Technological Innovation in the Irish Manufacturing Industry

INTRODUCTION

This report presents the preliminary findings of the 1993 Survey of Innovation in Ireland.

The survey set out to examine Irish industry's levels and management of technological innovation. The survey, fieldwork for which was carried out in the latter half of 1993, was part of a European-wide survey funded by the European Commission. A standard questionnaire was drawn up by the EU Statistical Office (Eurostat) and the OECD in an effort to collect statistically comparable data across all participating countries.

Increases in manufacturing and services employment will only occur when Irish enterprises provide increasing levels of goods and services which can compete successfully on international markets. Existing products must obviously be produced to the highest standards of quality and design but any significant growth in employment will require continuous product innovation.

There is anecdotal evidence that the level of innovation in Irish industry, particularly traditional industry, is relatively low. The Chief Executive of the Irish Exporters Association commented in an article in the Irish Times (October 1993) that "...we have a major product problem in this country. There is a major need for investment in product design, in packaging, in the application of technology. In order to go to market, you have to have marketable products."

This survey is one of the first attempts to take a wide ranging look at the actual levels of product and process innovation in Irish manufacturing industry. Regular surveys are carried out of R&D performance in the business sector but R&D is not the only way to introduce innovations and this survey provides a much more comprehensive picture of what is happening.

This report presents the preliminary findings of the survey, which relates to the period 1990 - 1992. More detailed results will be available at a later stage.

Technological Innovation in the Irish Manufacturing Industry

SUMMARY OF MAIN FINDINGS

- 1 in 3 manufacturing firms in Ireland produced either new products or processes during the period 1990 - 1992. Large firms (100+ employees) are the most likely to be innovative.

- The electrical/electronics and chemical/pharmaceutical sectors have the highest share of innovating firms. Food and wood/furniture are the sectors with the lowest share of innovating enterprises.

- Irish industry as a whole spent 2% of its turnover in 1992 on innovation related activities, divided equally between current and capital expenditure.

- 18% of Irish industry's turnover in 1992 was accounted for by products changed or introduced during the period 1990 - 1992. Within the small firm grouping (10 - 49 employees), just 8% of sales revenue came from innovative products.

- R&D accounts for approximately one third of industry's innovation budget. The other major innovation related activities are product design and trial production/training. Different groups (in terms of ownership, size and sector) have different priorities for their innovation spend.

- The main objectives underlying innovation include the improvement of product quality and growing/maintaining existing markets. Innovators place least emphasis on opening up new international markets.

- The sources of information rated highly by the greatest number of innovators are those which are closest to the firm - internal sources, customers, suppliers and even competitors. Publicly accessible sources of information such as technical institutes, consulting firms and the universities are judged to be significant by a small proportion of innovators.

- There is a considerable degree of linkage between innovators and other parties:

    - 1 in 3 innovators were involved in co-operation activities on R&D in 1992, mostly with customers, suppliers and universities;

    - 4 in 10 innovators had acquired technology from outside the firm, most frequently in the form of purchasing equipment, buying licences and hiring skilled employees;

    - 1 in 6 innovators had transferred technology out of the firm in 1992, most frequently in the form of communication with other enterprises.

- Maintaining a lead time advantage over competitors in product and process innovations was judged to be the most significant way of guarding competitiveness. Use of patents and registration of design were judged to be effective by a small proportion of innovators.

- Almost one half of non-innovators identified innovation as being of possible relevance to their firm while 1 in 4 claimed that they would get involved in innovation over the next 2 - 3 years.

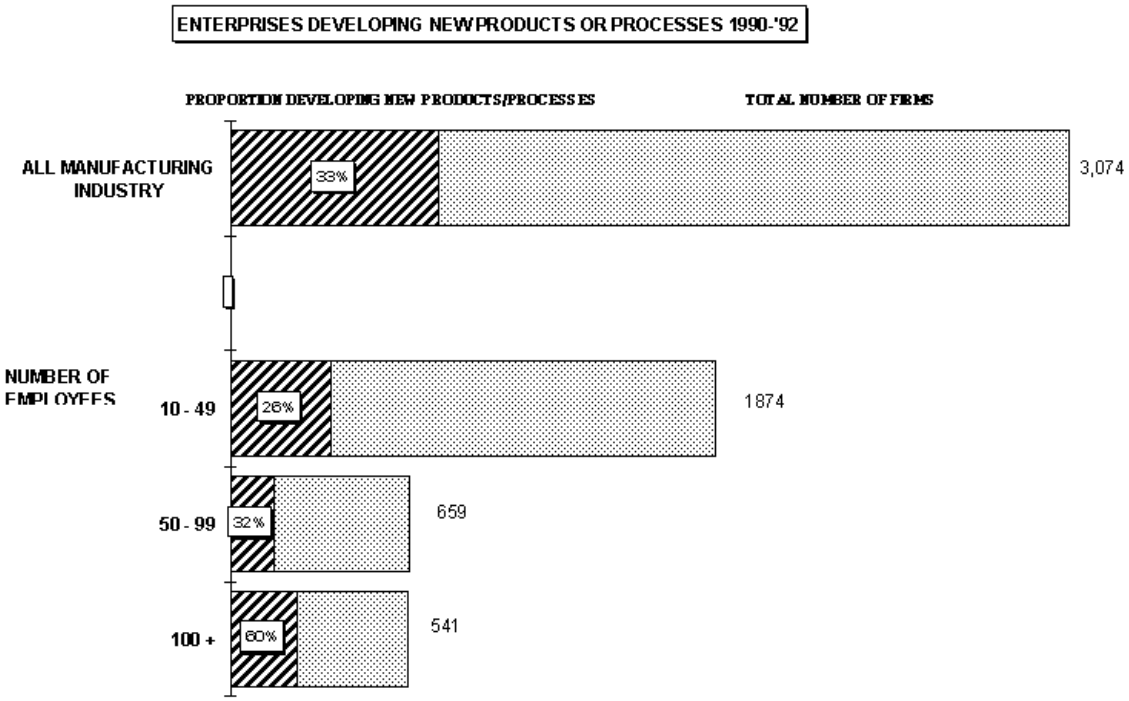
- Financial and risk factors, including the lack of appropriate sources of finance, are judged to be the most significant impediments to innovation by both innovators and non-innovators alike. Another major factor hampering innovation relates to company specific issues such as a lack of skilled employees, resistance to change within the enterprise and a lack of information on markets and technologies.

THE LEVEL OF INNOVATION IN IRISH INDUSTRY

PROPORTION OF FIRMS DEVELOPING NEW PRODUCTS OR PROCESSES

- The population surveyed was manufacturing firms with 10 or more employees (3,074 enterprises). Most of these firms employ between 10 and 49 people with the remainder being spread fairly evenly between those employing 50 - 99 and 100+.

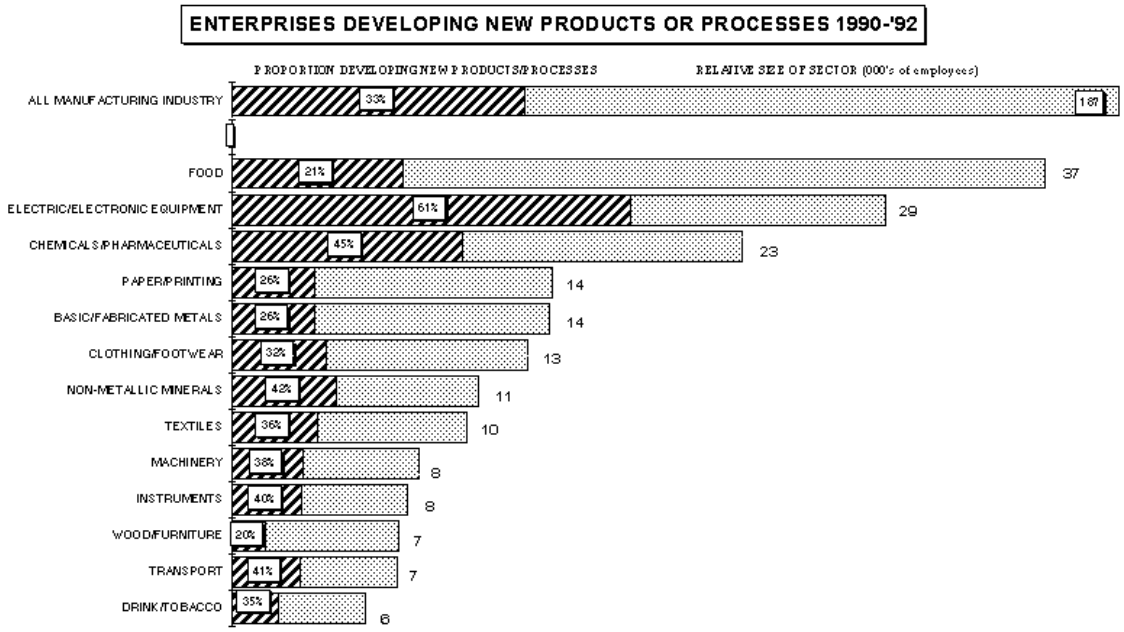
- 1 in 3 manufacturing enterprises can be described as innovative, having developed at least one technologically changed product or process during the period 1990 - 1992.



- The incidence of new product/process development differs with respect to size. 26% of firms in the 10 - 49 employees grouping are innovative compared to 60% of larger sized firms (100+ employees).

- The graph below displays the proportion of innovative firms in different industry sectors. The sectors are ordered by total employment to give an indication of the relative importance of each to the Irish economy.

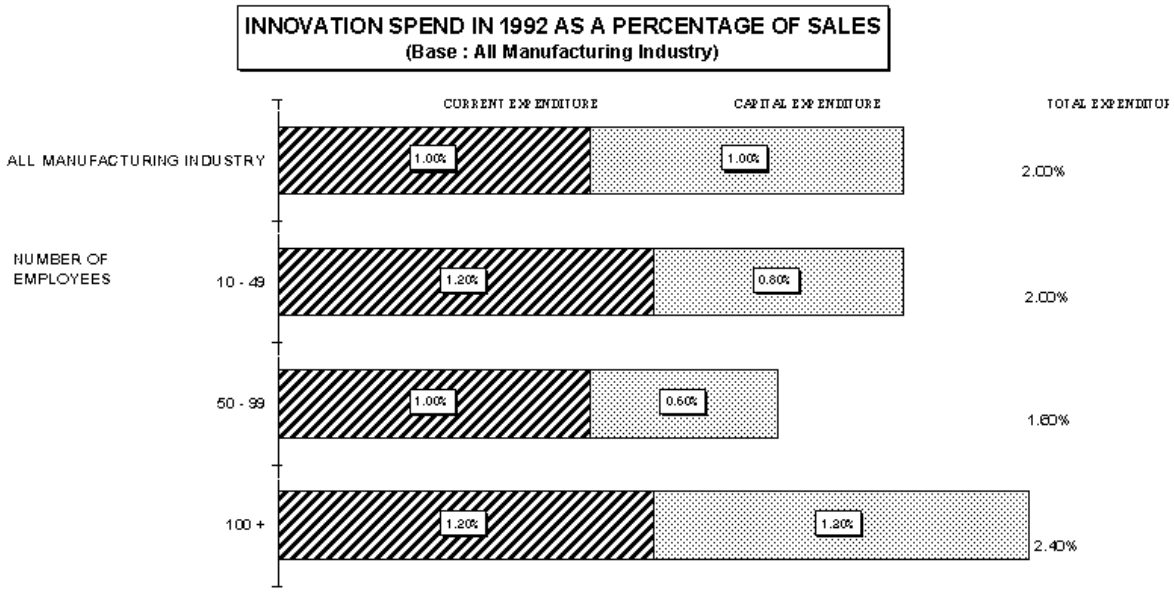
- There is a large amount of variation in the incidence of new product/process development. Industries with the highest proportion of innovating enterprises include electrical and electronic equipment and chemicals and pharmaceuticals. The industries with a below average share of innovating firms include food, paper and printing, basic and fabricated metals and wood and furniture.



INNOVATION SPEND AS A PERCENTAGE OF SALES IN IRISH INDUSTRY

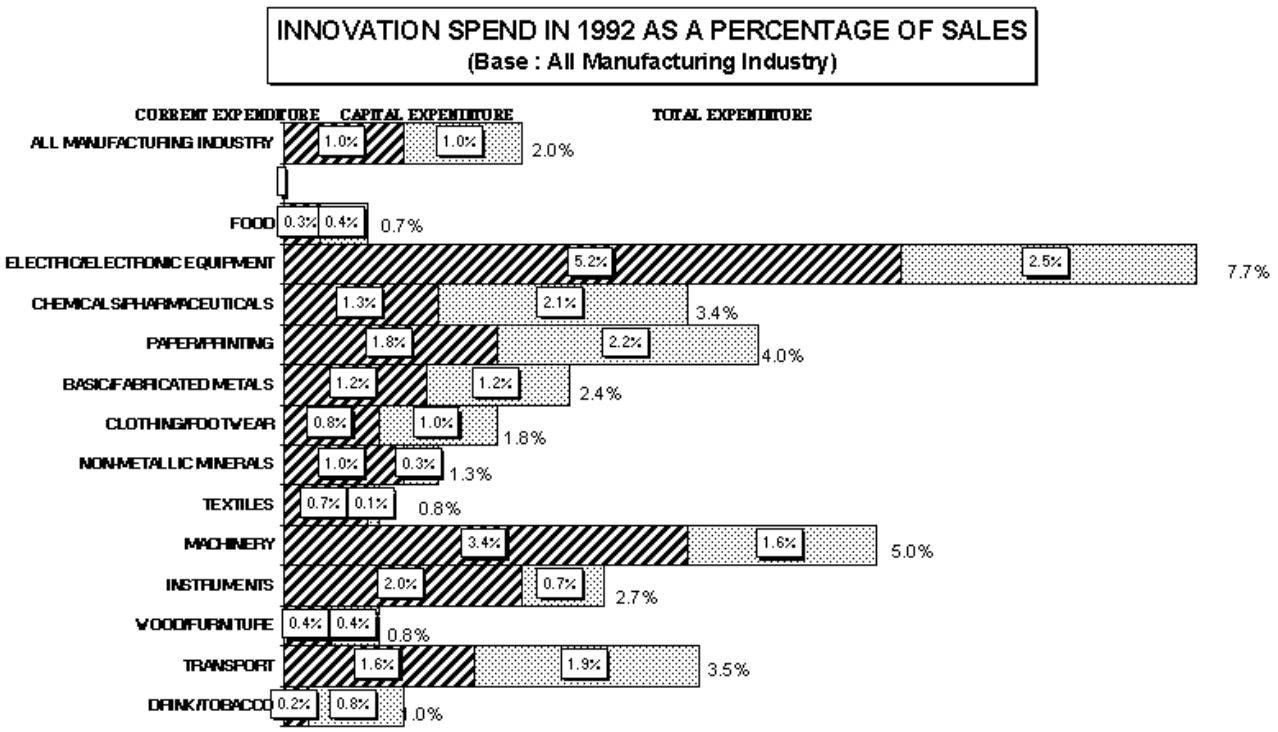
- Overall, Irish industry spends approximately 2% of its sales revenue on innovation related activities, divided equally between current and capital expenditure.

- The large firm grouping (100+ employees) spends the greatest proportion of turnover on innovation, again divided equally between current and capital spending.



- The percentage spend of firms in the 10 - 49 employees grouping is relatively high given the share of firms in this sector actively involved in innovation. This is due to a number of highly innovative firms in this size range having an innovation spend as a percentage of sales significantly greater than the overall industry average.

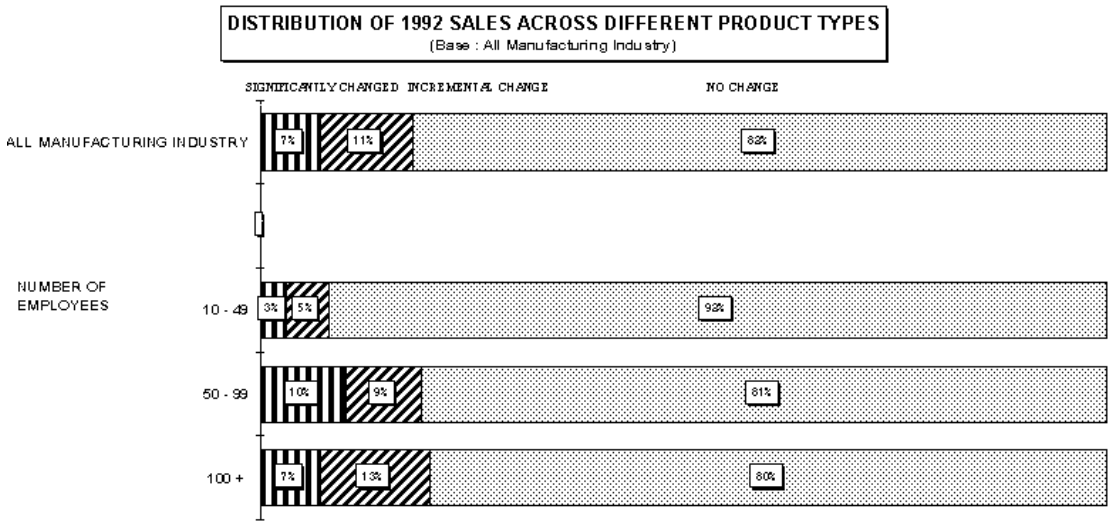
- A divide between newer and more traditional industries vis-à-vis spending on innovation as a percentage of sales is evident. There are some interesting exceptions however, where low-medium technology sectors such as paper and printing, machinery and transport are spending a proportion of turnover on innovation similar to some of the more “high-tech” sectors.



- The sectoral ratios charted here mask a certain amount of variation within each sector with a number of firms spending a significantly greater proportion of turnover on innovation than their sectoral average.

SALES ACCOUNTED FOR BY NEW OR CHANGED PRODUCTS

- Another indicator of innovation in Irish industry is the impact which product innovations developed during 1990 - 1992 had on sales in 1992. Respondents were asked to estimate the proportion of sales fitting into each of the categories below:
    - Products significantly changed or introduced during 1990 - ‘92;
    - Products subject to incremental change 1990 - ‘92;
    - Products essentially unchanged 1990 - ‘92.



- Irish industry can be judged to be reasonably innovative with 18% of turnover accounted for by products that are either completely new or changed to some degree. The small firm grouping (10 - 49 employees) seems to be most reliant on products that were unchanged during the previous two years with just 8% of its turnover coming from new products.

- A sectoral analysis of this data is provided below. Sectors such as non-metallic minerals and drink and tobacco appear to have produced a substantial output of innovations (greater perhaps than their relative spend on innovation would suggest).