

# **International Comparisons of the Third Community Innovation Survey (CIS3)**

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# INTRODUCTION

This report compares recent innovation performance across Europe using results from the Community Innovation Survey (CIS). Some of the comparisons just look at the totals for each country, while others compare the size breakdown or broad sector breakdown for only the largest countries.

## The Survey

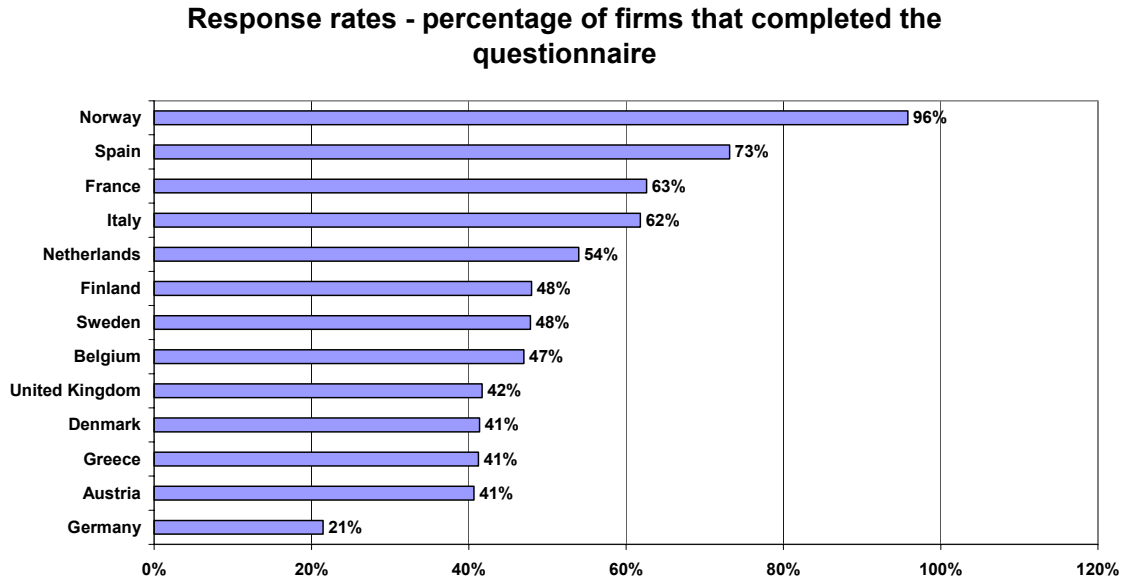
The CIS takes place every 4 years in EU countries to investigate levels of innovation in business. CIS3 was the third iteration of the survey and covered the period 1998–2000. Results were gathered via a postal questionnaire asking questions on topics such as “effects of innovation”, “factors hampering innovation” and “innovation-related expenditure”. The survey goes out to a sample of enterprises in each country. Within each country the sample is designed to be representative of all regions, all industrial sectors and all enterprise sizes.

The source of the data in this report is the Statistical Office of the European Commission (Eurostat), which publishes international comparisons of CIS data on its New Cronos website (<http://europa.eu.int/newcronos/>). Analysis of the EU as a whole can be found at [http://epp.eurostat.cec.eu.int/pls/portal/url/page/PGP\\_MISCELLANEOUS/PGE\\_DOC\\_DETAIL?p\\_product\\_code=KS-59-04-257](http://epp.eurostat.cec.eu.int/pls/portal/url/page/PGP_MISCELLANEOUS/PGE_DOC_DETAIL?p_product_code=KS-59-04-257). Existing analysis of the UK results can be found at: <http://www.dti.gov.uk/iese/ecslis.htm>. Note that there will be some minor discrepancies between the UK figures in the UK reports and this report due to the fact that there are differences between the UK sectoral coverage for CIS3 and the European core sectors. Further details of the UK survey methodology may be found in Annex B of the following report: <http://www.dti.gov.uk/iese/industrial2001.pdf>

## Response rates

Chart 1 shows the response rates by country.

### Chart 1



Key points to note:

- The response rates varied considerably across Europe from 96% for Norway to 21% for Germany.
- The survey was compulsory for Norway, Spain, France, Italy and Sweden but voluntary for all other countries. This explains the exceptionally high response rates for some countries.
- Most countries including the UK achieved a response rate of between 40 and 50 percent, which is quite reasonable considering it was a voluntary survey for most countries.

## Sample Sizes

Table 1 shows the sample sizes and populations of the EU countries that took part in the survey. The population refers to the number of companies in the country from which the sample was chosen.

Table 1

| <b>Country</b>        | <b>Number of firms in the sample</b> | <b>Number of firms in the population</b> |
|-----------------------|--------------------------------------|--|
| <b>Italy</b>          | 29208                                | 157708                                   |
| <b>Spain</b>          | 16101                                | 147872                                   |
| <b>United Kingdom</b> | 15419                                | 89210                                    |
| <b>Germany</b>        | 13642                                | 117979                                   |
| <b>France</b>         | 11208                                | 101040                                   |
| <b>Netherlands</b>    | 9408                                 | 25554                                    |
| <b>Belgium</b>        | 4482                                 | 13827                                    |
| <b>Sweden</b>         | 4266                                 | 16034                                    |
| <b>Portugal</b>       | 4097                                 | 23816                                    |
| <b>Denmark</b>        | 3929                                 | 10254                                    |
| <b>Norway</b>         | 3796                                 | 9316                                     |
| <b>Finland</b>        | 3462                                 | 7698                                     |
| <b>Austria</b>        | 3207                                 | 14488                                    |
| <b>Greece</b>         | 2681                                 | 8968                                     |

Source: spreadsheet compiled for the OECD Oslo Manual revision process

## Interpretation of results

The core questions in the survey are common across countries and based on concepts and definitions laid out in the OECD's Oslo Manual. However, the following important points could affect the accuracy of the data in this report:

- Survey **response rates** varied considerably, from 21% in Germany to 96% in Norway. The low German response in particular gives cause for concern about the reliability of their results.
- Differences in **interpretation of questions** are likely. For example, questions about the impact of changes to business structure and practices, such as significantly changed marketing concepts/strategies, on firms' performance are likely to be interpreted differently in 11 different languages;
- Results are based on responses from a sample of firms. The sample is chosen to be representative of the population as a whole, but there is still an **element of uncertainty** attached to the estimates not accounted for in the presentation. As a result, it is likely that **perceived small differences in results between countries are not statistically significant**;
- There are still some **methodological differences** across countries. Not all countries use an official business register to draw their sample and different methods are applied to treat missing values;
- Figures are **weighted** to be representative of the population of firms from which they were selected. Each firm's response is given an equal weight, and hence overall figures will be heavily influenced by SME responses (especially for the UK, where SMEs dominate the population).

Given the above points, we cannot be too confident about the accuracy or precision of the international comparisons. They do, however, help to give an indication of recent innovation performance across Europe.

Throughout this report:

- "total industry" includes:
  - manufacturing
  - mining & quarrying
  - electricity, gas and water supply
- "services" includes:
  - wholesale and retail trade
  - repair and sale of motor vehicles, motorcycles and personal and household goods
  - transport, storage and communication
  - financial intermediation
  - real estate, renting and business activities
- enterprise size:
  - "Small" = 10-49 employees
  - "Medium" = 50-249
  - "Large" = 250+

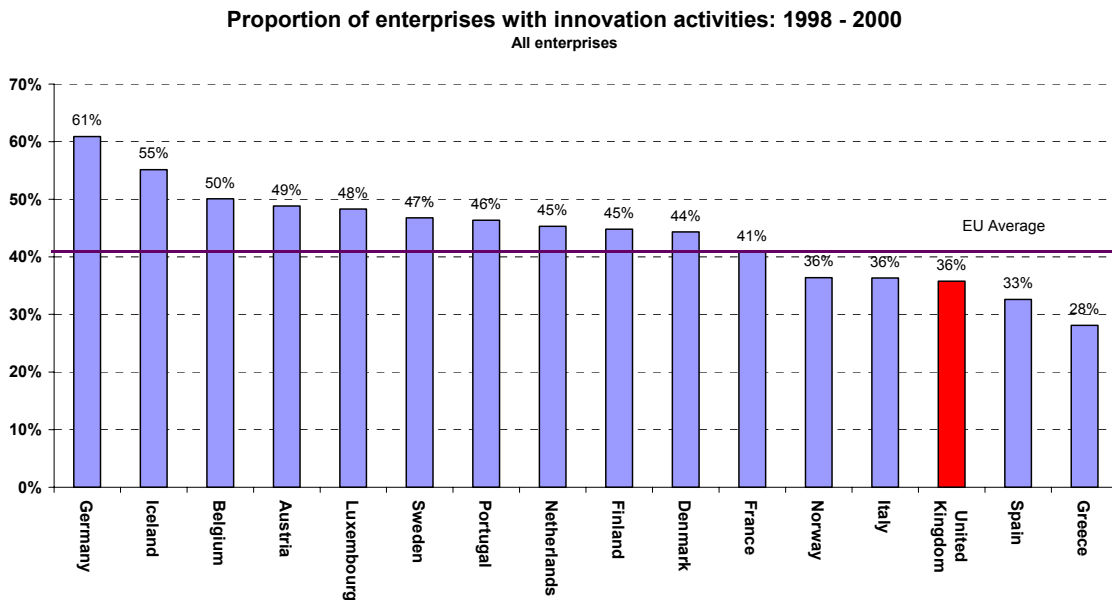
# Results

## Innovation Activity

Chart 2a shows the proportion of enterprises with innovation activities (sometimes referred to as the proportion of innovation active firms). “Innovation active” here indicates that the firm reported the introduction of a new product or process and/or had innovation activities that were incomplete or abandoned in the period 1998-2000.

Charts 2b and 2c show the size and sector breakdowns.

Chart 2a



Key points to note:

- This indicator gives a measure of firms’ propensity to engage in innovation activity, be it through the introduction of a new product to the market or the implementation of a new means of production or supply of goods and services.
- The UK has a relatively small proportion of enterprises with innovation activities with 36%.
- Germany has the highest proportion of enterprises with innovation activities with 61% and is a long way ahead of its main competitors, although this may in part be a reflection of the different sample structure used in Germany.

Chart 2b

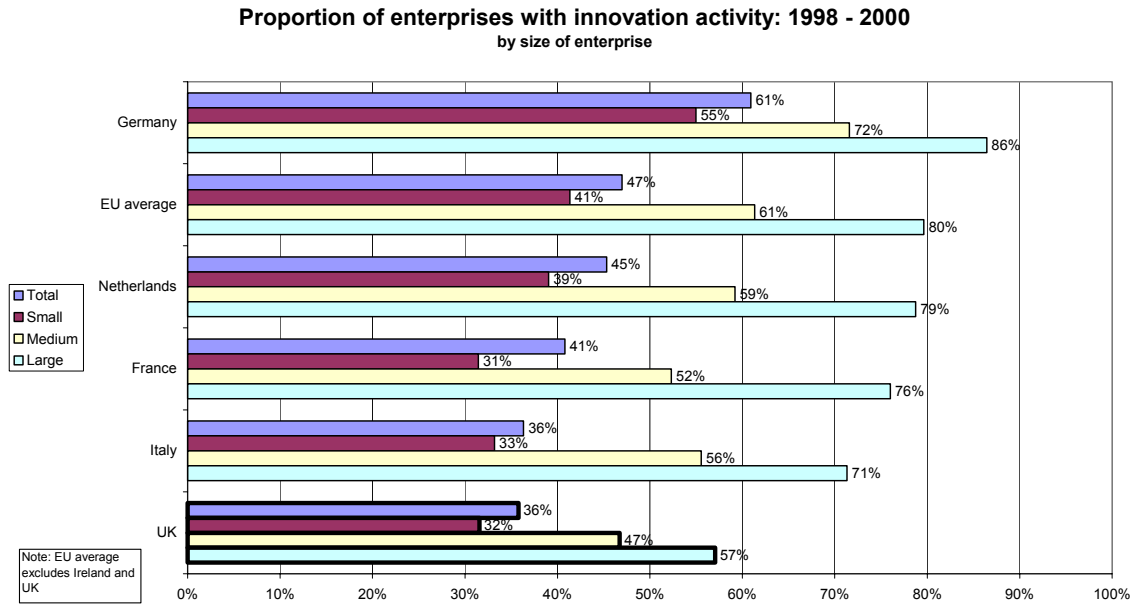
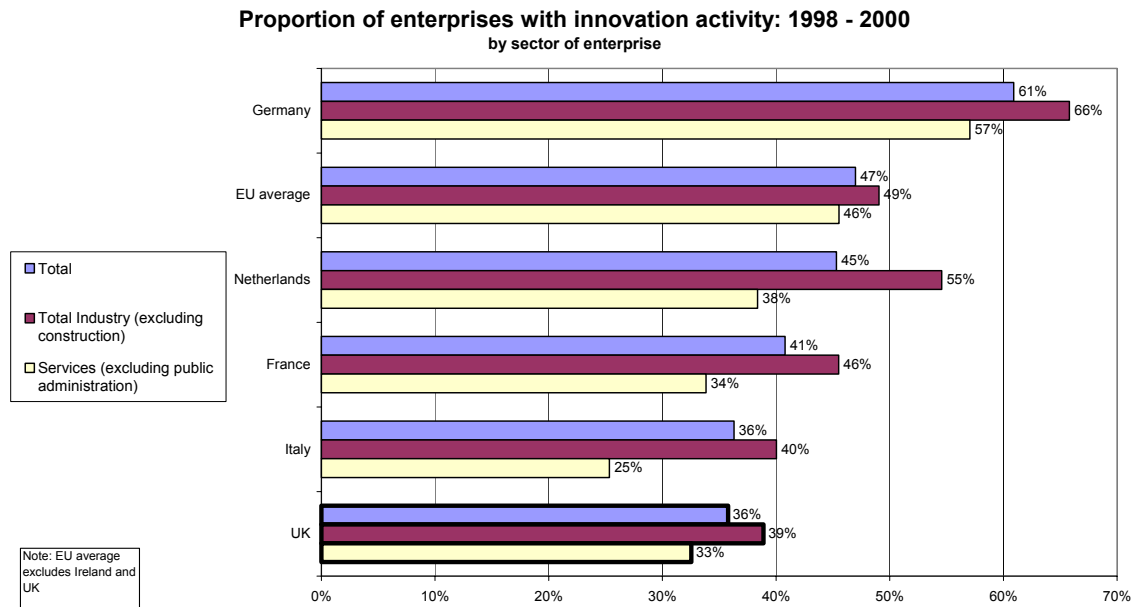


Chart 2c

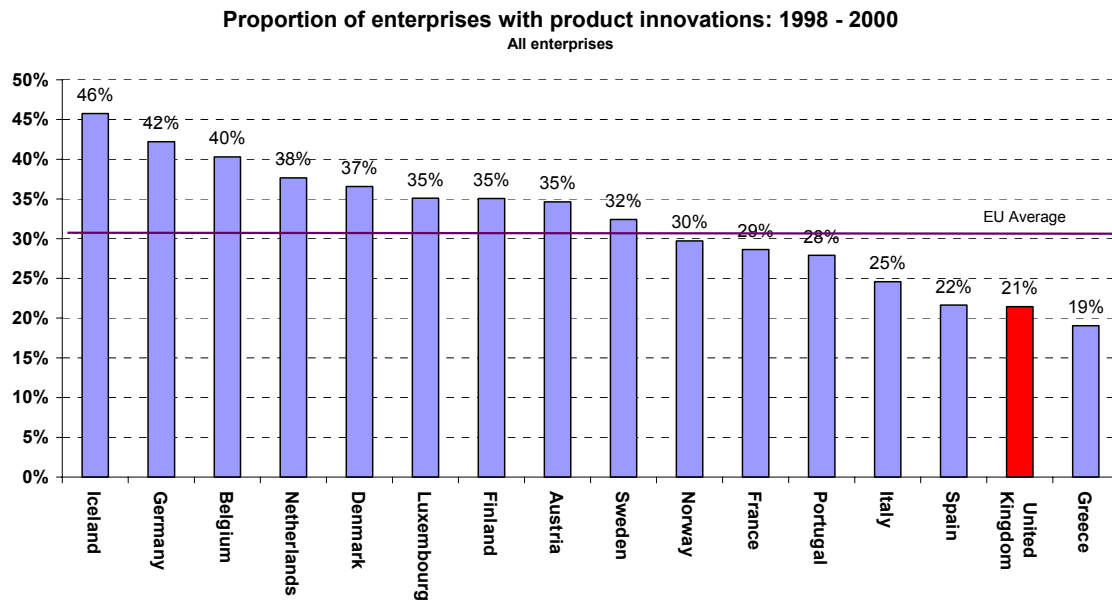


## Product Innovation

Chart 3a shows the proportion of enterprises in each country that were product innovators. Product innovators are firms that reported the introduction of new or significantly improved goods or services in the 3-year period 1998 - 2000.

Charts 3b and 3c show the size and sector breakdowns.

Chart 3a



Key points to note:

- This indicator gives a measure of firms' propensity to introduce new or significantly improved products (goods or services). It includes those firms that introduced products that were already available on the market.
- Iceland has the highest proportion of product innovators with 46%.
- The UK has a very low proportion of product innovators with 21% - only Greece is lower with 19%.

Chart 3b

Proportion of enterprises with product innovations: 1998 - 2000  
by size of enterprise

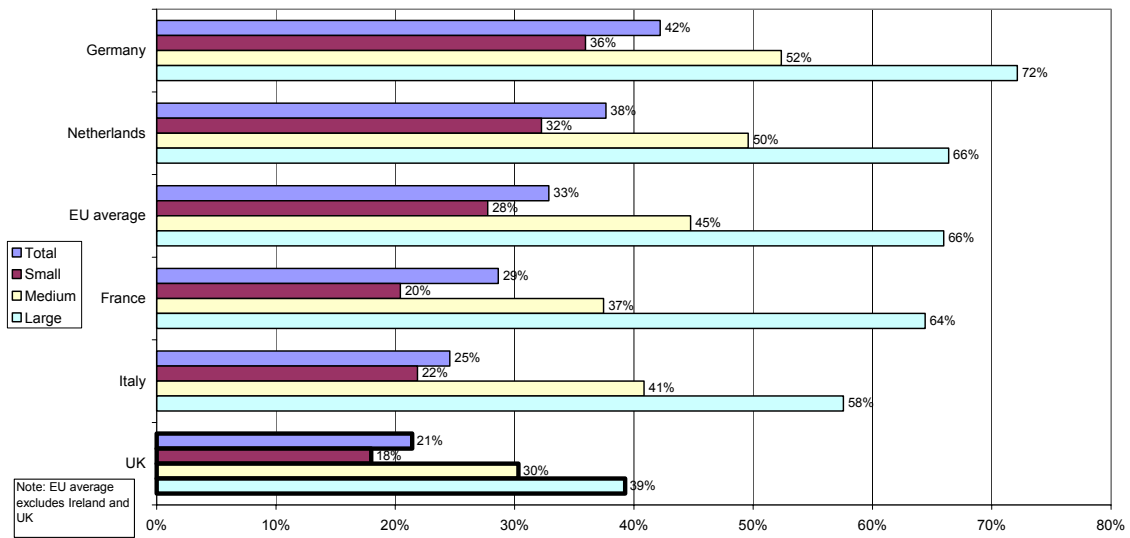
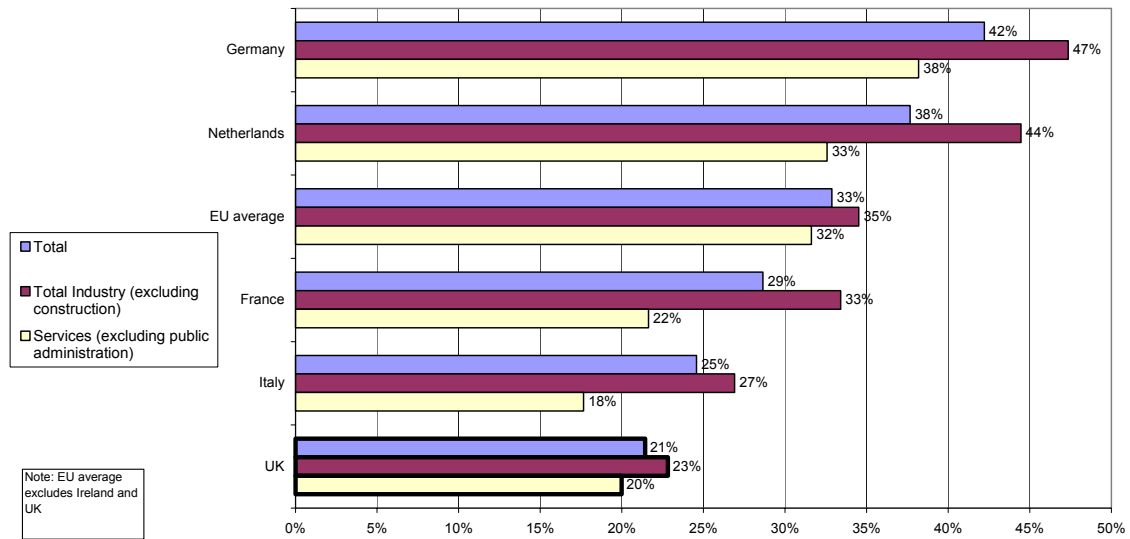


Chart 3c

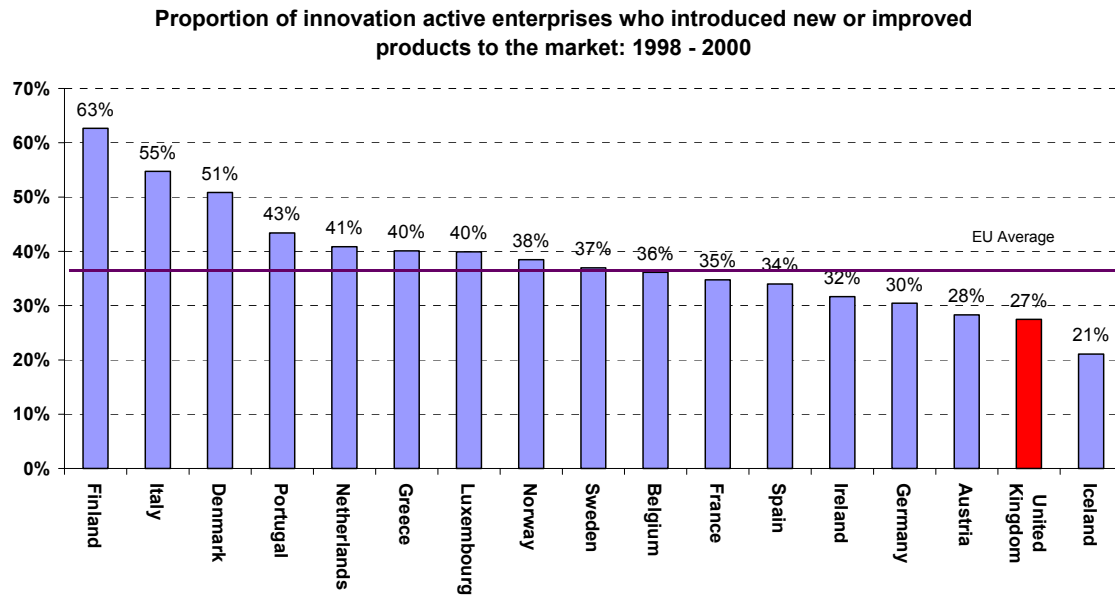
Proportion of enterprises with product innovations: 1998 - 2000  
by sector of enterprise



## Novel Product Innovation

Chart 4 shows the proportion of innovation active firms that were novel product innovators. Novel product innovators are firms that reported the introduction of new or improved goods or services that were not only new to their firm but also new to their market.

Chart 4



Key points to note:

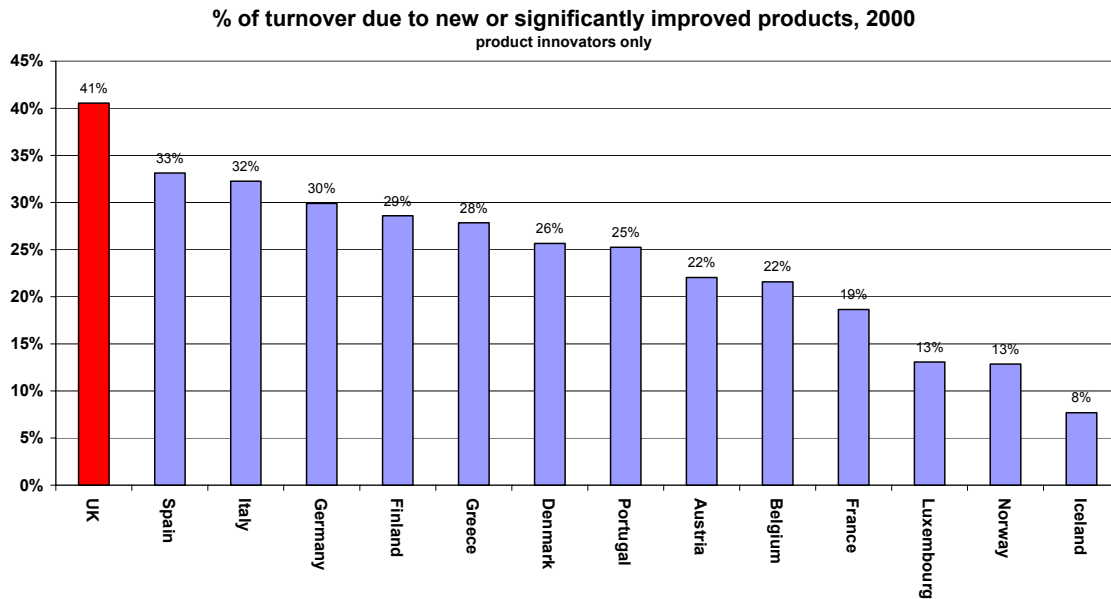
- This indicator gives a measure of novelty in that it measures firms' propensity to introduce products that are not only new to the firm but also new to the market.
- Finland had the highest proportion of innovation active enterprises that introduced new or improved products to the market with 63%.
- The UK had the second lowest with 27% - only Iceland was lower with 21%.

## Innovation Turnover

Chart 5a shows the proportion of turnover due to product innovations for product innovators only. Product innovation refers to new or significantly improved goods or services.

Chart 5b shows this for all firms, not just product innovators.

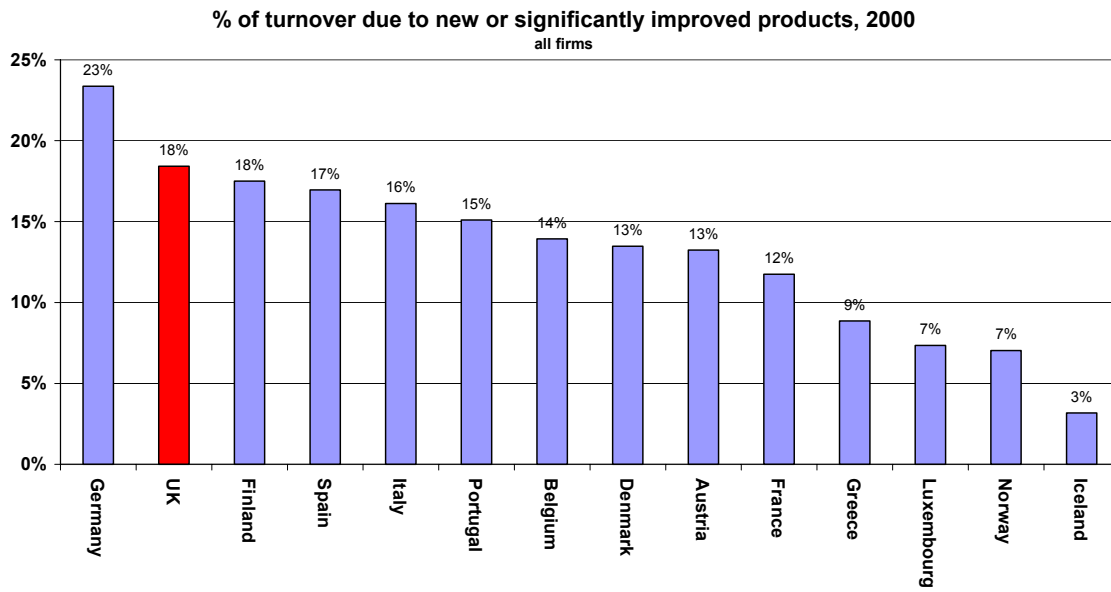
Chart 5a



Key points to note:

- This indicator gives a measure of innovative output. It measures the extent to which firms' product innovations impact on sales.
- The UK has the highest proportion of turnover due to product innovations among product innovators with 41%
- Iceland has the lowest with 8%

Chart 5b



Key points to note:

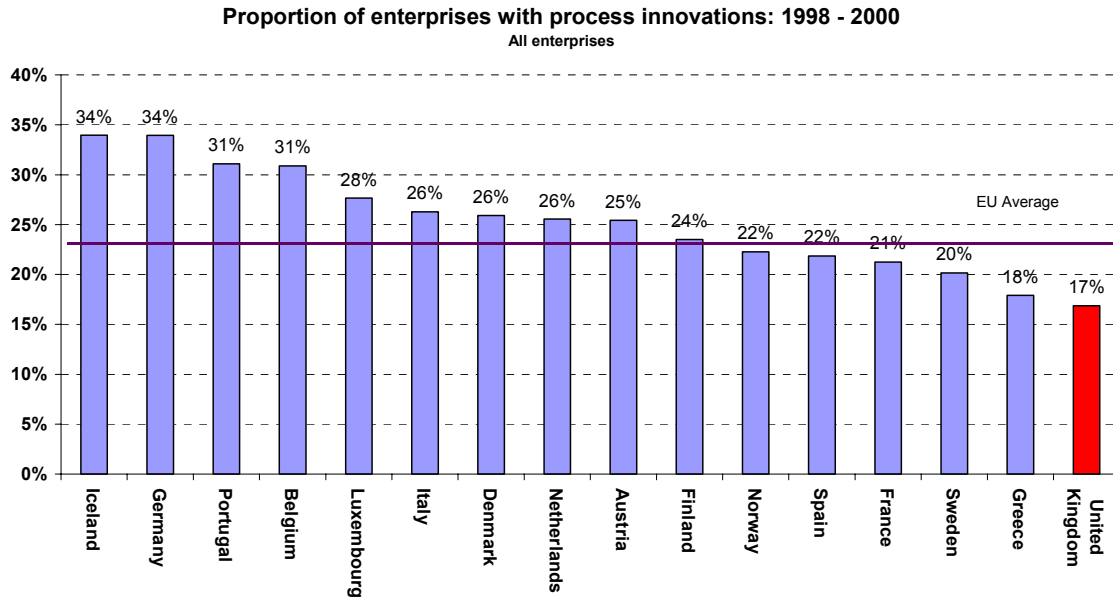
- The UK had the second highest proportion of turnover from product innovations among all firms with 18%
- Germany had the highest with 23% and Iceland had the lowest with 3%.

## Process Innovation

Chart 6a shows the proportion of firms that were process innovators. Process innovators are firms that used new or significantly improved technology for production or the supply of goods or services.

Charts 6b and 6c show the size and sector breakdown.

Chart 6a



Key points to note:

- This indicator gives a measure of the extent to which firms bring in new ways of producing or supplying their goods or services.
- Iceland and Germany had the highest proportion of process innovators with 34%.
- The UK had the lowest with 17%.

Chart 6b

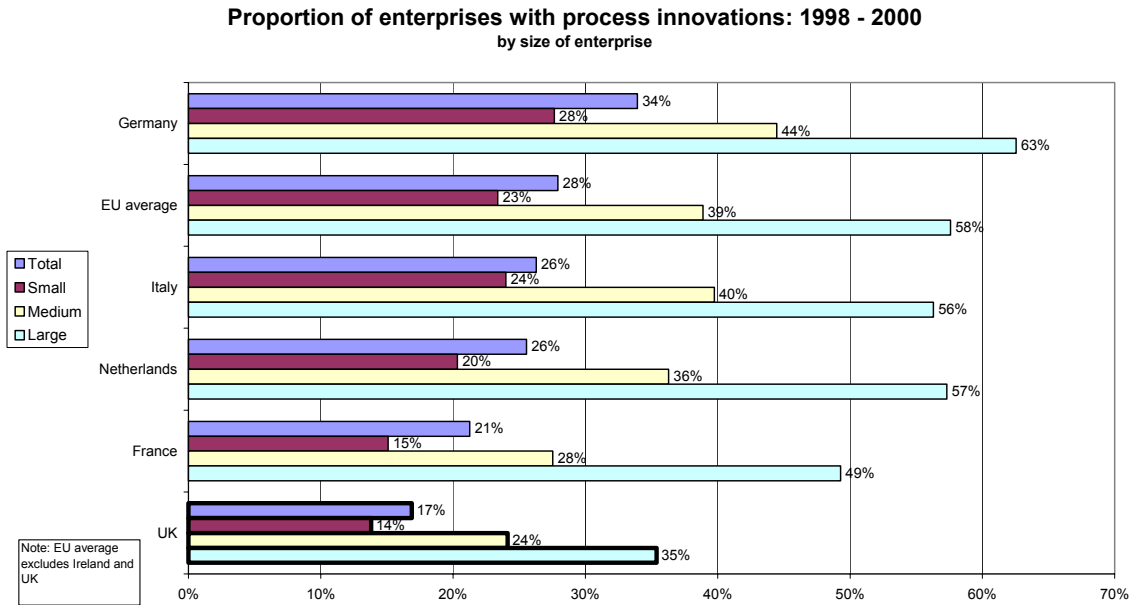
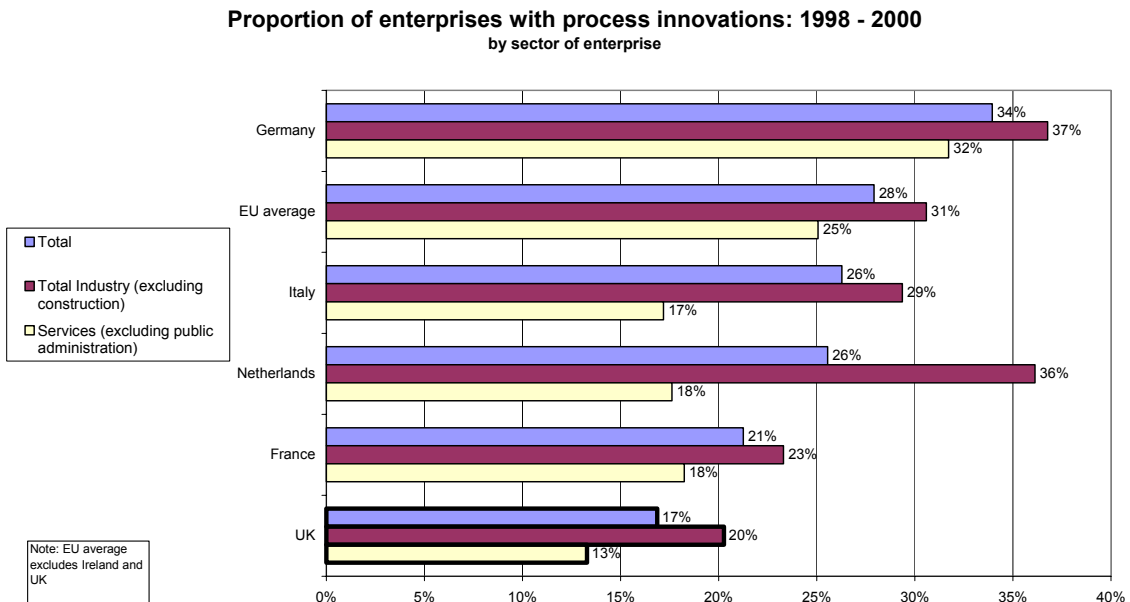


Chart 6c



## Cooperation arrangements

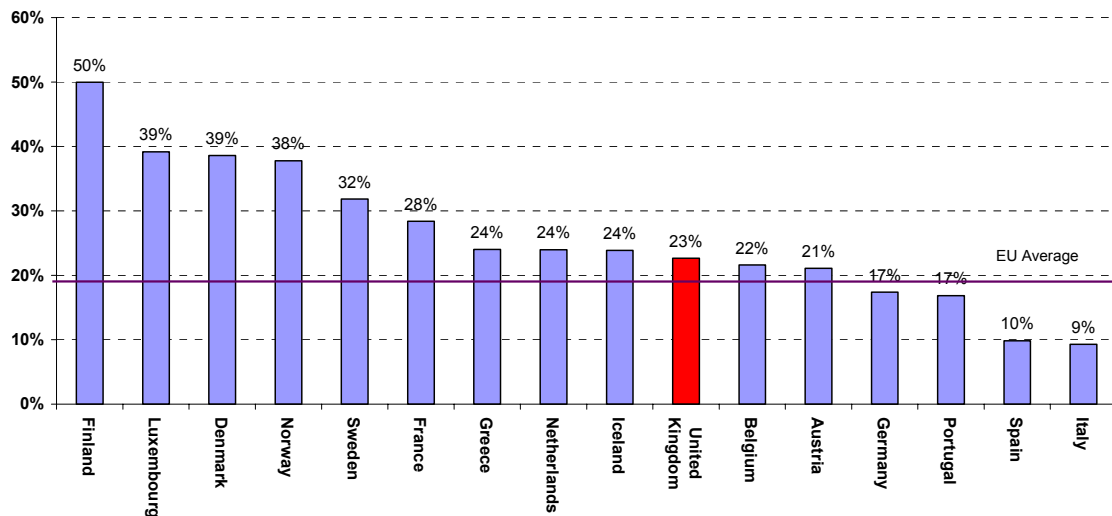
Chart 7a shows the proportion of innovation active firms who reported any form of innovation cooperation.

Charts 7b and 7c show the size and sector breakdown.

Chart 7d shows the proportion of firms with partners in different locations among firms with cooperation arrangements. It is possible for a firm to have more than one partner in different locations.

### Chart 7a

**Proportion of innovation active enterprises who reported any form of cooperation arrangements on innovation activities: 1998 - 2000**



Key points to note:

- This indicator gives a measure of firms' propensity to engage in formal networks or linkages for their innovation activity
- Finland had the highest proportion of enterprises reporting any form of cooperation with 50%.
- Italy had the lowest with 9%, while the UK was about average with 23%.

Chart 7b

Proportion of innovation active enterprises who reported any form of cooperation arrangements for their innovation activities: 1998 - 2000  
by size of enterprise

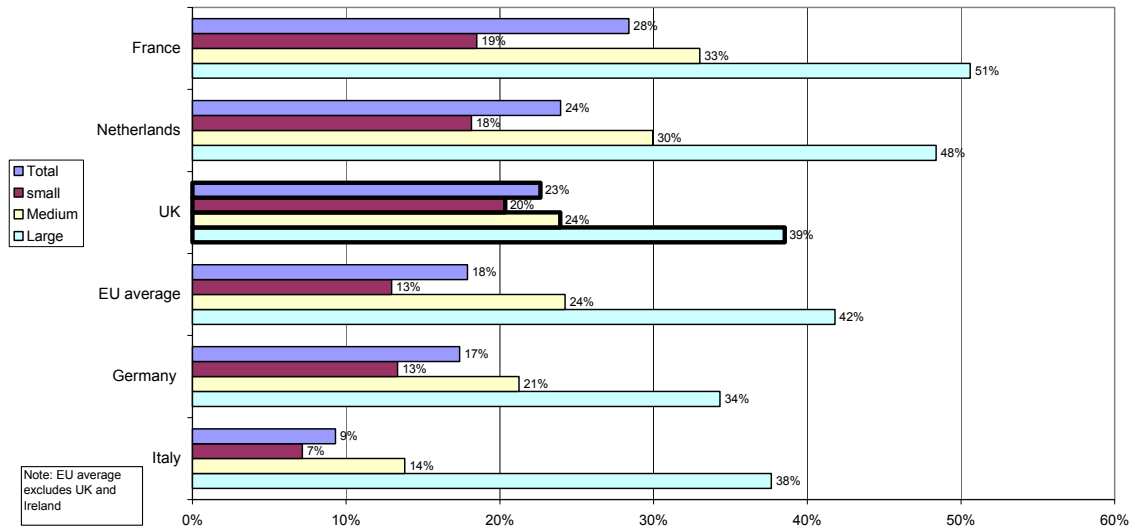


Chart 7c

Proportion of innovation active enterprises who reported any form of cooperation arrangements for their innovation activities: 1998 - 2000  
by sector of enterprise

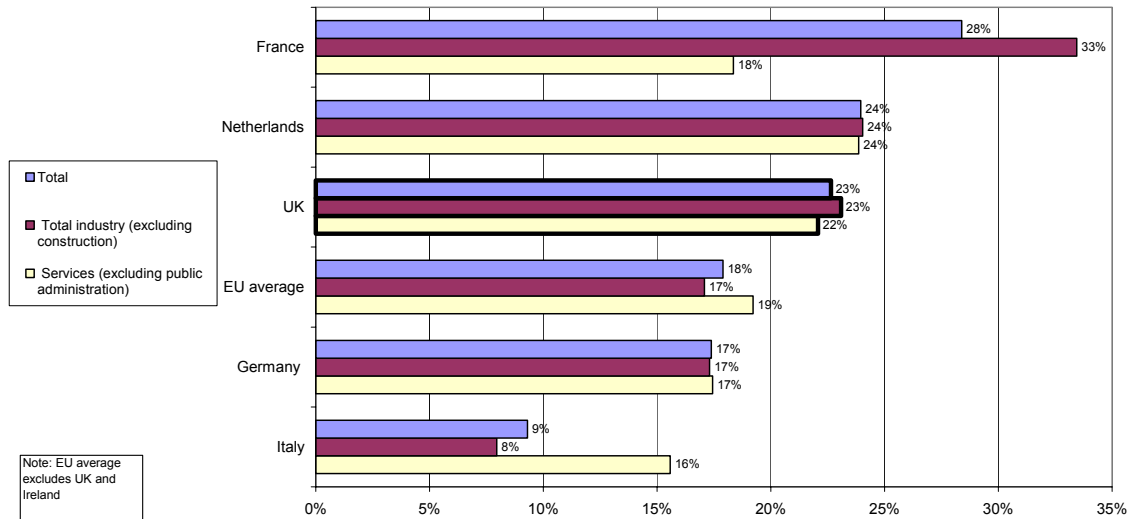
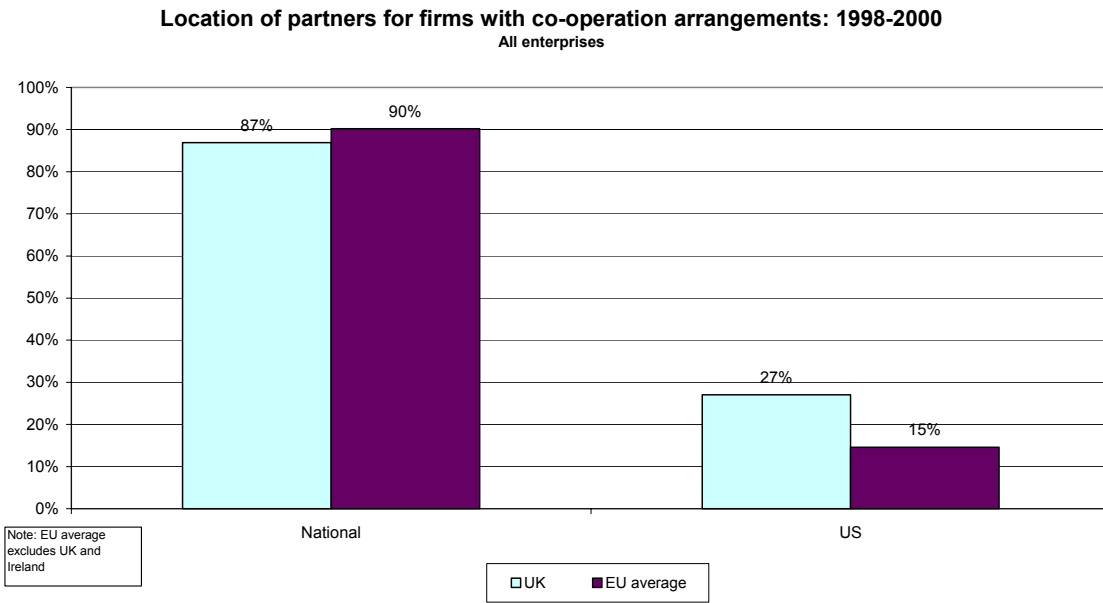


Chart 7d



Key points to note:

- Most firms that cooperate on innovation activities do so with partners at a national level - 87% for the UK and 90% for the EU average.
- The UK is shown to have stringer links to US partners than the rest of the EU.

## **Hampering Factors**

Table 2 shows the ranking of hampering factors by innovation active firms. The ranking is in terms of the proportion of innovation active firms that cited that hampering factor as being highly important in inhibiting their innovation activity.

Table 3 shows this same ranking but among non-innovation active enterprises.

Table 2

### **Ranking of hampering factors cited as being highly important by innovation active firms: 1998-2000**

| <b>Hampering Factor</b>                         | <b>UK</b> | <b>EU average</b> | <b>Germany</b> | <b>France</b> | <b>Italy</b> | <b>Netherlands</b> |
|---|-----------|-------------------|----------------|---------------|--------------|--------------------|
| Innovation costs too high                       | 1         | 1                 | 1              | 1             | 1            | 3                  |
| Lack of appropriate sources of finance          | 2         | 2                 | 3              | 2             | 2            | 2                  |
| Regulations and standards                       | 3         | 5                 | 5              | 4             | 5            | 7                  |
| Excessive perceived economic risks              | 4         | 3                 | 4              | 3             | 3            | 4                  |
| Lack of qualified personnel                     | 5         | 4                 | 2              | 5             | 4            | 1                  |
| Lack of customer responsiveness                 | 6         | 6                 | 7              | 7             | 7            | 9                  |
| Lack of information on markets                  | 7         | 8                 | 8              | 8             | 8            | 6                  |
| Organisational rigidities within the enterprise | 8         | 7                 | 6              | 6             | 9            | 5                  |
| Lack of information on technology               | 9         | 9                 | 9              | 9             | 6            | 8                  |

Key points to note:

- This indicator gives a measure of the extent to which firms are constrained and reasons why.
- Most countries ranked the hampering factors in a similar order with the exception of the Netherlands, where the pattern was very different.
- Costs of innovation and sources of finance were considered the most important hampering factors while lack of information on markets and technology and organizational rigidities were considered the least important.
- Regulations and standards feature more highly in the UK than across the EU as a whole.

Table 3

**Ranking of hampering factors cited as being highly important by non-innovation active firms: 1998-2000**

| <b>Hampering Factor</b>                         | <b>UK</b> | <b>EU average</b> | <b>Germany</b> | <b>France</b> | <b>Italy</b> | <b>Netherlands</b> |
|---|-----------|-------------------|----------------|---------------|--------------|--------------------|
| Innovation costs too high                       | 1         | 1                 | 1              | 1             | 1            | 5                  |
| Excessive perceived economic risks              | 2         | 2                 | 2              | 4             | 3            | 3                  |
| Regulations and standards                       | 3         | 5                 | 5              | 3             | 6            | 7                  |
| Lack of appropriate sources of finance          | 4         | 3                 | 4              | 2             | 2            | 2                  |
| Lack of qualified personnel                     | 5         | 4                 | 3              | 5             | 4            | 1                  |
| Lack of customer responsiveness                 | 6         | 6                 | 6              | 7             | 5            | 9                  |
| Organisational rigidities within the enterprise | 7         | 7                 | 7              | 6             | 8            | 6                  |
| Lack of information on markets                  | 8         | 9                 | 8              | 8             | 9            | 4                  |
| Lack of information on technology               | 9         | 8                 | 9              | 9             | 7            | 8                  |

Key points to note:

- Table 3 shows broadly similar trends to table 2, with the exception that perceived economic risks was ranked slightly higher and sources of finance was ranked slightly lower by non-innovation active firms compared to innovation active firms.

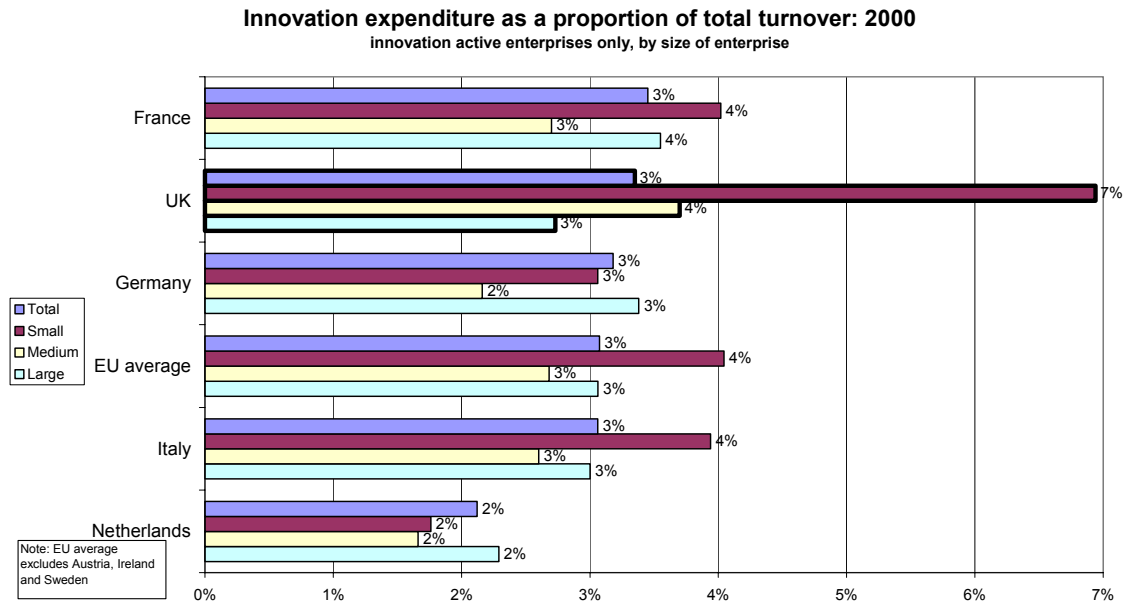
## Innovation expenditures

Chart 8a shows the size breakdown of expenditure on innovation as a proportion of total turnover and Chart 8b shows the sector breakdown.

Chart 8c shows the breakdown of innovation expenditure by category of expenditure.

All these charts show results for innovation active firms only.

### Chart 8a

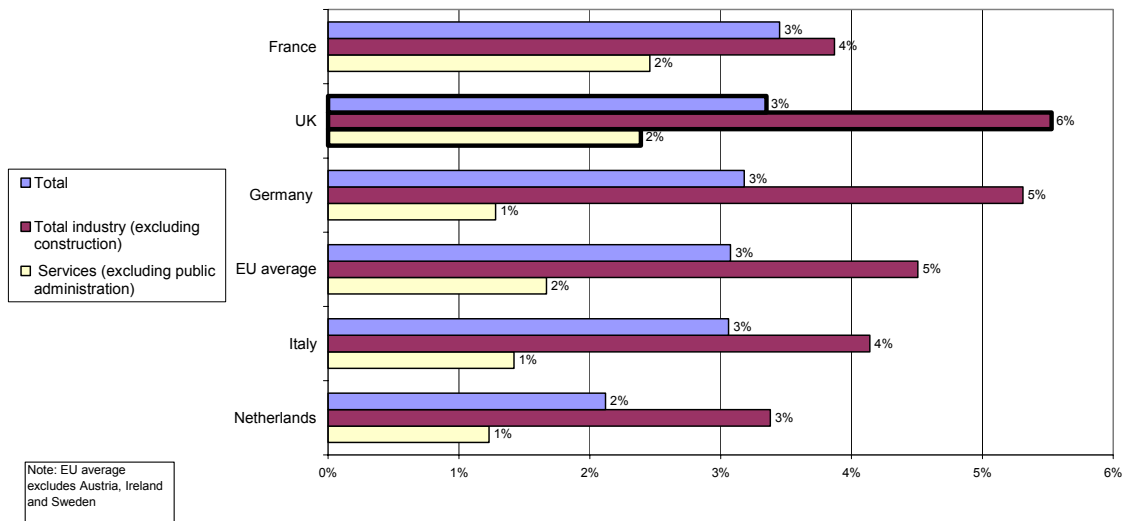


#### Key points to note:

- This indicator gives a measure of the extent to which firms are investing resources in innovation activity.
- In most countries, small firms spent a higher proportion of their turnover on innovation than medium or large firms. This is most noticeable in the UK.
- France and the UK spend the highest proportion of turnover on innovation, slightly above the EU average.

Chart 8b

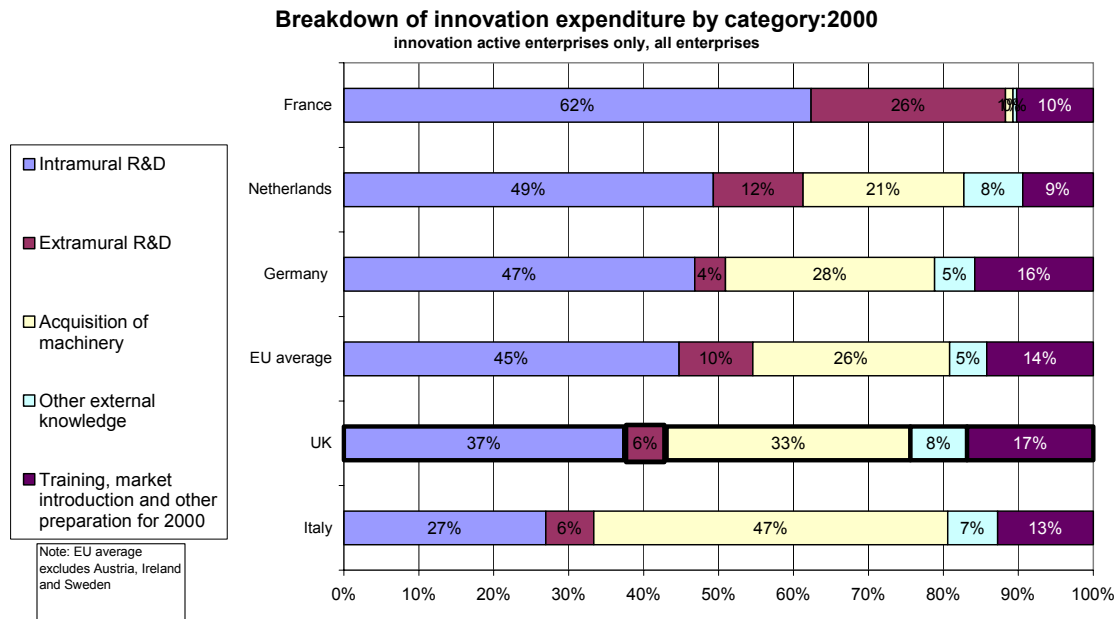
**Innovation expenditure as a proportion of total turnover: 2000**  
innovation active enterprises only, by sector of enterprise



Key points to note:

- In all countries, a higher proportion of turnover is spent on innovation by enterprises in industry than by enterprises in services.

Chart 8c



Key points to note:

- All countries spend the majority of their innovation budget on intramural R&D and the acquisition of machinery with very little spent on extramural R&D and other external knowledge. France is an exception, spending very little on the acquisition of machinery and considerably more than other countries on extramural R&D.

## Sources of information for innovation

Charts 9a and 9b show the proportion of innovation active enterprises that rated the importance of sources of information for innovation as high. They show the extent to which firms access different knowledge sources to inform their innovation activity.

Chart 9a shows the 3 most commonly cited sources in the EU.

Chart 9b shows all 7 sources for the UK and the EU average

Chart 9a

Proportion of innovation active enterprises who rated the importance of sources of knowledge for innovation as high - 3 most commonly cited sources in the EU: 1998 - 2000

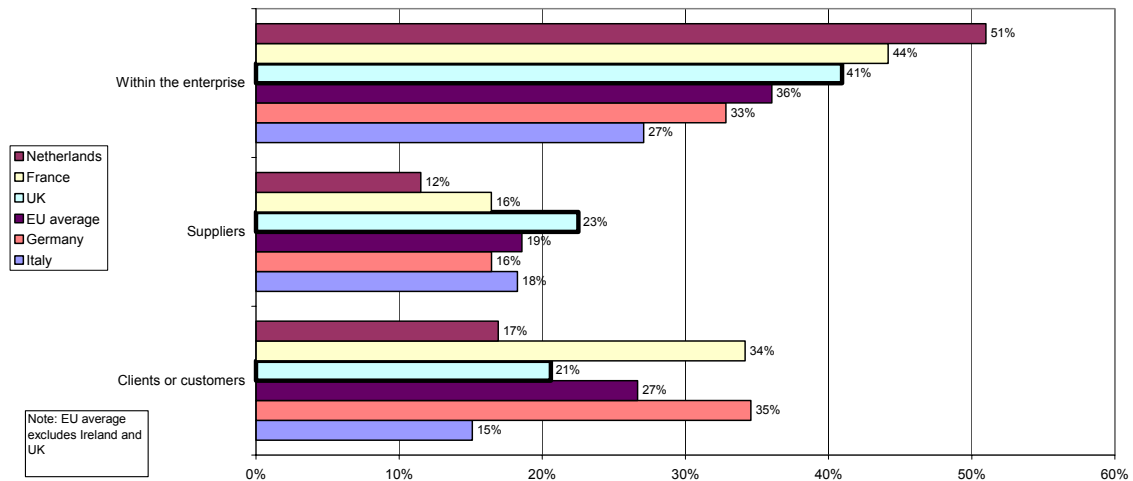
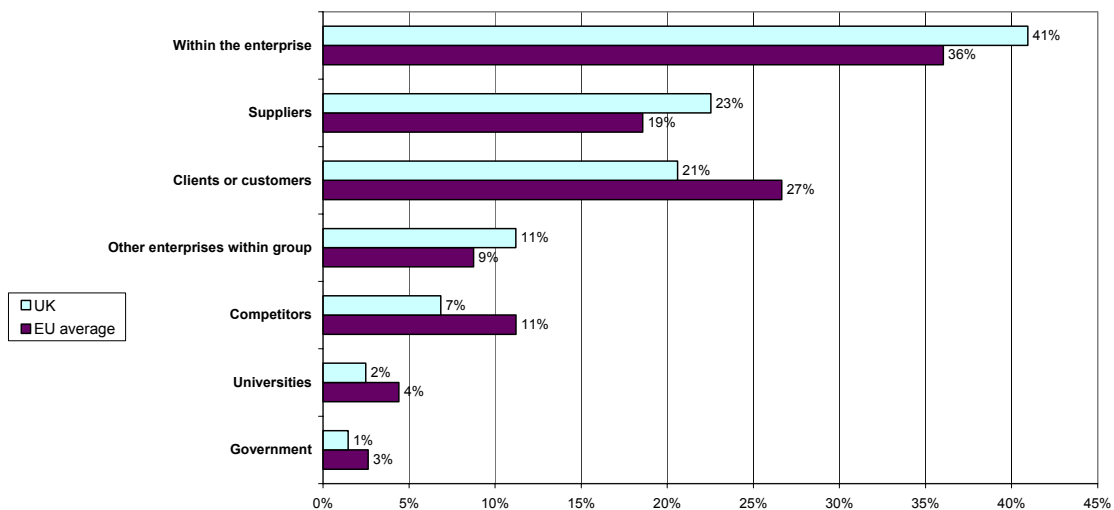


Chart 9b

Proportion of innovation active enterprises who rated the importance of sources of knowledge for innovation as high: 1998 - 2000



## Effects of innovation

Charts 10a and 10b show the proportion of innovation active enterprises who reported a high level of effects from innovation. They show the way in which previous innovation activity impacted on firms.

Chart 10a shows the 4 most commonly cited effects in the EU

Chart 10b shows all 9 effects for the UK and the EU average.

Chart 10a

Proportion of innovation active enterprises who reported a high level of effects from innovation (4 most commonly cited effects in the EU): 1998-2000

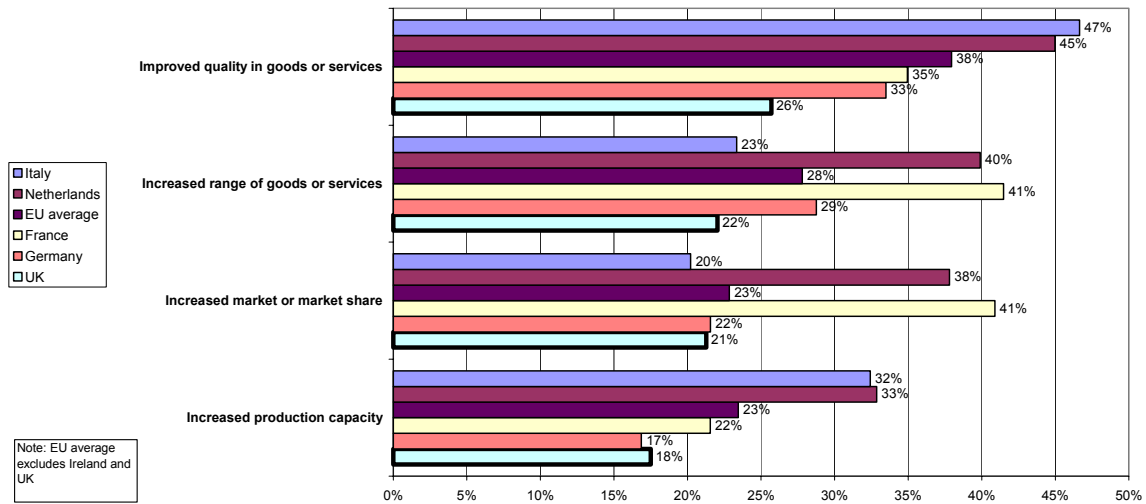
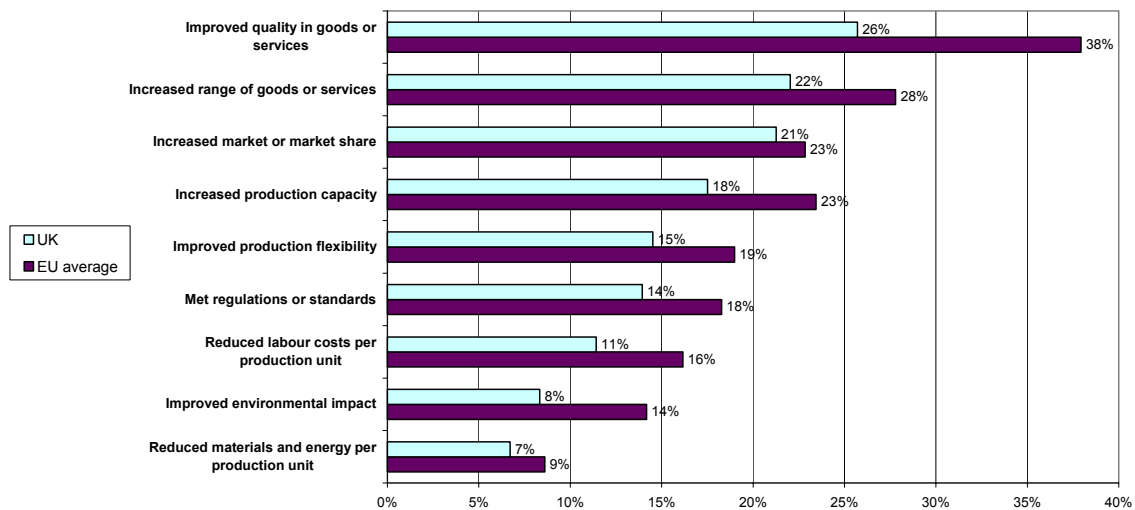


Chart 10b

Proportion of innovation active enterprises who reported a high level of effects from innovation: 1998 - 2000



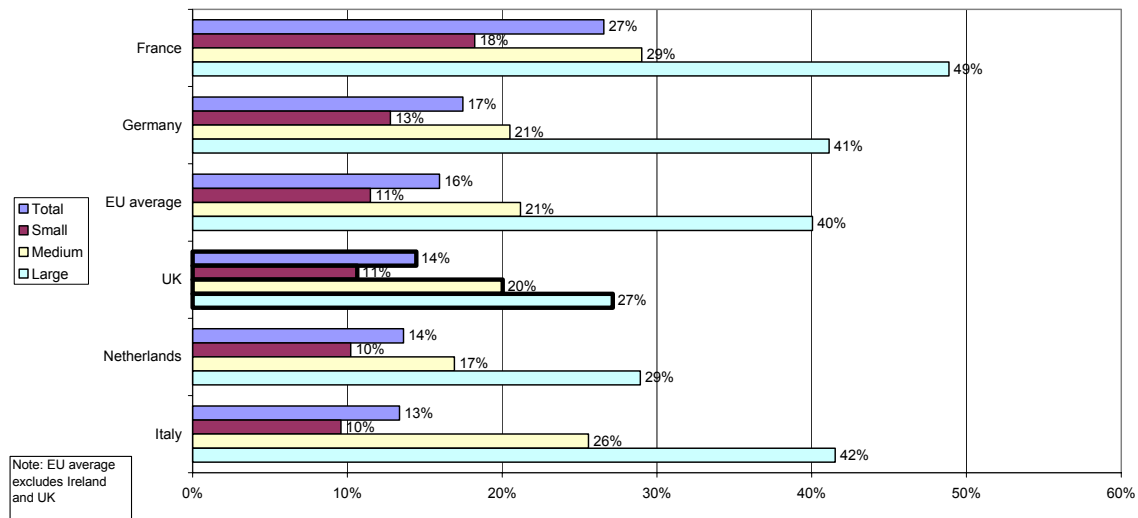
## Protection methods

Charts 11a and 11b show the proportion of innovation active firms that applied for one or more patents.

Chart 11a shows the size breakdown and chart 11b shows the sector breakdown.

### Chart 11a

**Proportion of innovation active enterprises that applied for one or more patents:  
1998 - 2000  
by size of enterprise**



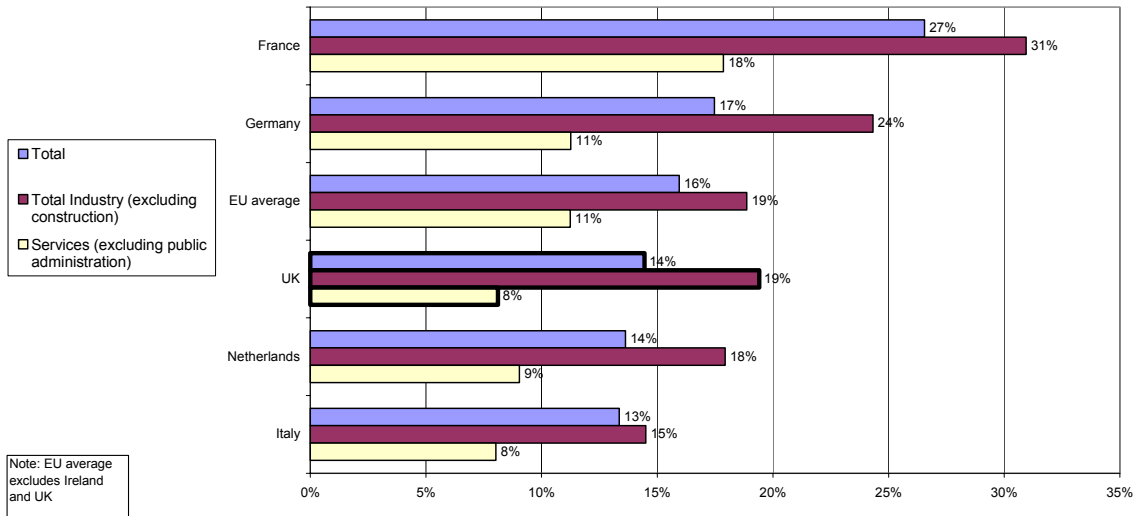
### Key points to note:

- This indicator identifies the importance of intellectual property rights in firms' innovation activity.
- In all countries, a much higher proportion of large enterprises had applied for at least one patent.
- Of the UK's main competitors, France had the highest proportion of enterprises that had applied for at least one patent and Italy had the lowest.

Chart 11b

**Proportion of innovation active enterprises who applied for one or more patents:  
1998 - 2000**

by sector of enterprise



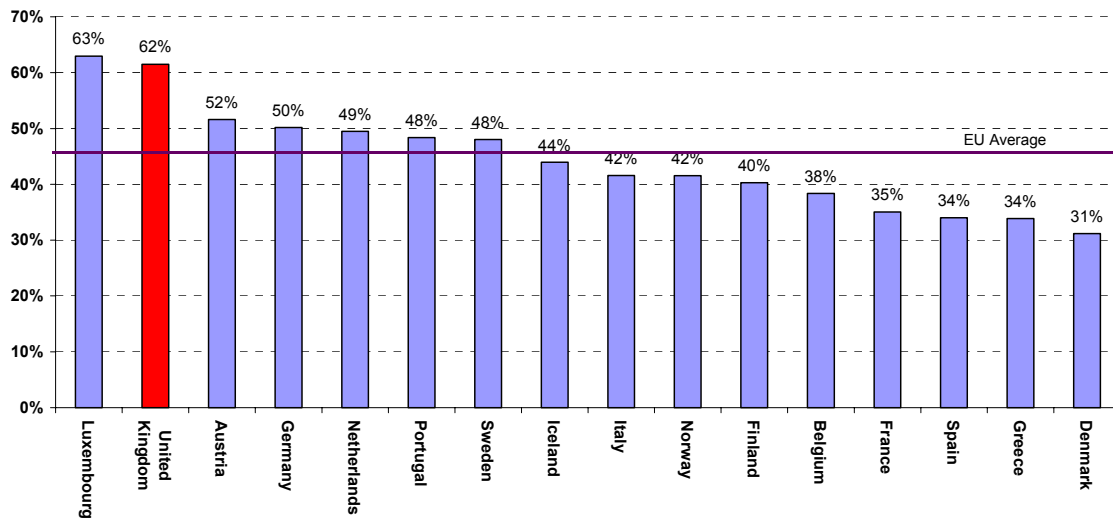
## Wider Innovation

Charts 12 – 19 show the proportion of enterprises that made major changes in business structure or practices. These indicators give a measure of the importance of non-technological innovations, or “softer” innovation.

Charts 12 – 15 show this for innovation active enterprises and charts 16 – 19 show this for non-innovation active enterprises.

### Chart 12

**Proportion of innovation active enterprises that implemented new or significantly changed corporate strategies: 1998 - 2000**

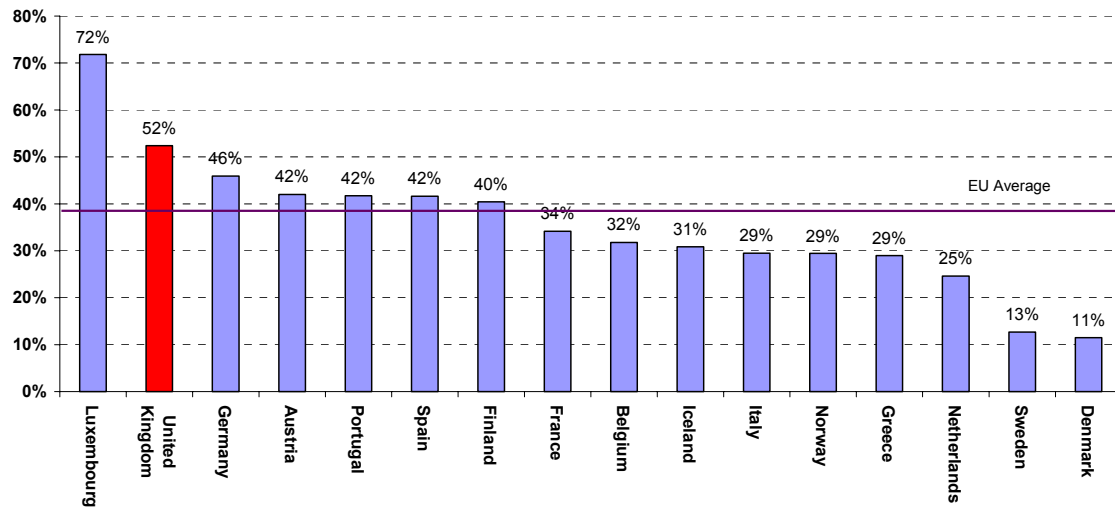


Key points to note:

- The UK had the second highest proportion of enterprises that had implemented new corporate strategies with only Luxembourg higher.

Chart 13

Proportion of innovation active enterprises that implemented advanced management techniques: 1998 - 2000

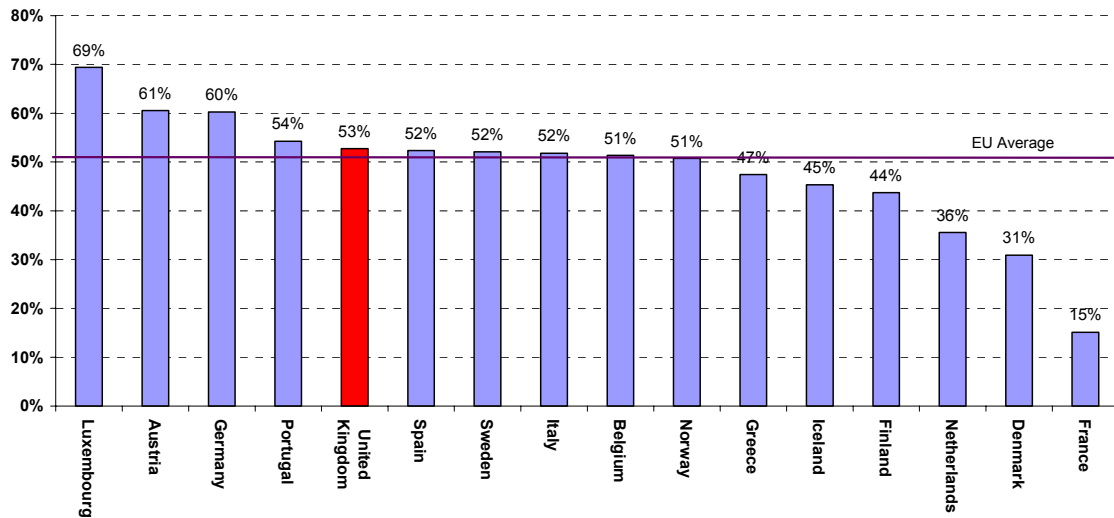


Key points to note:

- The UK had the second highest proportion of enterprises that had implemented advanced management techniques with only Luxembourg higher.
- There was a very wide range of values from 72% for Luxembourg to 11% for Denmark.

Chart 14

Proportion of innovation active enterprises that implemented new or significantly changed organisational structures: 1998 - 2000

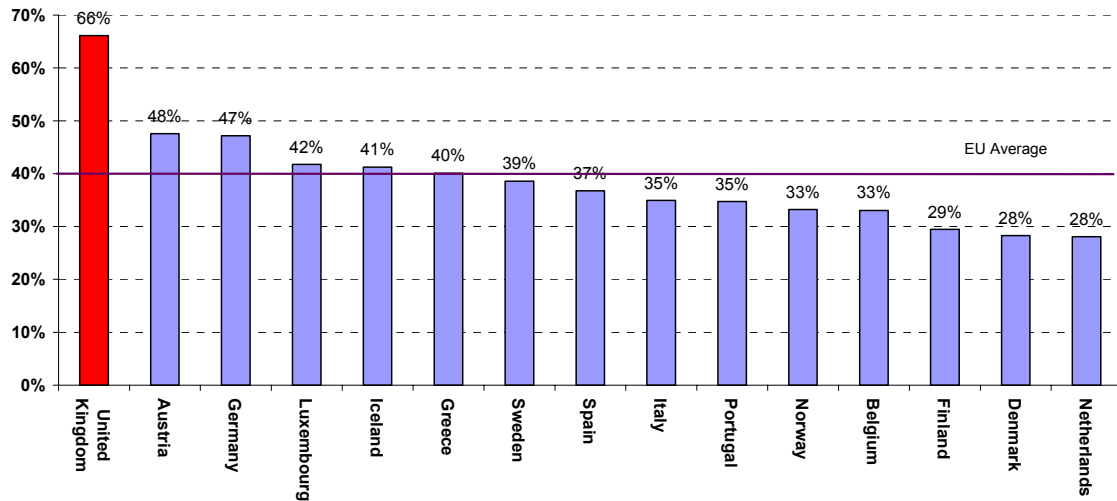


Key points to note:

- 53% of innovation active firms in the UK implemented new organisational structures, which was around average.
- France has the lowest proportion with 15%, which is considerably lower than all other EU countries.

Chart 15

Proportion of innovation active enterprises that significantly changed their marketing concepts/strategies: 1998 - 2000



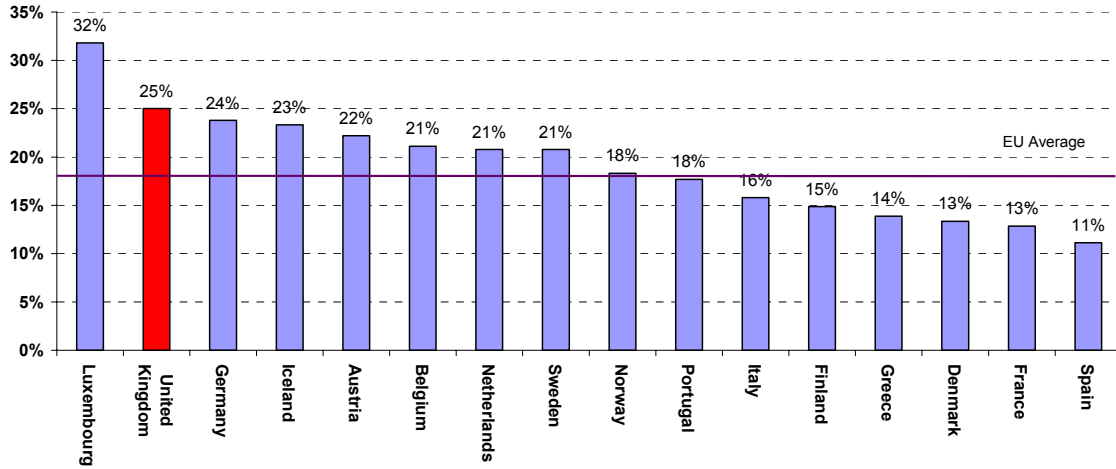
Note: No data available for France

Key points to note:

- The UK has the highest proportion of innovation active enterprises that changed their marketing strategies with 66% and is a long way ahead of second highest Austria with 48%.

Chart 16

Proportion of non-innovation active enterprises that implemented new or significantly changed corporate strategies: 1998 - 2000

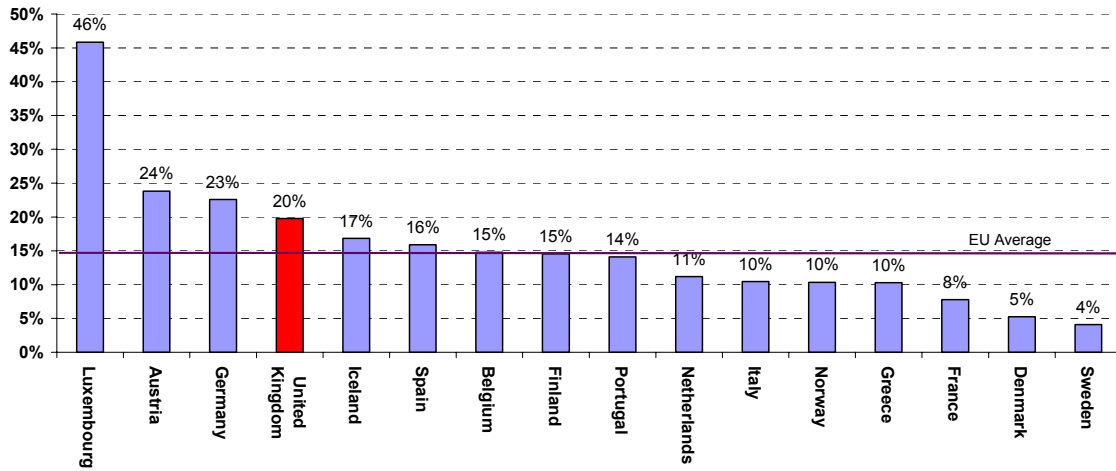


Key points to note:

- The UK had the second highest proportion of non-innovation active enterprises that had implemented new corporate strategies with only Luxembourg higher.

Chart 17

Proportion of non-innovation active enterprises that implemented advanced management techniques: 1998 - 2000

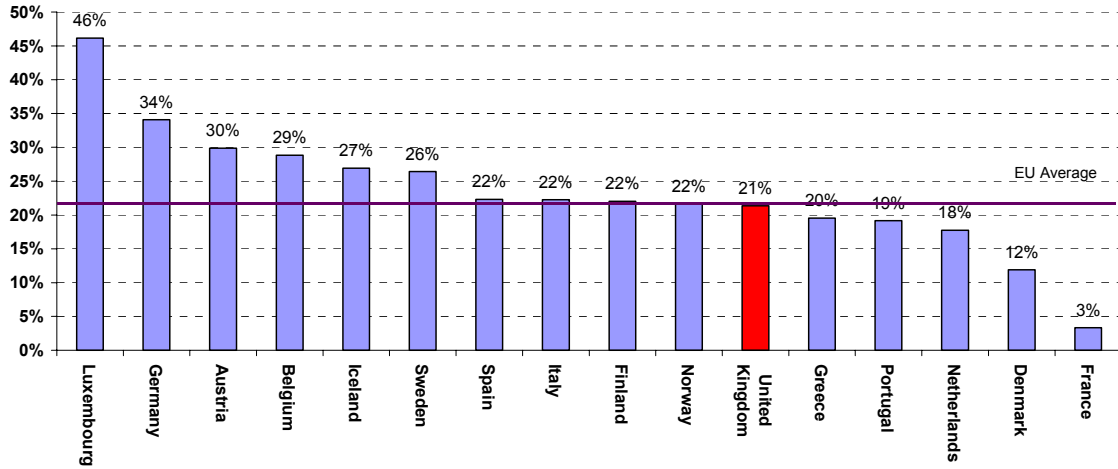


Key points to note:

- The UK has the fourth highest proportion of non-innovation active enterprises that implemented advanced management techniques.

Chart 18

Proportion of non-innovation active enterprises that implemented new or significantly changed organisational structures: 1998 - 2000

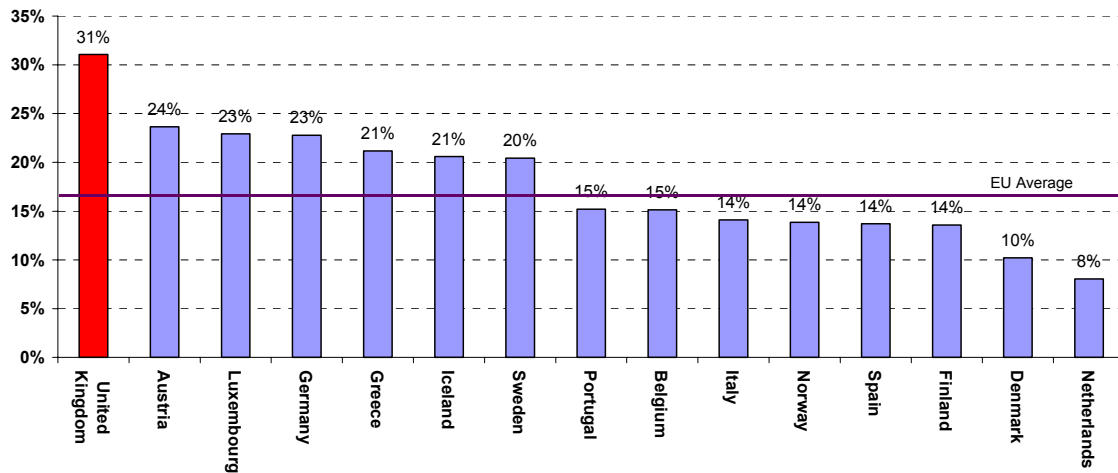


Key points to note:

- 21% of non-innovation active enterprises in the UK implemented new organisational structures, which was about average.
- Luxembourg had the highest proportion of non-innovation active enterprises that implemented new organisational structures with 46% and France had the lowest with 3%.

Chart 19

Proportion of non-innovation active enterprises that significantly changed their marketing concepts/strategies: 1998 - 2000



Note: No data available for France

Key points to note:

- The UK had the highest proportion of non-innovation active enterprises that changed their marketing strategies with 31% and the Netherlands had the lowest with 8%.
- The UK had the highest proportion of both innovation active and non-innovation active enterprises that had changed their marketing strategies.