the business include management techniques, organisational restructuring and approaches to the market place. The innovation surveys run by the DTI in 2001 and 2005, and DIUS in 2007, have included lines of questioning around these important topics and this chapter brings out some of the results (mainly from the recent survey).

The following paragraphs report the basic facts about innovation through organisational and management change, taken as distinct forms and also in conjunction with other forms of innovation directed activities and outcomes.

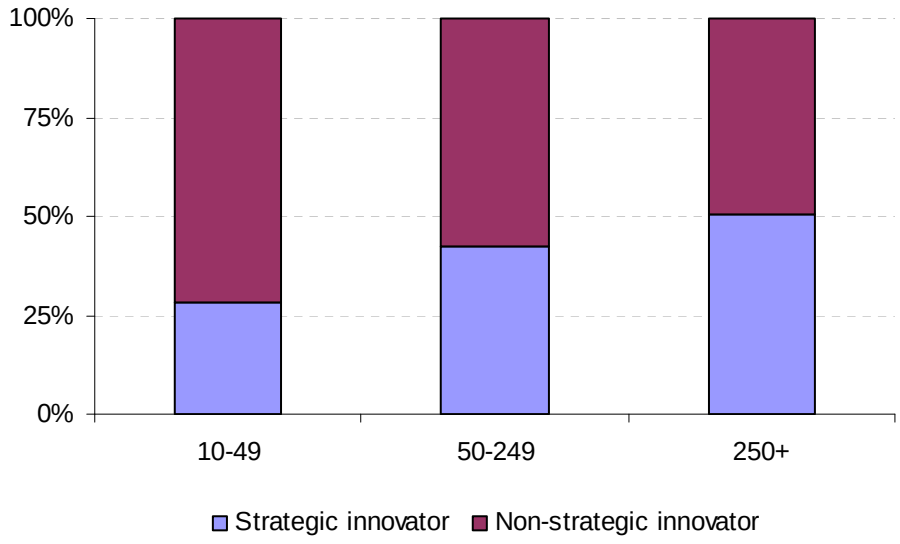
Organisation, management and marketing: strategic changes

The majority of research studies on innovation have emphasised technological change and how it is manifested in products and production processes (Salter & Tether, 2006). This reflects theories of innovation that have themselves been technology and manufacturing industry focussed. The importance of service providing sectors in the economy and increasing awareness of the role of business processes and organisation for efficiency and meeting customer requirements has led to new awareness of how change can be effected through these broadly managerial forms distinct from or in combination with technologically based innovation.

A section of the innovation survey questionnaire seeks to identify the number of businesses that have undertaken distinct and significant changes in pursuit of competitive advantage, under the heads of Organisation, Advanced Management Techniques, and Marketing strategy. Overall, 31 per cent of enterprises adopted one or more such changes during 2004 -2006.

As expected, the share of strategic innovators increases with business unit size, with 50 per cent of large firms reporting one or more types.

Figure 1.15: Strategic innovation by business size, per cent of enterprises



- Almost 45 per cent of employment is in business units with one or more forms of strategic innovation.

The shares of businesses adopting the four forms of strategic innovation are summarised in Table 1.6.

Table 1.6: Types of strategic innovations, percentage of all enterprises

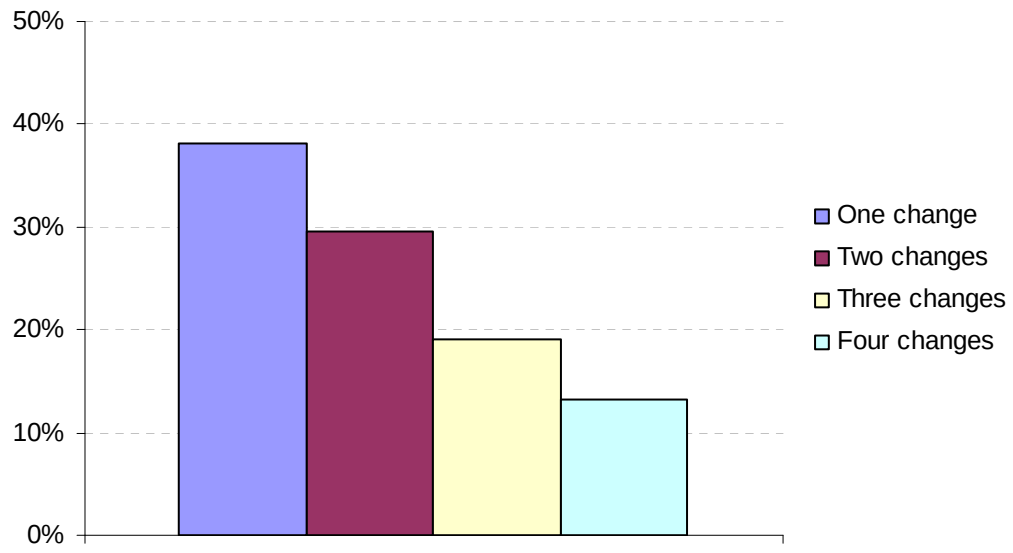
		(Size of enterprise, employees)		
Per cent	All firms	10-49	50-249	250+
All forms	31	28	42	50
Corporate strategy	15	14	21	26
Management	12	10	18	25
Organisational structure	20	17	28	37
Marketing	18	17	22	26

- Although the larger firm categories show a higher proportion engaged in these activities, within each of the size bands the pattern in frequency for the four types of strategic innovation is consistent.
- For all size bands, revisions of the organisational structure were more frequently reported.
- Introducing advanced management techniques, which are more likely to be codified in published guides to best practice is marginally the least cited.

Intensity of managerial change

It is clear from the above that firms often combine forms of strategic innovation and a simple indicator of the intensity of managerial change is a count of the number of types adopted and the combinations that are favoured. Figure 1.16 shows the count measure, based on those with some form of strategic innovation.

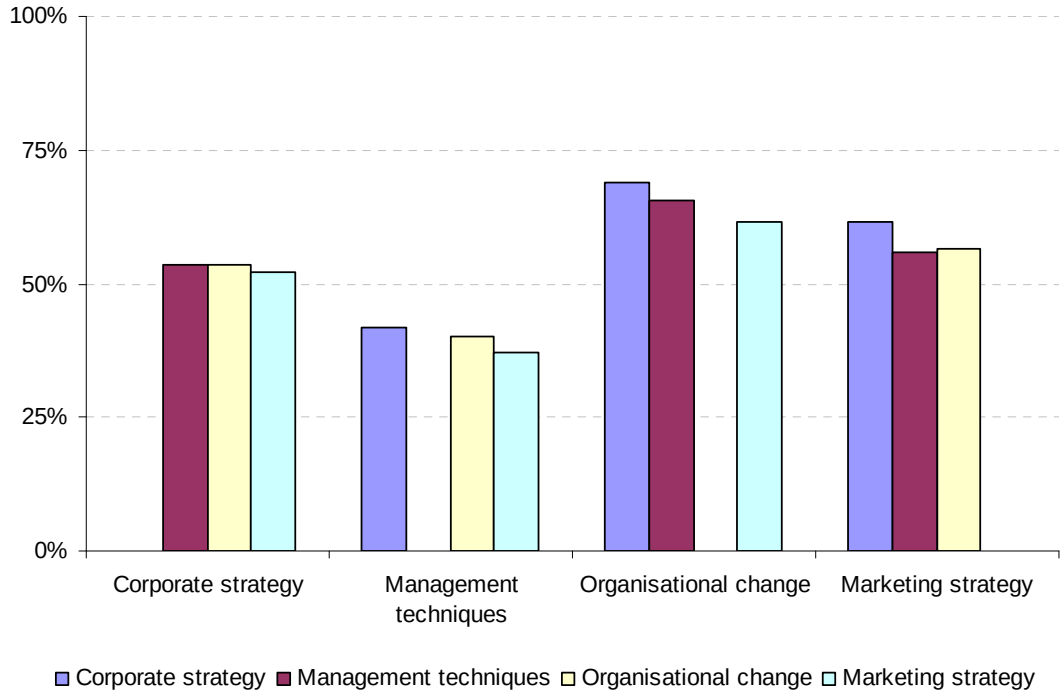
Figure 1.16: Number of strategic innovations, strategic innovators only



- Of those with some strategic change, 38 per cent had one form only. The majority brought about two or more while 13 per cent introduced all four types.

Some of the combinations of types of managerial changes are summarised in Figure 1.17 below:

Figure 1.17: Strategic innovation combinations, strategic innovators only



- Over 60 per cent of those enterprises with organisational change also made changes in corporate strategy, management techniques, or in marketing strategy.

Linkages in the system

A fruitful way of thinking about the economics of innovation is in terms of a national system, where innovators and the external environment, including other enterprises, institutions and the business infrastructure are linked by flows of knowledge or by collaboration in research or other forms of joint innovation. Much analysis has pointed to the effectiveness of the collaborative mode in achieving innovation objectives where economic conditions, and the absorptive capacity of the businesses involved are appropriate. Here we review the results on the broader patterns of information flows and collaborative arrangements.

Sources of information

A wide variety of sources of information were included in the survey form and most were quite widely accessed by enterprises. Table 1.7 shows the shares of innovation active enterprises who attached degrees of importance to the different types of source. In common with the results of previous surveys, commercial sources of information were recorded by more businesses than were institutional or specialized providers. The final column of Table 1.7 records the share who reported some degree of interaction.

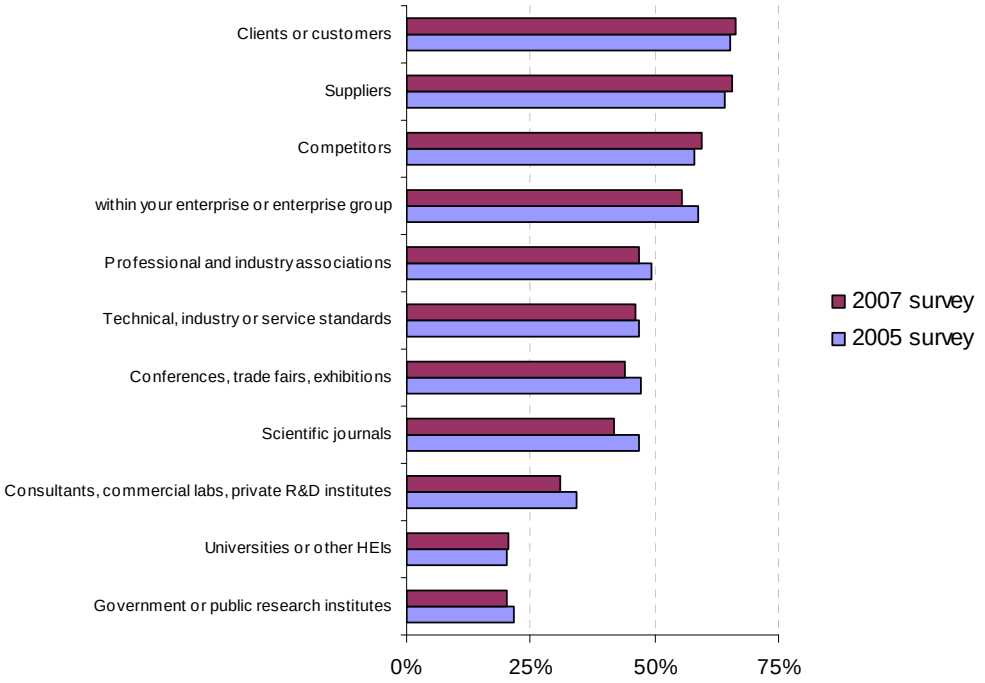
Table 1.7: Importance of information sources, innovative enterprises only

Per cent	Not used	Low	Medium	High	Some use
within your enterprise or enterprise group	31	14	26	29	69
Suppliers	20	22	37	21	80
Clients or customers	21	13	27	40	79
Competitors	28	24	33	15	72
Consultants, commercial labs, private R&D institutes	61	23	13	4	39
Universities or other HEIs	75	16	7	2	25
Government or public research institutes	75	17	7	2	25
Conferences, trade fairs, exhibitions	45	26	22	7	55
Scientific journals	48	29	19	4	52
Professional and industry associations	43	28	23	7	58
Technical, industry or service standards	43	25	23	9	57

Overall suppliers were most frequently cited as being as some use as a source of information. Clients and customers were, however, most frequently rated as an information source being of ‘high’ importance.

Changes over time – 2005 and 2007 surveys

Figure 1.18: Source of information, all respondents, percentage rating as of some importance



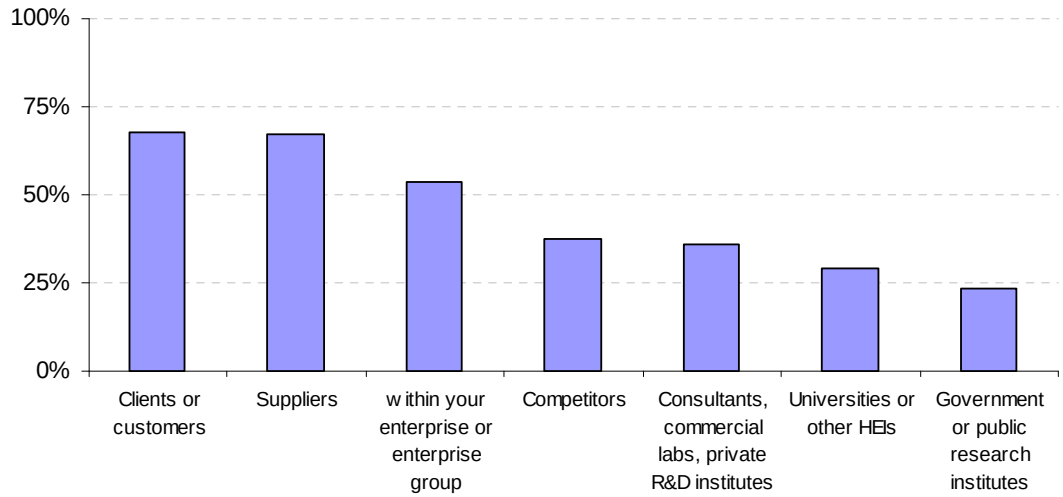
- The survey results indicate that businesses are becoming increasingly reliant on market sources.

- Slightly less importance was placed on specialized and institutional sources during the latest reference period.

Cooperation

Cooperation arrangements to enable innovation are an important aspect of the innovation system and have high policy priority because of accumulated evidence of the benefits that flow from sharing knowledge and the potential for economic application of the outputs of the world ranking UK research base, which can in some circumstances be enabled through direct co-operation between business and HEIs. The extent to which enterprises cooperate with other enterprises and with the more specialised technology generators, such as the public research base emerges from the survey. Around 10 per cent of enterprises report cooperation arrangements. Figure 1.19, shows the shares for each type of cooperation partner.

Figure 1.19: Cooperating enterprises' partners, cooperative enterprises only



- Enterprises collaborate more with their suppliers and their customers, than with specialist intermediaries and the research base, although taken together these are a major source of partners for innovation.

- Half of all enterprises with cooperation agreements collaborate within their enterprise or enterprise group.

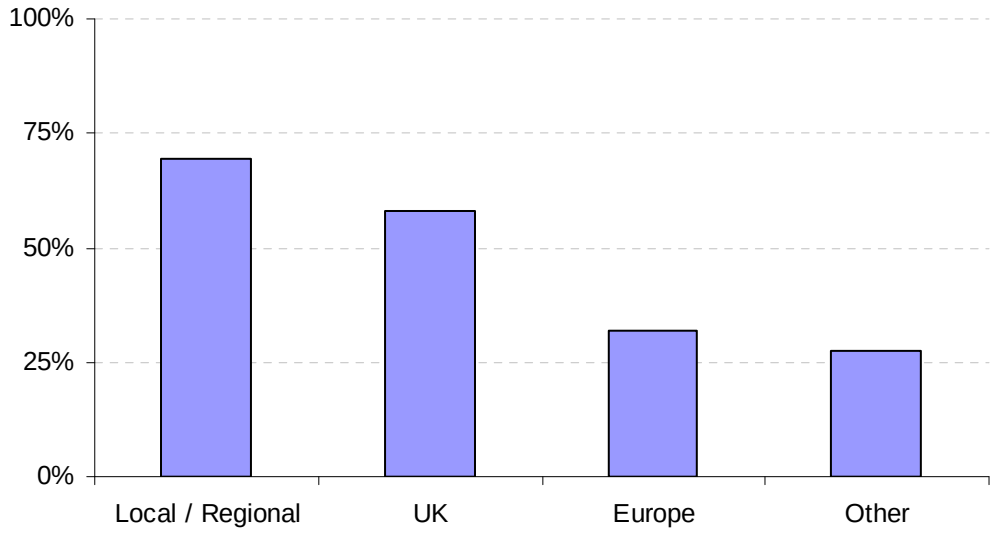
- Both novel and follower product and process innovators collaborated at similar levels with external partners.

Table 1.8 Regional breakdown of partners, cooperative enterprises only

Per cent	North East England	North West England	Yorks & the Humber	East Midlands	West Midlands	Eastern England	London	South East England	South West England	Wales	Scotland	Northern Ireland	UK Total
within your enterprise or enterprise group	53	56	54	43	57	48	56	53	50	55	67	61	54
Suppliers	63	72	68	60	63	76	67	68	66	65	62	72	67
Clients or customers	63	69	73	73	60	70	69	66	64	68	64	68	68
Competitors	46	30	40	36	34	40	41	33	35	41	44	43	37
Consultants, commercial labs, private R&D institutes	43	28	33	31	33	46	33	38	42	42	29	39	36
Universities or other HEIs	39	21	34	28	35	28	27	22	31	39	35	38	29
Government or public research institutes	23	19	23	25	23	28	19	22	24	33	25	32	23

- The highest degree of regional variation exists in cooperating with HEIs.

Figure 1.20: Geographical distribution of enterprise partners, cooperative enterprises only



- More enterprises cooperate with partners situated in the same local region.
- Over 25 per cent of businesses that cooperate have partners located outside the UK.

Table 1.9 Geographical distribution of firms' partners by region, cooperative enterprises only

Per cent	North East England	North West England	Yorks & the Humber	East Midlands	West Midlands	Eastern England	London	South East England	South West England	Wales	Scotland	Northern Ireland	UK Total
Local / Regional	65	62	56	64	55	49	59	58	51	58	71	68	58
UK	66	69	64	76	72	77	66	75	68	73	59	49	70
Europe	31	27	29	35	32	41	27	35	30	28	25	39	32
Other	26	22	28	23	26	39	32	28	28	23	20	27	28

- Businesses in Eastern England have the largest share of partnerships outside the UK. Northern Ireland reported a relatively high share of partnerships within Europe along with South East England.

Constraints on innovation

A potentially important use of innovation survey data is to identify the reasons for absence of innovation activities and outcomes. These can provide insights into possible policy actions to alleviate the constraints and to create a more innovation friendly business environment. The survey looks at the issue of low or absent innovation levels through two aspects – reasons for lack of innovation activity and the specific constraints on the ability to innovate successfully.

Absence of activity

Enterprises who reported no innovation activity were asked to choose the reason for this from a menu of three options. The responses are set out in Table 1.10.

Table 1.10: Reasons for no innovation, percentage of non-innovation active respondents only

		(Size of enterprise, employees)		
Per cent	All 10+	10-49	50-249	250+
No need due to prior innovations	19	18	21	21
No need due to market conditions	52	52	55	55
Factors constraining innovation	28	28	28	31

NB: This is a multiple response question and columns can sum to more than 100%.

- Over half of non-innovators did not perceive a market need to change their products or processes, while over a quarter were inhibited by specific constraining factors.

Specific Constraints

Respondents were offered a list of specific constraining factors. Table 1.11 shows the shares of all respondents who reported these as having various degrees of importance.

Table 1.11: Constraints faced, percentage of all respondents

Per cent		Not important	Low	Medium	High
Cost factors	Direct innovation costs too high	62	12	15	11
	Cost of finance	59	16	15	10
	Excessive perceived economic risks	63	14	15	9
	Availability of finance	62	19	12	8
Knowledge factors	Lack of qualified personnel	60	19	15	6
	Lack of info on technology	65	23	9	2
	Lack of info on markets	64	24	10	2
Market factors	Market dominated by established enterprises	62	18	13	6
	Uncertain demand for innovative goods or services	62	18	14	6
Other factors	Need to meet UK Government regulations	66	16	10	8
	Need to meet EU regulations	69	16	9	7

- Consistent with other surveys, cost factors, including direct resource costs, risks and finance were reported as of some importance with greater frequency than other forms of constraint.
- But around half of firms did not find any constraints of importance.

Enterprises without innovation activity, due to specific constraint factors attributed significantly lower levels of importance to the range of constraints, as summarised in Table 1.12.

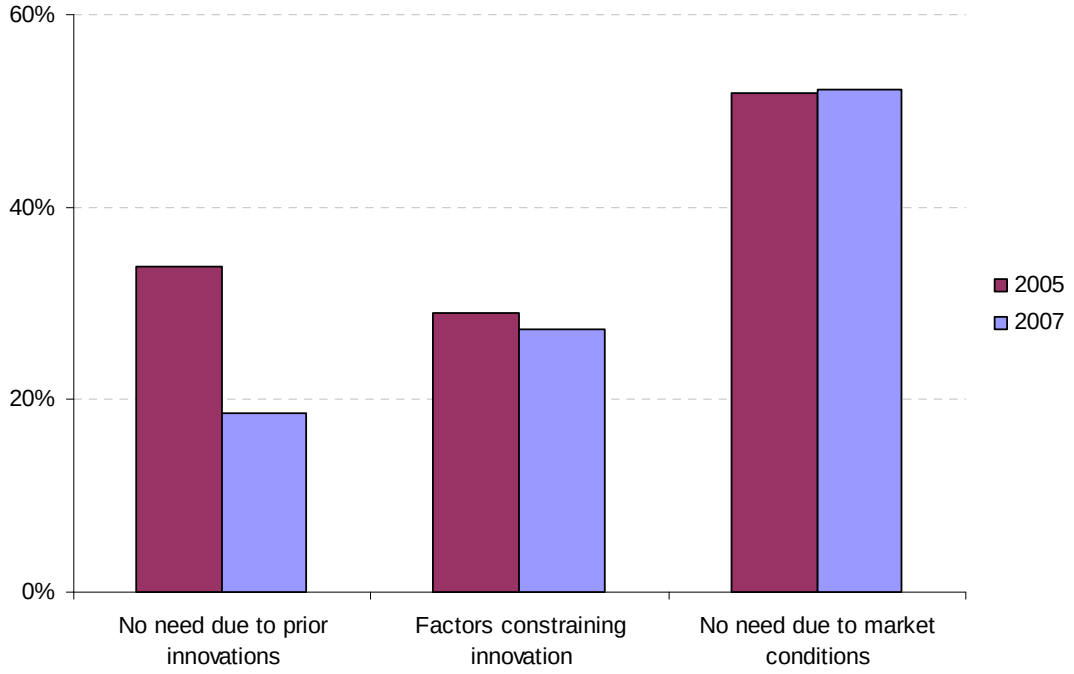
Table 1.12: Constraints faced, non-innovation active enterprises only

Per cent		Not important	Low	Medium	High
Cost factors	Excessive perceived economic risks	87	5	4	4
	Direct innovation costs too high	86	5	4	5
	Cost of finance	83	6	5	6
	Availability of finance	84	7	5	4
Knowledge factors	Lack of qualified personnel	84	8	5	4
	Lack of info on technology	87	8	3	2
	Lack of info on markets	86	9	3	2
Market factors	Market dominated by established enterprises	85	6	5	3
	Uncertain demand for innovative goods or services	85	6	5	4
Other factors	Need to meet UK Government regulations	85	6	4	4
	Need to meet EU regulations	88	6	3	3

- Innovation active enterprises, having experienced barriers while innovating are much more likely to report some importance to specific constraints.

Changes over time – 2005 and 2007 surveys

Figure 1.21: Reasons for no innovation activity, non-innovation active enterprises only



- Across both surveys, market conditions limiting the need for innovation was the most important factor preventing innovation. In fact, in the 2007 survey it was the main reason as firms citing no need due to prior innovations fell considerably on the previous survey result.

Chapter 2 - Innovation active indicator composition

Introduction

This chapter provides an explanation of the innovation survey's headline indicator and explores the relationship with the sub-components from which it is comprised. The differences between the indicator's results in the 2005 and 2007 surveys are also explored and explained. In order to simplify this comparison, no adjustments are made to the data to account for differences in sectoral coverage, with the data presented referring to the full results for each survey.

Innovation active breakdown

The UK Innovation Survey's headline indicator, 'innovation active', provides a measure of the proportion of enterprises that are involved with innovation related activities. An enterprises is deemed to be innovation active if it fulfils one or more of the following characteristics during the reference period of the survey:

1. the enterprise introduced a new or improved product (goods or services)
2. the enterprise introduced a new or improved process
3. the enterprise participated in innovation related activities (e.g. R&D)
4. the firm had ongoing or abandoned innovation related activities intended to develop product or process innovations[7]

[7] The 2007 innovation survey was expanded to allow respondents to select either 'ongoing' or 'abandoned' innovation, while in the 2005 survey these categories were combined.

Figure 2.1: Innovation active and components, percentage of enterprise

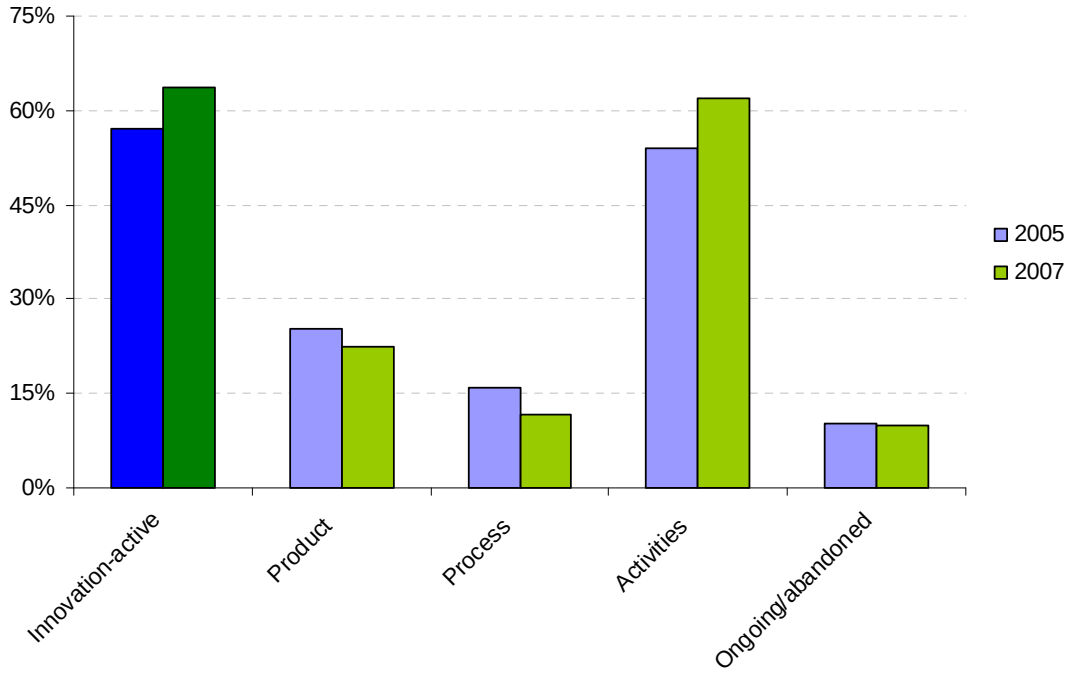


Figure 2.1 above shows the innovation active headline result for the 2005 and 2007 surveys, along with the above components from which this indicator is comprised. Although the headline indicator increased from 57 per cent in 2005 to 64 per cent in 2007, three of the four components showed a decline. As can be seen from Figure 2.1, the headline result is driven largely by the activities category, but it is not possible to see how firms combine the four inputs.

Figure 2.2: Innovation active – number of components

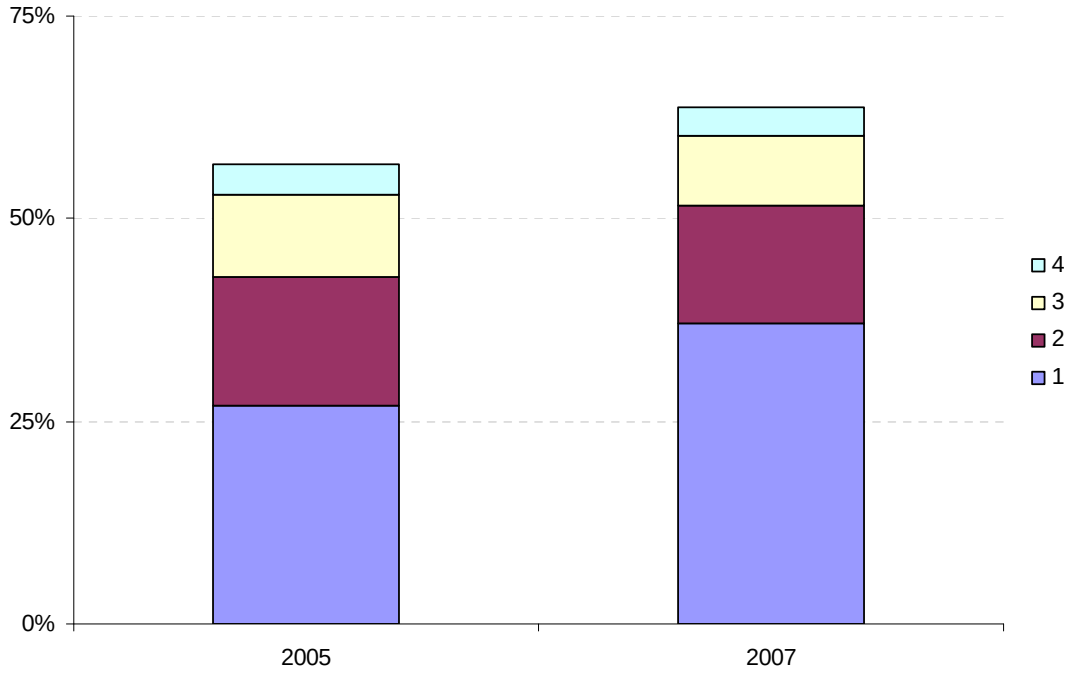


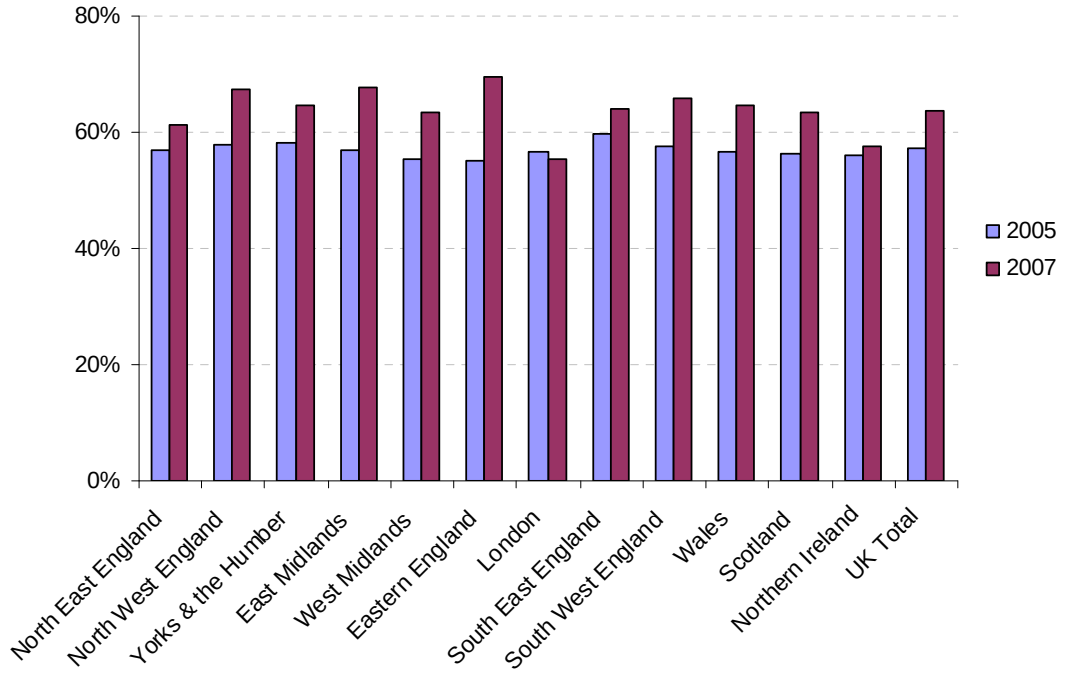
Figure 2.2 shows the innovation active indicator for both surveys broken down by the proportions of firms that participated in different numbers of the four components. It is clear that most firms participated in just one component, and that this proportion grew between the 2005 and 2007 surveys, while the other three categories saw some decline.

Regional Perspective

This section continues the investigation into the innovation active indicator by repeating the approach used so far for each region in isolation.

As can be seen from Figure 2.3, as well as general overall growth the 2007 innovation survey showed far more variation in the innovation active indicator between the regions than was evident in the 2005 survey.

Figure 2.3: Innovation activity by region, 2005 vs. 2007



Figures 2.4 - 2.7 below show the four separate sub-components of the innovation indicator for each region.

Figure 2.4: Product innovation by region

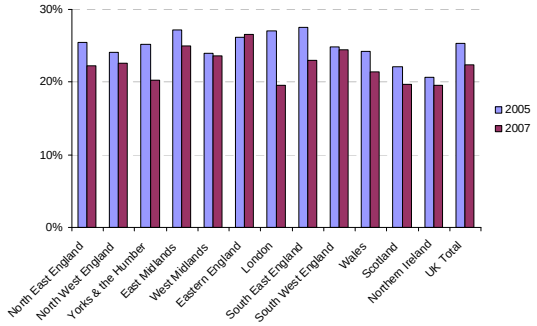


Figure 2.5: Process innovation by region

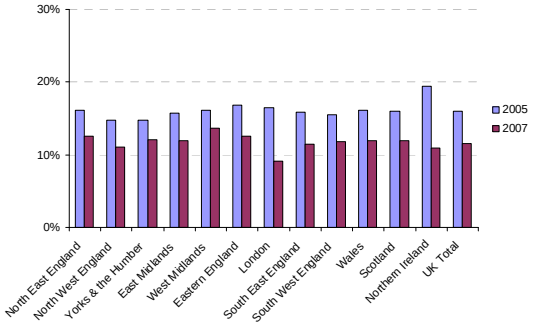


Figure 2.6: Innovation activities by region

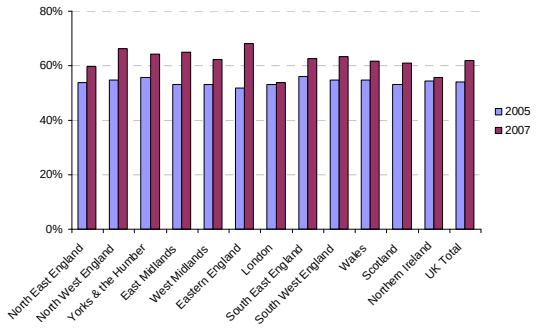
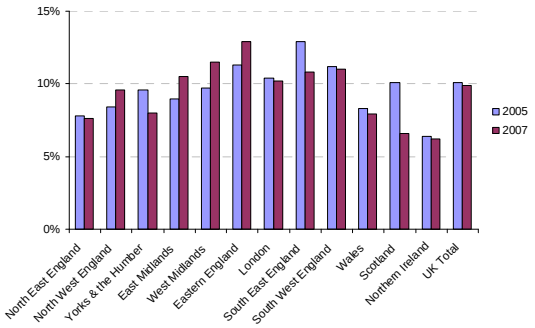


Figure 2.7: Ongoing/abandoned innovation by region



As can be seen from Figure 2.4, product innovation fell slightly in most of the regions. Three of the regions, however, saw a more marked decline, namely Yorks & the Humber, London and South East England. A more pronounced overall decline occurred in process innovation, shown in Figure 2.5, with London and Northern Ireland showing the largest falls, although the latter was from a high base. Innovation activities, as shown in Figure 2.6, increased in each region, with the largest increase being in Eastern England, and the smallest in London.

SECTION 2. PANEL ANALYSIS

Chapter 3 - Panel dynamics analysis 2002-04 and 2004-06

Introduction

This chapter focuses on the 2005 and 2007 survey panel, i.e. just the results of those enterprises that responded to both of the two most recent surveys. This allows like-with-like comparisons to be made between the two periods, thus avoiding the possible interferences, for example sample bias, which could affect the results of comparing the two datasets in their entirety.

In addition to evaluating the overall results for the sub-set of firms common to both surveys, the response given by each enterprise in the 2005 survey can be compared directly with the response given by the same enterprise in the 2007 survey, in a pair-wise fashion. This enables observations to be made that reflect how far businesses are persistent or variable in their innovation behaviour. For example, it is possible to examine a particular aspect of innovation by dissecting the proportions of enterprises that have either commenced, ceased or participated consistently in that dimension of innovation over the period covered by the two surveys.

The 2005 and 2007 surveys were sent to the same c28,000 enterprises, with the exception of a few alterations due to changes in the make-up of the enterprise population. Both surveys achieved a response rate of over 50 per cent, and just over 7000 enterprises responded to both surveys, providing a panel size that is adequate for robust analysis.

Elsewhere in this publication the results presented are weighted-up to give an estimation of the whole business population of interest, which reduces the impact of any sample bias present. The panel analysis is a direct comparison of the same firms over time and therefore the results in this chapter are based on the un-weighted 7000 businesses.

Innovation activity and main indicators

Table 3.1 reproduces a selection of the key indicators set out in Chapter 1 for the 2005 and 2007 survey panel. The first two columns of Table 3.1 show the overall results for the 2005 and 2007 surveys for all enterprises in the panel. The next four columns respectively from left to right show, for example in the case of the first row, the proportions of firms that were innovation active in both surveys, not innovation active in both surveys, innovation active in only the 2005 survey, and innovation active in only the 2007 survey.

Table 3.1: Main indicators, percentage of enterprises, panel only

			Innovation indicator:			
Per cent	2005 survey	2007 survey	both 05 and 07	neither 05 or 07	05 but not 07	07 but not 05
Innovation activity	66	71	53	16	13	19
Product innovation	31	25	15	60	15	10
Goods innovation	21	18	10	72	10	7
Services innovation	19	17	7	72	11	9
Process innovation	22	16	8	70	14	8
Ongoing/abandoned	13	13	5	80	8	7
Expenditure	63	70	50	17	13	20
Wider innovation	41	38	23	45	17	14
Broader innovation	70	74	58	13	12	17

Within the panel, the proportion of innovation active enterprises increased by five percentage points between the two observation periods. The analysis shows that this increase is due to the proportion of enterprises commencing innovation activity (19%) being larger than the proportion that ceased (13%), with the increase in innovation activity being equivalent to the difference between the two. Apart from the ongoing or abandoned innovation result, which remained unchanged at 13%, expenditure, which increased by 7 percentage points, and the broader innovation result, which showed an increase of four percentage points, all of the remaining categories show a degree of decline. In these cases where a fall was recorded, the percentage of enterprises that ceased the activity is greater than the percentage that commenced. Table 3.1 also shows the degree of 'churn', the shares of the panel changing their involvement in the types of innovation related behaviour. Through either commencing or ceasing activity, the degree of churn relative to continuity is greater for the "core" categories of product and process innovation.

Table 3.2: Innovation activity by size, percentage of enterprises, panel only

Per cent			Innovation indicator:			
Enterprise size (employees)	2005 survey	2007 survey	both 05 and 07	neither 05 or 07	05 but not 07	07 but not 05
10-49	60	66	47	20	14	20
50-249	71	78	60	11	11	19
250+	73	74	59	12	13	15

Table 3.2 shows a similar breakdown of the changes in the innovation active measure for the panel, by firm size. Larger firms (250+ employees) report a more consistent pattern between surveys. The small and medium enterprise categories, however, have both seen roughly equal increases of more than 5 percentage points, with both categories seeing around one fifth of enterprises

within the panel becoming innovation active only in the 2007 survey's reference period.

Figure 3.1: Innovation activity by sector, percentage of enterprises, panel only

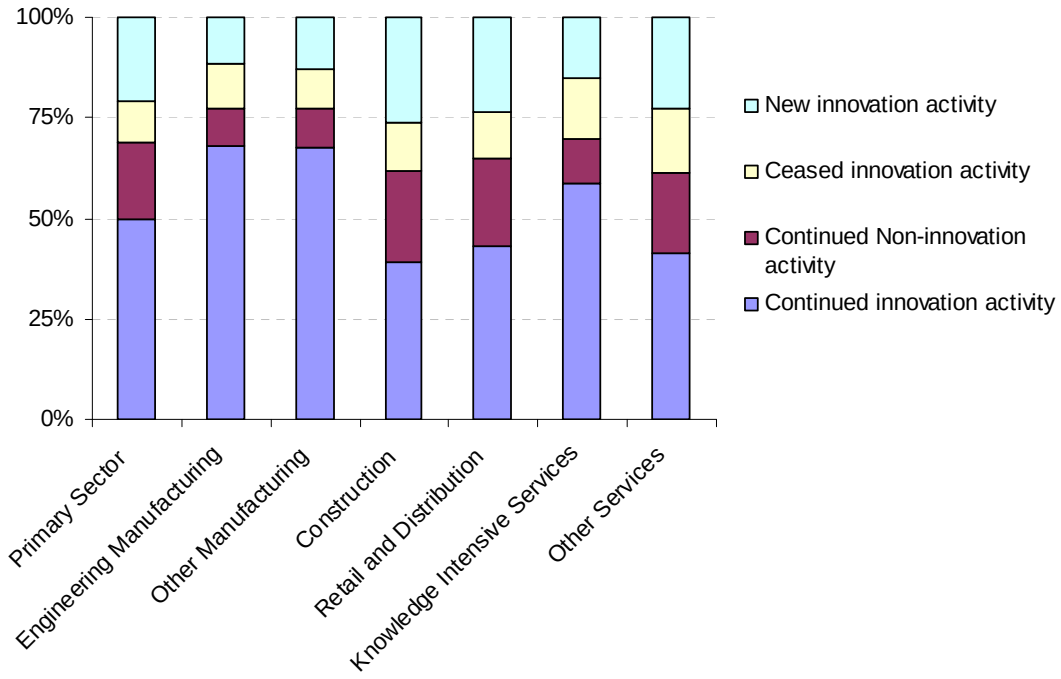


Figure 3.1 shows a sectoral breakdown of changes in the innovation active measure for the panel. The two sectors that saw the largest gains in the innovation active measure within the panel were construction and retail and distribution, sectors that also have the highest share of persistent non-innovators. Figure 3.1 shows that these sectors saw the highest proportion of enterprises that commenced innovation activity in the second period. These sectors also show relatively small proportions of enterprises ceasing innovation activity in the second period . In contrast, the knowledge intensive services sector, which within the panel saw the smallest increase in the innovation active measure, shows both a relatively small proportion of enterprises commencing innovation activity, and a relatively large proportion ceasing innovation activity, in the second period of the panel.

Figure 3.2: Innovation activity by region, percentage of enterprises, panel only

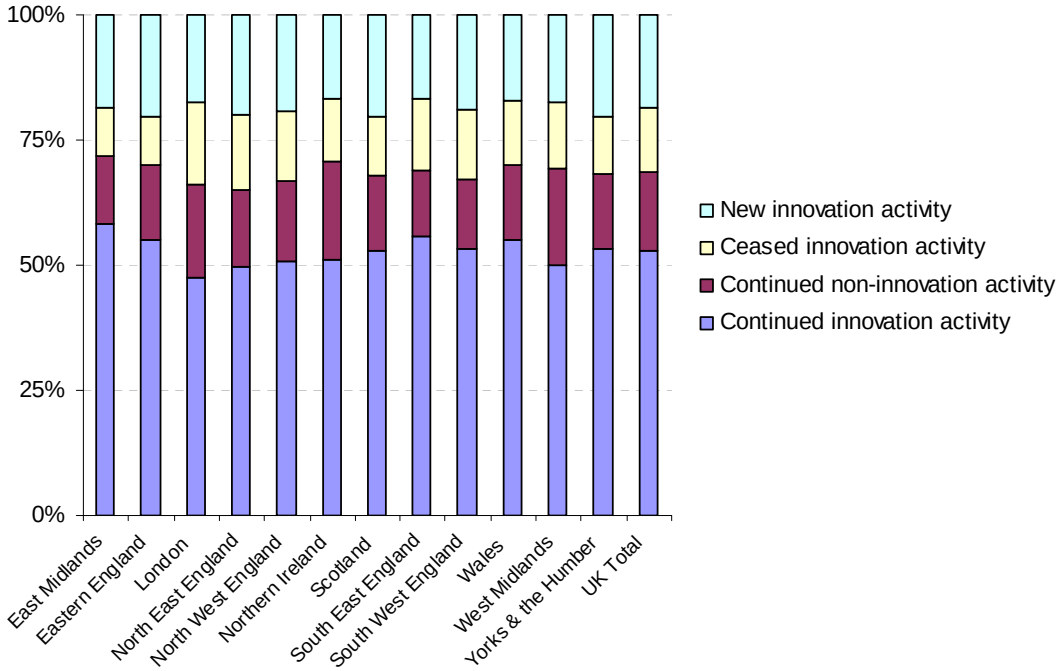


Figure 3.2 shows the regional breakdown of changes in the innovation active measure for the panel. The Eastern England region, which saw the largest increase in the innovation activity measure, shows the joint highest proportion of enterprises commencing innovation activity in the second period, and the joint lowest proportion ceasing activity. London saw the smallest increase in innovation activity between the two periods. However, it is interesting to note that of all the regions, London showed the second highest degree of movement in the composition of the results, when comparing the proportion of enterprises commencing or ceasing activity. It was also one of the regions with a larger share of persistent non-innovators along with Northern Ireland and the West Midlands.

Figure 3.3: Product innovation by sector, percentage of enterprises, panel only

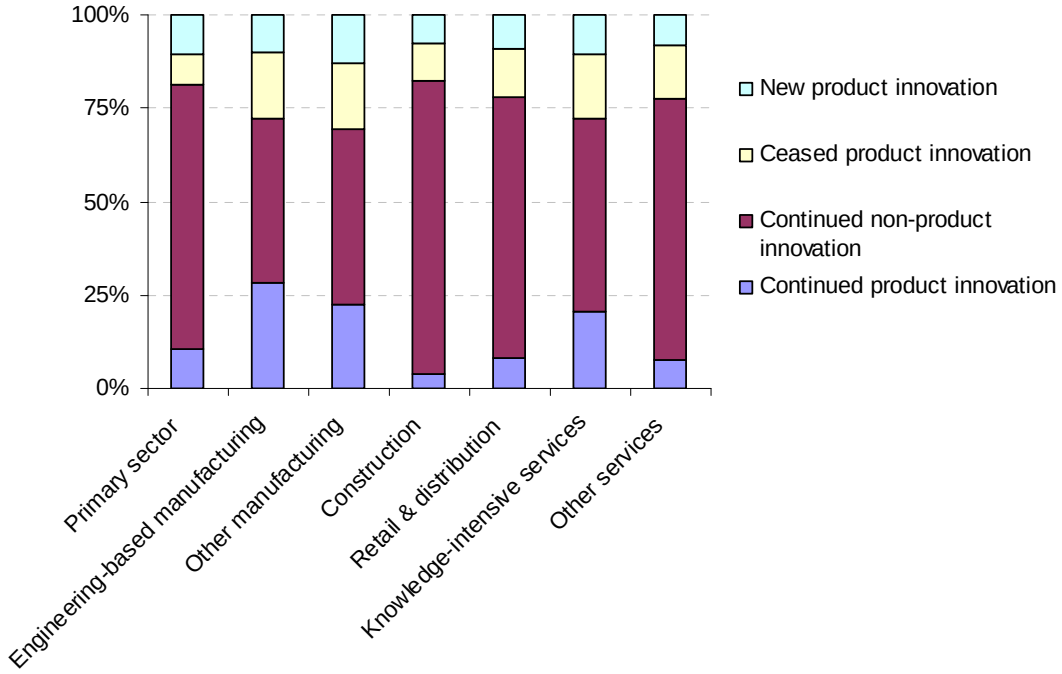


Figure 3.3 shows the panel composition of the product innovation indicator by sector. Between the '05 and '07 survey periods only the primary sector reported an increase in this measure. As can be seen from Figure 3.3, the primary sector had the smallest proportion of firms that ceased product innovation, and had the third highest proportion of new product innovators.

Figure 3.4: Product innovation by region, percentage of enterprises, panel only

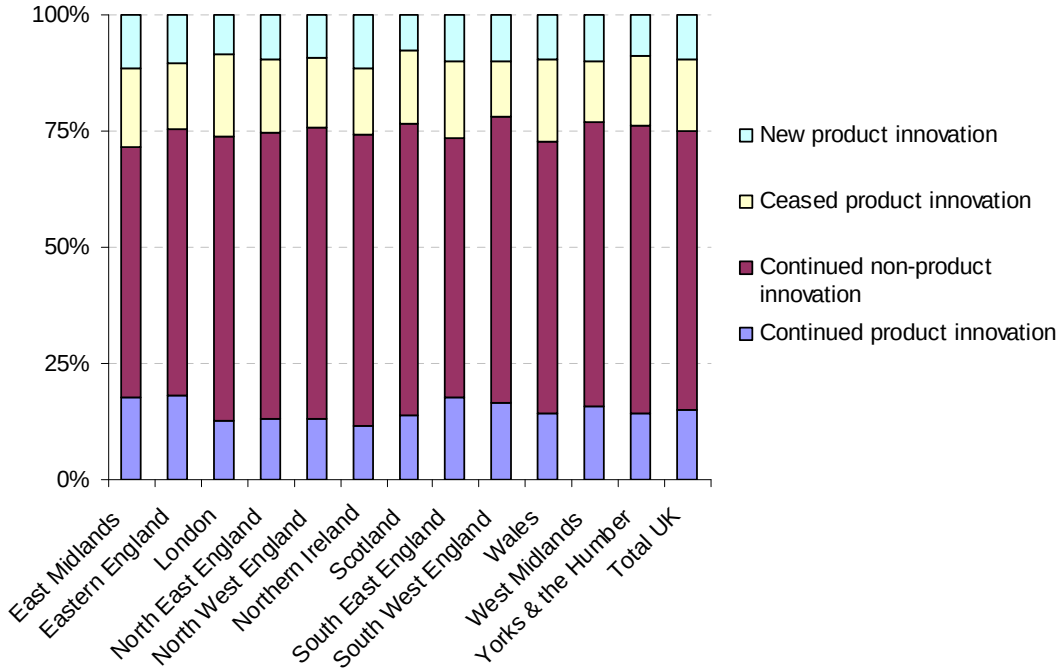


Figure 3.4 shows the regional make-up of the panel changes in the product innovation measure. London saw the largest fall within this measure over the observed period, with the highest proportion of enterprises ceasing product innovation, and the second lowest proportion commencing. Within the regions the South West had the best relative improvement in performance on this measure, with the smallest proportion of enterprises ceasing product innovation.

Figure 3.5: Process innovation by sector, percentage of enterprises, panel only

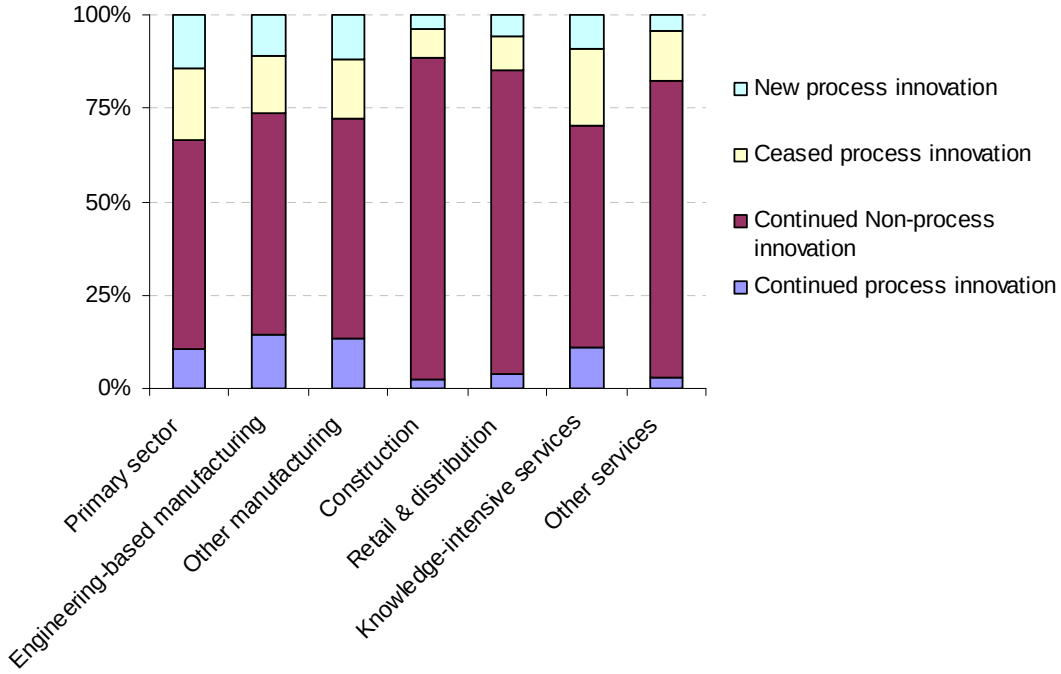


Figure 3.5 shows a sectoral split of the panel variation in the process innovation indicator. Between the two periods the service sector saw the largest deterioration in performance on this measure. As Figure 3.5 shows, the two services categories both had relatively small proportions of enterprises commencing process innovation and relatively high proportions ceasing.

Figure 3.6: Process innovation by region, percentage of enterprises, panel only

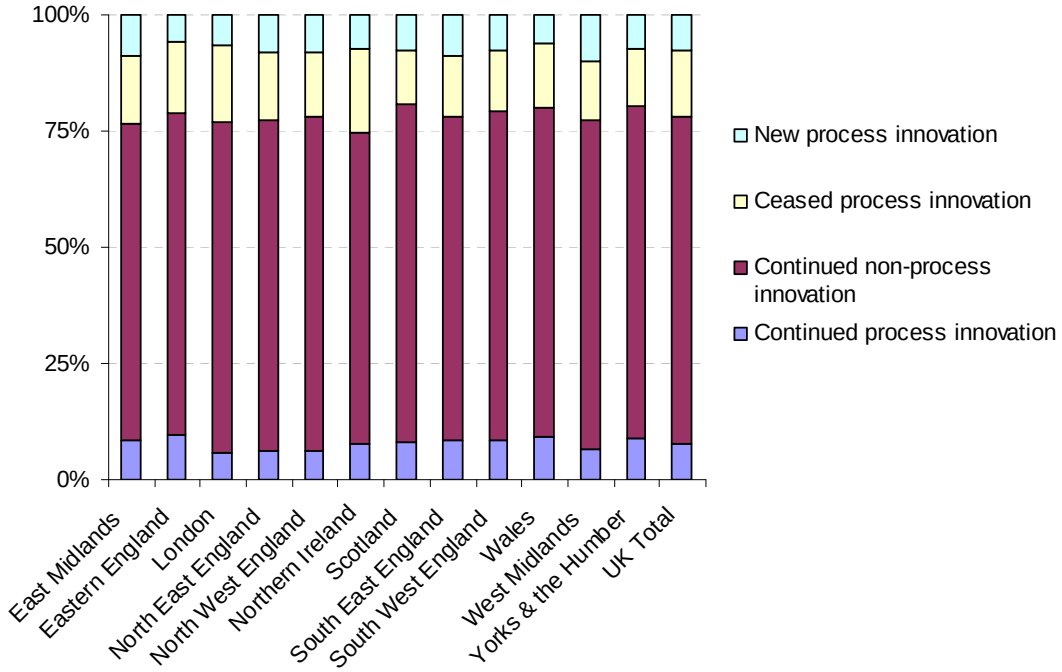


Figure 3.6 shows the regional breakdown of the changes within the panel for the process innovation indicator. Northern Ireland saw the largest deterioration in this measure between the two survey periods, with Figure 3.6 clearly showing a large proportion of enterprises that ceased process innovation. It should be noted that Northern Ireland had a clear lead on this measure in the '05 survey period, and this move merely brings it in to line with the other regions in the '07 survey period. The West Midlands had the highest proportion of enterprises commencing process innovation in the '07 survey period.

Innovation related activities

Table 3.3 shows the panel dynamics of the various types of innovation related activity reported over the two surveys. All but two of the categories (internal R&D and training) show an increase.

Table 3.3: Innovation activities, percentage of respondents, panel only

			Innovation indicator:			
Per cent	2005 survey	2007 survey	both 05 and 07	neither 05 or 07	05 but not 07	07 but not 05
Any activity	63	70	50	17	13	20
Internal R&D	33	33	22	54	12	12
External R&D	13	14	5	78	8	9
Acquisition of machinery, equipment and software	50	67	40	22	11	27
Acquisition of external knowledge	15	15	6	75	9	10
Training	43	40	24	40	19	16
Design	20	21	10	69	10	11
Marketing	27	40	18	51	9	22

The largest change occurred in the acquisition of machinery, equipment and software category, where the percentage of enterprises commencing activity in the more recent survey is twice as high as the proportion that ceased. This result can be interpreted as more firms modernising or scaling up their internal asset base – equipment and ICT, for innovation in the future. The acquisition of external knowledge category shows the greatest share of businesses changing their involvement, suggesting that this is a form of innovation directed investment pursued more on the basis of opportunity than as a systemic and regular policy.

Innovation expenditure

Table 3.4: Innovation expenditure, panel only

	Innovation expenditure, 2004 vs. 2006 survey:				
Per cent	Down more than 10%	Down less than 10%	Unchanged	Up less than 10%	Up more than 10%
Internal R&D	16	6	51	11	16
External R&D	6	2	76	8	7
Acquisition of machinery, equipment and software	23	6	24	17	30
Acquisition of external knowledge	6	4	74	10	6
Training	13	13	40	22	12
All forms of design	8	4	69	11	8
Marketing expenditures	12	5	48	15	20
Total	32	6	23	10	29

Table 3.4 gives a breakdown of the change within the panel in the amount of innovation expenditure. Overall a high degree of change is apparent, with

only two categories (acquisition of external knowledge and all forms of design) showing more than half of enterprises reporting unchanged levels of investment. Acquisition of machinery, equipment and software, and marketing expenditure show the most dramatic variations across the surveys, with 30 per cent and 20 per cent of enterprises reporting an increase of more than 10 per cent respectively.

On balance, the percentages of enterprises either increasing or reducing their expenditure are roughly balanced, indicating little change in the overall levels of innovation related expenditure.

Strategic Innovation

As shown in Table 3.5, within the panel there was a slight overall decrease in the proportion of enterprises that were involved with strategic innovation – some significant change in the form of organisation, management or strategic orientation of the business. The share of the panel reporting repeated incidence of these changes across the surveys was relatively low, perhaps reflecting the time needed for a major re-structuring or change of strategy to be fully implemented and absorbed, given that the only net increase in the share of the panel enterprises with activity was organisational structure.

Table 3.5: Strategic innovation, percentage of enterprises, panel only

			Strategic Innovation indicator:			
Per cent	2005 survey	2007 survey	both 05 and 07	neither 05 or 07	05 but not 07	07 but not 05
Strategic innovation	39	37	22	46	17	15
Corporate strategy	19	18	8	71	12	10
Advanced management	18	15	7	73	11	8
Organisational structure	22	25	10	64	12	14
Marketing	24	20	9	66	15	11

Sources of Information

The innovation survey asks enterprises to rank the importance of various sources of innovation related information as high, medium, low or not applicable. Table 3.6 shows the percentage changes in the importance of each as observed within the two-survey panel.

Table 3.6: Information sources, percentage of respondents, panel only

Per cent	2005 survey	2007 survey	Information source, 2005 survey vs. 2007 survey: Importance up	Importance down	Importance unchanged
Within group	27	28	26	27	47
Suppliers	18	19	29	29	42
Clients or customers	31	35	29	26	45
Competitors	12	14	29	26	45
Consultants	3	3	19	23	58
Universities	2	2	15	14	71
Government or public research	1	2	14	16	70
Conferences/trade fairs/exhibitions	6	6	21	26	53
Scientific journals	4	3	21	28	52
Professional and industry associations	6	6	23	27	49
Technical, industry or service standards	8	8	24	26	50

The results show a general overall increase in the importance of information sources. Only one source, scientific journals, shows a decline, although this is of the very marginal magnitude of just one percentage point. Five of the categories showed no change between the two surveys periods, while a further five showed an increase. Clients or customers saw the greatest increase in the proportion of enterprises increasing their importance rating, up by four percentage points.

Co-operation

Within the panel, the shares of firms reporting some co-operation fell between the 2005 and 2007 surveys, by less than 2 percentage points. Table 3.7 shows the changes by co-operation partner within the panel, only for those enterprises with co-operation agreements.

Table 3.7: Co-operation partners, percentage of co-operative enterprises, panel only

			Co-operation partner:			
Per cent	2005 survey	2007 survey	both 05 and 07	neither 05 or 07	05 but not 07	07 but not 05
Other businesses within group	56	58	48	25	13	14
Suppliers	77	67	61	15	16	9
Clients or customers	75	70	64	14	14	9
Competitors	46	38	31	39	18	12
Consultants	46	39	35	34	16	15
Universities or other HEIs	38	33	36	42	13	9
Government or public research institutes	32	24	22	53	16	9

Only the other business within group category showed any growth, higher by two percentage points in the 2007 survey. The largest fall occurred within the suppliers group, down by 10 percentage points. Overall the difference in the proportion of firms ceasing collaboration appears larger than those commencing, to a degree which seems to outweigh the slight overall fall of less than 2 percentage points outlined above. This suggests that while some enterprises still have co-operation agreements, the number of types of agreements with different types of partner has declined. Indeed the data shows that the average number of different types of co-operation partner that the enterprises have, has fallen between the survey periods by 0.4 percentage points.

Effects/deciding factors

Between the 2005 and 2007 surveys, the innovation survey questionnaire was changed to investigate the determinants (or reasons for participation in innovation) rather than the effects of innovation. The figures in Table 3.8 are therefore not directly comparable.

Table 3.8: Effects/deciding factors, percentage of respondents, panel only

			Innovation factor, 2005 survey vs. 2007 survey:		
Per cent	2005 survey rating 'high'	2007 survey rating 'high'	Importance up	Importance down	Importance unchanged
Increase range of goods	19	43	38	20	42
Enter new markets	23	48	38	19	43
Improve quality	30	53	36	18	47
Improve flexibility	18	30	36	24	40
Increase capacity	17	30	33	25	42
Reduce costs	21	37	34	22	43
Reduce environmental impact	15	25	35	21	44
Meet regulations	25	30	32	26	42
Increase value added	24	45	34	21	45

In each of the categories the percentage of enterprises increasing their importance rating is higher than the percentage decreasing. Although the general upward shift in the proportions of each category should be attributed to the change in the survey question, the change in the pattern of relative importance within each survey can be examined. Improved quality remains the most important category in both surveys, while reducing environmental impact remains the least important. Meeting regulations was rated the second most important effect in the '05 survey, but fell to be the sixth most important determinant in the '07 survey.

Barriers

The change in the importance ratings of various potential barriers to innovation are given in Table 3.9.

Table 3.9: Innovation barriers, percentage of respondents, panel only

			Innovation barrier, 2005 survey vs. 2007 survey:		
Per cent	2005 survey rating 'high'	2007 survey rating 'high'	Importance up	Importance down	Importance unchanged
Economic risks	13	10	18	33	49
Costs	15	12	19	31	50
Cost of finance	11	9	20	31	49
Availability of finance	9	7	20	29	51
Lack of qualified personnel	7	6	21	31	48
Lack of info on technology	3	2	18	29	53
Lack of info on markets	3	2	18	28	54
Market dominated by established business	9	7	20	30	50
Uncertain demand	8	7	20	30	50
UK regulations	11	8	18	30	53
EU regulations	10	7	17	28	55

For all categories of innovation barrier, the proportion of enterprises reducing their importance rating is higher than the proportion increasing. The largest fall, of four percentage points, occurred in the economic risk rating, while the smallest fall was present in the lack of information on technology segment. Between the two surveys there has been very little change in the relative importance of each category of barrier. In both surveys costs are rated with the highest importance, and lack of information on technology and markets are rated the least important.

Innovation protection

Table 3.10 shows the inter-survey change in the importance rating given by enterprises to different methods of innovation protection.

Table 3.10: Innovation protection, percentage of respondents, panel only

			Innovation protection method, 2005 survey vs. 2007 survey:		
Per cent	2005 survey rating 'high'	2007 survey rating 'high'	Importance up	Importance down	Importance unchanged
Registration of design	6	9	17	11	72
Trademarks	9	12	19	12	69
Patents	8	10	14	10	75
Confidentiality agreements	14	18	25	16	59
Copyright	7	10	18	12	70
Secrecy	12	13	22	20	58
Complexity of design	6	7	18	18	65
Lead-time advantage	12	15	24	19	58

The proportion of enterprises ranking each of the protection strategies shown in Table 3.10 as 'high', increased between the '05 and '07 surveys. The greatest increase occurred within confidentiality agreements, up 4 percentage points. Within each survey the relative importance of each protection method compared to the others remained identical.

Reason for no innovation

Table 3.11: Reasons for no innovation, percentage of respondents, panel only

			Reason for no innovation:			
Per cent	2005 survey	2007 survey	both 05 and 07	neither 05 or 07	05 but not 07	07 but not 05
No need due to prior innovation	36	30	14	48	23	16
No need due to market conditions	50	53	29	24	21	25
Factors constraining innovation	27	23	10	59	18	13

Table 3.11 shows the proportion of enterprises that identified a particular reason for not innovating. Between the two surveys the change in the frequency of each reason was mixed, with market conditions more frequently reported but with a lower share of panel firms reporting prior innovation and constraining factors.

Chapter 4 - Panel Dynamic Groups

As shown previously in Chapter 3, it is possible to identify a number of mutually exclusive groups of enterprises based on the changes in their innovation behaviour, as set out below:

Persistent innovators: those enterprises that were innovation active during both survey periods within the panel

Persistent non-innovators: those enterprises that were not innovation active during either of the survey periods

New innovators: those enterprises that became innovation active during the second survey period

New non-innovators: those enterprises that ceased being innovation active during the second survey period

This chapter focuses on these separate groups of enterprises, considering the ways in which their attitudes towards innovation differ. The analysis concentrates on three particular areas of interest: innovation barriers, motivating effect/factors for innovation, and possible reasons for not innovating.

Innovation barriers

Table 4.1 below shows how each of the four groups of firms identified above viewed the importance of various potential barriers to innovation in the 2005 and 2007 surveys. The survey questionnaire provides eleven alternative constraints that enterprises can specify, which are summarised in Table 4.1 by showing the average response. Although this approach is perhaps less intuitive than a separate result for each constraint, the resulting tables produced otherwise would be too expansive for a document of this type. The same principle is also used for comparable tables in the remainder of this chapter.

Table 4.1: Proportion of enterprises average rating of innovation barriers by degree of importance, panel only

2005 survey panel	Importance:				
Per cent	Not applicable	Low	Medium	High	Some
Persistent innovator	34	32	23	11	66
Persistent non-innovator	79	10	7	4	21
New innovator	71	14	9	6	29
New non-innovator	40	28	21	11	60

2007 survey panel	Importance:				
Per cent	Not applicable	Low	Medium	High	Some
Persistent innovator	45	28	19	8	55
Persistent non-innovator	86	6	4	3	14
New innovator	64	18	11	6	36
New non-innovator	79	11	6	4	21

The innovation survey reveals results that are perhaps counter-intuitive; firms that innovate are more likely to rate innovation barriers with greater importance. A possible explanation is that firms learn about barriers as they experience them while they attempt to innovate, and develop a stronger view of their significance. Meanwhile, firms that do not attempt to innovate are unaware of the potential hurdles and have less appreciation of their weight.

It is also possible to examine, in a pair-wise fashion, the extent to which enterprises have altered their view of the possible barriers to innovation between the two survey periods, and whether this has had any impact on their decision whether or not to innovate.

Table 4.2: Change in the average importance assigned to innovation barriers, pair-wise, panel only

	Importance, 2005 survey vs. 2007 survey:		
Per cent	Up	Down	Unchanged
Persistent innovator	21	34	45
Persistent non-innovator	8	16	76
New innovator	24	19	57
New non-innovator	8	46	46

Table 4.2 continues the inverse pattern seen above, with those firms participating in innovation rating barriers with more importance. This is evidenced by the 'new-innovators' having the highest proportion of enterprises increasing their average rating of barrier importance over the two periods, and new 'non-innovators' having the highest proportion of enterprises reducing their rating of importance.

Determinants/Effects of innovation

Table 4.3 below shows how the four groups of enterprises viewed the importance of the potential motivations to innovate in the 2005 and 2007 surveys. It should be noted that the part of the questionnaire that provides this information was altered in the 2007 survey to reflect the determinants, or intended consequences of innovation, rather than the actual effects or observed results of innovation, as was the case in the 2005 survey.

Table 4.3: Proportion of enterprises average rating of innovation effects/determinants by degree of importance, panel only

2005 survey panel	Importance:				
Per cent	Not applicable	Low	Medium	High	Some
Persistent innovator	22	16	34	28	78
Persistent non-innovator	73	9	11	6	27
New innovator	62	11	18	9	38
New non-innovator	29	15	32	25	71

2007 survey panel	Importance:				
Per cent	Not applicable	Low	Medium	High	Some
Persistent innovator	14	14	31	41	86
Persistent non-innovator	75	7	10	9	25
New innovator	28	13	28	32	72
New non-innovator	59	11	15	15	41

In both periods a higher proportion of persistent innovator enterprises rate the importance of the innovation effects/determinants as 'high', when compared to the persistent non-innovators. For example, within the 2007 panel, 41 per cent of persistent innovators rated the determinants of innovation as of 'high' importance on average, compared to just 9 per cent of persistent non-innovators. Also within the 2007 panel, the proportion of new innovator enterprises rating the determinants as 'high', at 32 per cent, exceeds the equivalent 15 per cent of new non-innovators.

Table 4.4: Change in the average importance assigned to innovation effects/determinants, pair-wise, panel only

	Importance, 2005 survey vs. 2007 survey:		
Per cent	Up	down	Unchanged
Persistent innovator	33	22	45
Persistent non-innovator	18	22	60
New innovator	53	15	32
New non-innovator	16	50	34

Table 4.4 shows that the proportion of persistent innovators increasing their rating of the importance of innovation effects/determinants between the two surveys, at 33 per cent, is far greater than the equivalent 18 per cent for persistent non-innovators. The proportion of new innovators increasing their rating of the effects/determinants was also far higher than the proportion of new non-innovators. Additionally, the proportion of new non-innovators decreasing their rating of the effects/determinants (50 per cent) was far higher than the proportion of new innovators (15 per cent).

Reasons for no innovation

Table 4.5 shows the proportion of each enterprise type during the two survey periods selecting one of three reasons for not innovating. The pattern in the results is somewhat mixed. The 'no need due to previous innovations' category predictably has a general low association with those enterprises that exhibit less innovative behaviour. Looking at the '07 survey results, a greater proportion of persistent non-innovators (56 per cent) cited 'no need due to market conditions' as a reason for not innovating in comparison to persistent innovators (49 per cent). Higher proportions of the less innovative firm types cited 'factors constraining innovation' category. This result is more intuitive than the inverse relationship found when looking at innovation barriers above. The divergence in these results may be due to the different points at which enterprises form their opinions about the dimensions being explored. Enterprises tend to rate 'barriers' with more importance when they experience them during the innovation process, while firms are already aware of the 'reasons not to innovate' before any innovation process is begun, and decide not to pursue this type of activity.

Table 4.5: Proportion of enterprises, reasons for no innovation, panel only

Per cent		2005 survey panel	2007 survey panel
No need due to prior innovations	Persistent non-innovator	33	20
	New innovator	34	34
	New non-innovator	42	26
No need due to market conditions	Persistent non-innovator	54	56
	New innovator	53	55
	New non-innovator	46	57
Factors constraining innovation	Persistent non-innovator	28	25
	New innovator	26	19
	New non-innovator	32	28

Table 4.6 shows the change, in a pair-wise fashion, in how the enterprises within the panel view the reasons for not innovating in each period. From left to right the columns in the table show the proportion of enterprises that cited each reason in both the '05 and '07 survey periods, in neither of the periods, in just the '05 period, or in just the '07 period.

Table 4.6: Change in the reasons for no innovation, pair-wise, panel only

		Reason for no innovation:			
Per cent		both 05 and 07	neither 05 or 07	05 but not 07	07 but not 05
No need due to prior innovations	Persistent non-innovator	11	55	23	11
	New innovator	14	46	20	20
	New non-innovator	15	43	28	14
No need due to market conditions	Persistent non-innovator	31	21	23	26
	New innovator	31	22	22	24
	New non-innovator	28	26	18	28
Factors constraining innovation	Persistent non-innovator	10	57	18	14
	New innovator	8	63	18	11
	New non-innovator	13	51	20	17

The persistent non-innovators showed the lowest proportion stating 'no need due to prior innovations'. Within the 'no need due to market conditions' category the new-innovator group of enterprises had the smallest proportion of firms stating this as a new factor, while the new non-innovator group had the highest proportion. Similarly in the final category, 'factors constraining innovation', the new-innovator group of enterprises had the smallest

proportion of firms stating this as a new factor, while the new non-innovator group had the highest proportion.

Annex A: Technical details of the UK Innovation Survey 2007

Methodology

The UK Innovation Survey is funded by the Department for Innovation, Universities & Skills (DIUS). The survey was conducted on behalf of DIUS by the Office for National Statistics (ONS), with assistance from the Northern Ireland Department of Enterprise, Trade and Investment (DETINI).

The UK Innovation Survey is part of a wider Community Innovation Survey (CIS) covering European countries. The survey is based on a core questionnaire developed by the European Commission (Eurostat) and Member States. This is the fifth iteration of the survey (CIS 5) – CIS4, covering the period 2004 to 2006, was carried out in 2005, and CIS 3, covering the period 1998 to 2000, was carried out in 2001.

The UK Innovation Survey 2007 sampled over 28 thousand UK enterprises. The survey was voluntary and conducted by means of a postal questionnaire. A copy of the questionnaire used can be found on:
http://www.berr.gov.uk/files/file44938.pdf

Coverage and sampling

The survey covered enterprises with 10 or more employees in sections C-K of the Standard Industrial Classification (SIC) 2003. The 2007 survey included the addition of the motion picture and video production sector (SIC 92.1), which was excluded from previous surveys. The 2005 survey included additional sectors Sale, maintenance and repair of motor vehicles (SIC 50), Retail Trade (SIC 52) and Hotels and restaurants (SIC 55) excluded from the 2001 survey. The sample was drawn from the ONS Inter-Departmental Business Register (IDBR) in December 2006.

Response and Weighting

The questionnaires from the initial survey were distributed on March 31 2007. Valid responses were received from 14,872 enterprises to give a response rate of 53 per cent.

The results in this article are based on weighted data in order to be representative of the population of firms. The responses were weighted back to the population using the inverse sampling proportion in each stratum i.e. the weight attributed to each enterprises was the number of enterprises in the population divided by the number of responses in that stratum. On

average each respondent represents 12 enterprises in the population.

Changes over time – 2005 and 2007 surveys

Comparisons can be made with the 2005 UK Innovation Survey, which measured innovation over the period 2002-2004. The sectoral coverage of the Innovation Survey in 2007 was widened slightly to include the motion picture and video production sector. Other differences between the surveys; such as in the sample design and weighting methodology, are not accounted for.

Definitions

Division

Enterprises are defined by the Standard Industrial Classification of Economic Activities – SIC(2003).
SIC(2003) is a hierarchical five digit system.
Each division is uniquely defined at the two digit level. Division are broken down into groups (3 digits).
Then into classes (4 digits) and, in several cases, into subclasses (5 digits).

Division No SIC codes Main activities

Division 1 10 to 14 Mining and Quarrying
Division 2 15 to 22 Mfr of food, clothing, wood, paper, publish & print
Division 3 23 to 29 Mfr of fuels, chemicals, plastic metals & minerals
Division 4 30 to 33 Mfr of electrical and optical equipments
Division 5 34 to 35 Mfr of transport equipments
Division 6 36 to 37 Mfr not elsewhere classified
Division 7 40 o 41 Electricity, gas & water supply
Division 8 45 Construction
Division 9 50 to 51 Wholesale Trade (incl cars & bikes)
Division 10 52 Retail Trade (excl cars & bikes)
Division 11 55 Hotels & restaurants
Division 12 60 to 63 Transport
Division 13 64.1 Post and courier activities
Division 14 64.2 Telecommunications
Division 15 65 to 67 Financial intermediation
Division 16 70 Real estate activities
Division 17 71 Renting of machinery, equipment, personal, and household goods
Division 18 72 Computer and related activities
Division 19 73.1 Research and experimental development on natural sciences and engineering
Division 20 73.2 Research and experimental development on social sciences and humanities
Division 21 74.2 Architectural and engineering activities and related technical consultancy
Division 22 74.3 Technical testing and analysis
Division 23 Rest of 74 Other business activities
Division 24 92.1 Motion picture and video production

Sectors of industry

Enterprises were clustered into seven sectors of industry. Those sectors are defined as followed by their SIC(2003) codes:

Sector SIC codes

Primary sector 10 to14, 40 to 41
Engineering-based Manufacturing 28 to 35
Other Manufacturing 15 to 27, 36 to 37
Construction 45
Retail & distribution 50 to 52
Knowledge-intensive services 64.2, 65 to 67, 72 to 73, 74.1 to 74.4
Other services 55, 60 to 64.1, 70 to 71, 74.5 to 74.8, 92.1

Response rates

Overall	Sample	Achieved sample	Response rate
UK	28530	16445	0.58

Regions	Sample	Achieved sample	Response rate
North East England	1945	1065	55%
North West England	2500	1285	51%
Yorks & the Humber	2340	1240	53%
East Midlands	2290	1235	54%
West Midlands	2400	1250	52%
Eastern England	2430	1310	54%
London	2700	1380	51%
South East England	2645	1365	52%
South West England	2385	1295	54%
Wales	2000	1135	57%
Scotland	2315	1225	53%
Northern Ireland	2015	1080	54%

Size	Sample	Achieved sample	Response rate
Small	15660	8215	52%
Medium	5915	3320	56%
Large	6395	3335	52%

Industries	Sample	Achieved sample	Response rate
Division 10-14	110	55	47%
Division 15-22	2810	1435	51%
Division 23-29	4100	2115	52%
Division 30-33	940	490	52%
Division 34-35	525	260	50%
Division 36-37	675	365	54%
Division 40-41	105	65	62%
Division 45	1855	1030	55%
Division 50-51	2340	1325	57%
Division 52	1795	935	52%
Division 55	1860	875	47%
Division 60-63	2110	1120	53%
Division 64.1	160	75	49%
Division 64.2	120	60	50%
Division 65-67	965	505	52%
Division 70	1125	620	55%
Division 71	490	270	55%
Division 72	1025	515	50%
Division 73.1	170	90	52%
Division 73.2	70	35	50%
Division 74.2	955	520	55%
Division 74.3	90	50	54%
Rest of Division 74	3250	1910	59%
Division 92.1	325	155	47%

Unweighted population

	Sizeband (no of emplyees)			
Industry	**10-49**	**50-249**	**250+**	**All 10+**
Division 10-14	25	10	20	55
Division 15-22	820	310	305	1435
Division 23-29	1345	465	305	2115
Division 30-33	265	115	110	490
Division 34-35	95	60	100	260
Division 36-37	250	60	50	365
Division 40-41	35	15	15	65
Division 45	575	270	185	1030
Division 50-51	545	415	370	1325
Division 52	510	165	265	935
Division 55	420	255	200	875
Division 60-63	745	165	210	1120
Division 64.1	55	10	10	75
Division 64.2	20	10	30	60
Division 65-67	275	80	145	505
Division 70	445	85	85	620
Division 71	210	30	30	270
Division 72	370	75	70	515
Division 73.1	45	15	30	90
Division 73.2	30	5	0	35
Division 74.2	415	60	50	520
Division 74.3	30	10	10	50
Rest of Division 74	550	630	730	1910
Division 92.1	140	10	5	155
All divisions	**8215**	**3320**	**3335**	**14870**

	Sizeband (no of emplyees)			
Region	**10-49**	**50-249**	**250+**	**All 10+**
North East England	720	235	110	**1065**
North West England	640	285	360	**1285**
Yorks & the Humber	645	310	285	**1240**
East Midlands	730	270	235	**1235**
West Midlands	675	295	275	**1250**
Eastern England	745	290	280	**1310**
London	535	220	625	**1380**
South East England	620	265	475	**1365**
South West England	790	290	215	**1295**
Wales	640	380	120	**1135**
Scotland	635	325	260	**1225**
Northern Ireland	840	150	90	**1080**
All regions	**8215**	**3320**	**3335**	**14870**

Weighted population

	Sizeband (no of emplyees)			
Industry	**10-49**	**50-249**	**250+**	**All 10+**
Division 10-14	180	50	35	**265**
Division 15-22	8,500	2,275	620	**11,390**
Division 23-29	12,410	3,470	705	**16,585**
Division 30-33	2,705	930	225	**3,860**
Division 34-35	920	420	220	**1,565**
Division 36-37	2,380	460	85	**2,930**
Division 40-41	45	25	20	**90**
Division 45	15,980	2,075	355	**18,415**
Division 50-51	21,575	3,550	620	**25,750**
Division 52	13,445	1,315	505	**15,260**
Division 55	20,870	2,220	355	**23,445**
Division 60-63	7,390	1,325	385	**9,095**
Division 64.1	600	105	20	**725**
Division 64.2	235	85	55	**375**
Division 65-67	3,100	760	370	**4,225**
Division 70	7,585	645	155	**8,385**
Division 71	3,085	215	55	**3,360**
Division 72	6,820	740	130	**7,685**
Division 73.1	690	105	55	**850**
Division 73.2	630	85	0	**715**
Division 74.2	6,625	470	85	**7,180**
Division 74.3	335	60	20	**415**
Rest of Division 74	9,155	5,105	1,300	**15,565**
Division 92.1	3875	170	5	**4,050**
All divisions	**149,140**	**26,655**	**6,385**	**182,175**

	Sizeband (no of emplyees)			
Region	**Oct-49**	**50-249**	**250+**	**All 10+**
North East England	4,880	960	215	**6,055**
North West England	16,165	2,945	700	**19,810**
Yorks & the Humber	12,220	2,305	515	**15,040**
East Midlands	10,790	2,035	435	**13,260**
West Midlands	13,100	2,315	570	**15,985**
Eastern England	13,885	2,375	495	**16,755**
London	20,895	3,955	1,210	**26,055**
South East England	21,040	3,610	935	**25,585**
South West England	13,530	2,090	420	**16,035**
Wales	5,645	1,010	230	**6,885**
Scotland	11,155	2,065	475	**13,695**
Northern Ireland	5,835	995	185	**7,015**
All regions	**149,140**	**26,650**	**6,385**	**182,175**

Annex B: Data supporting Figures

This annex provides the data for all the Figures in this report. All data are in percentages.

Data for Figure 1.1

	250+	50-249	10-49
2005 survey	72	67	55
2007 survey	74	73	62

Data for Figure 1.2

	2005 survey	2007 survey
Other services	47	55
Primary sector	55	59
Construction	44	59
Retail & distribution	52	61
Engineering-based manufacturing	73	75
Other manufacturing	70	75
Knowledge-intensive services	69	76
All firms	57	64

Data for Figure 1.3

Launch advertising	19
Changes to maketing methods	21
Market research	18
Changes to product or service design	22
of which,:	
Market introduction of innovaitons	37
All forms of design	17
Training	36
Acq of external knowledge	14
Computer software	54
Computer hardware	52
Advanced machinery	20
of which,:	
Acq of machinery, equipment & software	61
Extramural R&D	11
Intramural R&D	28

Data for Figure 1.4

	Innovation expenditure - % of total
Acq. of external knowledge	3
Training	5
All forms of design	6
Extramural R&D	6
Marketing expenditure	20
Intramural R&D	27
Acq. of machinery, equipment & software	33

Data for Figure 1.5

	Primary Sector	Engineering Manufacturing	Other Manufacturing	Construction	Retail and Distribution	Knowledge Intensive Services	Other Services
Acq of machinery, equipment & software	78	28	48	47	34	29	61
Intramural R&D	5	43	23	7	8	35	6
Training	3	2	2	14	8	5	6
All forms of design	1	7	3	15	3	6	3
Marketing expenditure	8	9	18	13	43	17	18
Extramural R&D	5	10	5	1	3	3	4
Acq of external knowledge	1	1	2	2	1	4	2

Data for Figure 1.6

	East Midlands	Eastern England	London	North East England	North West England	Northern Ireland	Scotland	South East England	South West England	Wales	West Midlands	Yorks & the Humber	UK Total
	3	3	2	2	2	2	2	3	2	5	3	1	3
R&D	1	5	1	0	7	6	5	8	1	5	1	8	0
Acq of machinery, equipment & software	3 9	2 7	4 7	4 8	4 5	5 2	5 8	3 0	4 4	2 6	3 5	5 4	4 0
Acq of external knowledge	2	1	4	4	2	3	1	2	2	3	1	3	2
Training	4	5	5	4	6	6	3	4	5	2	3	9	5
All forms of design	5	7	4	8	4	3	3	6	7	3	4	2	5
Marketing expenditure	2 0	2 4	1 9	1 6	1 6	1 0	1 0	2 1	2 1	1 1	2 5	1 4	1 9

Data for Figure 1.7

	New to market (product)	New to industry (process)
Other Manufacturing	38	19
Retail and Distribution	33	20
Construction	16	23
Total	34	26
Engineering Manufacturing	44	26
Other Services	24	27
Knowledge Intensive Services	43	34
Primary Sector	27	36

Data for Figure 1.8

	New to market (product)	New to industry (process)
UK Total	34	26
Northern Ireland	27	21
Scotland	30	24
South West England	31	17
North West England	32	30
North East England	33	30
East Midlands	34	25
Yorks & the Humber	34	16
Eastern England	34	28
Wales	35	26
London	37	33
West Midlands	38	20
South East England	40	32

Data for Figure 1.9

	Novel process innovators	Novel product innovators
2005 survey	30	56
2007 survey	25	34

Data for Figure 1.10

	New to market	New to the firm	Improved product
Primary Sector	11	13	15
Other Manufacturing	9	15	15
Engineering Manufacturing	10	14	18
Retail and Distribution	12	17	15
Construction	9	18	23
Other Services	11	20	21
Knowledge Intensive Services	15	15	27

Data for Figure 1.11

	New to market	New to the enterprise	Significantly improved
UK Total	12	16	20
Northern Ireland	10	15	15
East Midlands	9	18	15
South West England	9	13	19
Eastern England	12	16	17
Yorks & the Humber	10	17	18
West Midlands	10	17	18
North West England	10	17	21
Wales	13	16	20
North East England	11	19	20
Scotland	12	20	19
London	15	14	23
South East England	15	16	25

Data for Figure 1.12

	Engineering Manufacturing	Other Manufacturing	Primary & Construction	Retail and Distribution	Knowledge Intensive Services	Other Services
2005 survey	7	3	4	3	20	3
2007 survey	8	3	3	4	20	2

Data for Figure 1.13

	Not relevant	Low	Medium	High
Reduced environmental impacts or improved health & safety	27	22	31	21
Met regulatory requirements	26	19	25	31
Increased value added	13	9	33	45
Improved flexibility of production or service provision	20	18	33	29
Increased capacity for production or service provision	24	18	29	29
Reduced costs per unit produced or provided	23	18	28	30
Increased range of goods or services	16	9	28	48
Entered new markets or increased market share	14	10	29	47
Improved quality of goods or services	11	5	28	57

Data for Figure 1.14

	2005 survey	2007 survey
Reduced environmental impacts	64	73
Met regulatory requirements	68	75
Increased capacity	70	77
Reduced costs	68	77
Improved flexibility	73	80
Increased range	75	85
Entered new markets	75	86
Improved quality	83	89

Data for Figure 1.15

	10-49	50-249	250+
Strategic innovator	28	42	50
Non-strategic innovator	72	58	50

Data for Figure 1.16

One change	Two changes	Three changes	Four changes
38	30	19	13

Data for Figure 1.17

	Corporate strategy	Management techniques	Organisational change	Marketing strategy
Corporate strategy		42	69	62
Management techniques	54		66	56
Organisational change	54	40		56
Marketing strategy	52	37	62	

Data for Figure 1.18

	2005 survey	2007 survey
Government or public research institutes	22	20
Universities or other HEIs	20	20
Consultants, commercial labs, private R&D institutes	34	31
Scientific journals	47	42
Conferences, trade fairs, exhibitions	47	44
Technical, industry or service standards	47	46
Professional and industry associations	50	47
within your enterprise or enterprise group	59	56
Competitors	58	60
Suppliers	64	66
Clients or customers	65	66

Data for Figure 1.19

	Cooperative firms' partners
Clients or customers	68
Suppliers	67
within your enterprise or enterprise group	54
Competitors	37
Consultants, commercial labs, private R&D institutes	36
Universities or other HEIs	29
Government or public research institutes	23

Data for Figure 1.20

	Geographical distribution of enterprises' partners
Local / Regional	70
UK	58
Europe	32
Other	28

Data for Figure 1.21

	2007	2005
No need due to prior innovations	19	34
Factors constraining innovation	27	29
No need due to market conditions	52	52

Data for Figure 2.1

	2005	2007
Innovation-active	57	64
Product	25	22
Process	16	12
Activities	54	62
Ongoing/abandoned	10	10

Data for Figure 2.2

	2005	2007
1	27	37
2	16	15
3	10	9
4	4	3

	North East England	North West England	Yorks & the Humber	East Midlands	West Midlands	Eastern England	London	South East England	South West England	Wales	Scotland	Northern Ireland	UK Total
Data for Figure 2.3													
2005	57	58	58	57	56	55	57	60	57	57	56	56	57
2007	61	67	65	68	64	69	55	64	66	65	63	57	64
Data for Figure 2.4													
2005	25	24	25	27	24	26	27	28	25	24	22	21	25
2007	22	23	20	25	24	27	20	23	25	21	20	20	22
Data for Figure 2.5													
2005	16	15	15	16	16	17	17	16	16	16	16	19	16
2007	13	11	12	12	14	13	9	11	12	12	12	11	12
Data for Figure 2.6													
2005	54	55	56	53	53	52	53	56	55	55	53	54	54
2007	60	66	64	65	62	68	54	63	63	62	61	56	62
Data for Figure 2.7													
2005	7.8	8	10	9	10	11	10	13	11	8	10	6	10
2007	7.6	10	8	11	12	13	10	11	11	8	7	6	10

Data for Figure 3.1

	Continued innovation activity	Continued Non-innovation activity	Ceased innovation activity	New innovation activity
Primary Sector	50	19	10	21
Engineering Manufacturing	68	9	11	11
Other Manufacturing	68	10	10	13
Construction	39	23	12	26
Retail and Distribution	43	22	12	23
Knowledge Intensive Services	59	11	15	15
Other Services	41	20	16	23

Data for Figure 3.2

	Continued innovation activity	Continued non-innovation activity	Ceased innovation activity	New innovation activity
East Midlands	58	14	10	19
Eastern England	55	15	10	20
London	48	19	17	17
North East England	50	15	15	20
North West England	51	16	14	19
Northern Ireland	51	20	13	17
Scotland	53	15	12	20
South East England	56	13	14	17
South West England	53	14	14	19
Wales	55	15	13	17
West Midlands	50	19	13	17
Yorks & the Humber	53	15	12	20
UK Total	53	16	13	19

Data for Figure 3.3

	Continued product innovation	Continued non-product innovation	Ceased product innovation	New product innovation
Primary sector	10	71	8	10
Engineering-based manufacturing	28	44	18	10
Other manufacturing	22	47	18	13
Construction	4	78	10	8
Retail & distribution	8	70	13	9
Knowledge-intensive services	21	51	17	10
Other services	8	70	14	8

Data for Figure 3.4

	Continued product innovation	Continued non-product innovation	Ceased product innovation	New product innovation
East Midlands	18	54	17	11
Eastern England	18	57	14	10
London	13	61	18	9
North East England	13	62	16	10
North West England	13	63	15	9
Northern Ireland	12	63	14	12
Scotland	14	63	16	8
South East England	18	56	17	10
South West England	17	61	12	10
Wales	14	58	18	10
West Midlands	16	61	13	10
Yorks & the Humber	14	62	15	9
Total UK	15	60	15	10

Data for Figure 3.5

	Continued process innovation	Continued Non-process innovation	Ceased process innovation	New process innovation
Primary sector	10	56	19	15
Engineering-based manufacturing	14	59	15	11
Other manufacturing	13	59	16	12
Construction	2	86	8	4
Retail & distribution	4	81	9	6
Knowledge-intensive services	11	60	20	9
Other services	3	79	14	4

Data for Figure 3.6

	Continued process innovation	Continued non-process innovation	Ceased process innovation	New process innovation
East Midlands	9	68	15	9
Eastern England	10	70	15	6
London	6	71	16	7
North East England	6	71	15	8
North West England	6	72	14	8
Northern Ireland	8	67	18	7
Scotland	8	73	12	8
South East England	8	69	13	9
South West England	9	71	13	8
Wales	9	71	14	6
West Midlands	7	71	13	10
Yorks & the Humber	9	72	12	7
UK Total	8	70	14	8

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