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UK Innovation Survey 2005: Northern Ireland Results

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UK INNOVATION SURVEY 2005: NORTHERN IRELAND RESULTS

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The UK Innovation Survey provides a wide range of information related to innovation activity among enterprises, and includes information on the extent of innovation activity, the impact of innovation on businesses and the barriers to innovation. Headline figures for the Northern Ireland (NI) data show that:

- In the three-year period 2002-2004, 56 per cent of enterprises in NI were innovation active. This is similar to the equivalent UK figure of 57 per cent.
- Twenty-one per cent of NI enterprises introduced innovations to their products (goods and/or services), which was slightly lower than the comparable UK figure of 25 per cent. However, a slightly higher proportion of NI enterprises were process innovators (19 per cent) when compared to the UK (16 per cent).
- A larger proportion of enterprises in the production and construction sector (63 per cent) were innovation active compared to those in the distribution and services sector (52 per cent).
- Cost factors were most commonly regarded as significant barriers to innovation among NI and UK enterprises.
- When measuring the effects of innovation, almost two fifths (39 per cent) of NI and one third (34 per cent) of UK innovation active respondents rated the improved quality of goods or services as highly important.
- Suppliers were the most likely partners in co-operation arrangements (78 per cent of enterprises with co-operation arrangements) and universities or higher education organisations the least likely (36 per cent).
- Comparisons between the 2001 and 2005 surveys are limited by differences in methodology and the type of business sectors covered. However, when similar sectors are compared, the proportion of firms in NI engaged in innovation activity had increased from 46 per cent in 1998-2000 to 63 per cent in 2002-04.

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Executive Summary

1

INTRODUCTION

This report presents emerging results from the Northern Ireland element of the UK Innovation Survey 2005, covering the three-year period from 2002 to 2004. The UK-level results can be found on the Department of Trade and Industry (DTI) website, and a link to that information is provided in section 8 of this publication. This is part of a wider European Community Innovation Survey (CIS) and is the fourth such survey, with the previous survey being undertaken in 2001.

Business innovation is a vital ingredient in raising the productivity, competitiveness and growth potential of modern economies. It is a key objective for the Department of Enterprise, Trade and Investment (DETI) to encourage NI businesses to become more directly engaged with potential partners in Higher and Further Education and the wider public sector. This applies to both R&D and innovation activity to improve not only processes, products and near market product development but also management techniques. Benchmarking our overall innovation performance in NI against comparable regions competing in the global economy contributes to this objective.

The Community Innovation Survey complements other indicators of innovation by providing a regular snapshot of innovation inputs and outputs and the constraints faced by NI businesses in their innovation efforts, across the range of industries and business enterprises. It has the additional benefit of providing the basis for some comparisons with other European countries.

The 2005 survey sampled enterprises with 10 or more employees in sections C to K of the Standard Industrial Classification (SIC) 2003, and with 1,359 of the 2,562 enterprises selected responding, the survey had a 53 per cent response rate. In order to be representative, the responses have been weighted back to the sample population and this is reflected in the results shown throughout the publication.

INNOVATION ACTIVITY

Innovation takes place through a wide variety of business practices. The majority of the survey is concerned with innovation through new and improved products and processes and with the investments that develop and implement them. Table 1 shows the proportion of enterprises that actively innovate, broken down by the components that feed into the definition of innovation activity for this publication.

Fifty-six per cent of NI businesses were innovation active during 2002-04, compared to 57 per cent in the UK. Twenty-one per cent of NI enterprises introduced innovations to their products (goods and/or services), which was slightly lower than the comparable UK figure of 25 per cent. However, a slightly higher proportion of NI enterprises were process innovators (19 per cent) when compared to the entire UK (16 per cent). As was the case at a UK level, large enterprises with 250 or more employees were more likely to engage in each of the components of innovation activity.

Innovation by size of business

While 67 per cent of large enterprises engaged in at least one of these components, the comparable figure for small and medium-sized enterprises (SMEs¹) was 11 percentage points lower (56 per cent) over the period. The difference in innovation levels between SMEs and large enterprises is most marked when examining the proportion of firms that use new or significantly improved methods for the production or supply of goods and services (process innovators). Over two fifths (43 per cent) of large enterprises are process innovators, while less than one fifth (19 per cent) of SMEs process innovate.

¹ SMEs are defined here as having 10-249 employees. They may be part of an enterprise group.

Innovation by industry type

The proportion of firms reported to be innovation active also varied considerably across industrial and commercial sectors, with 63 per cent of respondents in the production and construction sector (SIC 2003 sections C-F) being innovation active compared with 52 per cent of enterprises in the distribution and services sector (SIC 2003 sections G-K).

Enterprises that were innovation active, by type of activity, 2002-04

Table 1 Percentage of all enterprises

	SIZE OF ENTERPRISE		
	SMEs	Large	All
Innovation active	55.7	66.6	55.9
Product innovator	20.2	37.6	20.6
Process innovator	18.9	43.2	19.4
Innovation-related expenditure	54.1	65.3	54.4
Ongoing or abandoned activities	6.2	14.0	6.4

Innovation by region

Fifty-six per cent of NI enterprises were classed as being innovation active during 2002-04. This is similar to the comparable UK proportion (57 per cent) as published by DTI in its March 2006 Economic Trends article.

Figure 1 shows the relative lack of variation in the levels of innovation activity among enterprises in the countries and regions of the UK.

Regional innovation patterns

Figure 1 Mean percentages



COMPARISONS WITH THE 2001 SURVEY

The sectoral coverage of the Innovation Survey in 2005 was widened considerably from the 2001 survey, and included a larger proportion of service sector enterprises. If the additional sectors are excluded from the 2005 results, then 63 per cent of

the remaining enterprises are innovation active. The comparable UK proportion is 62 per cent. The level of innovation activity for Northern Ireland enterprises reported from the 2001 survey (with a reference period of 1998-2000) was 46 per cent - this, however, should be taken in the context of the changes in the definition of innovation activity between the two surveys, and the fact that the 2001 survey sampled relatively few Northern Ireland-based enterprises.

FACTORS IMPACTING ON INNOVATION

The survey asked about a range of constraints that enterprises might perceive as limiting their ability to innovate. Cost factors were most commonly regarded as significant barriers to innovation among NI and UK enterprises. Indeed, 14 per cent of responding NI SMEs and large enterprises cited 'Direct innovation costs too high' as being a highly important constraint on innovation. It is of interest to note that NI and UK enterprises engaged in innovation activity were more likely to perceive barriers to be of high importance when compared to non-innovators.

Enterprises were also asked to apply a degree of importance to the effect of product and/or process innovations introduced during 2002-04. Product-related effects were considered to be of particularly high importance, with the 'improved quality of goods or services' being considered highly important by almost two fifths (39 per cent) of innovation active NI respondents and one third (34 per cent) of UK respondents.

Innovation activity

2

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 achievement (the introduction of new or improved products and/or processes). This section reports on the types and levels of innovation activity over the three-year period, 2002-2004².

We define innovation activity here as whether enterprises were engaged in any of the following:

- introduction of new or significantly improved products (goods and/or services) or processes;
- innovation projects not yet complete or abandoned; or
- expenditure in areas such as internal research and development, training, acquisition of external knowledge or machinery and equipment linked to innovation activities.

Enterprises that were innovation active, by type of activity, 2002-04

Table 2 Percentage of all enterprises

	SIZE OF ENTERPRISE		
	SMEs	Large	All
Innovation active	55.7	66.6	55.9
Product innovator	20.2	37.6	20.6
Process innovator	18.9	43.2	19.4
Innovation-related expenditure	54.1	65.3	54.4
Ongoing or abandoned activities	6.2	14.0	6.4

Overall, 56 per cent of NI enterprises were classed as being innovation active during this period compared to 57 per cent in the UK. Large enterprises with 250 or more employees were more likely to engage in some sort of innovation activity, with 67 per cent innovation active, as opposed to 56 per cent of SMEs. This was even more marked at a UK level (72 per cent among large enterprises compared to 57 per cent among SMEs).

Twenty-one per cent of NI enterprises introduced innovations to their products (goods and/or services), which was slightly lower than the comparable UK figure of 25 per cent. However, a slightly higher proportion of NI enterprises were process innovators (19 per cent) when compared to the entire UK (16 per cent). The level of product and process innovation was considerably greater in large firms.

Fifty four per cent of NI and UK enterprises had some innovation-related expenditure, showing that firms recognise the need to allocate resources to innovation. Six per cent of NI enterprises (10 per cent at a UK level) had projects during the period to develop product or process innovations that had either to be abandoned or were ongoing at the end of 2004.

The percentage of firms reported to be innovation active varied considerably across industrial and commercial sectors as shown in Table 3. A larger proportion of respondents in the production and construction sector (63 per cent) were innovation active compared to those in the distribution and services sector (52 per cent).

While SMEs and large enterprises in the distribution and services sector had relatively similar levels of innovation activity, large enterprises in the production and construction sector were considerably more active.

² Throughout this report, all results are grossed up to the business population.

Innovation activity by industry

Table 3 Percentage of all enterprises

	SIZE OF ENTERPRISE		
	SMEs	Large	All
Production and Construction Sector	62.5	87.2	63.2
Manufacturing	72.0	88.7	72.7
Mining and Quarrying	51.9	-	51.9
Construction	D	D	51.4
Electricity, gas and water supply	D	-	D
Distribution and Services Sector	52.3	54.3	52.3
Real estate, renting and business activities	73.6	66.7	73.3
Financial intermediation	D	D	69.7
Transport, storage and communication	55.1	-	55.1
Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	46.5	40.9	46.4
Hotels and restaurants	40.5	37.5	40.5
ALL INDUSTRIES	55.7	66.6	55.9

Key

D = disclosive figures.

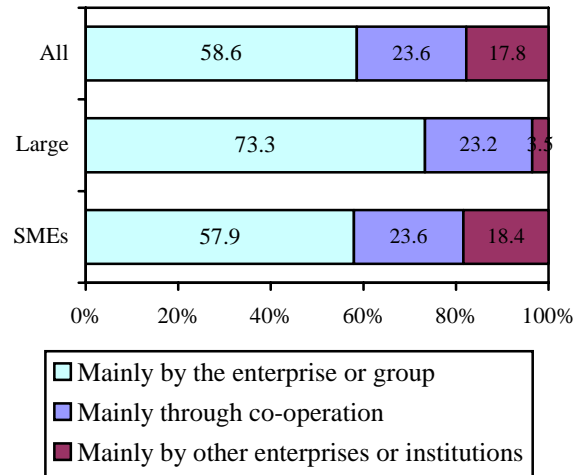
- = no enterprises responded in this sector/size group.

PRODUCT AND PROCESS INNOVATION

Firms stating that they had introduced new or significantly improved products or processes were asked whether these had been developed mainly by the enterprise or enterprise group, mainly through co-operation with other enterprises or institutions, or mainly by other enterprises or institutions. Most such innovation was reported to have been developed internally, for both products and processes, however this was most noticeable among large enterprises that product innovated. Results are summarised in Figures 2 and 3.

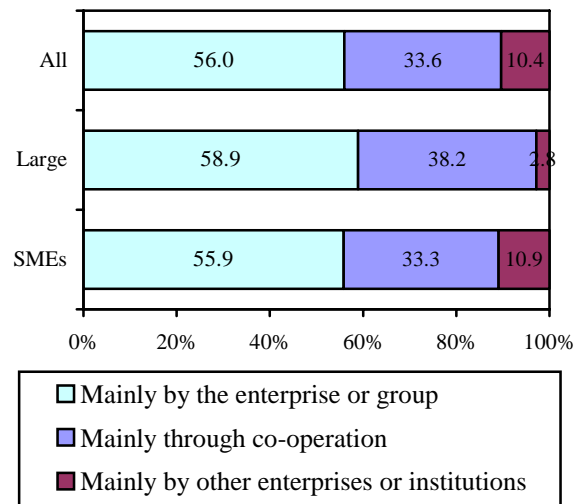
How product innovations were developed

Figure 2 Percentage of product innovators



How process innovations were developed

Figure 3 Percentage of process innovators



Constraints on innovation

3

Successful and evidence-based policy interventions require an understanding of the barriers to business innovation. These barriers can be internal obstacles that the enterprise encounters while carrying out innovation activities as well as external factors preventing innovation.

The survey asked about a range of constraining factors and their effect on the ability to innovate. Table 4 shows the proportion of respondents who gave a 'high' rating to each category of constraint.

Cost factors were most commonly regarded as significant barriers to innovation among NI and UK enterprises. This was particularly true with regards to the direct costs of innovation being too high (14 per cent of NI respondents associated a high degree of importance to this, compared to 15 per cent of UK respondents). The impact of UK and EU regulations was also thought to be a barrier to innovation, particularly for smaller enterprises. Fewer enterprises felt highly constrained by a lack of knowledge.

Enterprises regarding potential barriers to innovation as 'high'

Table 4

Percentage of respondents

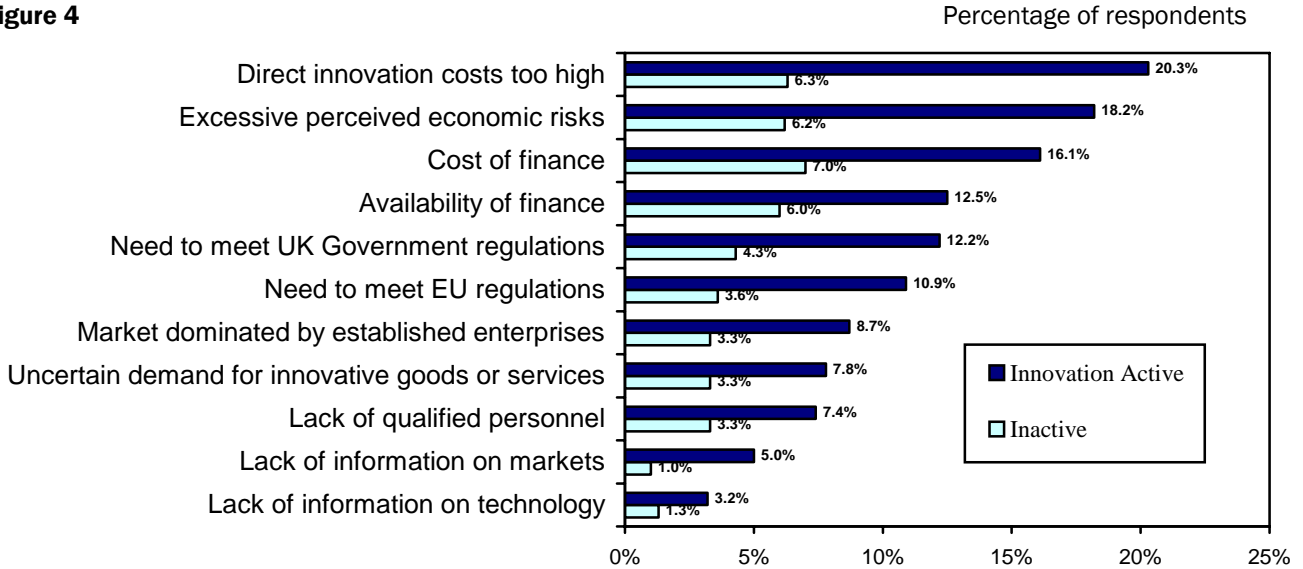
BARRIER		SIZE OF ENTERPRISE		
		SMEs	Large	All
Cost Factors	Direct innovation costs too high	14.2	14.2	14.2
	Excessive perceived economic risk	13.0	13.1	13.0
	Cost of finance	12.2	7.7	12.1
	Availability of finance	9.6	10.2	9.7
Knowledge Factors	Lack of qualified personnel	5.6	6.1	5.6
	Lack of information on markets	3.3	2.7	3.3
	Lack of information on technology	2.4	1.4	2.4
Market Factors	Market dominated by established enterprises	6.4	6.4	6.4
	Uncertain demand for innovative goods or services	5.9	4.0	5.9
Other Factors	Need to meet UK Government regulations	8.8	5.8	8.7
	Need to meet EU regulations	7.7	6.8	7.7

As shown in Figure 4, across all these categories, those enterprises engaged in innovation activity were more likely to perceive barriers as being highly important compared to those who did not attempt to

innovate. This was also true at a UK level. This suggests that businesses 'learn' about the severity of barriers to innovation as a result of their attempts to innovate.

Enterprises regarding potential barriers to innovation as 'high'

Figure 4

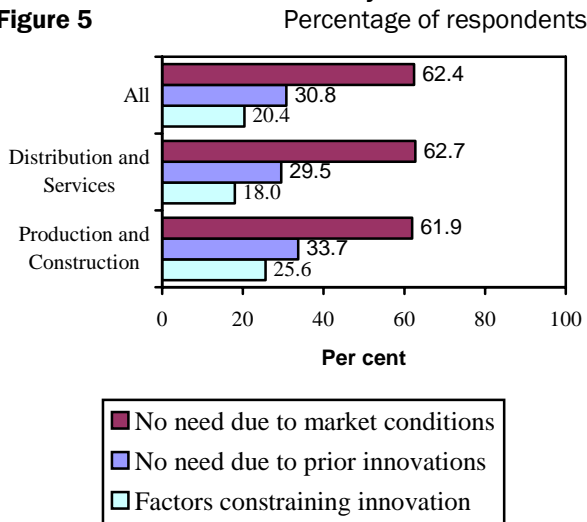


REASONS FOR NO INNOVATION

Enterprises were asked if they had no innovation activity during 2002-2004, to indicate why it had not been necessary or possible to innovate. Results for the production and construction, and distribution and services sectors are shown in Figure 5

Reason for no innovation activity

Figure 5



Effects of innovation

4

The survey sought information about the direct and indirect effects of innovation. Establishing the nature and extent of the benefits arising from innovation activity can help inform businesses of the potential commercial value of such activity. Respondents were asked to rank a number of effects arising from their innovation activities on a scale from 'no impact', through 'low', 'medium' or 'high' impact. The proportion of innovation active respondents who answered 'high' in each category is shown in Table 5.

Product-related effects were more often cited than process (cost) effects at both an NI and UK level. Almost two fifths (39 per cent) of NI and one third (34 per cent) of UK respondents rated the improved quality of goods or services as highly important,

confirming a strongly customer-focused approach to innovation. The effects of meeting regulatory requirements and increasing value added in the business were also widely reported.

The least cited impacts in NI and the UK were reduced environmental impacts or improved health and safety. For large enterprises in NI, their innovation activities had most impact on reducing costs per unit produced or service provided, almost double the impact for SMEs. The most marked effect for SMEs in NI, and SMEs and large enterprises in the UK, was the improved quality of goods or services arising from innovation.

Enterprises rating effects of innovation as 'high'

Table 5

Percentage of innovation active respondents

EFFECT		SIZE OF ENTERPRISE		
		SMEs	Large	All
Product-related	Improved quality of goods or services	39.3	41.7	39.4
	Entered new markets or increased market share	26.5	44.9	27.0
	Increased range of goods or services	25.5	35.4	25.8
Process-related	Reduced costs per unit produced or service provided	25.1	49.3	25.8
	Improved flexibility of production or service provision	23.7	29.3	23.8
	Increased capacity for production or service provision	22.3	28.1	22.5
Other	Met regulatory requirements	29.0	46.2	29.5
	Increased value added	28.4	32.7	28.5
	Reduced environmental impacts or improved health and safety	20.7	33.3	21.1

Sources of information and co-operation for innovation

5

It is important to know how enterprises relate to external sources of technology and other innovation-related knowledge and information, as innovation is increasingly complex, requiring the co-ordination of multiple inputs. Firms can gain guidance, advice or even inspiration for their prospective innovation projects from a variety of both public and private sources.

Respondents were asked to rank a number of potential information sources on a scale from 'no relationship' to 'high importance'. The proportion who answered 'high' in each category is shown in Table 6. These sources are:

- **Internal:** from within the enterprise itself or from within the enterprise group;
- **Market:** from suppliers, customers, clients, consultants, competitors, commercial laboratories or research and development institutes;
- **Institutional:** from the public sector such as government research organisations and universities; or

- **Other:** from conferences, trade fairs and exhibitions, scientific journals and trade/technical publications, professional and industry associations or technical, industry or service standards.

SMEs and large enterprises in NI and the UK reported internal and market sources as most important for information on innovation. This suggests that enterprises tend to rely on their own experience and knowledge coupled with information from suppliers, customers and clients.

Almost 24 per cent of NI, and 27 per cent of UK respondents felt that clients or customers were a highly important source of information. Most of the market sources of information were considered of relatively high importance. The institutional sources were considered to be less highly important among NI and UK enterprises.

Enterprises rating information sources as of 'high' importance

Table 6

INFORMATION SOURCE		Percentage of respondents		
		SIZE OF ENTERPRISE		
		SMEs	Large	All
Internal	Within the enterprise or enterprise group	19.1	36.5	19.5
Market	Clients or customers	23.8	29.0	23.9
	Suppliers of equipment, materials, services or software	13.5	21.8	13.7
	Competitors or other enterprises in the industry	9.8	15.1	9.9
	Consultants, commercial laboratories or private research and development institutes	2.5	3.4	2.5
Institutional	Universities or other higher educational institutes	2.1	2.7	2.1
	Government or public research institutes	1.0	1.4	1.1
Other	Conferences, trade fairs and exhibitions	6.6	8.0	6.6
	Technical, industry or service standards	5.5	13.1	5.7
	Professional and industry associations	4.9	6.5	5.0
	Scientific journals and trade/technical publications	3.3	3.7	3.3

INNOVATION CO-OPERATION

Eight per cent of enterprises had co-operation arrangements on innovation activities and, of these, 85 per cent had agreements that operated at a local/regional level. This was 20 percentage points higher than the proportion of UK collaborators co-operating at a local/regional level (65 per cent), with UK enterprises likelier to co-operate on a UK level (69 per cent compared to 51 per cent among NI

enterprises with co-operation arrangements). The most frequent partners for co-operation among NI (and UK enterprises), as shown in Table 7, were suppliers (78 per cent of NI and 76 per cent of UK enterprises with co-operation agreements) followed by clients or customers (NI: 71 per cent; UK: 74 per cent). Just over one third of collaborators included universities among their partners, indicating that this is the least likely co-operation arrangement in NI.

Partners for innovation co-operation

Table 7

Percentage of those enterprises with co-operation arrangements

TYPE OF PARTNER	GEOGRAPHY OF CO-OPERATION				
	Local/Regional within the UK ³	UK ⁴	Other Europe	All other countries	Any
Suppliers of equipment, materials, services, or software	39.6	35.3	21.1	8.0	77.6
Clients or customers	51.4	23.3	17.0	9.8	71.2
Other enterprises within enterprise group	34.1	7.0	4.1	6.0	46.7
Competitors or other enterprises in your industry	31.2	15.7	6.2	4.4	45.6
Consultants, commercial labs, or private R&D institutes	26.7	15.7	2.8	4.6	40.3
Government or public research organisations	33.1	10.9	2.3	2.8	38.3
Universities or other higher education institutes	30.9	10.5	5.6	3.7	35.7
Any	85.1	50.9	35.2	16.7	100.00

³ Within approximately 100 miles of the enterprise.

⁴ Within the UK but more than 100 miles away from the enterprise.

Wider forms of innovation

6

Innovation is not wholly about the development or use of technology or other forms of product or process change. Enterprises can also change their behaviour or business strategies to make themselves more competitive, often in conjunction with product or process innovation but also as an independent means of improving competitiveness.

Enterprises were asked whether they had made major changes to their business structure and practices in the three-year period 2002 to 2004. Headline results are summarised in Table 8.

As might be expected, for NI and UK respondents, a noticeably greater proportion of large firms engaged in one or more of these changes (NI: 54 per cent of large enterprises compared to 26 per cent of SMEs; UK: 58 per cent of large enterprises compared to 32 per cent of SMEs). A change in marketing strategy was most commonly reported among NI enterprises, with a change in corporate strategy least often reported.

Enterprises that introduced wider forms of innovation

Table 8 Percentage of respondents

	SIZE OF ENTERPRISE		
	SMEs	Large	All
Wider innovator (any of changes below)	25.6	53.9	26.2
Change in marketing strategy	16.3	33.3	16.7
New organisational structures	13.2	31.9	13.6
Advanced management techniques	13.0	32.5	13.5
Change in corporate strategy	12.7	30.2	13.1

Regional variation and historical changes



Figure 6 shows the distribution of innovation active businesses across the countries and regions of the UK. There is very little variation in the proportion, ranging from 55 per cent in Eastern England and the West Midlands to 60 per cent in South East England.

Regional innovation patterns

Figure 6

Mean percentages



COMPARISONS WITH THE 2001 INNOVATION SURVEY

Comparisons can be made with the 2001 Innovation Survey, which measured innovation over the period 1998-2000. The sectoral coverage of the Innovation Survey in 2005 was widened considerably to include a larger portion of the service sector. The estimates presented below adjust for this by excluding data from the additional sectors introduced in the 2005 survey⁵.

⁵ These are: sale, maintenance and repair of motor vehicles, retail trade, hotels and restaurants. Other differences between the surveys, such as in the sample design and weighting methodology, are not accounted for.

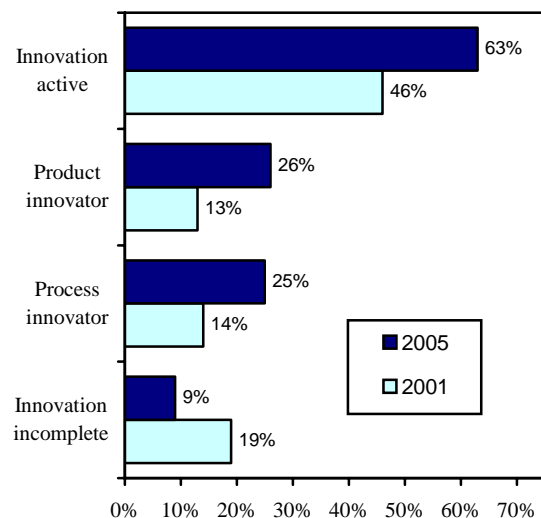
Using this more restricted but comparable sector coverage, the proportion of innovation active enterprises in the 2005 survey is around 63 per cent (62 per cent among UK enterprises), an increase of 17 percentage points on the NI results reported in 2001. This includes an eighteen percentage point increase, to 63 per cent, for SMEs and a 3 percentage point increase to 79 per cent for larger enterprises. The proportion of enterprises reporting product innovation increased by 13 percentage points and the proportion reporting process innovation increased by 11 percentage points. It should be noted, however, that there were changes in the definition of innovation activity between the two surveys.

Figure 7 compares results for the two surveys.

Comparisons of 2001 and 2005 Innovation Surveys: proportions of innovating enterprises

Figure 7

Percentages



Background Notes for Innovation Survey 2005



METHODOLOGY

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 fourth iteration of the survey (CIS 4) – CIS 3 was carried out in 2001 and the results form part of various EU benchmarking exercises (see www.cordis.europa.eu/int/en/home.htm).

The UK Innovation Survey 2005 surveyed over 2,500 enterprises in NI. The survey was voluntary and conducted by means of a postal questionnaire.

COVERAGE AND SAMPLING

The 2005 survey covered enterprises with 10 or more employees in sections C to K of the Standard Industrial Classification (SIC) 2003, including some SIC divisions excluded from the 2001 survey: sale, maintenance and repair of motor vehicles (SIC 50); retail trade (SIC 52); and hotels and restaurants (SIC 55).

The sample was drawn from the ONS Inter-Departmental Business Register (IDBR) in December 2004.

The methodology, sample details and first UK-level findings from CIS 4 can be found on the DTI website at:

www.dti.gov.uk/innovation/innovation-statistics/cis/page10957.html

RESPONSE AND WEIGHTING

The questionnaires from the initial survey were distributed on 31 March 2005. Enterprises not responding received written reminders in mid-May and mid-June with the second reminder also including a copy of the questionnaire. Finally, around 1,000 non-responding enterprises were contacted by telephone in an effort to further boost response rates.

Of the 2,562 enterprises selected, 1,359 valid responses were received, to give a response rate of 53 per cent. The population and achieved sample are summarised in Table 9 below.

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, that is, the weight attributed to each enterprise was the number of enterprises in the population divided by the number of responses in that stratum.

Please note that as with all sample surveys, the estimates provided in this publication are subject to an associated degree of sampling error.

Summary of sample frame

Table 9 Number of enterprises

ENTIRE NI POPULATION			SIZE OF ENTERPRISE		
SMEs	Large	All	SMEs	Large	All
6,718	172	6,890	1,278	81	1,359

FURTHER INFORMATION

Further information is available on request from:

**Department of Enterprise, Trade & Investment
Statistics Research Branch
Room 110
Netherleigh
Massey Avenue
Belfast BT4 2JP**

Telephone: (028) 9052 9385 or 9052 9897

Fax: (028) 9052 9459

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Website: www.statistics.detini.gov.uk