

UK results from the 2nd Community Innovation Survey

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Introduction

The important role that technological innovation plays in the economy is now widely recognised. The aim of the European Community Innovation Survey was to gather up-to-date information on the extent and characteristics of technological innovation activity in enterprises both in UK and other European countries. The survey also asked about organisational and management change.

The UK survey was conducted by the Office for National Statistics on behalf of the DTI. This article describes some initial survey results and will be followed by a more detailed report in early 1999. Requests for further results and more general queries on the survey should be made to Marc Thomas at the Department of Trade and Industry (0207 215 1911). Results at a European level are expected next year.

The survey was voluntary and conducted by means of a postal questionnaire. The fieldwork took place between August 1997 and March 1998 and the reference period for the survey was 1994 to 1996. The survey covered enterprises in the United Kingdom with more than 10 employees. The sample was drawn from commercial enterprises in most of the economy: see Annex A for more details. We are very grateful to the organisations and enterprises who responded to the survey.

Results

The results in this article are based on weighted survey data and are therefore representative of the target population. Many of the results are shown by size of enterprise. The split used is between Small and Medium Sized Enterprises (SMEs) - enterprises which have fewer than 250 employees - and larger enterprises with 250 employees or more. It should be noted that around 95 per cent of enterprises in the population covered by the survey are SMEs.

The average in the following tables refers to the *median* rather than the mean. This is because some analyses produce outlying values which influence the mean considerably and may obscure the central message of the data.

The extent of technological innovation is shown first, followed by the employment growth of innovating enterprises. The introduction of new management or organisational practices and the scale of involvement in technological innovation activities are then examined. The objectives of innovation, the sources of information used, the extent of co-operation and, finally, the use of government schemes are discussed. A description of the methodology is at Annex A.

Innovators

The survey sought to identify the extent and type of innovation carried out by enterprises. An innovator is defined (in this article) as an enterprise that introduced any technologically new or improved products, processes or services between 1994 and 1996.

Overall, 52 per cent of all enterprises were innovators (*table 1*). Large enterprises were more likely to innovate than SMEs. This was particularly true in the manufacturing sector where 83 per cent of large enterprises, but only 48 per cent of SMEs, were innovators. Taking both size groups together, the share of enterprises who innovated was broadly similar in both manufacturing and services.

	<i>Percentages</i>		
	SMEs	Large Enterprises	All
Manufacturing	48	83	50
Services	54	58	54
<i>Overall</i>	52	74	52

Novel innovators

The survey also asked about the introduction of products, processes or services which were completely new to the market place. Enterprises introducing these are termed 'novel' innovators and overall, accounted for 9 per cent of all enterprises. Large firms were approximately three times more likely to be novel innovators than SMEs, while novel innovation was more likely in manufacturing than services.

	<i>Percentages</i>		
	SMEs	Large enterprises	All
Manufacturing	10	33	11
Services	7	23	7
<i>Overall</i>	8	29	9

Enterprise growth

The survey allows a comparison to be made of employment in individual enterprises in 1994 and 1996. Innovators demonstrated considerably higher growth in employment over the period than non-innovators (*chart 1 and table 3*). The average growth in employment amongst innovating enterprises was 12 per cent compared with 3 per cent amongst non-innovators. The difference between innovators and non-innovators was greater in the manufacturing sector.

Chart 1: Average change in number of employees between 1994 and 1996

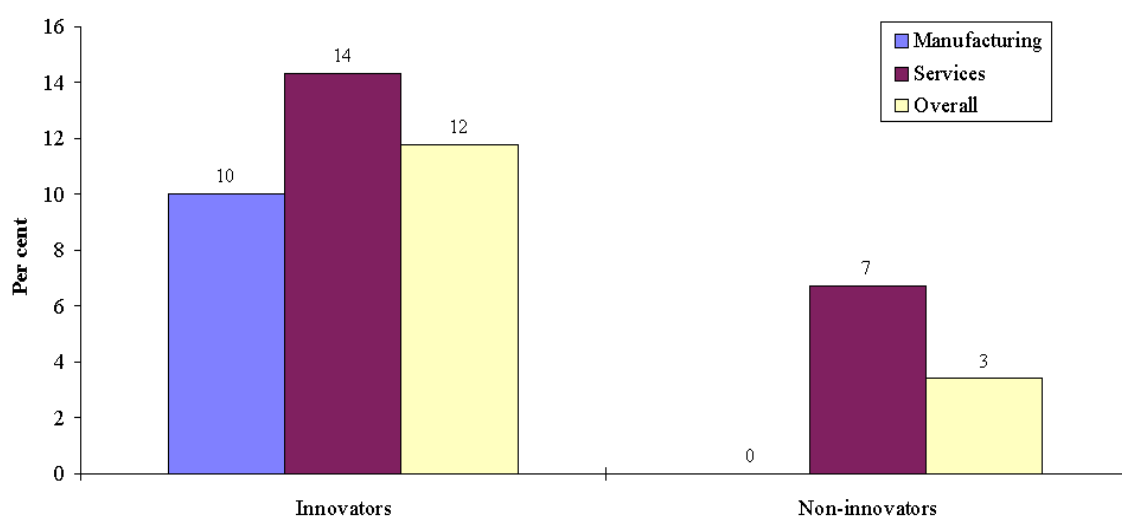


Table 3: Average change in number of employees between 1994 and 1996

	<i>Percentages</i>								
	Innovators			Non-innovators			All enterprises		
	SMEs	Large enterprises	Total	SMEs	Large enterprises	Total	SMEs	Large enterprises	Total
Manufacturing	11	5	10	0	3	0	6	4	6
Services	14	6	14	7	5	7	10	6	10
<i>Overall</i>	<i>13</i>	<i>6</i>	<i>12</i>	<i>3</i>	<i>4</i>	<i>3</i>	<i>8</i>	<i>4</i>	<i>7</i>

Note: Enterprises who were established or altered in size due to a merger between 1994 and 1996 are excluded.

The growth in employment for innovative SMEs was around twice that for large enterprises across both manufacturing and services whereas amongst non-innovators, SMEs and large enterprises showed similar rates of growth.

Management or organisational change

The survey asked about the implementation of a range of modern management techniques and organisational practices. *Chart 2* below (and *table 4*) shows that 43 per cent of innovators but only 28 per cent of non-innovators introduced one or more of these. The most frequently cited innovations were quality management systems, e-mail and the internet.

Chart 2: Proportion of enterprises introducing one or more management or organisational changes between 1994 and 1996

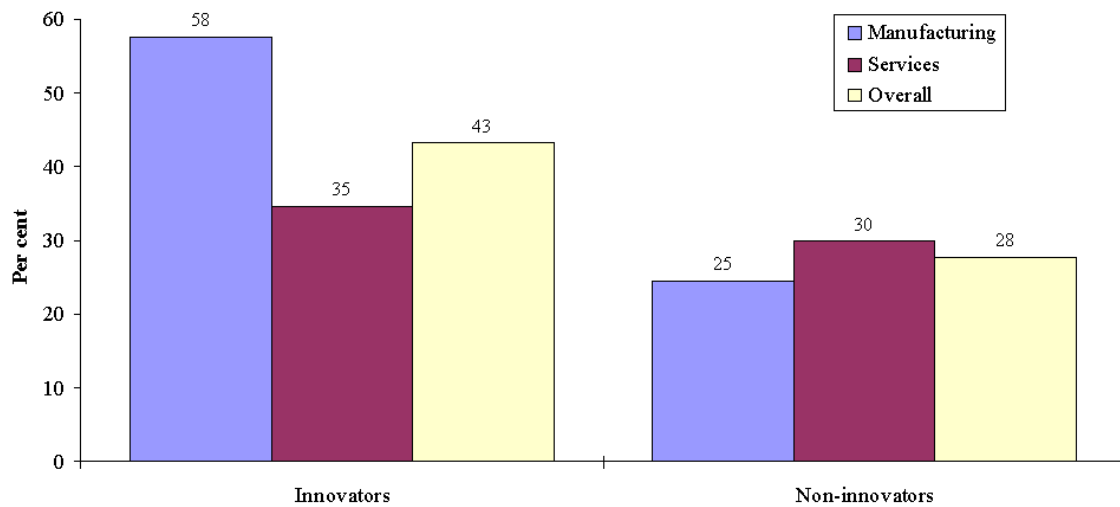


Table 4: Proportion of enterprises introducing one or more organisational or management changes between 1994 and 1996

	Percentages								
	Innovators			Non-innovators			All enterprises		
	SMEs	Large enterprises	Total	SMEs	Large enterprises	Total	SMEs	Large enterprises	Total
Manufacturing	55	83	58	23	78	25	38	82	41
Services	33	94	35	29	77	30	31	87	32
Overall	41	86	43	27	77	28	34	84	36

The introduction of one or more of these innovations was over twice as likely in large enterprises. Amongst innovators, the extent of organisational change in service sector SMEs was noticeably low.

Innovation activities

The survey asked about business activities in the development of new products, processes or services. These activities form the components of technology - knowledge, artefacts and skills - used in innovation. The chart below shows that 25 per cent of all innovators undertook Research and Development (R&D) in 1996. A much higher proportion (42 per cent) of manufacturing than services enterprises (14 per cent) did R&D. The chart also shows that a range of other technological activities were important to the innovation process. Taken together, they are more frequently cited as a source of innovation than R&D expenditures. These other activities include the purchase of capital equipment, external sourcing of technology, industrial design and training linked to technological change.

Chart 3: Proportion of innovators engaging in technological innovation activities in 1996

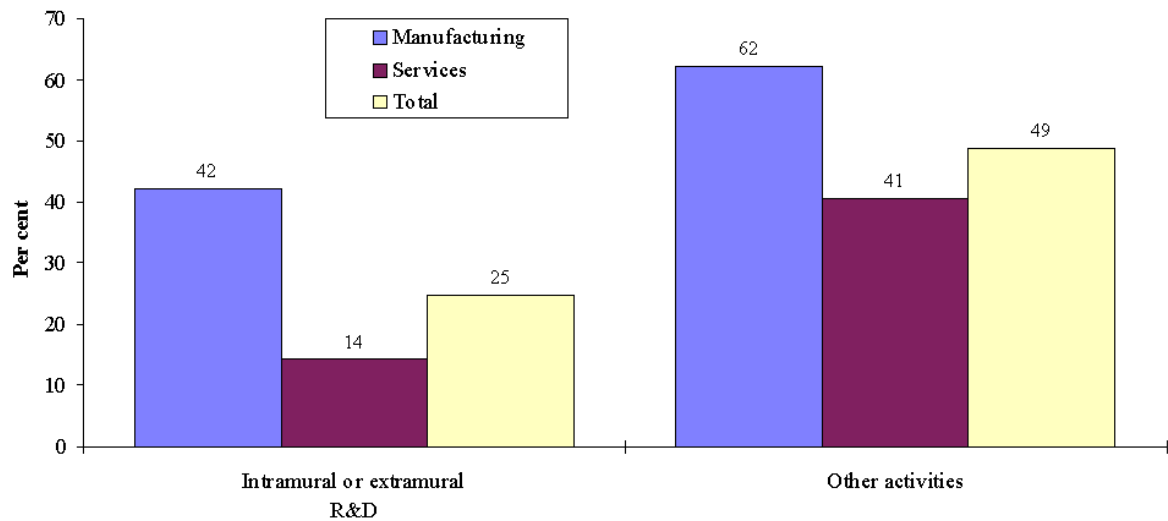


Table 5: Proportion of enterprises engaging in technological innovation activities in 1996

	<i>Percentages</i>					
	Innovators			All enterprises		
	SMEs	Large enterprises	Total	SMEs	Large enterprises	Total
Manufacturing						
Intramural or extramural R&D	39	72	42	18	60	21
Other technological activities	61	75	62	29	62	31
Services						
Intramural or extramural R&D	14	38	14	7	22	8
Other technological activities	39	91	41	21	53	22
All enterprises						
Intramural or extramural R&D	23	62	25	12	46	13
Other technological activities	47	79	49	24	59	26

Objectives

The most important objectives for enterprises engaging in business innovation were related to the market place, with improving product quality the most frequently cited (88 per cent of innovators). This was closely followed by opening up new markets (82 per cent) and extending product range (74 per cent). Reducing labour costs was more important in manufacturing enterprises than in services. Meeting regulations and

standards was also cited as an important innovation objective by nearly 60 per cent of innovators.

	<i>Percentages</i>		
	Manufacturing	Services	Overall
Improve product quality	81	92	88
Open up new markets or increase market share	78	85	82
Extend product range	67	77	74
Reduce unit labour costs	70	57	62
Fulfil regulations, standards	56	57	57

Information sources

Enterprises used a wide range of both technical and commercial information sources to inform their innovation activities (*table 7*). Customers were by far the most important source of information with 76 per cent of innovators rating the source as moderately or very important. Surprisingly, customers were more frequently cited than the enterprise itself (62 per cent of innovators). Direct links with the science base were important to only 10 per cent of innovators (not shown in table).

	<i>Percentages</i>		
	Manufacturing	Services	Overall
Customers	76	77	76
Within own enterprise	62	63	62
Competitors	49	58	55
Suppliers of equipment, materials, components or software	57	49	52
Health and safety regulations	45	32	37
Product standards	45	n/a	n/a

Co-operation

Respondents were asked about their technological co-operation arrangements with other organisations including customers, suppliers, other enterprises in their group and

the science base. Amongst innovators, over 50 per cent of large enterprises engaged in some co-operation arrangements whereas only 17 per cent of SMEs did so.

The most common co-operation arrangements were with other enterprises in their group (11 per cent of innovators) followed by customers, suppliers and competitors. Only 4 per cent of innovators had co-operation arrangements with Higher Education Institutions.

Table 8: Proportion of innovators having co-operation arrangements with other organisations between 1994 and 1996			
	<i>Percentages</i>		
	SMEs	Large enterprises	All
Manufacturing	22	52	25
Services	14	52	15
<i>Overall</i>	<i>17</i>	<i>52</i>	<i>19</i>

Government assistance

The survey asked about enterprises' involvement with Government programmes aimed at encouraging innovation (not all involving financial assistance). Six per cent of all enterprises participated in such programmes, with manufacturing enterprises around three times more likely than services enterprises to have participated in a programme; this reflects the nature of many of these schemes. The most frequently cited support programme - by 3 per cent of enterprises - was Investment Support (eg. Regional Selective Assistance, Regional Investment Grants, etc.).

Chart 4: Proportion of enterprises receiving assistance from innovation-related Government programmes between 1994 and 1996

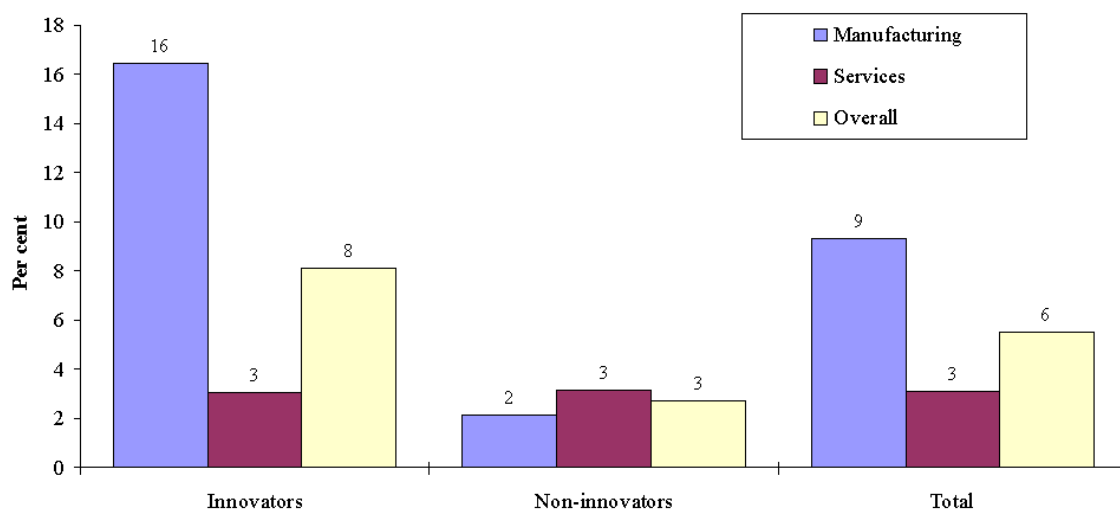


Table 9: Proportion of enterprises receiving assistance from innovation related Government programmes between 1994 and 1996

	<i>Percentages</i>								
	Innovators			Non-innovators			All enterprises		
	SMEs	Large enterprises	Total	SMEs	Large enterprises	Total	SMEs	Large enterprises	Total
Manufacturing	16	24	16	2	2	2	9	21	9
Services	3	12	3	3	3	3	3	8	3
<i>Overall</i>	7	21	8	3	3	3	5	16	6

Annex A - Methodology

The Community Innovation Survey was conducted in the United Kingdom by the Office for National Statistics (ONS) with assistance from the Northern Ireland Department of Economic Development. It was undertaken on behalf of the Department of Trade and Industry (DTI) and the European Commission (Eurostat).

The survey was voluntary and was conducted by means of a postal questionnaire. Fieldwork and reference period. Eurostat proposed a core questionnaire which was supplemented with additional questions provided by the DTI. The questionnaire differed slightly depending on whether it was targeted at manufacturing or service enterprises. Copies of the questionnaires are available from Marc Thomas at the DTI (0207 215 1911) or Peter Jones at the ONS (01633 813063).

Coverage

The sample was drawn from enterprises in the United Kingdom with more than 10 employees in sections C-K of the Standard Industrial Classification (SIC) 92. This includes mining and quarrying enterprises, the whole manufacturing sector and most of the service sector. It (primarily) excludes enterprises in the economy in the following sectors: agriculture; fishing and forestry; public administration and defence; education; and health and social work. The coverage of the UK survey was slightly wider than that proposed by Eurostat.

Sampling

The sampling frame used was the Inter-Departmental Business Register (IDBR). In line with standard ONS practice, the majority of companies supplied data at enterprise level (the smallest combination of legal units which have a certain degree of autonomy within an enterprise group) but a small number of companies supplied data at a less aggregated level.

A stratified random sample was used with a minimum of 5 enterprises selected in each stratum. The sample was stratified by SIC92 2-digit class and by 8 employment size bands. A full census was conducted in strata which contained less than 5 enterprises and in size bands with 1,000 or more employees. The sampling proportions varied between sector and sizeband depending on the size of the strata and the policy interest in the DTI.

Response

At the time of the selection the IDBR held details of around 155,000 enterprises, of which 5,892 were sampled. The final response was 2,344 which, after accounting for enterprises which had ceased trading and those that were established after 1996, gave a response rate of 43.2 per cent). The survey results were weighted to match the sample with the number of enterprises on the IDBR. The population is summarised below.

A non-response analysis was carried out to investigate whether the survey returns were biased in favour of innovators (or non-innovators). This took the form of a simple random sample of 317 of the non-responders. A preliminary analysis of the results of the non-response analysis showed there to be no bias in the returned sample. However, we are collaborating with Eurostat and other countries to investigate this

further and it is possible a method of weighting will be agreed. It is expected that it will not materially affect the raw data for the UK produced in this report.

Table A1: Number of enterprises in the population covered by the survey			
	SMEs	Large enterprises	All
Manufacturing	57,435	3,815	61,250
Services	91,722	2,278	94,000
<i>Overall</i>	<i>149,157</i>	<i>6,092</i>	<i>155,250</i>

This article appeared in the October 1998 edition of Economic Trends, the authoritative official monthly journal of the latest key economic data. Economic Trends is an essential and widely used source for anyone who needs to go beyond the headlines in understanding the latest economic developments. Produced for the Office for National Statistics, Economic Trends is available from the Stationery Office on 020 7873 9090.