

NESC REPORT NO. 64

A REVIEW OF INDUSTRIAL POLICY

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NATIONAL ECONOMIC AND SOCIAL COUNCIL CONSTITUTION AND TERMS OF REFERENCE

1. The main task of the National Economic and Social Council shall be to provide a forum or discussion of the principles relating to the efficient development of the national economy and the achievement of social justice, and to advise the Government, through the Taoiseach on their application. The Council shall have regard, *inter alia*, to:

- (i) the realisation of the highest possible levels of employment at adequate reward
- (ii) the attainment of the highest sustainable rate of economic growth.
- (iii) the fair and equitable distribution of the income and wealth of the nation,
- (iv) reasonable price stability and long-term equilibrium in the balance of payments,
- (v) the balanced development of all regions in the country, and
- (vi) the social implications of economic growth, including the need to protect the environment.

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4. The membership of the Council shall comprise a Chairman appointed by the Government in consultation with the interests represented on the Council.

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Ten persons nominated by the Confederation of Irish Industry and the Irish Employers' Confederation,

Ten persons nominated by the Irish Congress of Trade Unions,

Ten other persons appointed by the Government, and

Six persons representing Government Departments comprising one representative each from the Departments of Finance, Agriculture, Industry, Commerce and Tourism, Labour and Environment and one person representing the Departments of Health and Social Welfare.

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6. The Council shall have its own Secretariat subject to the approval of the Taoiseach in regard to numbers, remuneration and conditions of service.

7. The Council shall regulate its own procedure.

NATIONAL ECONOMIC AND SOCIAL COUNCIL

A Review of Industrial Policy

A report prepared by the
Telesis Consultancy Group

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February 1982

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PREFACE*

1. The Council is sponsoring a five-part study of policies for industrial development. A Government statement of 2 December, 1977 stated that appropriate strategies for the expansion of employment in manufacturing industry similar to the Council's review of the agricultural sector, could benefit from examination by the Council.
2. The first of the five parts was a survey of the relevant literature and of policy changes in Irish Industrial policy since the early 1960s. It was undertaken by Mr Eoin O'Malley of the Institute of Development Studies, University of Sussex and is published as Report No. 56 of the Council.
3. The second part was an evaluation of the infrastructural constraints which hamper existing Irish firms and may act as a barrier to the attraction of new industrial projects to Ireland. The focus of the study was on physical infrastructure and it was decided to concentrate on three basic services – roads, telecommunications and water supply. The study was undertaken by Professor Christopher Foster, Mr Jim Dorgan, Mr Stephen Dewar and Dr Nick Segal of Coopers and Lybrand Associates. Their findings are contained in NESC Report 59.
4. The third part was an analysis of the extent and nature of job losses in manufacturing industry. A draft report has been prepared by Mr John Blackwell, Mr Gerard Danaher and Mr Eoin O'Malley.
5. The fourth part was an evaluation of existing Irish industrial policy. This study was undertaken by a team from the Telesis Consulting Group, led by Mr Ira Magaziner. The results of their study are published through this report.
6. The objective which the Council gave to Telesis for the study was:

*This preface was agreed at the Council meeting of 17 December, 1981. The Council's views on industrial policy are contained in *Policies for Industrial Development: Conclusions and*

to evaluate existing industrial policies, and to make recommendations designed to ensure that the Irish Government's industrial policy is appropriate to the creation of an internationally competitive industrial base in Ireland which will support increased employment and higher living standards.

7. The Council wishes in the following paragraphs to draw attention to what it considers to be the fundamental recommendations in the Telesis' report. The Council is not, in this report, expressing its own views on these issues. A separate report, containing the Council's own conclusions and recommendations on industrial policy, having regard to the four parts mentioned above, is in the course of preparation. The fundamental recommendations outlined in the paragraphs which follow have themselves led the consultants to put forward many other specific recommendations. These specific recommendations are not discussed in the following paragraphs.

The Telesis Report

8. The consultants recommend a reallocation of public expenditure on industrial promotion in favour of internationally trading indigenous industry and skilled sub-supply firms. The development of indigenous industry is a stated priority of existing industrial policies. The Industrial Development Authority (IDA) says that the main constraint on the development of indigenous industry has been the shortage of entrepreneurs and companies willing to start up new companies or expand existing enterprises. The IDA strategy is based on a two stage approach which seeks to identify and support stronger companies *after* initially increasing the population of business entrepreneurs. Telesis believe that the present programmes for small company promotion will not succeed in creating new, strong, exporting and skilled sub-supply companies. They recommend a more structured approach which would focus on building competences within companies. This approach is not intended to substitute for the present programmes for the development of small industries. They refer to their recommendation as a "hands on" approach which could only be undertaken in a selected number of cases. This approach is expected to make job creation initially more expensive, but to result in more successful companies and a reduction in the present rate of job losses in indigenous firms.

9. A second major recommendation by Telesis is that there should be a substantial reduction in the level of grants offered to new foreign firms. There are two main reasons for their recommendation. Firstly, they estimate that Ireland offers considerably higher incentives than other comparable locations for the average project which is of interest to

Ireland; second, they believe that the funds could be better used in the development of indigenous industry. However, it is recognized that there would be considerable risks in adopting this approach due to the increasing intensity of international competition for inward investment. There would be concern that no action should be taken to reduce the effectiveness of Irish incentives in attracting foreign investment. Advocates of the present system say that the level of incentives for foreign industry is designed to reflect the international competition for projects and the supply of projects. In defence of the present levels of incentives it is argued, firstly, that they are based on a detailed knowledge and experience of attracting foreign industry which has involved extensive negotiation with foreign firms by state agencies and the monitoring of incentives offered by other countries, and secondly, it is said that experimentation with reduced grant levels could have the effect of destroying Ireland's reputation for consistency in its policies for attracting foreign investment. In this situation, it is argued that the reduction of grant levels could have a serious impact on job creation.

10. A third major recommendation by Telesis relates to improving control of the process of industrial development. They say that Ministers and Government Departments should play a more active role in the setting of overall strategy and policy direction, monitoring results and reviewing on-going policy. The formulation of current strategy for industrial development is, in their view, at present primarily the responsibility of the IDA. In effect advocates of the present situation however would hold that it is clearly difficult to pinpoint the exact points of control of industrial policies and the differences between the role of different participants. The Authority of the IDA, however, is appointed by the Minister for Industry and Energy and it includes representatives of the Departments of Industry and Energy and Environment. There are frequent discussions between IDA officials and Government departments and public representatives. Telesis argue, however, that the staff and information which are necessary for an effective primary role in steering the direction of industrial policy, are not available to the relevant Government Departments.

11. The Telesis report includes a survey of the electronics industry. They state that, despite the rapid growth in the number of firms operating and the number of jobs in this industry, the functions which would provide the basis for the development of higher value-added businesses are not located in Ireland. Proponents of the present situation would argue that the promotion of an electronics industry has been a relatively recent goal of Irish industrial policy. The IDA strategy for the development of an electronics industry was formulated in 1975. Employment

in the industry totalled 5,000 in 1975, and is expected to approach 30,000 by 1985. In the context of its short life, it is argued that there has been rapid progress in developing an electronics industry in Ireland and in deepening the industry's roots and creating locally based ancillary functions such as systems engineering and software activities. Telesis contend, with regard to national sectoral strategies based on foreign enterprises, including electronics, that the main constraint is the economic rationale which guides the operation of the foreign owned high-technology multinational firms.

12. In their study of natural resource based industries, Telesis undertook short studies of the beef and dairy industries. They curtailed their evaluation of these industries because agriculture was outside the specific terms of reference for the Council's review of industrial policy. In their brief analysis of the industry they refer to various aspects of agricultural production. The Telesis comments take issue with the reported results of other research projects in this area. The Council wishes to point out, at this stage, that some of its members believe that the Telesis evaluation is too brief to substantiate the considerations presented.

13. The Council's own comments on industrial policy will address the main issues arising from the Telesis Report together with a number of issues which for time, resource or other reasons were not analysed by Telesis. It is the view of the Council that the Telesis report is a major contribution to the formation of Irish industrial policies to meet the challenges of the coming decade. The Council decided that the final report from Telesis should be transmitted to the Government as soon as possible with a view to early publication.

A REVIEW OF IRISH INDUSTRIAL POLICY

SUMMARY

The main conclusions to the review of industrial policy by the Telesis Consulting Group for the National Economic and Social Council are summarised below. The summary does not present the detailed evidence and reasoning which are set out in the full report. The summary was drafted by the Council secretariat.

A REVIEW OF INDUSTRIAL POLICY

SUMMARY

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INTRODUCTION

In July of 1980, Telesis was asked by the National Economic and Social Council (NESC) to carry out a review of Ireland's industrial strategy. The objective of the policy review was "to ensure that the Irish government's industrial policy is appropriate to the creation of an internationally competitive industrial base in Ireland which will support increased employment and higher living standards".

For the past thirty years, Ireland has been engaged in a massive national effort to industrialize. Over the past two decades gross national product per capita has almost tripled. The Irish population increased in the 1970s for the first time this century. Ireland has succeeded in opening its economy in the mid-1970s while still increasing its overall manufacturing employment.

Though Ireland has been improving its living standards, the income gap between it and most other industrialized countries has seriously widened over the past twenty years; the economy has become increasingly dependent on foreign corporations for its industrial jobs; the net trade balance has deteriorated; the cost of state aids to industry has risen rapidly. In addition the country faces an international environment changed by recession, the energy crisis and industrial development in many new regions of the world.

The report presents the conclusions reached after a seven month study carried out between September 1980 and March 1981. Summary views are given of various Irish industrial sectors such as dairy, textiles and electronics. The sectors highlighted were chosen for their importance to the Irish economy. These summaries are brief audits. The goal of this report is to provide a brief strategic overview, to identify problems and suggest overall directions for future policy.

The study is divided into four sections. The first section gives a brief introduction to the approach taken in the study; the next section presents a brief survey of the current structure of Irish industry and various threats and opportunities which confront it. The third section reviews Irish industrial policy and presents an assessment of the potential success of current policies in ensuring Ireland's continued employment and income growth in the coming decade. The final section presents a series of recommendations for the strategy and conduct of Irish industrial policy based on the foregoing analysis.

THE APPROACH

Greater wealth for each person in a nation is created by increasing the value added per work hour embodied in the goods and services produced in the country. Improvements in value added per work hour, however, are not sufficient. The potential for greater wealth can only be realized if workers displaced by efficiency improvements or resource shifts find work in other productive enterprises.

The standard of living of a nation involved in world trade depends upon its competitive productivity in the goods and services it produces which are subject to trade. If absolute productivity for a product is increasing by 2% per year in Ireland, but major international competitors are improving their productivity by 5% per year, then Ireland's standard of living may not improve.

The creation of wealth in an open economy requires continual restructuring of industrial activities toward businesses which allow higher value added per employee, attaining higher productivity than others participating in these higher value added industries, and maintaining high levels of employment. Some industries are not subject to international trade. In the analysis a distinction is made between traded and non-traded activities. Non-traded business include services which are usually localized within a country or a region of a country, such as health care, goods distribution, public administration and house construction. They also include certain manufactured goods in which the productivity improvements that can be achieved through increased production scale are not great enough to offset the increased costs of distributing the product to a foreign country. Typically, manufactured goods of this sort include those with a low value to bulk ratio, such as steel reinforcing bars or large steel beams; products where the value of scale is limited, such as large plastic moulding; and products which are difficult to transport, such as sulphuric acid or fresh milk.

For an economy such as Ireland's, which is small and very dependent on world trade, industrial policy must focus on traded goods and on the non-traded industries such as infrastructural activities, whose inputs are crucial to competitive success in the traded-goods areas.

Goals of Industrial Strategy

The goals of industrial strategy for traded businesses in a developed country trying to achieve high international income levels are to:

- exploit opportunities where natural raw material endowments can provide competitive advantage;
- continually restructure industry to phase out businesses which are becoming subject to competition from low wage countries;
- gain competitive productivity advantage in selected manufacturing businesses vis-a-vis other developed countries. (Wage rates or investment and tax subsidies can be used to gain advantage initially but they must be replaced by productivity advantage if incomes are to rise.)

For businesses which are usually non-traded in developed countries, the first task for Irish industrial policy is to ensure that imports are substituted. Then, efficient competition should be promoted where appropriate, or efficient monopolies where scale economies dictate their necessity. Maximizing absolute productivity improvements is of prime importance.

Natural resource-based industries

In choosing the products which it will export, a country should first look at its physical endowments to see where it may gain competitive productivity advantage due to natural factors such as geology, geography or climate. Natural resource-based industries are those in which the raw material input, extracted from the land or sea, is a large portion of the total cost of a manufactured product. These industries offer particularly strong opportunities for wealth creation. The proportion of value added domestically in natural resources is likely to be much greater than in manufacturing, where a significant proportion of inputs must be imported, especially in a small country.

Competitive position in a raw-materials business depends on two major factors; extraction costs, including both the direct and indirect infrastructure costs; and transportation costs to industrial and personal consumers. Over time, however, transportation costs, particularly for long distances over water, have declined in relative terms. With the development of international capital markets and the increased government financing of infrastructure, the previously inhibiting high capital costs associated with the development of industries such as mining and forestry become less important. With the decrease in the importance of transportation and capital barriers, extraction efficiency is now the key to competitive success.

Products based on farm output still account for almost half of

Ireland's net exports. Other raw materials-based industries in Ireland have been small, though Ireland does have one of the world's best lead/zinc deposits and possesses timber resources which represent a potential source of wealth. In addition, offshore gas is currently mined in small quantities, and offshore oil is a possible resource in Ireland's future.

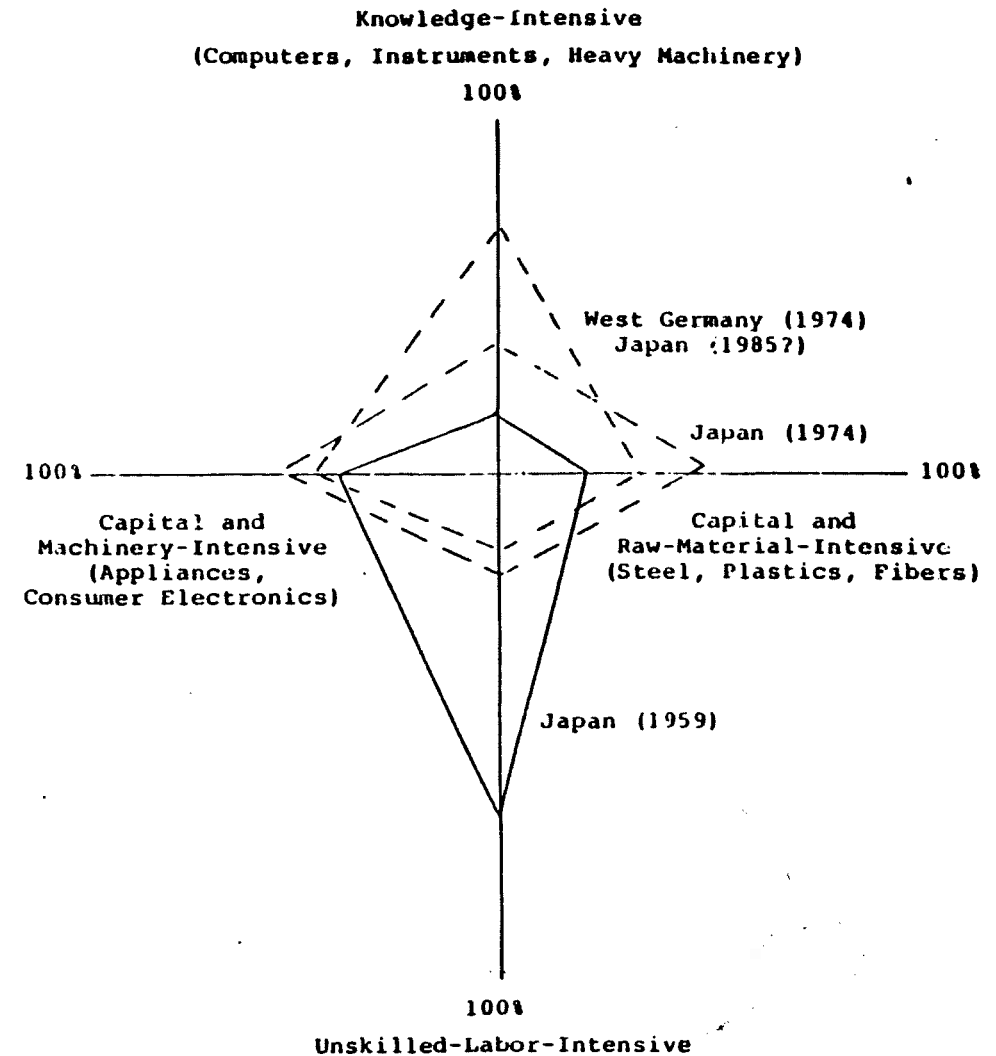
Manufacturing Business

The relative success of a country's efforts at industrialization can be illustrated by the relative placement of its industrial activities on a chart used by the Japanese Economic Planning Agency to express Japan's economic development. The movements of Japan toward higher value added industries is depicted in Exhibit A which represents Japan's industrial strategy and has provided a paradigm for some newly industrializing countries. The diamond shape represents Japan's mix of total exports among four different categories of industry, each presenting different requirements for competitive success. The significance of the diamond is that industrial activities at the lower end can be performed in many countries, including those with low incomes and wages. Those at the top can only be performed in a limited number of countries as they require more complex factors, such as technology organization and strategy for competitive success. The proportion of businesses an economy has which are complex-factor cost determined rather than being low wage-rate dependent, is a measure of its potential for increased living standards.

The process of overcoming the investment barriers to participation in businesses towards the top of the diamond, and achieving the ability to pioneer new "knowledge-intensive" businesses, is the means to achieve higher living standards. The keys to successful restructuring toward higher valued added businesses are a skilled white-collar workforce, a skilled blue-collar workforce, a sufficient number of organizations which are internationally competitive and physical infrastructure. If the Irish manufacturing sector is to provide increased living standards it will be a necessary, but not sufficient, condition to effect a restructuring away from low-wage businesses. Competitive advantages over other developed countries in selected complex-factor cost businesses must also be achieved.

To achieve competitive advantage in a business, a producer need not be the most productive competitor in every element of the cost structure of a product. Nor must the producer be the most productive competitor in the largest element of the cost structure, since significant productivity differences may not always be possible to attain in these areas. Instead, the most critical areas of cost are those that offer opportunities for gaining productivity advantages relative to competitors.

THE EVOLUTION OF INDUSTRIAL STRUCTURE



For example, in certain segments of the plastics conversion business, all competitors can readily achieve equivalent materials and manufacturing productivity, which together represent more than 80% of the product cost. Productivity advantages can, however, be gained by one competitor over another in warehousing and distribution.

There are five main areas where productivity advantages may be gained in complex-factor cost businesses:

- (i) purchasing e.g., unit price reductions to large volume purchases
- (ii) manufacturing e.g., scale, run length or proprietary technology
- (iii) marketing and distribution. Lower costs may be achieved through obtaining a high share of sales in a given geographic region
- (iv) application engineering. A high market share per application provides the opportunity to gain competitive advantage
- (v) research and development. In some businesses research and development can constitute the key area of competitive advantage. These businesses typically are characterized by a small total market for the product, high purchase price, and low purchasing frequency. Cost advantages derive from a competitor's ability to capture a large share of the market for a product generation.

The following sections analyse to what extent Ireland's manufacturing businesses are based on low wage-rates or complex-factor costs, the country's success in overcoming the investment barriers to industrial restructuring and the threats and opportunities facing the complex-factor cost businesses in which Ireland participates.

CURRENT STRUCTURE OF IRISH INDUSTRY

IRELAND'S NATURAL RESOURCE-BASED INDUSTRY

Agricultural-Based Industries

Ireland's food processing industry employs 24.7% of all workers in manufacturing in Ireland, down from 26% in 1973. The sector's share of total Irish gross exports is 37% down from 49% in 1970. If exports are considered net of import content, the Irish food sector accounts for almost 45% of total Irish net exports.

In this section the focus is on those product areas which are clearly natural endowment based and which are exported from Ireland. For these products, such as beef, dairy, fish, animal feed and margarine, agricultural production accounts for an average of 80 to 90 per cent of total product cost.

Two product areas stand out as being of particular importance to Ireland: beef processing and dairy products. Together, they represent 71% of total gross food processing exports in 1979 (Exhibit B) and about 30% of total employment in 1980.

The success of Irish dairy and beef processors is to a great degree dependent on the competitive strength of Irish farmers. It is also dependent upon the terms of the Common Agricultural Policy. From 1973 to 1978, Irish intervention prices rose rapidly to catch up with EEC prices at a time when EEC prices were still moving up steadily. The existence of sizeable surpluses in the 1978-1980 period has caused demands from some member states for reductions in food prices and in Community expenditure on agriculture. The first response to these pressures has been a real reduction in intervention prices. A longer term response is likely to involve a gradual shift of production between countries, from the inefficient to the efficient ones. It is therefore essential to understand whether Ireland's actual or potential cost position is lower than that of its competitors.

The Irish dairy processing industry is dependent on exports to other EEC countries. Over 90 per cent of skim milk production and 70 per cent of butter production are exported. Currently the Irish processing industry is potentially competitive with similar plants abroad. However, Irish dairy farming is still generally uncompetitive and the impact on processing costs is to make the total dairy product uncompetitive. While present milk prices are competitive, this is made possible only through

**Exhibit B
Food Processing Export Sales
(constant 1979 £)**

	Total (1979 £'s)	Meat (%)	Dairy (%)	Other (%)	Total (%)
1970	477M	51	18	31	100
1975	887M	46	29	25	100
1979	1108M	41	30	29	100
Average Annual Change 1975-79 (%)	+5.7	+2.7	+6.0	+10.3	-

Source: CSO Trade Statistics

farm incomes which do not provide many farmers with an adequate living standard and involve a considerable array of financial support by the government. In addition current farming practices and products cause disadvantages at the processing stage. The low fat content of Irish milk and the seasonality of production induces under-utilization of capacity at certain times of the year. Seasonality also limits developments in cheese to products which have a long storage life or those destined to be processed.

The beef industry's performance in the past five years has been at best moderate. The beef sector grew very fast from 1969 to 1975. Since that period, notwithstanding the higher price levels prevailing under the CAP, its performance in terms of output and product mix has not improved noticeably. It has remained cyclical, seasonal and very uneven in quality of output. Live exports still constitute a significant portion of output.

The effectiveness of the traditional tendency to direct most food and beef exports towards Great Britain is questionable. After many years of investment, the relative price of Irish food products in the UK does not demonstrate a premium brand image. The recent success in selling into Germany, though limited, indicates a great potential for Irish food products on the Continent. However, measures to improve the marketing of Irish agricultural products cannot be totally successful until the problems are solved at the primary production level.

Non-Agricultural Resource-Based Industries

In addition to its grassland endowment, Ireland has a series of other

**EXHIBIT C
IRISH EXTRACTIVE INDUSTRIES
(1981)**

	(000) Est. Employment	Est. Sales (£m)	% To Export
Base Metals	1.6	130	99
Industrial Minerals	0.1	24	85
Coal	0.1	2	0
Peat	6.3	40	20
Quarries	3.5	120	0
Cement, concrete, clay and products there	1.6	140	0
Gas	0.1	45	0
Forest Products	4.6	50	5
	<hr/> 17.9	<hr/> 551	

natural advantages which provide the basis for industrial development. Exhibit C presents a summary list of these industries. In the study the focus is on the largest of these which are currently or potentially tradeable – mining, gas and forest products. The zinc, barytes and gypsum resources are well used. The desirability of the use of natural gas to produce ammonia and urea is questionable. The forestry resources are under-utilized due to poor organization. Finally there are a number of valuable assets awaiting development, such as, the deep water ports of Bantry Bay and the Shannon Estuary, and the Bula zinc mine.

IRELAND'S INDIGENOUSLY OWNED INDUSTRY

The indigenous sector (defined as companies owned in majority by Irish interests) represented two-thirds of total manufacturing employment in 1980, down from three-quarters in 1973. During the period 1973-80 employment in indigenous manufacturing industry grew by only 2,000. This overall picture hides a deep structural change. The number of jobs in textiles, clothing, and footwear fell by more than 10,000 over the period. This was matched by increases in metals and engineering (more than 5,000), food, cement and glass, and printing and packaging (2,000 each). Despite their importance in terms of numbers employed, indigenous businesses have not been major exporters, and represent only 30% of total Irish exports of manufactured goods (Exhibit D).

This very simple description of structural change might be interpreted as showing the successful replacement of employment in the "old" protected sectors by a generation of companies in new growth sectors. A different picture emerges, however, from an analysis which examines the competitive environments of these businesses.

A rough distinction between traded and non-traded or "local" industries shows that the two industry types have performed very differently. Most traded industries have fallen from their 1973 employment levels, with some noticeable exceptions in glassware and agricultural machinery. Almost all non-traded industries, on the other hand, have enjoyed net employment increases, e.g. packaging, cement, and metal fabrication.

Growth generated by the development of non-traded business opportunities can only provide a limited source of income due to the size limitations of domestic demand. Long-term industrial growth can only be provided by the development of businesses exporting outside Ireland.

In the analysis of the reasons for past performance and the contributions that indigenous businesses make to the development of a higher income economy, a distinction is made within each industrial sector between three broad types of businesses which cut across the common trade classifications: businesses subject to low wage competition;

EXHIBIT D

IRISH EXPORTS BY COMPANY OWNERSHIP

(Gross Exports)

Company Ownership	IR £M	1979 Exports
		Exports as % of Production
Total	1856	51.2
Irish	549	29.5
Mixed	35	42.3
Multinationals	1272	74.5

Source: CTT and Exhibit 3.2 of main text.

businesses subject to competition from developed economies ("complex-factor cost") and "non-traded" businesses.

Traditional Indigenous Industry

A high proportion of the businesses in textiles, clothing, footwear and simple metal fabrication have disappeared or reduced employment in the face of competition from low wage producers. Some Irish companies can retard their decline by investing in improved production facilities. Other companies may also identify defensible business segments based on such factors as short lead times, design and proprietary process technology. It is most likely that further job losses can be expected in industries like textiles, clothing or footwear where there is still a significant number of low wage-rate businesses (long-run knitting and non-wool clothing, men's semi-leather shoes, and others). The rate of job loss should be somewhat lower than the historical figure of 6% per year, however.

The requirements for successful complex-factor cost businesses have already been discussed. These businesses must identify key factors in the cost structure (run length, scale per application, distribution scale) and establish long-term competitive advantages in these factors through appropriate investments and organizational structure.

Seventy five per cent of exports by indigenous companies go to the United Kingdom. In addition to language and culture similarities and geographical proximity, some characteristics of the British consumer are close enough to those of the Irish to make this a relatively easy market to enter. However, geographical barriers such as consumer tastes, safety standards or measurement systems, tend to erode over time. As the UK progressively integrates into the EEC, standardization will take place as it did a decade earlier between the original six members. Brighter colors and plain patterns, favoured in the UK, are appearing in carpets from continental producers. Electrical standards are progressively being harmonized within the EEC. As a result of this, Irish companies may have to face increased competition in the UK from stronger competitors in Europe who may be several times larger than British competitors. In ladies' outerwear for instance Ralph of Germany has a larger volume resulting in run lengths per style that are twice as large as Vistex of the UK who has so far been the Irish company's chief competitor.

As Ireland's share of its traditional market erodes, the factors which have protected some of its exports to the UK can often be barriers to further international expansion. These barriers may be in production (retooling for different measurement standards, setup cost between

runs), design (meeting different standards of different user requirements), or distribution (cost of initial advertising campaigns and sampling programs). Not many Irish companies have been willing or able to make the high-risk investments and accept the long payback horizons for new technologies or product redesigns.

Irish companies have also had difficulty in developing marketing, technical selling and distribution advantage in export markets. Again, the rule is demonstrated by the ease with which one can name almost all of the exceptions. Distribution organizations, for example, require high initial investments in working capital and the ability to sustain losses for a number of years in the penetration period. Only a few companies, relatively large by Irish standards, have been able to do it.

Marketing expenses are mostly linked to a specific geographical market, since each country has differences in language, distribution, structure and consumer taste, the absolute cost of any specific advertising campaign tends to be the same. This implies an obvious cost disadvantage for the entering Irish exporter who is small relative to existing competition.

Most Irish food exports are either in bulk beef and dairy commodities, or come from the Irish installations of multinational companies which can overcome the logistics and distribution problems through their elaborate networks abroad. Indigenous firms have not developed significant exports in complex-factor cost food businesses because of a failure to overcome key competitive cost barriers. The most significant of these barriers are high packaging and energy costs, high internal logistics costs within foreign country markets, and the difficulty of creating a successful brand image in other countries.

In contrast to the traded complex-factor cost and low wage-rate businesses discussed above, large companies in non-traded businesses such as cement, packaging, distribution and importing have experienced considerable growth over the last five to ten years. Many have invested abroad in businesses in the same fields as those in which they participate in Ireland and in unrelated non-traded businesses in Ireland itself. While these strategies are understandable from the point of view of the individual companies, from the point of view of the country this is not the best use of the managerial, financial and organisational capability of these companies.

The New Indigenous Industries

About 1,262 indigenous companies have been created since 1973, with a total employment of 21,850 in 1980. Most of this growth has been in non-traded businesses, stimulated by plant construction, agricultural investments and infrastructure expenditures. About 15 per cent of the new employment has been created in predominantly traded sectors

such as textiles and clothing. The other 58 per cent is attributable to heterogenous sectors like metals and engineering, food or consumer goods and plastics (Exhibit E).

Few of the newly created businesses serve the sub-supply needs of foreign firms in Ireland. Only 8 per cent of the components and sub-assemblies used by the largest foreign sector, engineering, were sourced in Ireland in 1976. This is a result both of the type of foreign investments in Ireland and of the failure of existing Irish indigenous companies to adapt to the stringent requirements of a competitively traded sector. In Belgium, a small country with a similar proportion of foreign-owned firms, indigenous firms are 3 times as successful in supplying the requirements of foreign-owned companies.

There has been successes in areas such as plastic injection, plastic moulding tools and hydraulic components. Overseas companies which were interviewed, however, frequently complained of difficulties in sourcing products in Ireland, either because of poor quality or lack of cost competitiveness. Most computer cabinetry is still being imported from sub-contractors in the UK at high cost to manufacturing companies in Ireland. Manufacturing companies are also importing precision iron castings and precision moulded plastic parts due to the shortage of high-quality producers in Ireland.

A few companies have established end product export businesses in areas such as ambulances, excavator buckets and transmission equipment. Most of them, however, are limited to exploiting customer or distribution similarities between Ireland and the UK and find it difficult to export to Europe or beyond. The overall impression is that individual entrepreneurs and investors have rarely been able to develop significant export businesses beyond the "British zone" and that most successes have required some form of continuing external support from public procurement or direct transfer of human skills from abroad – for example, through Irishmen returning after gaining extensive experience abroad.

In summary, the opportunities for Irish industry lie in better exploiting the market provided by multinational companies currently in the country, and in expanding current industries, now serving only Ireland and the UK, to serve the rest of the EEC market and beyond. The barriers to the realisation of these opportunities are adequate skill levels to produce engineered products of sufficient quality; resources to sustain long-term investments in product design, marketing, distribution and price-cutting necessary to penetrate new markets; and a sufficient organisation (either within a single company of adequate size or within a cluster of related small companies) to provide adequate efficiency, reliability and financial viability.

There is no one appropriate size for a firm. It takes a stronger cor-

EXHIBIT E
COMPANY CREATIONS IN IRISH INDIGENOUS
MANUFACTURING

1973 – 1980

	Number of Jobs Created	Number of Companies Created
Predominantly Non-traded Sectors		
Paper, Printing, Packaging	2,300	78
Wood, Furniture	2,200	257
Cement, Glass and Clay	1,300	113
Drink, Tobacco	50	4
Sub-Total	5,850 (27%)	452 (36%)
Predominantly Traded Sectors		
Clothing and Footwear	2,200	89
Textiles	1,100	47
Sub-Total	3,300 (15%)	136 (11%)
Mixed Sectors		
Metals, Engineering	7,300	417
Food	1,700	94
Consumer Goods and Plastics	2,800	133
Chemicals	900	30
Sub-Total	12,700 (58%)	674 (53%)
Total	21,850 (100%)	1,262 (100%)

Source: IDA Employment Survey

porate structure than is typically found in Ireland, however, to promote a skilled foundry, computer cabinet operation, or tool-maker. Small companies can indeed be a source of innovation, but bringing innovations to competitive business success often requires the assistance of entities with larger pools of resources.

FOREIGN-OWNED COMPANIES IN IRELAND

Foreign-owned firms employ about 80,000 people in Ireland, or about 34% of the total manufacturing workforce. The increase of 22,000 in the number of jobs during 1973-80, contrasts with the modest increase of just over 2,000 jobs in indigenous industry over the same period.

This increase masks a considerable turnover of jobs. About 16,800 jobs, equal to 29% of the total in foreign-owned companies in 1973, have been lost over the past seven years. Job gains in existing companies were proportionally similar to those in indigenous industry. Employment generated from new projects, however, was proportionally higher, than in the case of indigenous industry and is the main cause of the better performance in the foreign sector.

A large company producing traded goods will usually invest outside its home market for one or more of four reasons:

- (i) to gain access to a market which is difficult to serve competitively from outside due to tariffs, logistics, or customer preferences;
- (ii) to gain access to a pool of skills not sufficiently available in the home country;
- (iii) to gain access to a needed raw material;
- (iv) to gain access to low labor costs, or to special tax or other financial advantages.

Currently, most foreign-owned companies use Ireland as a convenient manufacturing satellite for sales in the EEC. Over 80 percent of the companies visited during the study came to Ireland primarily because it provided a tax shelter for penetrating the EEC. Fourteen percent, especially those who came in the 1960s or early 1970s, were attracted primarily by the relatively low wage rates.

The key questions to be answered in evaluating Ireland's program of attracting foreign companies are

- (i) to what extent the jobs and net exports earned will last and
- (ii) to what extent these companies will support higher industrial incomes by helping Ireland to overcome the investment barriers to successful participation in complex-factor cost businesses.

The remainder of this section contains an analysis of foreign-owned

companies focussing on the engineering sectors, both electrical and mechanical, since they represent the largest proportion of current employment and project approvals (Exhibit F). It also discusses the chemical and pharmaceutical industry since that industry has been responsible for a significant portion of total investment in the country.

Electrical Engineering Industries

Electrical engineering industries have been Ireland's most significant growth areas in the late 1970s and promise to expand even more in the 1980s. These industries have been the major focal point of activity for the IDA over the past few years. As of December 1980, about 70 multinational companies in the electrical and electronics industries had begun operations in Ireland, employing over 10,000 people. This number is forecast by the IDA to grow rapidly over the coming years.

The key competitive activities in computer businesses involve product design (including hardware, software, overall system architecture and language software) and, where sales are not done through original equipment manufacturers, marketing and service.

One must look carefully to determine the extent to which the electronics industry is really rooted in Ireland and can contribute to rising incomes in the country. Of the 60 companies surveyed, none have a truly stand-alone operation in Ireland, and only three have operations in Ireland which embody the key competitive elements of the company's business. All the others are currently manufacturing satellites, performing partial steps in the manufacturing process.

Skill development and linkages in Ireland have been limited. The electronics industry is a very high-skilled industry worldwide, but the activities in Ireland's electronics industry do not now reflect this. The interviews revealed that the limited sub-supply linkage is not due to lack of interest on the part of the foreign companies. On the contrary, many of these companies are suffering serious cost penalties by importing components.

The electronics industry in Ireland is growing rapidly and many of the companies are highly profitable. The industry ranks well in terms of viability in the near future. However, the industry has not so far provided the mechanisms for Ireland to move toward higher value-added businesses. Companies have come primarily for tax concessions and other subsidies, and to enter the EEC. If present levels of skill development and sub-supply infrastructure are not improved, the industry's long-term future will be threatened.

Mechanical Engineering

Ireland's foreign-owned mechanical engineering companies consist

EXHIBIT F

IDA GRANT AIDED FOREIGN COMPANIES:
JOB APPROVALS*
(1978-1980)

	Number of Projects	Job Approvals (Thousands)	Percent of Total Job Approvals
Electronics	44	15.9	33
Metals and Mechanical Engineering	77	11.4	24
Chemicals	22	3.7	8
Plastics	11	1.3	3
Food, Drink & Tobacco	7	1.4	3
Wood, Furniture, Paper and Printing	10	1.3	3
Textiles & Clothing	29	5.8	12
Clay, Glass & Cement	4	.7	1
Other	38	6.0	13
TOTAL	242	47.5	100

* New overseas firms

Source: IDA Unpublished Data, Telesis

mainly of sub-assembly and assembly shops of the sort commonly found in newly industrializing countries. Usually, some machining, turning, punching, metal-forming or coating functions are performed, but they are limited in complexity and assembly forms the basis for most employment. Of the 34 shops surveyed, about half had only one or two skilled blue-collar workers and one or two engineers. Most of the rest had a small pool of skilled workers and designers for modifications of products, but together they represented less than 1-2% of the workers in the plant.

There is one notable exception which employs over 40 skilled tool-makers and a number of engineers and draftsmen producing tools and, more recently, stampings for the auto industry. Four other companies perform significant design functions in Ireland and employ a number of skilled workers, but these companies remain in the minority.

The foreign mechanical engineering industry in Ireland is hampered by a shortage of skilled workers and by the absence of a skilled infrastructure of suppliers in areas such as casting, toolmaking, precision plastics and machine shop sub-contractors. The mechanical engineering companies in Ireland purchase less than 10% of their component needs in Ireland, though this is economically disadvantageous. They would like to buy more, but the low quality and high cost of the sub-suppliers prevents this.

Chemicals and Pharmaceuticals

The chemical and pharmaceutical industry in Ireland consists of fairly specialized plants which import feedstocks or intermediates, perform a few process steps and export either intermediates or finished products. The competitive key in most fine chemical and pharmaceuticals is R&D. In five of the 32 businesses surveyed, distribution scale was also a key determinant of overall competitive advantage. Significant competitive edges within a given business can often be gained, leading to very high profitability.

The industry represents 56% of total investment by US companies in Ireland, and 68% of all income earned by US companies in Ireland. The profitability of the industry partly explains (along with the tax rate) why the after-tax profits of US firms in Ireland is better than that in other European locations. In addition to being highly profitable, many of the chemical and pharmaceutical plants employ a higher proportion of skilled labor than other industries in Ireland.

Only two of the 32 companies surveyed carry on research and development in Ireland and none managed the distribution system from Ireland. Thus, the key activities which determine competitive success in this industry are not carried on in Ireland. Further, the

industry provides very little direct opportunity for sub-supply. Chemicals and feedstocks are brought in from abroad and sent out again.

The tax incentives offered by Ireland form the basis for these companies' presence in the country. Any changes in transfer pricing rules or in tax laws in other countries which made these incentives less attractive could cause a number of these facilities to close, since the companies interviewed reported that they suffer significant logistical penalties for operating in Ireland.

Obstacles to Successful Growth in Foreign-Owned Industry

Some people argue that the mix of companies more recently attracted to Ireland will lead to an improvement in job defensibility over past projects because they are higher technology engineering industries rather than more traditional textile, clothing and food sectors. There is no clear evidence to support this view. While the ratio of net change to existing employment was worse for the traditional sectors than for engineering industries during 1973-80, it is unclear whether this reflects sectoral differences or merely differences in the age of the companies.

It is too early to tell how the recent wave of electronics projects will perform. Though these companies are now growing rapidly, there are a number of threats which may dampen future performance. Capital intensity is likely to increase and may lead to job losses and to an increase in grants necessary to attract and maintain projects. An additional threat is the inevitable slowing of growth in some electronics businesses in the coming five to ten years, and the resulting "industry shakeouts". Most Irish operations in electrical engineering businesses do not embody key skills or processes which will make location in Ireland indispensable.

It is reasonable to expect a continuation of job losses in foreign-owned firms at a rate similar to that of the past decade. This means that new companies must be attracted to Ireland for significant employment gains to be registered in foreign-owned industry. The question which must be addressed, however, is the extent to which the employment provided will increase the sophistication of Ireland's industrial structure and, therefore, the industrial incomes of the country.

Foreign-owned industrial operations in Ireland with few exceptions do not embody the key competitive activities of the businesses in which they participate; do not employ significant numbers of skilled workers; and are not significantly integrated into traded and skilled sub-supply industries in Ireland. Many people in Ireland acknowledge these facts but believe that events already underway will change this situation as new higher-technology industries are attracted to the country. The electronics industry is often used as the primary example of the change many perceive to be occurring.

Programs currently underway will ensure that the structure of Irish industry will evolve slowly toward higher-skilled activity; a small number of additional firms will locate sensitive parts of their businesses in Ireland in the coming years; and sub-supply integration will increase. These programs will raise Ireland's income levels – but not dramatically. Ireland's education and skill levels and infrastructure will continue to be limiting factors, though efforts to improve these factors should continue.

The ultimate limiting factor, however, is the competitive economic dictates of the high technology multinational firms. There are a number of reasons why electronics companies might prefer to place key parts of their activities in countries other than Ireland:

- Applications engineering and marketing functions are often best performed near large concentrations of customers.
- Many American companies believe that it will become increasingly important to employ locals in large EEC countries in order to counter government efforts in these countries to develop an indigenous electronics industry.
- A number of American companies feel that crucial R&D functions should be performed close to home to minimize the risk of spinoffs.
- Ireland's remoteness and small size will always be a disadvantage for marketing functions.
- A tax haven is not necessarily a good place from which to handle marketing and engineering functions. Since these activities are often recorded as costs on the profit and loss statement, they subtract from current profits.

Further integration is occurring in Ireland's existing electronics plants, but with a few notable exceptions, this integration will not significantly increase the importance of the Irish facilities. Comparison with other countries which have been the sites of mobile electronics investments in the past does not support greater optimism. Scotland has a larger and longer established electronics industry than Ireland, with current employment for about 34,000 people in its foreign-owned electronics sector. Despite this longevity, the degree of integration in these operations is limited. A recent report on the Scottish electronics industry stated that the majority of non-Scottish operations were established as manufacturing satellites and few have progressed significantly beyond this role.

AN ASSESSMENT OF PRESENT IRISH INDUSTRIAL POLICY FOR THE FUTURE

CURRENT INDUSTRIAL POLICIES AND INSTITUTIONS

Ireland has a very sophisticated and extensive industrial policy, involving large numbers of people in a wide variety of activities to assist industrial development. The intentions expressed in the philosophy and goals of Irish industrial policy are intelligent and clear, the agencies are extremely inventive and energetic in devising programs to carry out these goals, and substantial sums of money are being spent in support of these efforts.

Modern Irish industrial policy has had as its goal the creation of new employment in industry with ever-increasing income levels. The methods for accomplishing this goal have been consistent since the 1950s: encouraging industrial investment by Irish and foreign companies through general promotional activities and financial incentives, and opening the Irish economy to free trade.

Indigenous Industry

The three Irish development agencies – IDA, Shannon Free Airport Development Company (SFADCo) and Udaras Na Gaeltachta have all recently put more emphasis on indigenous development in their statements of policies and programs. The IDA is aiming to have 35% to 40% of new job approvals in the next three years come from indigenous companies and has revamped its organization to achieve this goal.

The Small Industries Division has doubled its staff over the last four years to a current level of fifty people, of which twenty-five are professionals. In 1975, a Project Identification Unit was established to identify new manufacturing opportunities in Ireland and to encourage existing and new companies to exploit these opportunities. The Enterprise Development Programme was established in 1978 to encourage "first-time" Irish entrepreneurs with professional backgrounds (managers, engineers, etc.) to establish businesses for themselves.

SFADCo was given a mandate in 1978 by the Minister for Industry, Commerce and Tourism to launch a new pilot project for developing small indigenous firms in the Mid-West. This project was based on the concept of an agency for small firms. The agency would serve as a

"one-stop shop" for small industrialists, making all advisory services, financial incentives and support programs directly available to them. The staff resources and capital expenditures (in buildings particularly) devoted by SFADCo to small industry represents the greatest effort ever undertaken for these firms.

Foreign-Owned Industry

The IDA is the primary agency concerned with attracting foreign-owned companies to locate in Ireland and ensuring the success of their start-up in the country. It has done this by developing a marketing organization which is unquestionably the most dynamic, most active, most efficient and most effective of its kind in the world. The incentives which the IDA can use to induce a company to locate in Ireland are varied and substantial. The fundamental attraction is the 10% tax rate. In addition there are capital grants on fixed assets, grants for training and research and development and tax based lending. The current strategy of the IDA is to encourage firms locating in Ireland to develop an integrated business in the country, with particular emphasis on electronics companies and professional service companies.

Critique of Irish Industrial Policy

The stated goals for Irish industrial policy are appropriate. The industrial structure described earlier in this report does not, however, reflect the successful achievement of these goals:

- high-skilled, high-technology enterprises are rare;
- Irish indigenous exports are small and limited in geographic scope;
- Irish companies are not successfully providing sub-supplies to foreign-owned industry;
- small firms exist primarily in low-skilled non-traded businesses;
- little cooperation exists between primary producers and processors in raw materials-based businesses;
- foreign-owned industry is often unsophisticated and the evolution of existing companies shows inadequate promise for substantial improvement.

The State-sponsored agencies concerned with industry are generally extremely well-run organizations. Communication between private industry and public agencies is usually very good. There is undoubtedly in Ireland a degree of common purpose regarding industrial development that is rarely found in other countries.

It is sensible for a newly industrializing country, like Ireland, to actively attract foreign-owned firms to accelerate the development process. These firms bring needed capital, a market for the creation of industrial

infrastructure, skills, and jobs to the country. Successful indigenously-owned industry is, however, essential for a high-income economy. No country has successfully achieved high incomes without a strong base of indigenously owned resource-based or manufacturing companies in traded businesses. These companies inevitably bring managerial and high-skilled technical employment, a requirement for high levels of services and direct income to the home country.

THE COST OF IRISH INDUSTRIAL POLICY

Ireland has embarked upon an ambitious policy to create employment and raise income levels. The rapid rise in the cost of the country's industrial programs is not surprising. The benefits to be gained from industrial development are significant and it is appropriate that the Irish nation spends as much on investment for industrial development as it can afford. The concerns below refer not to the overall level of investment, but to the allocation of it.

The IDA receives by far the largest share of total funds for industrial policy (62% of all direct funding), must approve the leasing which represents half of the tax foregone from the banking sector and heavily influences other expenditures. The major portion of IDA funds is awarded in grants to companies investing in Ireland.

During the period 1973-79 the average grant approved for each anticipated job in foreign industry was £8,400 (1980 £s).^{*} The equivalent figure for indigenous companies over the period 1970-80 was £4,900. The average actual grant payment per job created and sustained in foreign industry was £7,400 (Exhibit G). The equivalent figure for indigenous industry was £12,500. The reason for the significantly higher cost for indigenous jobs is that unrealized jobs from foreign-owned firms arise primarily from firms never realizing their projected asset or employment targets and therefore not receiving full projected grants. In indigenous firms goals are more often met but not sustained, as firms decline or go bankrupt after having received their grants.

The levels of expenditure allocated to the attraction of foreign owned firms must be questioned on a number of grounds including a comparison of international incentive packages, Ireland's share of internationally mobile projects and the views expressed in the course of interviews.

In comparing the incentive packages of different countries simplifying assumptions have to be made, because of the discretionary nature of most schemes. There is a significant difference between what a country is prepared to offer a particularly attractive project and what it offers on average to ordinary projects. Nevertheless it can be said that Ireland

GRANT COST PER SUSTAINABLE JOB FOR FOREIGN COMPANIES LOCATING IN IRELAND UNDER IDA PROGRAMS (BY SECTOR)* 1973-1980

	Grant Paid (1980 mEs)	Grant Cost Per Jobs (000 1980 £)
Electrical Engineering	27.4	3.6
Mechanical Engineering	28.0	6.3
Wood, Furniture	1.1	4.1
Clay and Glass	2.5	3.7
Food	5.4	5.3
Drink and Tobacco	1.4	4.9
Textiles	59.5	12.8
Clothing	2.2	8.3
Plastic Products	12.4	9.0
Paper and Printing	2.4	11.3
Chemicals	24.9	9.3
Other	9.9	5.8
TOTAL	177.3	7.4

*Includes only those foreign owned companies who have received grant payments under the new industry, process and product and R + D Grant Programs.

^{*}All cost figures in this paragraph are 1980 pounds.

on average provides a substantially better incentive package, as measured by the discounted value of incentives offered, than other competing countries for attracting foreign firms. Its incentive package is considerably more generous than that of other European countries even when valued on a 5 year return basis which underestimates the value of Ireland's tax incentives.

In estimating Ireland's share of mobile greenfield projects a comparison was made with those regions and countries in Europe most often mentioned by multinational companies interviewed as potential alternate locations to Ireland. All of these entities, Northern Ireland, Scotland, Wales and Belgium actively recruit foreign investment. Within this group, Ireland attracted 80% of the new mobile projects (those without company facilities already in the country) during 1978 and 1979. No doubt this successful record is in part attributable to the marketing efforts of the IDA and the increasing relative attractiveness of Ireland as an industrial location. Nevertheless, in most businesses, if a company has an 80% market share and gives the largest discounts, it is usually appropriate to consider "testing the water" by raising prices (in this case, decreasing grants).

During the course of the study, almost 100 multinational companies were interviewed. Most had operations in Ireland and all of them had considered Ireland as an investment location. There were also discussions with officials from other development agencies. The distinct impression left by these interviews is that Ireland may be offering more than is necessary, in many cases, to attract foreign-owned firms to the country.

In our recommendations we will suggest a reallocation of Irish resources toward indigenous industry and in particular toward traded businesses. Any savings gained from paying less to foreign firms could be well used in indigenous industry development.

RESOURCE ALLOCATION

Statements on Irish industrial strategy have emphasized indigenous resource and manufacturing based industry. Government resources committed and actually spent do not reflect this goal. The funds approved for indigenous industry represent only about one third of the total, a proportion which has not increased over the decade. Actual funds paid to indigenous industry over the decade have increased only slightly in real terms despite the significant real increases in IDA budgets.

The subsidizing of non-traded businesses has taken place both under the re-equipment grant scheme and also the New Industry and Small Industry programs. It is suggested that subsidies to non-traded businesses have been too high a proportion of total IDA grants (Exhibit H).

A very high proportion of re-equipment grant payments were allo-

EXHIBIT H

ALLOCATION OF IDA GRANT PAYMENTS TO INDIGENOUS COMPANIES 1970-79

(Constant 1980 £'s)

IDA Programme	Traded		Non-Traded		Total	
	£m	%	£m	%	£m	%
Re-equipment	61	44	76	56	137	100
New Industry	102	80	26	20	128	100
Small Industry (1)	19	49	20	51	39	100

(1) The Small Industry figures are for the period 1967-79

cated to non-traded businesses which were not directly affected by the entry of new competitors. Companies in baking, bottling, animal feed, cement, concrete, wooden doors and plastics conversion compete mostly against other domestic firms. Other largely non-traded businesses such as newspapers, corrugated cartons and boxes, motor rewinds, plastic moulding, or van building have been recipients of many grants originally intended to help the country prepare for free trade. It is suggested that many of these resources could have been better used by businesses contributing to exports or those more directly affected by international competition.

The New Industry and Small Industry programs combined have allocated 72 per cent of their grants to traded businesses and 28 per cent to non-traded businesses. Despite the goal of encouraging sub-supply spinoffs this kind of operation represented only 23 per cent of total payments versus 77 per cent for finished goods manufacturers. Less than half of these sub-supply projects were traded or compete directly with imports.

On occasion, IDA funding has not been discriminating enough, creating oversupply in some industries. This policy of encouraging employment creation in the short term without discriminating among businesses on a supply-demand basis has led to failures in a number of businesses such as structural steel, joinery, agricultural machinery, and metal containers.

THE METHODS USED TO DEVELOP INDIGENOUS INDUSTRY

Despite the dedicated efforts of the various Government agencies involved in developing indigenous industry, the record of jobs created and sustained is not encouraging. Slightly less than half the jobs approved in projects during 1972-78 have actually been created, either by new companies setting up during the 1973-79 period or by established companies expanding. When subsequent losses of jobs by closure or redundancies in these companies are taken into account, only 20% of job approvals were actually in place at the end of the period.

It has been argued that recent programs initiated by the IDA, SFADCo, CTT and other agencies will improve on this record. We have some reservations about these programs, which in our view will make them only marginally better than previous ones.

Structure Necessary for Competitive Success

There is insufficient concern about the structure necessary to make a company or industry competitively successful long-term. This encourages the establishment of firms which are too small to be viable and the mushrooming of staff assistance functions in many public agencies.

There is a renewed emphasis in most countries on helping small businesses. The potential contribution of small firms in larger or more industrialized countries is very different, however, from that of small firms in Ireland for two main reasons.

First, small firms in skilled sub-supply businesses in other countries tend to grow up around large established firms engaged in trade. This industrial infrastructure does not exist in Ireland and the network of sub-suppliers has to be created in a more planned and organized way. This requires a stronger corporate structure than is typically found in small independent firms.

Second, small firms in larger domestic markets can turn to export once they have built economies of scale and financial reserves at home. In Ireland they have to export earlier if they want to reach viability. This also requires financial and marketing expertise, not usually available in very small firms.

Most development and support agencies have increasingly concentrated their efforts on small firms. The concept of "hand-holding" during project evaluation, initiated by IDA's small industries division in 1967, was further extended to "after-care" by SFADCo in 1978.

The philosophy of intense "hand-holding" of small firms must be questioned. It is doubtful whether it is an effective long-term means for development of skills and exports. It has the effect of increasing small firms' dependence on outside services, instead of stimulating in-house long-term solutions or direct cross-company initiatives. It also has the effect of making the agencies more staff intensive.

Unless questions of necessary company size and appropriate industry structure are confronted directly on a business-by-business basis, high failure rates and an ever more expensive group of supporting agencies is likely to continue to develop.

Creation of Skilled and Traded Sub-Supply Industries

Though the Small Industry and Enterprise Development programs of the IDA have in part been concerned with linkage developments in Irish industry, it is the Project Identification Unit (PIU) which has had primary responsibility for this effort.

The PIU does not, however, have full operational responsibility and interactions with the New Industry division are not sufficiently systematic. Companies are visited to obtain their sub-supply requirement lists, but follow-up is erratic. Opportunities are identified but no group ensures that competitive sub-suppliers can grow over time and become successful.

Emphasis of Grants on Capital Investment

The evaluation of the structural problems of Irish indigenous industry

has shown that many obstacles to development involve not production facilities but other areas of cost. For example, in the case of packaged food businesses the value added controlled by an individual processor is typically between 20 per cent and 30 per cent of total cost. Thus a cost disadvantage in the various inputs – raw materials, packaging materials, energy must be compensated for by a cost advantage 3 to 5 times larger in the value added, in percentage terms, in order to achieve a competitive cost overall.

Ireland also lacks sufficient programs for export assistance and overseas marketing and distribution. The level of resources offered by Governments and used by companies in the major European countries in these areas is far greater than in Ireland, even taking into account the relative sizes of the export sector.

Private Sector Associations

Too high a proportion of initiatives for industrial development now come from State-sponsored bodies, and not enough come from industry. In other countries there are significant levels of industry-sponsored research. In areas such as training or management consulting, industry associations or industry-sponsored service organisations typically perform the tasks performed in Ireland by specialized state bodies.

It is not suggested that private associations are necessarily better or worse than government agencies for performing these various tasks. It is generally true, however, that government action taken along with private sector initiative makes for more effective policy.

Co-ordination between Resource and Manufacturing Agencies

In agricultural-based products and in timber, the policies followed by Irish industrial agencies are still not well co-ordinated.

Competing in agricultural commodities requires a low cost position, and particularly a low-cost raw material source. The interaction between farming and processing influences processing costs downstream, and regularity of supply affects the overall marketing ability of the processor. The IDA has funded many projects to create greater processing efficiency, but the farm community has often not made the best use of this efficiency.

A similar problem exists in the forest industry where the IDA is undertaking significant investments at the processing level without adequate co-ordination with the policies of other agencies.

Development Policies and Foreign-Owned Firms

While there is continuing effort to encourage further investment and an upgrading of the skills functions and linkages provided by foreign firms, this effort lacks thoroughness. Greater success may only be possible

through the active structuring of specific ventures, rather than the mere provision of incentives. Currently, the IDA and AnCO have undertaken a joint training venture with Lapple, but this is the only example of such an effort.

CONTROL OF THE INDUSTRIAL POLICY PROCESS

Job Approvals

Irish industrial policy aims to create jobs. As it is now designed, it expends too much energy creating job approvals. The two are not synonymous. Only 30 per cent of the jobs approved in foreign-owned firms between 1970 and 1978 were actually on the ground in 1981. The total of payments in the period 1973-80 was equal to 30 per cent of grants approved.*

An even greater discrepancy exists for indigenous industry. Sustainable jobs as a percentage of job approvals is only 14 per cent, while grant payments as a percentage of grant approvals has been 40 per cent. The discrepancies are due mainly to company failures and employment losses in surviving companies.

There are three dangers inherent in the gaps between approvals and reality:

- the difficulty of planning. Job and grant approvals must be discounted in order to be useful for planning purposes
- expectations are created in the population at large which are not met
- the anticipation of inflated numbers, as with the anticipation of inflated currency, causes in itself further inflation.

Though there is value in job approval targets, both politically to a government and motivationally to a development organization, it is felt that a more complete system for evaluating the performance of the development agencies should be adopted.

Tax Expenditures

The fastest-growing part of government assistance to industry is virtually uncontrolled by government agencies. Tax expenditures through tax-based leasing, Section 84 of the tax code, and preference share arrangements now represent about 17% of all incentives granted to industry, up from virtually nothing six years ago. These expenditures are now too large to remain unaudited.

*The reasons for the differences between job approvals and jobs on the ground are given in Chapter 9 of the main report.

Information Systems

It does not seem possible for the government to control intelligently the direction of its industrial policy if it cannot obtain sufficient data on tax expenditures or to track such factors as jobs in place, relative skill levels, sales and export performance of companies. There is currently inadequate information well enough processed to make strategic decisions.

Responsibility for Strategy

By law, government departments are responsible for determining strategy, and the various development agencies are responsible for implementing it. The current strategy for Irish industrial development is embodied in a plan formulated by the IDA within a general mandate of job creation. The government bodies who should be responsible for policy-making are often "fire-fighting" and responding to IDA initiatives. They have neither the staff nor the information to formulate strategy, or to oversee the development agencies on an ongoing basis.

RECOMMENDATIONS

NEW DIRECTIONS FOR IRISH INDUSTRIAL POLICY

The philosophy, approach, institutions and policies associated with Ireland's industrial development are fundamentally sound. The changes recommended below – in resource allocation, in programs for indigenous industry development and in the control of Irish industry policy are designed to improve an already excellent effort.

Budget Levels and Resource Allocation

The level of funds devoted to Irish industrial development should be as high as the Irish people can bear. To optimize the use of those invested resources, the following changes are recommended in the allocation of resources within Irish industrial policy.

- (1) *A substantial reduction of average grant levels for many foreign-owned firms locating in Ireland.*

In many cases considerably more incentive is given to foreign firms to invest in Ireland than is necessary. Ireland must respond more selectively by bidding very high on the really attractive projects, and significantly lower on the bulk of potential projects.

A strategy such as this requires clear guidelines to determine which projects merit particularly high grants, and which ones should receive little or no grant. Projects with the following characteristics (in descending order) should be valued highly:

- projects which will locate functions which are key to the competitive success of the company in Ireland;
- stand-alone projects which can survive without significant reliance on the parent company;
- projects which form a significant market for potential sub-supply linkages;
- projects with a real commitment to skilled employment;
- projects which can substitute for imports.

Continuing high grant levels for projects with the desirable characteristics described above, while cutting grants substantially for other projects, will yield employment results which are as good as is currently achieved, for less money. These budget cuts would allow better use of funds for indigenous industry development which will in the long run, create more defensible and higher income jobs.

- (2) *A sharp reduction of grants given to indigenous companies for non-traded businesses (with the exception of high-skilled sub-supply industries).*

When Irish value added is not threatened by imports, grants should not be necessary to create business opportunities. The only justification for granting non-traded businesses is in cases of particularly acute regional disparities within Ireland.

The distinction between traded and non-traded businesses is one of degree which varies country by country and over time. The burden of proof that a business is traded should fall on the company applying for a grant. The IDA should develop a simple framework (market share, origin of competitors, cost structure with relative importance of scale and logistics) to evaluate the contentions put forward by companies.

In addition to being unnecessary, grants to non-traded businesses can create a "businessmen's dole" mentality. All companies may come to expect a grant for any investments. The lack of a grant may even become a stigma indicating that a company or project is not worthy.

- (3) *A substantial increase in funds devoted to the development of indigenous export businesses.*

Creating and sustaining jobs in indigenous firms is far more difficult and expensive than doing so in foreign-owned firms. Despite this, it is questionable whether the Irish economy can achieve the income goals to which it aspires with a traded industry structure based primarily on foreign-owned companies. Key business functions will continue to be located close to home or in major markets.

A goal of raising the proportion of funds allocated to indigenous export or skilled sub-supply firms from less than 40 per cent over the past 10 years to 50 per cent by 1985 and 75 per cent by 1990, should be made explicit.

A much higher proportion of funds should be used to encourage large firms to reinforce their export positions, expand in new markets or start new businesses with trade potential.

The Development of Indigenous Industry

Perhaps the greatest need for Ireland's industrial policy in the 1980's is to better manage the development of indigenous industry, both manufacturing and raw material based. The following recommendations address this issue.

- (4) *The development effort aimed toward new indigenous industry must be reorganized to emphasize the building of structurally strong Irish companies rather than strong agencies to assist weak companies.*

The encouragement of small company promotion and provision of elaborate "hand-holding" by IDA, SFADCo, CTT, IIRS, IPC, NBST, Innovation Centers, etc. will not, it is suggested, succeed in creating new, strong, exporting and skilled sub-supplies companies.

A more structural approach is necessary, focussing on building competence within companies and making sure they can meet all competitive challenges. This type of effort would be a "hands on" approach, which stresses the building of fewer larger companies with strong internal capability. It implies fewer company creations and a greater selectivity of businesses which receive backing. This is not proposed as a substitute for the development of small industries and the encouragement of new entrepreneurs, but rather as a supplement in those cases where the business opportunity is large and chances for success are great.

Small firm projects need not be handled by a specific agency. The building of structurally strong firms and the need to foster linkages with foreign firms argues for the IDA to keep small industry development as part of an integrated indigenous development charter.

- (5) *The Government should encourage greater participation by large indigenous companies and by the indigenous financial community in traded and skilled sub-supply businesses in Ireland.*

Ireland's indigenous industry will not develop at a fast enough pace without greater involvement of large companies in traded or skilled sub-supply industries. Many of these companies have received grants to invest in local non-traded businesses. Their risk-return relationships currently dictate investment abroad or in additional local non-traded businesses. The Irish government's industrial policy must alter these relationships in order to encourage other investments which conform more to national needs.

It is not suggested that government dictate investment decisions

in large Irish companies. There should be a more active dialogue between government policymakers and large companies about investment plans, and mechanisms for the government to fiscally favour certain types of investment over others.

- (6) *The grants available for indigenous industry should address specific cost penalties and should be directed to the long-term resolution of these penalties.*

The capital grant is overused in Ireland. The fact that the only way to reduce the cost of capital and therefore increase return on net assets in Ireland is to invest in fixed tangible assets, distorts the allocation of resources towards capital intensive businesses and away from knowledge intensive businesses.

For many companies, the large share of investment is not in equipment and plant but in areas normally reported as expenses on income statements such as product or process technology, overseas marketing, skill development, application engineering, etc. Similarly, many cost penalties from which Irish companies suffer are related to investments which need to be made in infrastructure. An additional set of potential grants should be introduced which will more specifically address these investments and cost disadvantages in areas such as logistics, R & D, linkages, overseas marketing and skill development.

These grants should be administered by existing agencies according to their area of competence: CTT for overseas marketing, IIRS for testing, ANCO for training, IDA for tooling and prototypes, and the NBST for general R & D, technology licenses, and new product user grants. Among these efforts, those directed at marketing (CTT) and R & D (NBST and IIRS) are the ones which need the greatest increments in grant budget.

- (7) *Consideration should be given to further use of loan, loan guarantee, redeemable equity and participative loans, for providing incentives to foreign firms.*

Ireland is relatively unique among countries in not having developed these mechanisms (beyond tax-based lending) as part of its incentive package. A fresh look should be taken at using these measures in lieu of capital grants in certain instances.

Loan guarantees would have the advantage of reducing cash outlays for the State and inducing banks to cooperate in financing industrial development.

- (8) *In order to spur indigenous industry development better advan-*

tage should be sought from foreign companies operating in Ireland.

Currently, the IDA relies on foreign companies to produce projects to "deepen" their investments in Ireland. A more productive model exists in the Lapple training project. In other countries foreign companies receive extensive incentives to participate in jointly sponsored projects which help develop indigenous skills and businesses.

The IDA should, either by itself or through private or public companies in Ireland, try to structure such ventures more directly. A separate section within IDA to coordinate and fund such developmental efforts including linkages with foreign firms should be considered.

- (9) *New joint efforts should be undertaken to oversee the development of Ireland's resource-based industries.*

Large sums have been mis spent on processing facilities for agricultural goods because proper coordination with primary producers did not take place. Because the study did not address the natural resource area directly, the form such a coordinated effort should take is not proposed here, but it is certain that a great opportunity will continue to be lost if nothing is done.

- (10) *Ireland's industry associations should play a more direct role in assisting the development of their industries.*

In areas of product and process design, and in various aspects of overseas advertising, marketing and distribution, industry associations in other countries often play a crucial role. It is suggested that the Confederation of Irish Industry could effectively expand its range of activities. The principal areas where this might be accomplished are in coordinating technical centers in Ireland and marketing efforts in selected foreign countries.

The Control of Irish Industrial Policy

Ireland's industrial policy is implemented by a group of strong, capably staffed agencies. There are a few areas where overall control of the process can be improved, however. These relate to information systems and goal measurement and to the control of tax expenditures.

- (11) *Better means are necessary to measure the progress of Ireland's industrial policy.*

The job measure is overemphasized with harmful results. Ireland needs

sustainable jobs with high incomes, not job approvals.

There is a need to develop a series of reports which measure the success of Irish industrial policy in clearer terms than exists today. These reports should clearly show job gains and losses and which correlate with job and grant approvals, employment levels, value added per employee, local purchases, exports, imports, grant payments, and other incentives.

(12) Government should gain better control of tax-based leasing and Section 84 disbursements.

As long as the tax advantage provided to the banks through these funding methods are in fact passed onto industry, we believe that these are useful funding mechanisms for industrial development.

The Department of Industry in cooperation with the Department of Finance should have the ability to set guidelines for the use of these funds for certain types of projects. The information as to the recipients of the funds should be made available to the Government for policy making purposes.

(13) The Government departments should reassume a more active policy role.

Better policy oversight is necessary so that responsible government departments can more forcefully set policy direction. Implementing boards should play a role in setting and evaluating the policies which govern their activities, but a competent higher authority should have the primary role.

It is recommended that to accomplish the dual goals of keeping the boards flexible and non-bureaucratic, and yet providing appropriate oversight, there should be active post-reviews. The development of appropriate data, such as referred to in recommendation (11), will be necessary for this to be successful.

A REVIEW OF INDUSTRIAL POLICY

by

The Telesis Consulting Group

SECTION I: THE APPROACH

INTRODUCTION

For the past thirty years, Ireland has been engaged in a massive national effort to industrialize. The pace of this effort has continually quickened over the years with the introduction of economic planning in 1958, the opening to free trade with Great Britain in 1965 and the European Economic Community in 1973, and the progressive expansion of state aids to industry.

The results of this effort are visible in the increase in living standards enjoyed by the Irish people. Over the past two decades gross national product per capita has almost tripled (Exhibit 1). Furthermore, the Irish population has increased in the 1970s for the first time this century (Exhibit 2). Finally, Ireland has succeeded in opening its economy in the mid 1970s while still increasing its overall manufacturing employment. The jobs which had been lost since Ireland entered the European Economic Community in 1973 have been replaced by jobs gained through state-promoted industry expansions and new industry creation.

Despite this record of accomplishment, many in Ireland feel the need to review the course of the country's industrial development strategy. This need arises partly from some persistent and annoying trends in Ireland's industrial performance in recent years. Though Ireland has been improving its living standards, the income gap between it and most other industrialized countries has seriously widened over the past twenty years (Exhibit 3). Furthermore, the economy is becoming increasingly dependent on foreign corporations for its industrial jobs. Foreign-owned corporations now make up a third of Irish manufacturing employment compared to only a quarter in 1973. Despite rapid increases in exports, Ireland's net trade balance has gone increasingly negative (Exhibit 4). Finally, state aids to industry are rising rapidly (Exhibit 5) (especially if tax expenditures are included) at a time when the national budget is stretched.

In addition to these disturbing signs, changes in the international economic environment have also given rise to concerns about future industrial growth. As the former Minister for Industry, Mr Desmond

O'Malley, stated in a recent speech:

We should be under no illusions about the international environment in which our industrial sector will have to operate in the 1980s. It is likely to be dramatically different from that of the 60s and 70s. We are likely to see only moderate economic growth in the developed countries of the world. Almost uniformly, forecasting institutes in most western countries are predicting slower growth in output, increasing inflationary forces, persistent monetary instability and dramatically increasing unemployment. We are likely to see rapid technological change continuing to be an essential element for development... we are likely to see increasing participation from developing countries in world economic exchanges.

Here in Ireland, we must be prepared for the fact that the determinants of economic growth in the decade ahead will be different in quality and in intensity from those that determined economic growth in earlier times.

These types of concerns were echoed by the then Taoiseach Mr Charles Haughey in a speech in February 1980:

While our economic circumstances and general economic environment have changed over the last twenty years, the basic elements of our industrial strategy have remained almost unchanged. The economic environment has changed under the impact of recession, the energy crisis, industrial development in many new regions of the world, and the competing claims for international investment funds. There is now almost complete free trade in manufactured goods while the pace of technological change has been accelerating all the time. Added to all this, serious bottlenecks to industrial development have begun to appear in the areas of manpower, education and infrastructure.

For all these reasons, the time has come to look at the kind of industrial development strategy which should lead us through the 1980s and beyond. Present policies have served us well, but we clearly need a comprehensive review of them in light of the circumstances of today.

In July of 1980, Telesis was asked by the National Economic and Social Council (NESCC) to carry out a review of Ireland's industrial strategy. The objective of the policy review is "to ensure that the Irish government's industrial policy is appropriate to the creation of an internationally competitive industrial base in Ireland which will

support increased employment and higher living standards".

This report presents the conclusions we have reached after a seven-month study carried out between September 1980 and March 1981. This effort was conducted as a problem-solving exercise and is by no means exhaustive. It should be read as a policy document rather than as an academic treatise.

Summary views are given of various Irish industrial sectors such as dairy, textiles and electronics. The sectors highlighted were chosen for their importance to the Irish economy. These summaries are brief audits. Thorough studies of each one of the sectors addressed would require at least as long as the whole timeframe of this study to do properly. The goal of this effort is only to provide a brief strategic overview to identify problems and suggest overall directions for future policy.

The results of the study rest on economic analysis of company and government data and on a broad series of interviews of company, union and government officials. The analysis and interviews were carried out in Ireland and in other countries whose experiences are relevant to Ireland or which house Ireland's foreign investors.

The study is divided into four sections. The first chapter gives a brief introduction to the approach taken in the study; Chapters 2 through 4 present a brief survey of the current structure of Irish industry and various threats and opportunities which confront it. Chapters 5 through 9 review Irish industrial policy and present an assessment of the potential success of current policies in ensuring Ireland's continued income growth in the coming decade. The final chapter presents a series of recommendations for the strategy and conduct of Irish industrial policy based on the foregoing analysis.

The opinions expressed in the study are those of the study team alone and do not necessarily represent those of the sponsors nor the people we have interviewed.

CHAPTER 1

THE APPROACH

This study is a practical exercise designed to assist policy formulation. It is therefore not appropriate to present a detailed theory of wealth creation. Nevertheless, there are a series of economic assumptions which have formed a framework for this inquiry. This chapter is a simple exposition of these assumptions.

WEALTH CREATION

Greater wealth for each person in a nation is created by increasing the value added per workhour embodied in the goods and services produced in the country. This is accomplished both by improving productivity for existing industrial activities and by shifting resources across industrial activities towards those which can command a higher international market price for an hour of labor. In the first case, if methods of building a house can be improved through the use of better equipment so that fewer manhours are required, then wealth can be created, as more houses can be constructed for the same amount of work. In the second case, if tool-making or the drawing of engineering plans can command a higher price per hour of labor than inserting components into a circuit board because fewer people in the world are capable of performing these activities, then shifting the production mix towards these activities can increase the wealth of the society.

Improvements in value added per work hour, however, are not sufficient. The potential for greater wealth can only be realized if workers displaced by efficiency improvements or resource shifts find work in other productive enterprises. Thus, if fewer people are needed to build a house in a given length of time due to the introduction of labor-saving machines, this productivity improvement can be translated into greater wealth only if displaced workers can be re-employed. Re-employment of workers requires that the economy be growing, developing new products and markets.

International trade complicates this picture. Theoretically, if a country can produce steel with a 2% increase in productivity every year, and it can use the time saved to increase output of steel or some

other product, then it will experience an increase in living standard. But where international trade exists, this result will not necessarily occur.

If steel producers in another country improve their productivity faster than those in Ireland and achieve higher levels of productivity, then they can choose to export their steel at a potentially lower price. Accordingly, the standard of living of a nation involved in world trade depends upon its competitive productivity in the goods and services it produces which are subject to trade. If absolute productivity for a product is increasing by 2% per year in Ireland, but major international competitors are improving their productivity by 5% per year, then Ireland's standard-of-living may not improve.

The creation of wealth in an open economy such as Ireland's therefore requires continual restructuring of industrial activities towards businesses which allow higher value-added per employee, attaining higher productivity than others participating in these higher value added industries, and maintaining high levels of employment.

THE BASIS FOR PRODUCTIVITY ADVANTAGE

In choosing the products which it will export, a country should first look at its physical endowments to see where it may gain competitive productivity advantage due to natural factors such as geology, geography or climate.

For example, Australian iron ore is of high purity and lies near the surface in very thick deposits; Swedish iron ore is one mile underground in thinner deposits and is mixed with considerable phosphorous impurities. It is not surprising that Swedish iron ore mining is less productive than Australian iron ore mining. Similarly, U.S. soil and climate are more favorable for growing many grains than the rocky, mountainous soil covering most of Japan. Again, not surprisingly, U.S. agricultural exports far exceed those of Japan. Efficient mining or farming methods, or improved technology in processing the raw material, can contribute to better relative costs, but the basis for potential competitive success in these commodity businesses is the natural endowment.

Some countries, such as sparsely populated OPEC countries, may be able to generate significant wealth solely from natural endowments as long as the endowments last and are not superseded by new, more competitive sources of raw materials or by substitute products. Other countries such as Japan have little natural endowment and thus must rely almost entirely on manufactured goods for industrial activity.

While geology, geography and climate provide the primary basis for potential competitive advantage in raw materials businesses, competitive success in manufacturing businesses depends on productivity advantages achieved through effective strategy, technology and organization within a firm. Relative productivity will often depend upon factors such as

production scale, production run lengths, distribution structure, product mix, product or process engineering design and so forth. Japanese companies, for example, assemble a color television set in one third the time required by their European or American competitors. This advantage is derived from product designs which incorporate fewer components, machines which automate board assembly and transfer, designs which use only one main printed circuit board and avoid the need to connect multiple boards, more elaborate pre-production quality control and so on.

High value added per job in both manufacturing and raw material industries is possible when the skills, technology, organization or natural endowment necessary to conduct a given business most productively are in relatively short supply in the world. When these necessary ingredients are widely distributed, then the businesses become subject to competition from countries with low living standards and therefore low wages.

In these low wage-rate businesses developing countries can compete successfully because of low labor costs, even though their productivity may be below that of developed-country producers. In shipbuilding, for example, Korean shipyards are only one-third to one-half as productive as major European yards, but their wage levels are one-eighth of those in Europe. As a result, Korean manufacturers can construct ships at a cost competitive with those manufactured in Europe.

Traditional theories which use labor intensity and capital intensity as indicators of whether businesses are appropriate for low-wage or high-wage countries are no longer adequate to predict which businesses will become dominated by low-wage producers. The increasing flow of capital due to the expanded activities of European, U.S. and Japanese banks, combined with increasing technology transfer, has broken down these stereotypes. A developing country can now buy the world's most modern steel-rolling mills, fibre plants or numerically controlled machine tools and achieve productivity levels sufficient to be low cost producers (given their relatively low wage rates) in many capital-intensive industries. The growth of large-scale retail and wholesale outlets in developed country markets combined with lower cost transportation and communication allows indigenous manufacturers in low wage countries to sell many products competitively without having to build their own distribution networks. A Korean manufacturer of monochrome television sets, for example, can gain a reasonable share of the U.S. market by selling to only a dozen large department store chains. In principle, once low-wage countries enter a business and gain productivity levels one-third to one-half those of developed-country producers, these businesses will in turn become low wage-rate businesses. We will examine later some of the barriers which prevent this from happening in all businesses.

Thus far, we have been discussing only industries subject to world trade. Many productive industries do not trade among nations (or trade only very slightly). For these, increasing living standards result from improvement in absolute productivity, and increasing output results from improvements in home demand only.

The definition of non-traded businesses is not straightforward. These include services which are usually localized within a country or a region of a country, such as health care, goods distribution, public administration and house construction. They also include certain manufactured goods in which the productivity improvements that can be achieved through increased production scale are not great enough to offset the increased costs of distributing the product to a foreign country. Typically, manufactured goods of this sort include those with a low-value-to-bulk ratio, such as steel reinforcing bars or large steel beams; products where the value of scale is limited, such as large plastic moulding; and products which are difficult to transport, such as sulphuric acid or fresh milk. The division between traded and non-traded economic activities is never completely black and white. In Ireland's case, the definition of non-traded goods is complicated by the existence of two separate political jurisdictions within Ireland and by Ireland's late industrialization. The first factor means that many nominally non-traded goods in fact flow to Northern Ireland and back, and therefore appear as exports and imports. The second factor means that some goods which would normally be produced locally are in fact imported to Ireland because there is no tradition of producing them in the country.

GOALS OF INDUSTRIAL DEVELOPMENT

An economy thus consists of raw materials and of manufacturing sectors, each of which has businesses which are subject to low wage competition and others which are not, and each of which has businesses which are traded and some which are not.

For an economy such as Ireland's, which is small and very dependent on world trade (Exhibit 1.1), industrial policy must initially focus on traded goods and on the non-traded industries such as infrastructural activities, whose inputs are crucial to competitive success in the traded-goods areas. The reason for this focus results not only from the large proportion of these goods in the economy, but also from the leveraged impact of traded goods on the economy as a whole. While an increase in productivity of non-traded businesses increases national wealth, a slower increase in productivity relative to other countries does not necessarily jeopardize living standards. For example, if barbers in Ireland are less productive than those in other countries, Irishmen may pay a higher price for haircuts than men in foreign countries. But because there is no international trade in haircuts, they would not run

the risk of losing large numbers of jobs in this industry or the ability to import other needed goods.

For products whose cost structure dictates that they are usually non-traded in developed countries, the first task for Irish industrial policy is to ensure that imports are substituted. Then, efficient competition should be promoted where appropriate, or efficient monopolies where scale economies dictate their necessity. Maximizing absolute productivity improvements is of prime importance.

The goals of industrial strategy for traded businesses in a developed country trying to achieve high international income levels are to:

- Exploit opportunities where natural raw material endowments can provide competitive advantage;
- Continually restructure industry to phase out businesses which are becoming subject to competition from low wage countries;
- Gain competitive productivity advantage in selected manufacturing businesses vis-a-vis other developed countries. (Wage rates or investment and tax subsidies can be used to gain advantage initially but they must be replaced by productivity advantage if incomes are to rise.)

The following sections discuss in more detail the requirements for wealth creation in raw material and manufacturing businesses in Ireland:

WEALTH CREATION IN NATURAL RESOURCE-BASED INDUSTRIES

Natural resource based industries are those in which the raw material input, extracted from the land or sea, is a large portion of the total cost of a manufactured product. These industries include the extraction and sale of the raw material itself, as in the case of crude oil, zinc ore or fresh vegetables, and the manufacture of products from these materials. This study has been defined by the sponsors to specifically exclude raw materials, i.e., agriculture, mining, forestry and fishing. However, the study is meant to include the processing industries related to these raw materials, such as beef, dairy, zinc smelting, etc. Since these processing industries may in some cases depend on raw material inputs for their competitiveness, it has been necessary to move into these areas peripherally in the study.

Natural resource-based industries offer particularly strong opportunities for wealth creation. The proportion of value added domestically in natural resources is likely to be much greater than in manufacturing, where a significant proportion of inputs must be imported, especially in a small country. It is for this reason that nations seek to industrialize

by first exploiting the advantages of any viable natural resources.

The wealth which can be created from natural resource-based industries is dependent on the physical characteristics of the endowment. Unlike manufactured goods, natural resource-based industries can be characterized as providing little opportunity for price discrimination. They tend almost by definition to be commodities where only the physical characteristics of the product (hard vs. soft wood, low- vs. high-sulphur oil or coal) can determine price premiums.

Competitive position in a raw-materials business depends on two major factors: extraction costs, including both the direct and indirect infrastructure costs; and transportation costs to industrial and personal consumers. Historically, transportation costs have played a key role, causing the location of major consuming industries near raw material deposits and restricting trade in many food products. Over time, however, transportation costs, particularly for long distances over water, have declined dramatically. It now costs less to ship iron ore from Brazil to Japan than from Minnesota to Pittsburgh in the United States.

Extraction costs have not experienced a similar decline. They depend on the physical characteristics of the resource. At best, in many renewable resources, extraction costs have remained constant in real terms (with capital substituting in many cases for labor). For non-renewable resources, yields tend to decline and extraction costs can increase over time.

Thus, wealth generation from natural endowments relies increasingly on extraction costs, which in turn rely on the physical characteristics of the endowment and the efficiency of organization and technology of extraction. In the past, in industries such as mining and forestry, high capital costs for development of a resource and associated infrastructure were a significant barrier to the growth of resource industries. Now, with the development of international capital markets and increasing government financing of infrastructure, these capital barriers are less important.

With the decrease of transportation and capital barriers, extraction efficiency is now the key to competitive success, and trade in raw materials-based industries is extensive, except where import barriers limit it. Wool from New Zealand and Australia is the base stock for Irish and Scottish sweaters; iron ore from Brazil and Australia serves German and Japanese steel industries; and oil from the Middle East may be processed in Singapore or the Caribbean and transported to Japan or the U.S.

The economic development of Ireland historically has been based in large part on grassland, which is the country's major natural resource. Farming and the processing of farm output still employ over 35% of Ireland's total workforce, the highest proportion in the EEC. Products

based on farm output still account for almost half of Ireland's net exports. Other raw materials-based industries in Ireland have been small, though Ireland does have one of the world's best lead/zinc deposits and possesses timber resources which represent a potential source of wealth. In addition, offshore gas is currently mined in small quantities, and offshore oil is a possible resource in Ireland's future.

When considering Irish resource-based industries, we will attempt to define when a particular business is in fact resource based and when it is not. We will also focus on the physical characteristics of the resource and on the efficiency with which Irish industry exploits the resource. We will, where possible, place the Irish industry within the appropriate competitive context.

Our discussion of Irish resource-based industry is in two parts, the first covering agriculturally based businesses and the second covering other raw material based businesses (Chapter 2).

WEALTH CREATION IN MANUFACTURING BUSINESSES

Raw material endowments are spread unevenly across the globe. Most countries cannot attain high living standards for all their people in raw materials businesses. Therefore, they must turn to manufacturing to create wealth. Countries have industrialized at different speeds. These uneven endowments and varying speeds of industrialization have led to significant wealth disparities among countries which are reflected in significant differences in wages received for an hour of labor.

Industrial Evolution to Higher Value Added Products

Though it is an oversimplification, the relative success of a country's efforts at industrialization can be illustrated by the relative placement of its industrial activities on a chart used by the Japanese Economic Planning Agency to express Japan's economic development.

The movement of Japan toward higher value added industries is depicted in Exhibit 1.2, which represents Japan's industrial strategy and has provided a paradigm for some newly industrializing countries. The diamond shape represents Japan's mix of total exports among four different categories of industry, each presenting different requirements for competitive success. The bottom point of the diamond represents the percentage share of Japan's total exports in unskilled labor-intensive industries like commodity clothing, footwear, and toys. These industries require relatively little capital investment or technology. The point at the right represents the share of capital-intensive processing industries, like steel and fibers. Competitive success in these industries requires a heavy capital investment and low-cost raw materials, and in most cases industry technology is relatively mature and not subject to major innovations. The left point of the diamond represents capital-intensive

machine industries, like automobiles and appliances. Competitive success in these industries requires a considerable investment in plant and equipment. The top of the diamond represents knowledge-intensive industries, like computer design, fine chemicals, and sophisticated machinery. Competitive success in these industries requires a substantial investment in research and development, applications engineering, and sophisticated marketing.

The shape of the diamond represents the mix of products composing Japan's total exports at a single point in time. In 1959, Japanese exports were mainly unskilled labor-intensive, and the diamond was skewed towards the bottom. Throughout the 1960s, Japan's exports became more capital-intensive. Industries like steel, motorcycles and ships increased their share of exports. By the middle 1970s, more complex products in the middle to upper areas of the diamond, like cars and color televisions, became significant exports. Japan's export mix is now shifting towards high-technology industrial machines and electronic products. By 1985, the Japanese Economic Planning Agency hopes that Japan will have an export structure similar to the structure of Germany's exports of manufactured goods in the mid-1970s.

A second group of countries is now trying to follow Japan "up the diamond". Korea, Hong Kong, Taiwan, Singapore, Brazil and Spain began exporting textiles, electronic assemblies, shoes and toys in the late 1960s. In the mid 1970s, they made competitive gains in more capital-intensive industries: shipbuilding, fibers and steel. Meanwhile, simple electronic assemblies and commodity clothing are now being produced in Malaysia, Thailand, Sri Lanka and the Philippines, where there are even lower wage rates.

A country's position on the diamond – the placement of a weighted average mix of its industries – provides an indication of its potential to achieve higher living standards. But as we shall see later on, one must be careful in the definition of activities. The integrated circuit industry provides examples of all four corners of the diamond. Final assembly, packaging and testing stages of the IC industry are unskilled labor intensive operations; fabrication of the semi-conductor is capital and process-intensive; and the manufacture of the wafer material is raw material- and capital-intensive. Finally, the design of the circuit is knowledge-intensive. Being careful in definition, one can examine the actual activities being performed in a country and gain a picture of their place in the development process.

In simple terms, one can consider businesses at the low end of the diamond to be low wage-rate based, and those toward the top to be based on more complex factors, such as technology, organization and strategy for competitive success. The proportion of businesses an economy has which are complex-factor cost determined rather than

being low wage-rate dependent, is a measure of its potential for increased living standards.

Implicit in the chart is the fact that economies based on industrial activities at the lower end of the diamond will command lower wage rates and lower value added for each hour of work than will economies based at the higher end of the diamond. The reasons for this relate to the relative number of countries which can perform these activities.

Value added per work hour can increase only if there is some investment barrier which maintains a limited supply in the provision of a given product or service. Value added is measured by subtracting raw material inputs from market price. If the physical output of an employee's work hour can be increased by the introduction of new machinery, but this machinery is available to all producers, then the overall wealth of society can be enhanced but value added per employee may not improve, as prices will fall. What allows one country to attain higher living standards through manufacturing is the ability to produce tradeable goods and services which cannot be produced by all other countries with sufficient productivity or quality. The significance of the diamond is that industrial activities at the lower end can be performed in many countries, including those with low incomes and wages, while those at the top end can only be performed in a limited number of countries.

The process of overcoming the investment barriers to participation in businesses towards the top of the diamond, and achieving the ability to pioneer new "knowledge intensive" businesses, is the means to achieve higher living standards.

Traditionally, the availability of capital to purchase equipment has been viewed as the major obstacle to this development. Though this still operates today, it is a less significant barrier than in the past. Capital is more mobile both in the form of equity investment from companies and in the form of loan finance from international banking institutions. Though developing countries cannot have unlimited capital investment possibilities, they can, in selected industries, achieve capital intensity ratios equal to or surpassing those of developed countries.

The investment barriers which must be overcome to allow a country to participate in higher value added businesses are more those of skill and organization than the mere ability to place a capital-intensive plant in the country. The following examines some of these barriers.

White-Collar Skills

In some businesses, product and process technology can be purchased from abroad through license or by importing a few selected people to provide these services. In other cases this is not possible because the ongoing engineering activity is too large and too fast moving to be handled

by license or a few imported engineers. Countries with large pools of experienced university engineers and a large number of companies working at the edge of new technical developments have the ability continually to generate experienced technical personnel. This can often be difficult for a developing country to match. Even if a good number of university educated engineers can be produced either from abroad or from an indigenous university of sufficient standing, these people must usually be seasoned in a sophisticated company environment in order to be in the forefront of technological development in industry.

In addition to engineering skills, overall managerial skills are difficult to acquire for developing countries. Most managers of successful companies have years of experience running different divisions in the company and holding different functional positions. Organizing and managing an international firm requires careful financial and accounting control, marketing, logistics, strategic planning and other functions which require experience to master. While management schools play a useful role in this training, they cannot substitute for experience. While white collar professional firms of architects, lawyers and accountants in developing countries can tailor the skills learned in professional schools to their home markets, managers of international businesses must compete with more seasoned managers from other countries.

The shortage of these experienced white-collar skills in the world and the long periods of time required to acquire them allows a premium to be paid per hour for this work and thus a higher value added per employee in businesses where they form a large proportion of the workforce. In addition to these white-collar skill premiums, there are also blue-collar skills which are in shortage worldwide and which are experience-based and therefore embody significant investment barriers to newly industrializing countries.

Skilled Blue-Collar Labor

In some complex-factor cost businesses, skilled labor can provide a barrier against competition from low-wage country producers. This is because developing countries may find it difficult to establish a skilled labor force in relatively short periods of time.

It is commonly believed that the best way for a developed country to defend itself against low-wage competition from developing countries is to substitute physical capital for labor in production. But this is not the case. In the manufacture of ball bearings, for example, a fully automated plant requires only 30 percent fewer workers than a standard plant of the same size: low wage labor can still be a determining factor in competitive cost position. This is true in many other industries as well.

Number of Workers Required

	Standard Plant	Automated Plant
Operators	204	137
Set-Up Operators	76	59
Maintenance	20	18
Transport	20	10
Control	40	23
Total	360	247

By contrast, the best defense against low-wage competition is often a manufacturing process that requires a skilled labor force. In the precision castings industry, for example, highly skilled labor is required in the diemaking, toolmaking, and form finishing and correction stages of the production process:

Functions of Precision Castings Production Labor

	Number of Employees	Nature of Task
Diemaking and Tooling	21	Highly skilled
Forming and Attaching Wax Pieces to Trees	70	-
Finishing and Correcting Forms	96	Judgement and experience required
Other Production Labor	200	-

Because the highly-skilled jobs must be performed at the same place as the rest of the production, and they involve a significant percentage of the total labor required to produce precision castings, the whole production process is protected against low-wage competition.

Mass production has reduced skill level requirements in many industries. The development of numerical computer control has accelerated this process. Significant business segments remain, however, where short run length, special production, and complex testing, maintenance, or process engineering require skills available only in a developed country. These skills typically can only be acquired over a period of time in the work environment itself. Conditions in many newly industrializing countries do not permit this sort of learning.

Machining operations, for example, usually provide significant opportunities for erecting a skilled labor barrier. Generally, products that are highly standardized and have long run lengths tend to be robotized. Products of medium run length with a limited number of grade varieties tend to rely on programmed, numerically-controlled machine tools. Both processes require only low-skilled labor. But products that have short run-lengths in which each small batch requires different machining steps must depend upon manual-control high-precision tools. These may require highly skilled operators.

A skill-level barrier against low wage competition also can exist in assembly functions where calibration, testing, and repair are likely to be necessary. This is frequently the case where the product is costly and requires fine mechanical adjustments. For example, the calibration of a separator bowl for the dairy industry requires high-skilled labor. By contrast, in circuit board assembly a simple semi-conductor can be thrown away if it does not work. Likewise, the assembly of a process control device may require fine mechanical adjustments, whereas the production of a calculator merely involves the assembly of components which can be discarded and replaced if defective.

Finally, the maintenance and process-engineering functions can create a skill-level barrier against low-wage competition. This is the case where complex, delicate equipment is needed, or when tools must frequently be changed by a skilled operator who must exercise skill and judgement.

Where skills can be acquired only over a long period of time in the work environment itself, competitors have a "skill level barrier" against competition. Although this does not prevent one developed country competitor from entering competition against a competitor from another developed country, this barrier effectively inhibits entry of low-wage competitors from newly industrializing countries.

Company Structure

In addition to skill level barriers, the most significant problem facing countries trying to develop industrially can be the lack of organizations which are well enough established and strong enough to conduct sophisticated industrial activities competitively. There is no one size nor one structure which is best for all businesses. However, in any given business, it is necessary to have a sufficient size to invest in modern, optimum-scale equipment, sufficient international contacts and organization to export and distribute products competitively, a critical mass of engineering and manufacturing skills, and sufficient financial resources to weather downturns in the market, changes in the competitive environment or strategic mistakes. It is also necessary to have an efficient enough structure so as not to suffer competitive cost disadvantages due to organizational inefficiencies.

Often developing countries do not have such organizations formed. In part, this is a function of the skill level insufficiencies mentioned earlier, but it also can be a function of the economic and social history of the country. Nations with a colonial past may have had only foreign-controlled companies of any size in their country; those with an agricultural or mining tradition may never have formed industrial companies organized for export.

Physical Infrastructure

Related to capital availability, skills development and levels of organization is the presence of basic infrastructural facilities in a country. The provision of adequate transport, communications, power, fuel and industrial materials supplies and construction services at a competitive cost is a necessary precondition for high value added industries. Developing countries vary in the extent to which they can provide these facilities with regularity.

Summary

These four factors – a skilled white-collar workforce, a skilled blue collar workforce, a sufficient number of organizations capable of doing business internationally and physical infrastructure – are the keys to successful industrial restructuring toward higher value-added-per-employee businesses. But mere participation in these businesses at the "middle-to-top half of the diamond" does not guarantee high living standards. Firms participating in these industries must find individual businesses where they can gain competitive productivity advantage over other international participants in the same businesses in order to achieve higher incomes from the activity. Differences in prevailing income levels in manufacturing between Great Britain and Germany result in part from greater competitive productivity by the Germans in businesses where the two countries compete.

The ability of the Irish manufacturing sector to provide increased living standards will depend on its success in overcoming the above investment barriers and restructuring its industrial activities away from low-wage businesses, but this will not be sufficient. Competitive productivity advantages vis-a-vis other developed countries in selected complex-factor cost businesses must also be achieved. The following section describes ways such advantage is gained.

Gaining Competitive Advantage in Complex-Factor Cost Businesses

Businesses consist of various functional activities including raw materials purchasing, manufacturing, marketing, product and process engineering, distribution, etc. While each of these functions is present in all businesses their relative importance varies by business. For many cosmetic products

the marketing and distribution value added may be 60-70% of the total product cost and manufacturing may be only 10%. For appliance motors, on the other hand, manufacturing value added may be 50-60% of total product cost and marketing and distribution only 5-10%.

To achieve competitive productivity advantage in a business, a producer need not be the most productive competitor in every element of the cost structure of a product. Nor must the producer be the most productive competitor in the largest element of the cost structure, since significant productivity differences may not always be possible to attain in these areas. Instead, the most critical areas of cost are those that offer possibilities of competitive leverage – opportunities for gaining productivity advantages relative to competitors. For example, in certain segments of the plastics conversion business, all competitors can readily achieve equivalent materials and manufacturing productivity, which together represent more than 80% of the product cost. But productivity advantages can be gained by one competitor over another in warehousing and distribution. Since these account for a relatively small percentage of the total product cost, they are easily overlooked as areas where competitive advantages might be gained.

Though it is an oversimplification, five main ways can be isolated in which productivity advantage can be gained in complex-factor cost businesses. These can be classified according to that part of their cost structure in which opportunities for competitive leverage are greatest in purchasing, manufacturing, marketing and distribution, applications engineering, and research and development. For many businesses, two or more of these elements are crucial to competitive success. We isolate them here to illustrate the ways in which competitive advantage can be gained.

Purchasing

In some businesses, the cost of materials offers an opportunity for competitive leverage. In these cases, a competitors' total purchasing volume becomes important, since unit price reductions are often offered to large-volume customers. A supplier may offer these discounts because it is cheaper for him to deal with a few large customers than with several small ones which together purchase the same total amount of goods, due to manufacturing economies of scale or lower total marketing costs.

For example, one European company has a world market share of approximately 50% in a certain heat exchanger business. In this business, materials account for more than 60% of total product cost. Due to its large size, it is the only competitor in the world in this segment that is able to secure significant price discounts in titanium, the key raw material. It thereby enjoys a considerable competitive productivity

advantage worldwide.

Manufacturing

There are many businesses in which manufacturing costs are the key area where competitive advantage may be gained. Depending on the specific characteristics of a given "manufacturing cost business", advantages may be realized as a result of scale, yield, run length, or proprietary technology.

Overall plant scale can be a source of competitive advantage in some businesses because of the savings it allows in direct labor and manufacturing overheads. For example, the production of ethylene oxide is a continuous process and the unit cost to manufacture it decreases directly as the size of the plant increases. This is because it does not require twice as many personnel to operate a machine capable of producing twice as much of the product; rather, the same number of people can run a machine capable of producing more, thereby lowering the labor content per unit produced. So, for example, a producer with a plant capacity of 150,000 tons realizes direct labor cost savings in the vicinity of 30% better than a competitor with a capacity of only 75,000 tons.

Machine scale, as opposed to total plant scale, can have a similar effect in other businesses. For example, in various parts of the paper industry, wider and faster machines yield more paper per unit of labor and energy than more standard machines.

A producer can also gain manufacturing productivity advantage in certain businesses as a result of superior process-technology which improves raw materials yields. For example, although U.S. steel producers have access to lower-cost coking coal (and therefore a possible materials cost advantage), Japanese steelmakers require 20% less coke per ton of pig iron produced, due to greater blast furnace efficiency and better coal-blending techniques. They therefore have an overall production cost advantage at this stage of production due to their manufacturing technology.

In other businesses, run length can be a critical determinant of manufacturing productivity advantage. This is especially true where the time to set up the machinery to produce a product is very long. The lot size, or "run length", of that product therefore becomes important; a longer run length allows costs incurred in the set-up phase to be spread over more units. This is so, for example, in the ball bearing industry, where Japanese competitors with narrower product ranges have been able to produce some high-volume bearings at lower costs than other producers. Besides lowering set-up costs, longer run lengths can lower manufacturing costs in less direct ways, such as reducing the costs of quality-control and generating a higher yield due to more uniform production. A longer run length can also facilitate more

efficient materials flow, require less complex supervision, and result in less unused production time — all of which results in lower unit costs of production and a consequent competitive advantage relative to other producers.

Finally, manufacturing cost advantage can be gained in some businesses through development of proprietary process technology. For example, one U.S. producer has lower costs of production of low-density polyethylene because of its investment in a proprietary low-pressure process to produce the resin. This process incurs lower operating costs than the traditional one, especially with regard to energy. As a result, the company enjoys an overall cost advantage in this business segment.

Marketing and Distribution

A third way in which cost advantages can be gained is in the marketing and distribution areas. Typically, this occurs when there is a fragmented customer base, in which many small customers have significant requirements for information, after-sales service, and/or spare parts.

In these cases, a low-cost position can be achieved by obtaining a high share of sales in a given geographic region. Share of sales within a region, rather than total world market share, is significant for two reasons: first, economies of scale can be realized at the dealer level in the selling function; second, after-sales services to customers can be provided at lower unit cost.

A high share of regional sales enables a dealer or distributor (whether a subsidiary of a manufacturer or independent) to incur lower operating costs per unit sold than low-share competitors in the region. This is because it can achieve lower sales costs. This results from higher sales for each salesperson and the ability to spread advertising and marketing costs over a large number of units.

In addition, a higher share of regional sales can facilitate higher inventory turns for a dealer, thereby lowering its working capital requirements per unit sold. "Inventory turn" (which is typically measured by dividing total annual sales by the average size of the inventory on hand at any given time during the year), refers to the number of times a dealer can empty his warehouse every year by selling his product. The higher the number of inventory turns, the lower the cost of keeping inventory on hand between sales. A higher inventory turn therefore can reduce unit costs.

Finally, a high share of regional sales can reduce a dealer's service costs per unit sold. A high share of regional sales enables a dealer to open more service depots. With more depots in a given region, service people must travel shorter distances to make each call. Shorter travel distances per service call permits the distributor to provide repairs or maintenance at lower cost; this can be passed on as a lower service

price to the customer. At the same time, the customer suffers less down-time on his product.

These savings in selling and service costs per unit sold can be a source of competitive advantage to a producer. Lower costs can enable him to earn a return equal to that of smaller competitors while charging a lower price. This, in turn, may help him increase his market share in a region, which again can help to further his competitive cost advantage by allowing him to open more service depots, reduce service costs, realize selling economies, and therefore reduce prices. A virtuous cycle may ensue, to the continued advantage of the low cost producer.

Marketing and distribution scale can affect overall profitability in another way. As a competitor's share of the local market increases, so does that population of machines which relies on the competitor's distribution system for service and spare parts. Service and parts often make up a key portion of both the manufacturer's and the dealer's profit. Generally, spare parts sales can account for 20-40% of total sales for the manufacturer and 40-60% of total profits. For the dealer, his service and parts business is an important marketing tool for replacement sales as well as a profitable business in itself.

Applications Engineering

Another means of gaining cost advantage in complex-factor cost businesses is through "applications engineering". Applications engineering costs are those incurred in tailoring basic equipment or software to the specific requirements of a customer. These costs typically are not classified as such in a company's accounting system, but rather are mixed in with general marketing, selling and engineering expenses.

In businesses where these costs are key to competitive success, high market share per application provides the opportunity to gain competitive advantage. Two steps are necessary to improve one's cost position: first, it is necessary to correctly identify and focus on specific end-use applications which require customized products or systems, and where sophisticated selling processes are required. For example, one "application" in the materials-handling business is the computerization of conveying systems for car assembly production facilities, as opposed to general all-purpose conveyor systems; another "application" might be a chemical cleaning formulation for one industrial machine which is different from that required for other machines.

Once having identified a particular application, the second step in building a low-cost position is to standardize modules of the product or system. With standardized modules, engineering time required to develop an individual system can be dramatically reduced both at the research-and-development or design stage and at the selling stage. Standardization may take place in software packages, blueprints,

chemical formulations, or pieces of hardware, depending on the precise nature of the particular business.

Parts of the telecommunication switching business offer a good example of applications engineering. In this industry, a single switch-gear installation requires a sophisticated software system. One successful competitor has been able to lower its overall cost of installing a site by developing standardized software modules which can be used in succeeding installations, thus lowering software costs per installation. Since software represents 60% of a total systems cost, the savings — and competitive cost advantage — are significant.

Applications engineering is also an important source of competitive advantage in the sale of dairy plants. For example, a European company has been able to achieve substantial engineering cost advantages over an American producer of dairy plants by gaining more orders and by standardizing hardware and process control modules.

Applications engineering has become increasingly important as the technology of products has become more complex. The introduction of computer and microelectronic technologies into many businesses has increased the integration potential of products and customer needs and lowered the costs of customization. This development has created a proliferation of applications-based businesses in industries as diverse as chemicals, office equipment and industrial machinery.

Research-And-Development Businesses

Innovation alone seldom provides a basis for long-term competitive advantage. It is often necessary, but is rarely sufficient to gain and maintain cost leadership. If innovation is to contribute to a sustainable competitive position, it usually must be accompanied by cost advantages in marketing, distribution, manufacturing, purchasing, or applications engineering. In a business where the pace of technological change is relatively slow, a leader can often maintain a market share lead while lagging behind in product development by duplicating the innovations of smaller competitors. In many businesses the technical leader in product development is not the most successful company.

In some businesses, however, research and development can constitute the key area of competitive leverage. These businesses typically are characterized by a small total market for the product, high purchase price, and low purchasing frequency. Customers in these businesses choose a particular product on the basis of its performance and cost of operation, and only secondarily on its purchase price. Thus, the competitor whose R&D produces a machine with the best performance-for-value in a given product generation will capture the greatest share of that generation's market, while a competitor with a poorer performing product cannot enlarge its market share by lowering its price. Examples

of businesses where R&D is a key cost include jet aircraft, steel rolling mills, and paper machines.

In these businesses, because it usually takes a long time to carry a product through from design to commercial production, competitors find it difficult to merely copy another's design. In addition, because the total market is small and customers are large and scattered, businesses of this type cannot easily take advantage of lower manufacturing or distribution-scale costs. Rather, cost advantages derive from a competitor's ability to capture a large share of the market for a product generation, since a large relative volume enables the producer to spread its R&D costs over a larger base, thereby lowering its unit costs and maximizing its return. This, in turn, enables the producer to fund the next product generation sooner than others are able to.

Price Premiums

In certain businesses, it is possible to attain a sustainable price premium over competitors which allows higher profits and more funds for sustaining the price premium over time through means other than production cost advantages, such as better quality or performance in products, better after-sales service and strong distributor coverage, or the creation of a brand franchise.

Product design leadership can sometimes result in products which are more reliable or which perform better or have special features not offered by competitors. On occasion (though not always) consumers are prepared to pay a price premium for this extra quality or performance. In these cases, if the price premium exceeds the extra cost of implementing the extra quality or performance, then a strategic competitive advantage is gained.

Sometimes consumers are also willing to pay a price premium in cases where the distribution network is more convenient or the after-sales service is more reliable. Rather than travel to the larger city 50 miles down the road, they will pay extra to buy in their own town. Rather than rely on a service depot which is far away, they would pay a premium and have service more easily available. A company which has invested to establish a more widespread distribution or service support network may, on average for the whole country, be able to command a price premium. Again, the price premium is a strategic competitive advantage only when it more than offsets the extra costs of establishing the more elaborate distribution network.

Finally, companies can sustain a price premium by out-investing competitors in advertising or promotion schemes or gaining wider "shelf space" access than competitors in retail outlets. This occurs when these measures result in a demonstrable brand image advantage which causes customers to seek out and pay more than for competitive

brands. Again, this is a strategic advantage only when the price premium exceeds the extra costs of the promotional activity.

The extra return from price premiums can be put to the same strategic uses as that obtained from being the low-cost producer in a business, i.e., reinvestment to sustain leadership.

Competitive advantage is a leading position in a race. Through investment, means are continually being found to improve product quality and lower product costs. A company which is a latecomer into an existing industry must catch and surpass a moving target. If it begins with lower labor costs and some investment assistance, it may be able to gain ground on an established leader, but these must be translated into competitive productivity advantage if high living standards are to be achieved.

Ireland's Manufacturing Businesses

Ireland has begun its drive to industrialize only recently. Its colonial past and the need to focus energies on goals of political independence early in the century, its small size and its relative geographic isolation from the main body of Europe have all been significant hindrances to industrial development.

We will examine Ireland's manufacturing businesses as they now exist to determine to what extent they are based on low wage rates and to what extent they are in fact complex factor-cost businesses. We will look at Ireland's success in overcoming the investment barriers which limit industrial development. We will also look at key complex-factor cost businesses in which Ireland participates, to determine competitive threats and opportunities.

Our discussion of manufacturing industries is divided into two parts: one addressing indigenous industry (Chapter 3), and the other discussing foreign-owned industry (Chapter 4).

SECTION II: CURRENT STRUCTURE OF IRISH INDUSTRY

CHAPTER 2

IRELAND'S NATURAL RESOURCE-BASED INDUSTRIES

AGRICULTURAL-BASED INDUSTRIES

Ireland's food processing industry employs 24.7% of all workers in manufacturing in Ireland, down from 26% in 1973. The sector's share of total Irish gross exports is 37% down from 49% in 1970. If exports are considered net of import content, the Irish food sector accounts for almost 45% of total Irish net exports.*

The food processing industry covers a number of businesses with fundamentally different economic structures. Exhibit 2.1 portrays different products in the sector according to the proportion of total production cost accounted for by manufacturing processes and marketing on the horizontal axis, and the proportion of product which is exported or imported (net) on the vertical axis. The size of the circle representing each product is proportional to its total sales from Ireland. Products near the left hand margin are those which could be characterized as raw material-based in so far as agricultural production (as opposed to manufacturing and marketing) makes up on average 80-90% of the total product cost. This includes beef, dairy, fish and seafood, animal feed, and margarine and fats. Products close to zero on the horizontal axis are by and large non-traded, such as grain milling, bread, biscuits and flour, and sugar. These commodities are most often shipped purely as raw materials, and are manufactured near end markets. A number of product areas within some of these categories become complex factor-cost businesses when distribution value added is considered. These will be discussed later. In this section, we will focus on those product areas which are clearly natural-endowment based, that is, close to the left hand margin, and which are exported by Ireland, that is, toward the top of the diagram.

Two product areas stand out as being of particular importance to Ireland: beef processing and dairy products. Together, they represent 71% of total gross food processing export in 1979 (Exhibit 2.2) and about 30% of total employment in 1980. These sectors have accounted

*Assuming an import content structure similar to that found by Henry in 1976.

for almost all of the employment growth in the food processing sector since 1973 (Exhibit 2.3).

The classification of beef and dairy products as raw material-based commodities is illustrated by Exhibits 2.4 and 2.5, which show processing versus farm costs as a percentage of total ex-factory costs for various beef and dairy products. With the exception of non-traded dairy products such as yogurt and liquid milk, farm output is by far the most important part of total cost for all of these products. The relative importance of farm output to total cost has been increasing over time as technology has led to more automated processing plants. For example, Irish dairies have decreased in number from 169 in 1962 to 82 in 1976, while average milk intake per plant per year jumped from 8 thousand tons to 44 thousand tons. A casein plant capable of processing 130 thousand tons of milk per year can be run by as few as eight operators, excluding the milk collection operation.

The health of Irish dairy and beef processors is thus to a great degree dependent on the competitive strength of Irish farmers. It is also dependent upon the state of the marketplace, which in the European Economic Community means the terms of the Common Agricultural Policy. The CAP as it is called, is a system of support for farmers' incomes through guaranteed prices for the major agricultural commodities.

Each year as part of the implementation of the CAP, the EEC council sets intervention prices at which butter, skim milk powder, beef, cereals and other products will be bought, in, regardless of quantity, by members of state intervention agencies at the expense of FEOGA, the CAP's financial arm.

The CAP acts as an instrument of income redistribution to farmers. Taxpayers finance the CAP through the FEOGA budget while consumers pay prices for food which are considerably higher than average world level (Exhibit 2.6). These high agricultural prices are also aimed at guaranteeing the EEC's self-sufficiency in the major agricultural products. The CAP is designed to cushion the impact of agricultural cycles on farmers by maintaining minimum prices for output.

Over the past seven years, the CAP has considerably benefited the Irish farming and food processing community. Irish farmers who formerly competed against world competitors at world prices were guaranteed a market for their total output at sharply increased prices. From 1973 to 1978, Irish prices rose rapidly to catch up with EEC prices at a time when EEC prices were still moving up steadily. Overall, agricultural prices during this period rose much faster than consumer prices in general in Ireland. This is in sharp contrast with other EEC countries, (except Italy) where consumer prices increased faster than agricultural prices (Exhibit 2.7). This means that Irish farmers buying power increased during those years without corresponding productivity

improvements.

Between 1978 and 1980 a slowing of demand growth combined with increases in production and continued concessional imports from some non-EEC countries led to large surpluses of dairy products and, to a lesser extent, of beef in the EEC. The surplus situation has recently eased very substantially, largely because of stronger demand for dairy products on the world market. Nevertheless, the existence of sizeable surpluses in the 1978-1980 period has caused demands from some member-states for reductions in food prices and in Community expenditure on agriculture. The major response to these pressures thus far has been a real reduction in intervention prices. The effect of this can be seen in Exhibit 2.8, which shows Irish butter price deflated by the consumer price index. After the rapid rise in the 1973-1978 period, the butter price has fallen considerably relative to other consumer products in the 1978 to 1980 period.

This real decrease in prices has been felt by all European farmers. Most of them had started a heavy investment program to respond to the stimulus of the good years, and borrowing had increased rapidly. Today, they are caught in a squeeze between falling real prices and rising input costs. In Ireland, the rapid rise of incomes had also caused an inflation of land prices. The downturn has now caused many farmers to decrease output and sell off future production capacity.

In the longer term the CAP could evolve in one of several basic directions. First, under the "co-responsibility" approach, part of the cost of disposing of farm products could be charged to the farmers themselves by way of levies on their production (this is already happening in some product sectors) while at the same time the European Commission would exercise its functions as regards market management - export refunds in particular - in a way increasingly biased towards financial caution. Secondly, market shares might be frozen by setting up production quotas. Prices would then be maintained at a high enough level to stabilize farmers' incomes, but Ireland would not be allowed to benefit from its most abundant resource. Another alternative would be to let intervention prices fall gradually in constant terms, as is now the case. The first consequence would be a rationalization of farming inside the different countries. In the longer term, however, there would also be a gradual shift of production among countries, from the inefficient to the efficient ones. It is thus essential to understand whether Ireland's actual or potential cost position is lower than that of its competitors. We will now look at the dairy and beef industries to determine their competitive position within the EEC.

Dairy Products

Ireland's dairy processing industry is particularly dependent on EEC

trade. Over 90% of Ireland's skim milk production is exported. Though Ireland represents only 6% of EEC skim milk production, because of its high export ratio it represents 30% of EEC skim milk net trade (production minus consumption in all countries). In butter, Ireland exports 70% of its production. As with skim milk, even though Ireland produces only 8% of total Community output, it represents 30% of EEC net trade.

The processing industry itself has invested heavily in modern large-scale facilities over the past decade, and appears to be second only to the Netherlands in the overall scale of its operations (Exhibit 2.9 (a) & (b)). Though scale is not the sole determining factor in cost of processing, it has been generally acknowledged in our interviews that the Irish dairy processing industry possesses facilities which can be fully competitive in Europe.

However, as indicated earlier, the major part of the total cost of production in dairy products rests at the farm. Also, the interface with the farming sector has a strong impact on dairy processing costs (milk assembly, milk quality, seasonal capacity utilization, etc.). While processing plants themselves may be competitive, this interface can result in high production costs. Therefore, though our charge specifically excludes agriculture, we have taken a brief look into the competitive position of Irish dairy farming in order to evaluate meaningfully the competitiveness of the Irish dairy food processing sector.

Overall, Irish dairy farming appears to have a serious cost disadvantage when compared to its major EEC competitors. Irish productivity per labor unit, is, with the French, the lowest in the EEC (Exhibit 2.10).^{*} The most efficient farmers, the Dutch and the Danish, produce over three times as much as the Irish farmer for the same labor input. Farmers' incomes are determined both by margins per kilo of output and labor productivity. Compared to the Irish, Danish, Dutch and German farmers achieve far greater incomes (Exhibit 2.11). This implies that dairy farmers in these countries could accept a reduction in milk prices and still have a much higher standard of living than Irish farmers.

The low labor productivity of Irish farming is itself the result of a lower number of cows per labor unit** (Exhibit 2.12) and lower milk yields per cow (Exhibit 2.13). To fully compare yields, the impact of the fat content of milk, which represents the greater part of the selling value, should also be taken into account. Exhibit 2.14 shows that in this dimension also Ireland performs less well than its competitors,

^{*}These and many of the following assertions are based on in-depth analysis of the EEC farm accountancy data backed up by a large number of discussions with Irish experts. While this data source is not flawless, it represents the best available source for intercountry comparisons.

**One labor unit = one man-year of full-time work.

compounding the results of its lower labor productivity.

The Irish farming system makes poor use of capital assets as well. Exhibit 2.15 shows that land productivity — milk output per hectare — is the lowest in the Community. Intensive farming countries achieve productivity up to 3 times greater. This is a consequence, again, of lower milk yield per cow, but also of much lower stocking rates (number of cattle per hectare of land) (Exhibit 2.16).

Apart from land, the Irish farmers' practice of concentrating production in the summer allows Irish farms to be much less capital intensive than continental ones on a per-farm basis (Exhibit 2.17). Fewer buildings and less machinery is required when cattle graze outdoors and winter feeding is small. But when comparisons are made on the basis of kilos of milk produced, the low yields of Irish farms reduce considerably this capital advantage (Exhibit 2.18). For example, Denmark's milk production turns out to be less capital intensive than Ireland's due to high Irish livestock capital per equivalent output of milk. The Irish capital structure is very different from that of EEC competitors (Exhibit 2.19). Ireland loses in livestock investment what it saves on other fixed assets.

Partially offsetting its relatively low land and labor productivity and roughly equivalent (though structurally different) capital utilization, Irish farming uses less inputs, particularly feedstuff, than any other country. However, this does not appear to be sufficient to overcome the advantage enjoyed for a comparable sized farm by other leading dairy producers. Ireland's total cost of production for a 10-20 hectare farm is higher than that of the UK, Holland, Germany and Denmark, though slightly lower than that of France (Exhibit 2.20).

Though we have shown this comparison for only one farm size, it holds also for a range of farm sizes. Irish farms are similar in size to others in the EEC. In all countries, labor productivity increases with farm size, but Irish productivity is considerably lower than other countries for every size of farm (Exhibit 2.21). Ireland's land utilization also remains lower for all farm sizes (Exhibit 2.22).

In addition to these disadvantages at the farming level, Irish farming practices and products cause disadvantages at the processing stage. The low fat content of Irish milk and the seasonality of production induces under-utilization of capacity at certain times of the year. An Irish plant has to have a 75% greater capacity than a Dutch plant to obtain the same output of butter (Exhibit 2.23).

Because, for the same annual production of milk, more cows are needed in Ireland than in Holland or Denmark, total output may be constrained. There are further disadvantages related to limitations on the breadth of product line. Some higher-value cheese products have relatively short shelf lives (Exhibit 2.24). The fact that Irish milk is

not available for cheese production from November until the end of March poses a severe constraint on potential production of these cheeses all year round, as customers often want full-year supply guarantees.

While some experts in Ireland^{*} believe that seasonality penalties are offset by lower feedstuff costs, these evaluations overlook these cost penalties at the processing stage.

Options For The Processing Industry

The Irish dairy processing industry has potentially competitive facilities but, it must face an agricultural sector whose farming practices create cost penalties at the processing stage and who though supplying milk at a relatively low price do so only by accepting lower incomes. The processing industry also faces continuing potential real declines in EEC prices as the CAP is reduced.

The most often-heard suggestion for this dilemma is to increase the value added in dairy products at the processing and marketing stages. Currently, Irish dairy exports are concentrated almost entirely in butter and skim milk powder. Some suggest that a shift towards products such as cheeses could improve the position of the Irish dairy industry. Cheese is one of the few dairy products where consumption is rising (at 4% per year between 1975 and 1978, compared to a 2% decline in butter) and new products are being developed. Also, though cheese is nearly a commodity business, it does contain slightly greater processing value added, and offers opportunities for price premiums through product differentiation. Though this strategy is intuitively obvious, we will now examine some of the difficulties that Ireland is likely to encounter in pursuing it.

Despite the wish to develop its cheese business, Ireland's mix of dairy products in 1979 is still very much weighted towards butter production. The share of the Irish whole milk supply directed towards cheese factories is the lowest in the EEC (Exhibit 2.25). While there was an increase in volume of around 4% per year for EEC cheese consumption in the last five years, Irish production developed quite unfavorably compared to that of its continental competitors (Exhibit 2.26). Output reached a peak of 60,000 tons in 1975 and has remained under this level since then. In 1980 production fell to less than 49,000 tons, a 15% drop from 1979, despite a Bord Bainne plan for increasing production to over 80,000 tons. In the period from 1975 to 1979, French production increased by 4% per year, Danish by 6%, German by 4% and Dutch by 4%. Irish production is almost totally concentrated in cheddar, (94%) which has its only major market in the UK, with small quantities of blue cheese and gouda being marketed. Finally, Ireland has been un-

successful in diversifying its export outlets. In 1979, Great Britain received 98% of all Irish cheese exports, up from 94% in 1975.

This particularly sombre performance is in sharp contrast with the scale and modernity in Irish cheese plants, which for hard cheeses are the largest in the EEC (Exhibit 2.27).

A comparison with Denmark shows potential opportunities being missed by Irish products. Over half of Danish cheese exports are directed outside the EEC. Its production is much more diversified than Ireland's including cheddar, tilsit, edam, gouda, blue cheese, feta and others. Some of these such as feta and blue cheese are sold over 90% into export, geared especially for selected markets. For example, Danish feta, created a few years ago to cater to Middle Eastern markets, has been remarkably successful, with an exported tonnage equal to nearly half of total Irish cheese production. This did not come without major efforts. It required a specially developed recipe, a new high-filtration process and new special packaging materials.

Seasonality is a major hindrance to Irish development in the cheese area. It induces very low capacity utilization at potentially competitive plants and high inventory requirements to supply year round markets. Apart from increasing processing costs, it also drastically limits product choices to cheeses with long storage life or destined to be processed. As shown earlier, this prevents Ireland from tapping higher value markets.

Direct milk costs, which comprises over three-quarters of the total cost of cheese (Exhibit 2.28), today are not a competitive barrier because milk prices paid to Irish farmers are the lowest in the community. A recent AFT study^{*} has demonstrated that this discount is offset by processing overcosts linked to suboptimal farming (plant capacity utilization, product mix, milk constituents). Further, it is not a tenable situation in the long-term to have farmers squeezed in between a low labor productivity and a low purchase price.

The economics of milk supply work at the level of the milk basin (the catchment area for a cheese plant). Efficient basins supplying low-cost raw material may exist in some areas of a country while other areas are high cost. In addition to individual farm productivity, assembly costs vary with average output per farm and average density of farms in the basin (Exhibit 2.29). Ireland's small average supplier size and small population density put it at a disadvantage relative to other EEC countries.

Processing cost is largely a function of plant scale. Cheese plants, despite commonalities in the areas of milk reception and maintenance, are almost always specific to a particular cheese (Exhibit 2.30). Ireland's focused, large-scale plants give it the potential for competitiveness in

*AFT "Seasonality of Milk Supply in the Irish Dairy Industry" 1980.

**A comparison of producer milk prices in EEC countries". AFT April, 1981.

processing hard cheeses, and it could build similarly focused plants to gain a competitive position in other cheeses. However, though Ireland could be competitive at the processing level, the practices of its dairy farms and their low density create serious competitive disadvantages.

In summary, the Irish dairy processing industry is dependent on exports to other EEC member countries. Currently, it is potentially competitive with other EEC industries in processing (with similar inputs). However, Irish dairy farming, which contributes a high proportion of the total cost of a processed dairy product, is still generally uncompetitive, and has a negative impact on processing costs making the total dairy product uncompetitive. While milk prices are competitive, this is made possible only through farm incomes which do not provide many farmers with an adequate living standard. These prices also do not reflect the serious processing cost penalties brought about by Irish farming practices. The poor competitive position at the farm level also hinders the industry in attempts to diversify into cheeses which might provide better growth opportunities and higher price realizations than current skim milk and butter exports.

The Irish Beef Processing Industry

The European beef market, in sharp contrast with most of the dairy sector, is not plagued by over-production and even enjoys some growth in final consumption.

The EEC is in most years a net importer of beef and some countries, like Italy and the UK, have large deficits in this area. Furthermore, the composition of imports shows that there exist some opportunities to supply types of cuts or qualities of meat which are not readily available inside the Community.

Ireland appears at first to be well equipped to benefit from this potential. Beef farming is probably the oldest and largest business in the country and has strong traditions. Abundance of land and grass provides a favorable environment for cattle raising. On the processing side, major investments have been made to create a network of modern, large-scale slaughterhouses. These plants have been integrated to include large facilities for deboning and vacuum-packing fresh cuts of meat to increase potential Irish value added.

However, despite this natural advantage and all of these efforts, the Irish beef industry's performance in the past five years has been at best moderate. The beef sector grew very fast from 1969 to 1975. However, since that period and notwithstanding the higher price levels prevailing under the CAP, its performance in terms of output and product mix has not improved noticeably. It has remained cyclical, seasonal and very uneven in quality of output.

The output of Irish beef farming reached a business cycle peak in

1979, but appears to have no short-term prospect of reaching that level again. Falling real prices in 1980 caused farmers to sell their cattle. In 1981, CBF estimates that output will decrease by some 20 to 25% compared to 1980, with little or no reconstitution of beef herds. In fact, the Irish breeding stock has declined steadily from over 700 thousand head of cattle in 1974 to less than 500 thousand in 1980.

Beef is a long lead-time industry (3-4 years from decision to actual output increase) where cycles are to be expected. But Irish cycles are particularly deep and have two dramatic effects. On the processing side, slaughterhouses can be forced to lay off workers or even go out of business, as happened in early 1981. At the farming level, a vicious circle of falling prices (low prices leading to more stock sales leading to lower prices) results in the sale of future production capacity. The intervention system of the CAP is limited to certain grades of cattle and to a certain quota per slaughterhouse per week. As in some other EEC countries, Irish farmers do not achieve these levels consistently.

Even if the intervention system was broader, the Irish cyclicity problem would still be far from solved. In contrast with dairying, beef farming in Ireland requires several transactions before the slaughterhouse: calves, mostly from dairy farmers, are sold to storing cattle farmers in the West and then to the finishing farmers, mainly in the Midlands. Destocking can happen at any of these stages, and price variations are felt throughout the chain.

As with dairy, seasonality is also a problem for beef. Beef slaughtering shows a strong seasonality with over a third of the yearly output produced in the fall and less than 20% in the spring. Measured on a weekly basis, the seasonality appears even stronger, with a peak-to-trough of 4-to-1 in 1980 (Exhibit 2.31(a) & (b)). Its impact is similar to that in the dairy sector, with poor capacity utilization all along the chain, high storage costs, and more importantly, considerable limits in marketing opportunities. For example, it has been measured that the discount of Irish to Scottish beef on the UK market varies from 3% to more than 10% when Irish beef is in oversupply.

In addition to cyclicity and seasonality, Irish beef suffers from quality problems. There is no simple measure of quality in beef. However, several examples from our interviews indicate that there is a major problem in this area:

- There are discounts for Irish beef on the UK market.
- Only 10% of a large Irish slaughterhouse supply is of high enough quality to use in fulfilling its contract with a UK supermarket chain.
- Quality meat for vacuum-packing is only available in large quantities to non-integrated operators who "buy from" several slaughter-

houses' production (while slaughterhouses themselves cannot fill their vacuum-packing capacity).

Despite its relatively small size as a beef producer, Ireland has been by far the largest user of beef intervention mechanism, with 40% more tons of Irish beef going into EEC cold storage than from Germany or France. Since 1974, about 20% of Irish beef production (29% excluding live exports), has been directed each year to intervention (Exhibit 2.32).

The specialized beef sector is small in Ireland and beef is often a by-product or a complement of dairy farming. Culled cows consistently represent nearly 40% of slaughterings.

The result of these structural problems has been that despite its size, the Irish beef chain today is quite weak. Drystock farmers are the least organized, least profitable and most vulnerable in Irish agriculture. Their income is on the average two to three times lower than that in other farming systems. Furthermore, they suffer more in times of agricultural recession, as is illustrated by a staggering drop in income of 37% in 1979 compared to 10 to 20% in the rest of farming.

Price variations in the market are very acute in Ireland compared for example with Germany or the Netherlands (Exhibit 2.33(a) & (b)) and correlation between slaughterhouses' purchase prices and volume supply is very strong. This has created a very unstable environment for beef farmers and prevents planning and organization of production. Slaughterhouses are financially troubled and employment in the industry has decreased steeply in 1981.

Finally, apart from some bright spots such as a contract for vacuum-packed cuts to be supplied to a West German supermarket chain, the industry's product mix has not evolved favorably. Live exports, for example, still constitute a significant portion of the output, (between 400 and 500 thousand head between 1976 and 1980) despite industry plans to reduce the number down to 300,000.

The poor industry condition lies as much in supply as in processing or marketing.

Adding Value in the Marketplace

Many in Ireland believe that adding value in the marketplace through forward integration into distribution and branding of products can overcome disadvantages in Ireland's beef and dairy production. Advocates of these ideas argue that forward integration of this sort can provide more stable market share, give greater control to the manufacturers, allow a price premium, and give to the manufacturer profits which currently go to the various distribution layers.

Indeed, distribution can offer opportunities for competitive advan

tage since, in cases such as cheese, distribution value added may be greater than the whole of manufacturing value added (Exhibit 2.34). However, in order for such an investment to yield a benefit, the distribution network acquired must itself be competitive, both at the importer level and the wholesaling level.

Distributing to retailers, in particular, can be a very difficult undertaking. Deliveries to retailers require a high density of drop points and the largest possible volume per drop. Wholesalers therefore carry many and often competing lines of products to fill their trucks. When integrating into physical distribution, a producer therefore either requires a very wide product line of its own (this is the case with major packaged food companies who carry more than a hundred lines), or it has to add lines through external purchases. Adams Foods, Bord Bainne's subsidiary in the UK, has to distribute many non-dairy and non-Irish products (juices, biscuits, confectionery) to try to reach adequate scale as a wholesaler. If it does not succeed in being an efficient wholesaler, the distribution function will jeopardize the cost position and the profitability of the whole dairy chain.

There are other drawbacks to forward integrations of this type. Wholesalers who were formerly customers can become alienated, limiting the manufacturer's further share gains to its success as a wholesaler. Further, it is not clear that forward integration of this sort is really necessary to promote a brand name or image. The German Food Promotion Board (CMA) promotes German cheeses on the French market through national advertising but has no formal ownership links with importers or wholesalers. The Danish butter organization in the UK, "Butterdane", plays the role of importer, drop shipping to large wholesalers and chains, and can promote the image of Danish butter without being fully integrated in distribution.

In general, good quality and low price are sufficient in most cases to get a product adequately distributed through existing channels. Only when it is certain that an integrated wholesale operation would have sufficient scale to be profitable as a stand-alone enterprise does an investment in distribution have economic value. Further, it cannot substitute for a product that lacks price and quality competitiveness.

The option of establishing a price premium through direct branding may offer a better opportunity, though it will not come painlessly. For an indigenous Irish exporter, establishing a brand name is typically a large-scale and long payback investment before market share and price premium are obtained. Even the long historical efforts for establishing Kerrygold as a premium brand in the UK have not yet paid off relative to Lurpak, the Danish brand. The latter commands higher market share, and higher price.

As long as brand premium is not established, the price discount

necessary at the consumer end is typically compounded by the larger margin required by the distributor. Hence, wholesale prices have to be significantly below that of established premium brands. This, compounded by higher internal logistic costs, constitutes the formidable barrier to entry perceived by Irish food exporters who have attempted to develop their own brand abroad.

In contrast, the cultivation of an Irish fresh food image appears to have a definite potential in some countries. Recent developments have allowed Irish fresh meat to be sold at a sizeable premium – up to 10% – in some German supermarket chains. Such results, following a quite limited marketing investment – 30,000 pounds from CBF, plus 10,000 pounds from the German contractor – may mean that there exists a potential positive attitude towards Irish food in Germany. Research performed recently for the Irish Agricultural Exports Coordination Group supports this opinion. Irish meat was perceived to be of equal or higher quality than German, Danish or Dutch. Irish dairy products were perceived to be higher quality relative to German, though not so relative to Dutch or Danish.

This raises two questions. The first one relates to the traditional tendency to direct most food exports towards Great Britain. Geographical proximity, historical links and language can easily explain this attitude. However, after many years of investment, the relative price realization of Irish food products in the UK does not demonstrate a premium brand image.

This may suggest that the UK is not the best choice for trying to develop a premium for Irish food products. The German success to date, though limited, indicates a greater potential for Irish food products on the Continent. Recent research performed in France supports this opinion, although it was not conducted in a manner that could yield as clear a result as in Germany. This suggests, perhaps, that more effort should be directed towards the Continent. These comments relate to the development of an Irish image for generic products rather than specific brand names owned by specific companies. Illustration of this type of marketing can be found in the advertising campaigns for German cheeses and pork products, Danish pork and dairy, or in the worldwide establishment of the "Beaujolais" name – as a French regional wine – as opposed to each individual winery promoting its own house brand.

These and other directions should be pursued to increase the potential sales and profits of Irish agriculturally-based products. However, they are no panacea and cannot substitute for efforts to improve basic competitiveness on the farm.

Summary – Agriculturally-Based Raw Material Industries

Though it is difficult to quantify, Ireland clearly possesses a natural

advantage in its grasslands which should provide the basis for competitive productivity advantage in various food industries, particularly beef and dairy products. Ireland possesses dairy and beef processing plants which are among the largest and most modern in Europe. However, Ireland does not take advantage of its endowment. Inefficient farming practices prevent the country from realizing its full income potential in its beef and dairy products. Since farm costs are between 70% and 90% of almost all traded products in dairy and beef, this penalty is particularly severe: it results in an uncompetitive final product and in low prices to farmers who cannot maintain a satisfactory standard of living. Efforts to improve the marketing of Irish agricultural products are laudable, but they cannot be totally successful until the problems are solved at the primary production level.

IRELAND'S NON-AGRICULTURAL RESOURCE-BASED INDUSTRIES

In addition to its grassland endowment, Ireland has a series of other natural advantages which provide the basis for industrial development. Exhibit 2.35 presents a summary list of these industries. Some, such as the quarries, are primarily non-traded, while others, such as the base metals, are almost completely exported. Our survey focuses on the largest of these which are currently or potentially tradeable.

Mining-Based Industries

Mining has a high profile in Irish policy discussions. Yet, mining is a moderately-sized industry consisting of one major mine and a handful of smaller ones. Mining employs only 2,000 people in Ireland, though it does account for almost 160 million pounds of exports.

The dominant factor in the industry is Ireland's one large mine at Navan. Operated by Tara Mines Ltd., a company of Canadian and Irish ownership, Tara works the greater part of one of the world's major zinc-lead ore bodies. This mine accounts for nearly 70 percent of Irish mine output (by value) and almost half of all mining employment.

The lesser part of the same ore body is likely to be developed by another company, Bula Ltd. Two other smaller base metal mines operate, one at Silvermines and the other at Avoca.

Industrial minerals are produced at several locations in Ireland:

- Gypsum at Kingscourt, feeding a plasterboard factory that exports most of its product to the UK.
- Barytes at Silvermines, Tynagh and Clonakilty, exported to supply a significant part of the drilling mud requirements of the U.S. oil industry.

- Dolomite at Bennetsbridge, later processed into magnesite for export.

Three very small coal mines make up the rest of the Irish mining industry, which is summarized in Exhibit 2.36.

Tara is one of the world's larger producing zinc and lead mines. It has a long expected life — perhaps 30 years, perhaps longer. Now in its fourth production year, Tara is one of the most recently-developed underground base metal mines in the world and uses high-productivity mining methods and equipment.

Defensibility should not be a problem for Tara Mines, unless some unexpected and fundamental change takes place in its competitive environment. It probably can cover its cash operating costs when the zinc price is \$ US 300 per ton (Exhibit 2.37). Covering full financing costs might require a price twice as high. This places it in approximately the middle of the cost league table of zinc mines. Only on rare occasions has the price of zinc ever gone as low as \$ 300 in 1980/81 dollars and typically it ranges up and down around a median of \$800.

However, this does not mean Tara is a great bonanza. Tara's concentrates are unusually pure, which probably means that they sell at marginally better smelter terms than other concentrates. But they are also very low in valuable by-products such as cadmium and especially silver. Many other base metal mines earn high revenues from these "minor" contained minerals. In zinc/lead mines like Mt. Isa or North Broken Hill in Australia, silver revenues are sufficient to cancel out cash operating costs entirely and these mines would break even on a cash operating cost basis at a zinc price of zero.

Competitively, Tara is probably more threatened by high silver and lead prices, causing other zinc mines to remain on stream, than by cost escalation in labor, power or cement, its major cost elements. Overall, however, these threats are minor.

Avoca's copper is not internationally competitive. It mines ore containing 0.8% copper, which is exceptionally low for an underground mine. A more typical underground copper mine would mine ore containing 2.5% copper. Its costs have been estimated (in terms of the copper price that would allow it to break even) to be in the area of £1,350-1,750 per ton. This compares with prevailing world prices for copper of about £1,000.

Mogul of Ireland, at Silvermines, has been profitable but is now nearing the end of its operating life. It earned £252,000 after tax in 1979, about 5% of sales. Present profitability is probably below this level. The exact date of its exhaustion will no doubt depend on how metal prices develop over the next 3-4 years. Mines do not often run out of ore all of a sudden, but rather have to mine ore of higher and

higher unit cost and thus lose their defensibility.

At present, there are no manufacturing facilities in Ireland making use of these base metal mines.

In addition to these base metal mines, a number of industrial minerals are mined in Ireland. The most significant of these among Ireland's traded products is barytes. This is a heavy material used in drilling muds, and demand for it is rising as the pace of oil drilling increases. The main market is the USA, which produces about two-thirds of its requirements and imports the remainder. Ireland is the second source country for U.S. imports, accounting for 19%, after Peru (30%) and ahead of Mexico (12%) and Morocco (9%). The Irish barytes mines are operated by Milchem, Inc. and Dresser Industries, Inc., two of the three dominant U.S. barytes companies, which ship crude material to the USA and grind and blend it there. Defensibility may not be a critical issue, except in the unlikely event of a downturn in oil drilling, but there is always some risk that the U.S. companies might locate a large and lower cost source of barytes (or substitute another material such as ilmenite), which would jeopardize their Irish operations.

Both gypsum production and the quarry/concrete group of industries are normally not traded because of their low value-to-weight ratio. In Ireland, the gypsum industry consists of the operations of one company, a subsidiary of a major UK plaster products company. Quarries, concrete and cement are dominated in Ireland by one Irish company, which has operations of sufficient scale in world terms to be competitive with imports.

Gas and NET

Ireland currently operates an offshore gasfield at Kinsale. A significant portion of the gas from the field is used to produce ammonia, a part of which is further processed into fertilizer-grade urea. This operation basically serves export markets:

- One-third of the ammonia is to be used to produce urea. While some of the urea is planned to be used in Irish agriculture, most of it will be exported. The main markets for urea as fertilizer are the great rice-growing countries, India and China.
- Another third of the ammonia will be exported direct into the "merchant" ammonia market. This is a spot market in which temporary excess supplies and shortfalls of ammonia in the world's nitrogenous chemical complexes are balanced out.
- The remaining ammonia will go to NET's own nitrogenous fertilizer plant at Arklow, where it is essentially a substitute for either imported "merchant" ammonia or ammonia that could be made with imported hydrocarbons such as naphtha.

In effect, Ireland is using its natural gas to produce two other commodities with added value and is selling those on international markets. Other countries do the same, particularly oil producing countries that have gas in great surplus. For them, unlike Ireland, gas fed into ammonia/urea complexes has a low, possibly zero, opportunity cost.

The plant at Cork has experienced significant construction cost overruns and has been a significant cash drain on the exchequer and government debt capacity. The question of its long-term competitive position rests on the value assigned to the gas it uses. A rough financial analysis (Exhibit 2.38) suggests that the Cork plant, treated as a stand-alone entity, would find it difficult to break even financially at gas prices near one pound per thousand standard cubic feet or higher. While its conversion cost can be assumed to be similar to that of other plants, its long-term defensibility rests on its relative opportunity cost of gas and its unit capital charges. The opportunity cost of gas and perhaps the financial charges would be lower in many OPEC countries. While it is not in our assignment to examine alternate energy uses, the NET plant is only competitive long-term, in so far as the valuation of gas it receives is low.

Forest Products Industries

The far-sighted planting programs of previous generations will result in an increasing supply of Irish forest products in the coming years (Exhibit 2.39). The competitiveness of these products rests both on the natural characteristics of the forests themselves and on the efficiency of gathering and processing industries. Factors such as climate and soil determine the rate of growth of the trees and their density and individual thickness. The lay of the land in part determines the degree of automation possible in harvesting the trees. The quality of wood determines the uses to which the wood can be put.

In the case of Ireland, trees grow quickly and reach competitive thickness and densities, though the land is often rocky and uneven. The wood in Ireland is primarily "whitewood" derived from spruce, which is limited in its application to indoor uses and not as flexible as, say, Swedish pine. Overall, Irish wood should be good enough to find many applications in Ireland and perhaps also some export opportunities in the UK or elsewhere in Europe.

Yet today, Ireland imports a significant portion of its forest products. Quality construction grades of timber are now virtually all imported, while Irish timber goes into low-value uses such as fence posts, or is left standing in the forests. In addition, a number of sawmilling and pulp companies have gone bankrupt and others are having difficulty.

Success in forest products development requires competitiveness at all stages of the production process, including growing, the rental for

cutting rights, harvesting and transport to sawmills and pulp mills, actual pulp and log processing, and transportation to end markets. A balance must also exist among products produced so as to use both the thinnings and the large tree stumps to get maximum value for the harvest. Currently Ireland is uncompetitive at all stages compared to major competitors in Canada. Irish wood often contains more knots due to poorer pruning during growth. Irish harvesting techniques are very inefficient. Lot sizes are small, mechanization is minimal and organization is lacking. Transport costs of raw wood to mills is also inefficient as it is often done through antiquated vehicles and covers broad areas. Sawmills are small in scale and lack facilities for drying and grading timber so that it can be used in higher-value applications. Businesses currently do not exist to use thinnings for pulp nor sawmill wastes for briquettes or other uses, resulting in poor wood yields. Finally, the pricing of cutting rights is relatively inflexible. Like many commodities, timber has cyclical pricing. In North America, the ups and downs of the market are often absorbed in integrated forestry/timber companies through fluctuating returns to them for ownership of forests, whereas in Ireland at present, the full brunt of price cycles has to be absorbed at the sawmilling stage, making this a more risky business.

Exhibit 2.40 summarizes this last point and also shows some of the cost differences at different stages for a Canadian and Irish producer. This chart shows the difficulties faced by Irish sawmills in market downturns. It also shows that cost disadvantages at the harvesting stage are bigger than those at the sawmilling stage.

The key question, however, as in the agricultural area, is whether successful manufacturing businesses can be built in this industry without more competitive raw material sources. As in agriculture, the natural endowment of climate and land seems to favor the development of at least a marginally competitive raw material, but current management of the resource and of its cultivating and harvesting make it uncompetitive when delivered to the processing plants, both on a cost and a quality basis. Bringing modern manufacturing plants to Ireland or modernizing existing plants is not in itself sufficient for competitive success.

Currently, the IDA has encouraged an American company to establish a medium density fibreboard plant to consume forest thinnings. This product has been selected because it is a relatively specialized premium product that is enjoying greater success in Europe currently than many more mature woodpanel products, and one for which Ireland can achieve reasonable scale. Investments are also occurring to modernize sawmills.

Adding Value to Raw Materials-Based Businesses

One of the cornerstones of development policy in the natural resources

field has been the notion that maximum value should be added to commodities of Irish origin before they are exported. Obviously, if more value is added, more employment will be created. However, value added industries frequently come into the "complex-factor cost" category, and the Irish resource may be only one of several significant inputs that are required. Overall cost competitiveness in the particular market is the essence of defensibility. Without it, a value added plant will be particularly exposed financially, since the prices of both the material it starts with and its end product are likely to be set on international markets.

An example of the dangers of a value added strategy can be seen in the idea of building a zinc smelter to process Ireland's zinc resources. At the present time there is too much zinc smelter capacity in Europe and average utilization is running in the area of 75-80 percent of name-plate capacity.

It would be difficult for a new entrant, with a plant built at the capital costs of 1981 or later, to compete profitably against existing smelters. Some of these, such as Budelco in Holland, have relatively modern technology, bigger scale than that ever envisaged for Ireland, much lower energy costs, and advantages in delivery costs to customers. It is not surprising that when the IDA sought proposals from international companies regarding the terms under which they might invest in smelting in Ireland, all asked for capital grants that were prohibitively high. This problem exists worldwide. The Australian Mining Industry Council recently reported that for the year ending June 30, 1980, all Australian mines earned a return on funds employed of 32.4% before taxes and royalties, while all Australian smelting and refining earned 10.6% before taxes.

Even when supply-demand evens out, the success of such a venture should be questioned. While smelting is a way of adding value to Irish zinc concentrates, the net gains from having a zinc smelter in Ireland could be very small.

The principal component of adding value to zinc, electric energy, would have to be derived from imported hydrocarbons or coal, which are the backup fuel sources to the Irish grid (unless Kinsale gas had been reserved for the purpose). Irish electricity is already relatively high in cost. In addition, much of the capital equipment and much of the project's financing would have to be foreign-sourced, and the employment created per pound of expenditure would be low. Finally, standard smelter operating practice would require the smelter to import much of its zinc concentrate feed to make the blends that optimize the mix of minor constituents of concentrates (cadmium, iron, arsenic, talc, etc.).

Tara mine is a defensible business because it has an ore body that

can be mined at reasonable cost and an ore that contains a competitively high combined percentage of zinc and lead. But an Irish zinc smelter would not have any competitive advantage on operating costs. Its energy price disadvantage alone could make it vulnerable (Exhibit 2.41). Electricity prices to smelters are often confidential. Rates currently being offered to attract new aluminum smelters to Australia are said to be in the range of 0.6p per kWh, compared to the 3.0p projected for a zinc smelter in Ireland.

Integrating forward to add value can be even more dangerous when it is done to protect an uncompetitive raw material source. In cheese processing, competitive disadvantages in milk and milk gathering will be very difficult to overcome regardless of the level of forward integration achieved.

Similarly, a fully competitive sawmill or pulpwood plant can be jeopardized seriously by an uncompetitive raw material. By their nature, natural endowment businesses have added a high proportion of their value at the raw material stage. A house built on the weak foundation of a poor raw materials cost cannot be saved by adding more stories at the top.

Other Irish Endowments

Our study has been limited in scope. We have not studied the Irish fishing industry nor the coal and oil resources. There are three other potential Irish resources which we have studied only in passing, but which deserve closer attention. The key issue in all three cases is whether Ireland is using the resources it has to their fullest potential.

One potentially strong Irish asset awaits further development. This is the deep water ports of Bantry Bay and the Shannon Estuary. These ports are practically unique in Western Europe and could play an increasing role in the future in handling bulk minerals that are moved in very large ships (steaming and coking coal, iron ore, bauxite). Some studies (e.g. the World Coal Study, 1980) show that very large scale port facilities are key to the development of supplies of coal for future European power stations. Ireland's ports could enable it to have in the future a relative advantage in electricity costs, as coal from the U.S. and elsewhere becomes an increasingly major factor in European energy. Moreover, just as Bantry Bay has been used for years for trans-shipment of oil from very large tankers to smaller ones that can enter other European ports, so might the delivered cost of other minerals to Europe be reduced by trans-shipment (or processing) in Ireland. Such is the basis of the alumina project under construction on the Shannon Estuary; the Japanese iron and steel industry has made similar use of a deep port in the Philippines to reduce the cost of shipping iron ore from Brazil. The oil trans-shipment and the alumina project

utilize very little operating labor. Other types of material, however, could give rise to significant, direct and indirect employment.

We have not studied this subject, but the value of trans-shipment ports in Belgium, Holland and Singapore has been significant for those economies. The potential opportunity deserves further attention.

Another significant asset, the Bula mine project, remains undeveloped. But it may well make commercial sense to await an upturn in the markets for zinc and lead (as well as resolution of environmental issues) before developing this mine.

One exceptionally strong Irish resource, the peat bogs, may be being overexploited under present Bord na Mona plans, which will lead to exhaustion of the bogs in about 40 years. Generating power from peat is even more expensive than generating it from imported oil. As a domestic heating fuel, peat is being sold at prices well below its value in energy equivalent units, which probably leads to an excessive rate of consumption and makes alternative fuels (e.g., briquettes from sawmill wastes) harder to commercialize. The value of peat as a future energy reserve is unlikely to fall if it is kept in the ground. Alternative programs to the present one, e.g. using cut-over bogs in which greater depth of turf is left behind as a base for fast-growing timber, may merit further study.

Summary

Ireland has significant natural endowments. Exhibit 2.42 summarizes these, and the extent to which they are currently being developed. The greatest endowments, the grasslands are underutilized because of uncompetitive farming methods. Other resources, such as forests, are also underutilized due to poor organization. Opportunities exist in both of these areas to improve Ireland's economy significantly. Ireland's zinc, barytes and gypsum resources are well used, though the use of the gas resource is less clear.

In general, moves to add value to Irish resources, either in Ireland or in foreign markets must be undertaken with caution. The added manufacturing processes or distribution must in themselves be competitive to contribute to the optimal use of the resource. In any case, investments made to add value cannot mask an uncompetitive raw material position.

Irish attempts to achieve brand image in food have generally been directed to Great Britain and have achieved little success. Some recent studies and business arrangements suggest that more success might be achieved by directing greater attention toward the continent. Building brand image may be an opportunity in Europe, though it will likely be an expensive process.

Overall, the key challenge for Ireland in agriculture and forest

products is to use the natural endowments better at the raw material production stage. In the long run, no feats of marketing genius abroad can substitute for this basic necessity.

Finally, issues of appropriate pace and optimal use of opportunities must be addressed for Ireland's deepwater ports, the Bula zinc mine and the peat bogs.

CHAPTER 3

IRELAND'S INDIGENOUSLY-OWNED INDUSTRY

INTRODUCTION

Despite the heavy investment of foreign companies in Ireland over the past two decades, the indigenous sector (defined as companies owned in majority by Irish interests) still represents two-thirds of total manufacturing employment in 1980, down from three-quarters in 1973 (Exhibit 3.1). The sectors which were primarily Irish-owned in 1973 and which are commonly considered the "traditional" industrial base are, in descending order of importance, food, clothing and footwear, cement and glass, paper and packaging, textiles, wood and furniture, and drink and tobacco. These sectors together account for approximately three-quarters of indigenous employment. The remaining quarter of indigenous employment is divided among the sectors forming the "new" industrial base; metals and engineering, chemicals, and miscellaneous other products. The metals and engineering sector has enjoyed the highest rate of employment increase of all indigenous industries and now accounts for 17% of total employment by indigenous firms. The remainder is divided between chemicals (3%) and miscellaneous (6%).

Despite their importance in terms of numbers employed, indigenous businesses have not been major exporters, representing only 30% of total Irish exports of manufactured goods. Irish firms export only 30% of their production compared to 75% for foreign-owned firms (Exhibit 3.2).

The late 1960s and 1970s have seen great change in the economic environment for Irish businesses. There was trade liberalization after a long period of protectionism, and entry into the Common Market. These developments have demanded that indigenous industry be restructured to deal with a fundamentally different competitive environment.

Structural Evolution of Employment

Total employment in indigenous manufacturing grew very little between 1973 and 1980 (+ 1.3% in seven years) which means that job losses from closures and redundancies were barely offset by job creations

from new companies or company expansions. This overall picture, however, hides a deep structural modification which can be seen in the very crude sectoral breakdown of Exhibit 3.3. Employment in Textiles, Clothing, and Footwear has shrunk by more than 10,000 jobs over the past seven years. This was compensated for primarily by increases in Metals and Engineering (more than 5,000), Food, Cement and Glass, and Printing and Packaging (2,000 each).

This very rough description of structural changes in indigenous employment corresponds to a widely held view of the Irish economy which can be summarized as follows. The advent of free trade meant considerable losses in the "old" protected sectors such as textiles, clothing and footwear. This was expected by everyone and indeed much was written in the late 60s and early 70s about the necessary restructuring that had to take place (C10 studies, C11 reports, etc. . .). A generation of new companies and growth in the better managed, stronger Irish groups were, however, expected to more than compensate for these losses and regenerate Irish industry in the long run.

Although there has not been an overall net increase in terms of employment, supporters of this view point to the strengthening of existing companies in sectors such as packaging and printing, drink and tobacco, construction materials and construction and contracting. Some of the Irish-owned companies in these businesses can be described as multinationals, having large investments or operations in Europe, the U.S., and even in the Middle East and Africa.

The indigenous sector has also created new companies at a fast rate, a third of them in Metals and Engineering (Exhibit 3.4). Most companies created between 1973 and 1980 were still fairly small in 1980 compared to the new foreign companies, particularly in Metals and Engineering (Exhibit 3.5). However, several stories of spectacular growth have occurred in special vehicles, in plant construction; and in construction and agricultural equipment, where successful companies created in the last decade have now grown to several hundred employees.

This description of business successes reinforces the view that Irish industry has been restructured, at least in part, in the manner anticipated and desired by government and business leaders. However, a different picture emerges from an analysis which transcends broad sectoral classifications and which exposes the nature of the competitive environment affecting different businesses.

At a first level a very rough distinction can be made between traded and non-traded or "local" industries* (Exhibit 3.6). These two industry

*Exhibit 3.6 is intended to provide only a broad idea of the distinction between traded and non-traded businesses. A more thorough analysis is provided later on in the chapter.

types have performed very differently. Most traded industries have fallen from their 1973 employment levels, with some noticeable exceptions in glassware and agricultural machinery. Almost all non-traded industries, on the other hand, have enjoyed net employment increases, as in the case of packaging, cement, and metal fabrication (structural steel, simple metal workshops. . .), all of which have been "pulled" by demand from overseas firms, farm, and infrastructure investments.

Growth generated by the development of non-traded business opportunities is not inherently undesirable, but it can only provide a limited source of income, due to the size limitations of domestic demand. In many ways, it is dependent upon the successful development of traded industries. Long-term industrial growth, therefore, can only be provided by the development of businesses exporting outside Ireland.

Trade Performance

Most of the "traditional" industries which have lost employment have been affected by increased import penetration in the home market (Exhibit 3.7). Ireland's exports have increased dramatically over the past decade, but this is mostly due to foreign companies beginning operations in the country.

Similarly, the drop in the UK's share of all Irish exports from 66% in 1970 to 43% in 1980 has also been mostly due to new foreign firms being established in Ireland. Indigenous firms are still relying for almost three-quarters of their exports on the UK market. This is particularly true for sectors where "local" businesses are predominant (the printing and packaging industry sends 85% of its exports to the UK; furniture 98%). More than a third of Irish indigenous exports go to Northern Ireland or the West Coast of the UK. Due to the proximity of these two areas to Ireland, many of these "exports" should in reality be considered non-traded goods; they belong more to the "local business" category, where geographical proximity is a key competitive variable, than to the truly traded sector*. Out of the two-thirds of indigenous exports which are fully subject to international competition, more than 80% come from the top 100 Irish exporting firms, of which 95% were established before 1967.

The "traditional" sectors provide more than 80% of indigenous exports and the "new" sectors (defined here as the metals and engineering, chemical and miscellaneous industries) provide less than 20%. In 1979, about 900 indigenous firms were exporting (excluding the Coops) but only 100 of these had exports valued at more than one million Irish pounds. Together they represented three-quarters of the total. The other 800, mostly small firms, had exports valued on average at

*A more thorough discussion of this economic distinction follows later.

less than 200,000 Irish pounds each.

Furthermore, a detailed analysis of the export performance of firms created since 1967 in the engineering industries, shows that only slightly more than a hundred firms out of about 600 created were exporting at all. These hundred new firms have exports valued on average at about 100,000 Irish pounds and together represent less than a fifth of all indigenous exports in this sector.

This performance is not surprising for a small, newly industrializing country which opened up to world trade only recently. The limited number of exporting companies and the small size of their individual sales abroad, however, is an indication of the magnitude of the challenge Ireland faces in the years ahead.

The simplistic division of the Irish economy into a "traditional" base comprising food, textiles, clothing and footwear, and a "new generation" in metals and engineering, chemicals, plastics, etc., is largely insufficient to explain the real structural changes that have occurred in the indigenous manufacturing sectors.

Some sectors which are commonly viewed as "declining", like textiles, are indeed contracting in employment but, at the same time, contain businesses which are gaining share in export markets, thereby contributing to an increasing standard of living for the country. Others, which are usually included in the new industrial base, like "engineering", are often contributing very little to exports, although growing in employment because of domestic demand.

To better understand the reasons for past performance and the contributions that indigenous businesses make to the development of a higher income economy, it is useful to distinguish within each industrial sector three broad types of businesses which cut across the common trade classifications: Businesses subject to low wage competition; businesses subject to competition from developed economies ("complex-factor cost") and "Non-traded" businesses.

The following section examines the traditional Irish industries according to these classifications and the subsequent section discusses the "new" Irish-owned industries created over the past decade. The purpose of these sections is to describe the competitive factors underlying the structural changes in Irish indigenous industry which must be taken into consideration in any policy review.

TRADITIONAL INDIGENOUS INDUSTRY

For reasons that relate to its colonial past, Ireland was not able to freely industrialize until after its independence. The division of the island into two parts left much of the industrial base in the North. The policies followed after the formation of the Republic, from the

early 1930s until the late 1950s, encouraged indigenous industry to cater mainly to the small domestic market, under the protection of very high tariffs and quotas.

The traditional industrial base at the time of trade liberalization was characterized by a high proportion of low wage businesses, many sub-scale, uncompetitive complex-factor cost businesses, and a profitable sector composed primarily of non-traded businesses.

In most low-skilled labor-intensive businesses, companies had not changed significantly since the pre-war period. Such companies were mostly found in the garment, knitting, cotton spinning and weaving, carpet, footwear and leather sectors, as well as in many metal trades such as cutlery, simple agricultural implements, and fasteners. Several hundred indigenous companies of this kind have closed down since 1973, mainly in textiles, clothing and footwear but also in metals and engineering (Exhibit 3.8).

A number of operations which were subscale both in production and distribution also existed serving the domestic market in consumer goods (appliances, light bulbs, packaged food) and industrial commodities (steel, fertilizers, paper). Several companies in this category are now in liquidation or receivership registered as of December 1980 with Foir Teoranta, the State Rescue Agency, (Exhibit 3.9). This list is only a very small sample (supposedly biased towards more viable firms) of failures in the past few years. Closures do not take into account the numerous employment contractions that have been undertaken by many firms in order to survive.

Very few indigenous companies outside the resource-based industries had developed an export business which could support an increasing standard of living. Exports in sisal ropes, shirts, linen and cutlery were based on low wage rates and were vulnerable when exposed to competition from countries with even lower wage levels. Complex-factor cost export businesses based on defensible competition advantages, such as glass crystal, were remarkable exceptions.

In addition to these potentially traded businesses, large and small indigenous companies operated in local non-traded businesses. These companies could remain defensible when the Irish economy opened up. Some were small companies in businesses with little scale-related cost advantage, such as building materials, concrete products, plastic conversion, and structural steel. Other larger companies existed in businesses with some scale-related cost advantages, such as cement, packaging, and civil engineering. These companies today form the core of Ireland's large indigenous corporate sector.

To understand the current competitive position of Irish indigenous industry, it is useful to review in detail the competitive economics which have attended the evolution of these different types of companies

during the opening of Ireland to free trade. In the following section we discuss the recent historical development of traditional Irish-owned industry, differentiating that which has been exposed to low wage competition, that which has been subjected to developed country competition, and that which is primarily in local, non-traded businesses.

Sectors of indigenous industry are very finely segmented, as illustrated by the number of companies and the wide contrast in performances. This report does not pretend to be an audit of these sectors nor does it try to offer strategic recommendations to any individual company. A brief review of past successes and failures is, however, necessary to better comprehend the structural problems of Irish industry today.

Low Wage Businesses

Low wage businesses are often wrongly associated with second-hand machines or antiquated methods of production. More and more, newly industrializing countries are buying the best equipment available, and Irish plants have found themselves surpassed both in technology and scale by low wage country producers.

In knitting, electronic V-Bed machines are replacing conventional punched-tape V-Bed machines, increasing output per person with reduced set-up time and less maintenance. One competitive knitting factory in Hong Kong has acquired 260 electronic machines from international suppliers, mostly in Germany, Switzerland and Italy, while only 20 are installed in Ireland. In shoe production, one Brazilian plant turns out 35,000 pairs per day, while the total Irish production of 60,000 pairs per day is divided among 12 firms.

This of course does not mean that all knitting or shoe factories should standardize their product line and merge into one large plant. It simply points to the higher economies of scale and levels of automation that Irish indigenous companies have been facing from low wage countries in some business segments. In businesses where production cost is important, and where the process, the machinery and the skills can be acquired (either from hardware vendors or very often from other producers selling their know-how), the only remaining competitive advantage is in low labor costs. When newly industrialized countries combine equal or better production economics and lower wage levels, competitive positions can erode in developed countries.

In leather tanneries, Argentina has invested in very modern large-scale facilities, bringing experts from Europe to transfer technology. Suppliers of equipment, pigments and dye-stuff from Italy, France or Germany would not hesitate to send technicians and engineers for several months to assist local managers in smoothing out any training, quality control, or other start-up problems. The productivity and lower labor costs of Argentina compared to Irish leather companies in

shoe uppers, for example, results in a total cost advantage of 20 pence per foot, or 50%.

Textiles, Clothing and Footwear are often viewed as industries inevitably declining because of the competition from newly developing countries. Those sectors, however, are not exclusively composed of low wage businesses. It is important to identify the basis for defensibility at a finer level of business segmentation. The rest of this section will briefly review how successful indigenous companies have been in recognizing competitive threats early, and in rationalizing production or moving into potentially defensible segments.

Textiles

The indigenous textile industry can be divided into three main groups of businesses: cotton processing; wool processing and finishing; and carpets. Cotton has been the only group seriously affected by low wage competition.

In standard long runs, such as cotton fabrics for shirts, competition from low wage, cotton-growing countries such as Pakistan, India or Egypt is in many products inevitable and insurmountable. Weaving technology in competitor countries is often the latest available, and labor cost, which still represents 20% of factory cost in an automated plant, is about ten times lower. This translates into a total production cost advantage of about 18%, not accounting for differences in productivity and capacity utilization.

The largest part of Irish cotton spinning and weaving operations was progressively regrouped by one company in the 1960s. In 1970, this company had 17 plants in Ireland, was exporting 94% of its production to the UK, and made £2 million in profits. Since then, it has declined in employment from 2,000 to 160 people, and has retreated into two small businesses less exposed to low wage based competition:

- One, in heavy duty industrial cloth for conveyor belts and brake linings. Production must be made to order and deliveries are due within five days, giving an advantage to a local supplier. In addition, the selling process requires a certain amount of technical skill. With £15 million in sales, it has 25% of the UK market.
- Another, in PVC coated cloth for footwear, bags and car upholstery. The production process is proprietary (a license was bought) and involves quite stringent temperature control and pigment application techniques.

There are no Irish-owned cotton spinners left in Ireland, and the only

surviving weavers in cotton or synthetics* have specialized in non-standard, short run-length product segments which are better protected from low wage competition such as in furnishings fabrics, industrial cloth, and printed towels for hotel chains; or in non-traded segments, such as Army and police uniforms.

Clothing

The indigenous clothing industry was primarily serving a small domestic market under protection, and the impact of trade liberalization has been quite dramatic. Irish industry has lost both employment and output continuously since 1970, while British industry has at least increased output (Exhibit 3.10). Employment levels have fallen by 25% to 40% depending on the sub-sector, with men's garments and knitted underwear being the most severely hit. Import penetration has risen from around 30% of the domestic market in 1973 to more than 60% in 1980 (90% for men's clothing). Exports have also developed, of course, but the net trade balance had turned negative by 1976 in every sub-sector and the total deficit reached 69 million pounds in 1979, compared to a surplus of 6 million pounds in 1973 (Exhibit 3.11).

The indigenous clothing industry is divided between knitting, with 112 firms and 1,600 people, and garments, with 366 firms and 1,000 people.** The importance of low wage competition and the basis for defensibility differs in each group.

Knitting can be segmented by run-length and quality standards, with different process technologies and production economies (set-up time, skills) being required for each group (Exhibit 3.12). Defensibility in each group is based on different economic factors.

The level of automation and labor costs are the prime cost factors in standard long-run knitwear produced on the V-Bed. In general, indigenous companies have been most severely hit in these business segments, which include such things as non-branded underwear and casual ladies' skirts. A number of small-scale operations have closed with the ending of the early 1970s knitted fashion boom. The only three indigenous companies left in these segments are much larger than average: one has 1,400 people; another has 1,000 people; and a third has 400 people. These companies invested heavily to rationalize and automate production in order to survive, though not without serious job losses. The first, for example, has lost around 1,000 jobs in the last 10 years. These companies are now viable - although some barely break even in these segments - because of this investment, in addition

*The synthetic fibre industry is almost entirely foreign owned except for some polypropylene extrusion which is completely separate from textiles, despite a common industry classification.

**ANCO 1978 Data.

to some competitive advantage in other elements of their cost structure: one in distribution in Scotland and England; another in common brand advertising; and a third in direct selling to large customers abroad.

Garment manufacture is even more segmented than knitting, as exemplified by the higher number of companies (around 400) and the high birth and death rates of companies. As in knitting, the importance of low wage competition will vary with product standardization and run-length. The other dimension of defensibility against developing countries lies in the material used, with wool being more defensible than cotton/synthetics. In the latter case, material quality and patterns are more stable and there is less opportunity for product differentiation based on material choice and preparation. Materials are therefore standard among competitors, and can be shipped to a distant location for downstream processing. German garment manufacturers use low labor cost facilities in Eastern Europe or the Far East, the French in Tunisia or Africa, the Italians in Cyprus, the Americans in Mexico or the Philippines, etc. We will see later that this dependence on low labor costs had developed less rapidly in wool-based garments, where industry-wide economies of scale in a given country are important and local links between wool processors and garment makers add to defensibility.

Exhibit 3.13 summarizes the business groups more exposed to competition from developing countries. For garments with long production runs such as standard men's shirts, which used to be a long established "cottage industry" in parts of Ireland, many Irish companies have succumbed to low wage competition. The Donegal shirt industry, for example, has lost several hundred jobs. This is inevitable as countries like Hong Kong or Korea take advantage of the latest technology available and have labor costs many times lower (Exhibit 3.14).

In men's clothing, Limerick Clothing (suits), Danus (suits), and Taltenn Textiles, followed more recently by Dubtex, Smith & Co. (underwear and socks) and Clubman (shirts), were all operations employing more than a hundred people which have closed for this reason. One traditional menswear company which remains has refocused its production to Irish tweed suits and, more recently, ladies outerwear where the competition is mostly from other European countries. Another large company has considerably reduced its menswear line, and a third is experiencing serious difficulties. In ladies' clothing, one of the leaders had to reduce its rainwear operation and another closed its pantyhose line as a result of low wage competition.

The footwear industry has experienced similar difficulties, with only twelve producers left from a peak of over thirty in the late 60s. Even the more successful companies have reduced employment by 20%

or 30% in the last decade.

Summary

Businesses affected by low-wage competition are not limited to textiles and clothing. Parts of the metalworking industry have also been affected. In cutlery, the only firms left are limited to plating and polishing. Similarly, in nuts and bolts, and nails and screws, the two main producers, have significantly contracted and are barely breaking even.

In summary, low-wage businesses, which formed a very high proportion of the Irish indigenous base in textiles, clothing, footwear and simple metal fabrication, have either disappeared or have reduced employment in order to survive. In many of those businesses newly industrializing countries are investing in larger-scale, newer technology production facilities, and are taking advantage of lower wage costs: Korea and Hong Kong in men's suits, skirts or knitting; Taiwan and Brazil in leather shoes and bags; Argentina in leather; Pakistan and India in cotton cloth; etc.

It is inevitable and beneficial that more and more developing countries move into manufacturing businesses. This represents a major challenge for Irish industry. It is most likely that further job losses can be expected in industries like textiles, clothing or footwear where there is still a significant number of low wage-rate businesses (long-run knitting and non-wool clothing, men's semi-leather shoes, and others). The rate of job loss should be somewhat lower than the historical figure of 6% per year, however.

Some Irish companies can continue to rationalize and invest in better production facilities in order to retard their decline. This has been accomplished to some extent by a few survivors. This generally means significant employment reductions, however. Companies can also identify business segments which can be defended against low-wage competition based on:

- Short lead time for design changes, production turn-around, and delivery – as one company has done in printed woven towels.
- Technical or design-based selling processes – as one company does in industrial cotton cloth.
- Proprietary process technology – as in PVC coated cloth.

These "refocusing strategies", however, represent only a small part of the total employment in low wage-rate businesses. Thus, the only long-term way to sustain an increasing income level is to develop more complex-factor businesses where the source of competition is in other developed countries, with similar or higher levels of labor cost.

Traditional Irish Complex-Factor Cost Traded Businesses

Competition in complex-factor cost businesses is based on the strategic allocation of resources and on organization, rather than merely on lower labor costs. At the time of trade liberalization, very few indigenous companies had developed a competitive position in internationally traded complex-factor cost businesses, and many subscale operations catering to the domestic market were threatened by much stronger competitors. As we said earlier, sustainable growth and defensibility in complex-factor cost businesses require identification of key factors in the cost structure (run-length, scale per application, distribution scale) and gaining long-term competitive advantage in these factors through appropriate investments and organizational structure.

This section will review how indigenous companies have succeeded or failed to do this, and draw some conclusions about the barriers that Irish-owned industry faces in its effort to develop successful international export businesses.

The Transition to an Open Economy

The entry of Ireland into the EEC has changed considerably the structure of its complex-factor cost businesses. A wide range of businesses have been forced to close or to shrink in size due to increased competition from more efficient competitors abroad.

In packaged foods like biscuits and confectionery, the opening of the economy has meant considerable losses in output and employment (Exhibit 3.15) with domestic needs being met increasingly by imports, which have risen much faster than exports (Exhibit 3.16). In basic consumer durables, such as electrical appliances, many Irish companies could not survive. Finally, some basic process industries such as paper and steel have suffered considerable hardship. The four paper mills which employed nearly 3,000 people in 1973 have been consolidated into two mills with many job losses. Irish steel has also had to consolidate its operations and remains unprofitable.

In contrast to these difficulties, a number of Irish companies have successfully weathered the competitive storm to maintain reasonably successful traded businesses. Irish Distillers have rationalized production by going from five small distilleries to one large scale, efficient unit. Waterford Glass has made the transition successfully due to its apprenticed, highly skilled labor force and elaborate overseas marketing and distribution systems.

Successful transitions have also occurred in sections of the textile, clothing and drink industries. However, as the following examples show, many of these companies will probably be under increasing competitive pressure in future years.

The Irish carpet industry currently makes up almost half the total

indigenous textile sector. Before trade liberalization, this industry was fragmented. Free trade forced the consolidation of many small companies and production modernization. In one company, employment fell from 3,000 in 1970 to 1,900 in 1980, for example. Today there remain six manufacturers in the industry; two of them represent 90% of total employment which stands at 2,700.

Competitive position in the carpet industry is principally determined by plant output in a given process/design segment, reinforced by distribution scale. Production processes — tufting and weaving — determine machinery type. Design styles — plain or pattern — determine run-lengths and material feeding systems. Different customer groups in turn require different materials — wool or synthetics — depending on wear characteristics and designs. Production and distribution economics are therefore linked. Economies of scale in one reinforce and are made possible by scale in the other.

Competition in tufted synthetics is based on large production volumes which allow long-run lengths and high machine output. Irish suppliers have been losing competitiveness in this segment because some U.S., Belgian, Dutch and German competitors are ten times larger than Irish producers and can establish more focused production lines.

Irish industry has concentrated on more design-intensive segments with shorter run-lengths, mostly in plain wool materials. In pure wool products, especially in those which are woven and patterned, leading Irish producers are only one or two times smaller than European and American producers. Cost differences arising from this scale disadvantage have until now been offset by marketing and distribution advantages in the home market and in the UK.

The future for the Irish carpet industry will however be characterized by fiercer competition in its prime export market, the UK, which represents more than half its output. The UK market, which formerly was somewhat protected from continental competitors by a different measurement system and different tastes (pattern, colors), has been recently penetrated by Belgian as well as U.S. manufacturers.

Automation and innovation in manufacturing (tufting machines, automatic spool system, etc.), as well as advertising and design expenses, represent considerable investments for Irish companies which are not generally very cash rich. Yet carpets still represent a growing market where Irish indigenous industry could hold its share in the specialty segments in which it has gained some reputation.

In the clothing industry, the largest Irish producer has built a successful business through production rationalization. Its success in the British and Scandinavian markets, where it exports almost half its production, is in striking contrast to the general state of the industry. It is usually said that Irish companies should go "up market" in price and design

into fashion segments, to defend themselves against low-wage competition. This company has followed a different route and has focused its ladies' outerwear line on what could be termed the "classic image" segment in contrast to the "fashion collection" segment.

In its segment, product design is relatively stable (except for minor changes in color) and the number of styles is small. This allows production runs to be increased as market share grows, which in turn allows for investments in material handling and production automation (programmable presses, automatic sewing).

The "fashion collection" segment, on the other hand, is characterized by frequent design changes and constant innovation. Success requires in-house design capability and production flexibility (often subcontracted). Production runs might be ten times shorter than in the "classic image" segment and automation neither possible nor desirable.

To each segment there correspond different distribution channels (department stores vs. franchised boutiques for example), different sets of competitors: mostly British and German in the classic segment; Italian and French in the fashion segment.

Cost structures differ in each case (Exhibit 3.17). Material savings from an efficient cutting room and manufacturing productivity are critical in the classic segment, while design and marketing are the most important factors in fashion.

For Ireland's largest company in the classic segment, total volume increased almost three-fold between 1972 and 1980, but even more important, the number of styles has been cut in half, which means that run length (units/day) has increased by six, and capital investments (£½ million in last 3 years) has become both possible and profitable. As a result of product focus and investments, productivity (units/day per employee) has quadrupled over the last eight years.

As with the carpet manufacturers, its solid position in the UK may be threatened in coming years by increased penetration of continental producers into the British market. Continued emphasis on production cost reductions will be required to defend its present strong position.

A number of small Irish companies participate in various fashion segments of the clothing industry. In cashmere sweaters, two companies have built successful export businesses. Two others have found niches in ladies' and children's fashion knitwear. Still others compete in men's blazers and suits, in ladies' lingerie, in ladies' suits, and in fashion shirts.

While successes have been achieved by these companies, scale is becoming more important in various parts of the fashion clothing business as well. The product variety and production flexibility needed in parts of the fashion industry can now be achieved through new machinery, which allow faster set-up times and require less maintenance. Scale advantages in handling, "collection" costs, and image promotion

can also be important for competitive success.

In men's wool suits, for example, competitors such as Vestra of France are developing specialized robots for stitching, computers to aid design, semi-automatic cutting machines, and automated materials-handling systems. They produce on subcontract, products for design houses such as Cacharel, Cardin, Torrente and Bayard, who concentrate on design and marketing. Vestra has a weekly volume of men's suits five to nine times greater than the largest Irish producer, depending on the segment.

Certain parts of the clothing industry which require extensive interactions between suppliers and customers, or between subcontractors and "assemblers", benefit from economies of scale that develop at the local or national level. Production and design skills are shared among groups of companies. This system of intra-company linkages reinforces each individual company's competitive position.

Wool processing has historically developed in this way in many countries, growing in regional clusters: The "Prato system" in Italy is probably the best example. Italian production of wool yarn – both worsted and woven – has grown at 8% a year over the last 10 years, while production in every other European country was declining (Exhibit 3.18). The Prato strength is based on a network of small companies specializing in different stages of wool processing (spinning, weaving, dyeing, finishing), pooling operations where possible (purchasing, training, machine maintenance, export financing), and, as a whole system, reaching economies of integration.

The Irish wool industry is not large enough to develop this level of integration with sufficient scale at each stage, nor is it regionally concentrated. Wool sorting is not done in Ireland and dyeing is not well developed. Some wools are not spun in Ireland and must be imported even to make "Irish tweeds". The Donegal wool industry, which can be considered the only regional cluster in the Irish textile and clothing industry, has barely reached a high enough level of demand to make possible the establishment of a modern finishing plant.

Therefore, even though there are a number of Irish woollen companies which are currently successful in both textiles and clothing, and well focused on particular quality requirements (Exhibit 3.19), they do have some diseconomies which may weaken their overall positions in the future.

Competitive Threats for Traditional Irish Complex-Factor Cost Businesses

These and a handful of other companies have succeeded in stabilizing their businesses despite the opening of Ireland to free trade. In many cases, however, these and other Irish exporting companies face increased competitive challenges in the coming years. By and large, they are

endangered by their reliance on the UK market for export and by a shortage of funds for investments necessary in product and process design, marketing and distribution, and increased manufacturing efficiency to secure competitive advantage.

The UK has been the primary export target for many companies for several reasons. In addition to language and culture similarities and geographical proximity, some characteristics of the British consumer are close enough to those of the Irish to make this a relatively easy market to enter in many businesses. Trading between countries which for historical reasons share traditions, tastes, and measurements and standards may create markets defensible against more remote competitors. Ireland has only entered the EEC recently and is closer to the UK than to the six original members. This allows temporary protection from European, Japanese and American competition, but also means that Irish companies have difficulty exporting outside the former British zone.

For example, similarities in standards and specifications mean that an Irish electrical equipment firm can sell overhead cables into the UK and compete successfully with mainly British competition, but it also means that considerable redesign of its products would be needed if it were to trade further afield. Soil condition and farming practices in the UK similar to those in Ireland make an Irish company's sugar beet harvesters suitable for both markets, but inappropriate in Germany and France. Consumer tastes and measurement systems make Irish carpets suitable for the English market but not for European countries.

A further factor which facilitated the penetration of the UK market by Irish companies has been the relatively weak performance and underinvestment pattern of British competitors. In businesses like carpets, crystal, porcelain, shoes, knitting and men's suits, Irish companies have intelligently exploited these weaknesses.

It is for these reasons, plus the proximity of Northern Ireland and the opening to free trade with Britain a decade earlier than with the EEC, that 75% of Irish indigenous exports go to Britain. This is not to underplay the success of many indigenous companies, but to recast them in the context of a changing market which is likely to become increasingly competitive.

Geographical barriers such as consumer tastes, safety standards or measurement systems, tend to erode over time. As the UK progressively integrates into the EEC, standardization will take place as it did a decade earlier between the original six members. Brighter colors and plain patterns, favored in the UK, are appearing in carpets from continental producers. Electrical standards are progressively being harmonized within the EEC.

As a result of this, Irish companies may have to face increased com-

petition in the UK from stronger competitors in Europe who may be several times larger than British competitors. In ladies' outerwear for instance, Ralph of Germany has a larger volume resulting in run lengths per style that are twice as large as Vistex of the UK, who has so far been the Irish company's chief competitor.

Exhibit 3.20 shows the differences in scale between British and European competitors in key businesses where Irish companies export. Irish companies are often smaller than the British ones but are aided by the relative inefficiency of their British competitors. Competitors from larger continental companies won't share these inefficiencies. Exhibit 3.21 shows the losses in market shares that have occurred to continental competitors over the last three or four years in some of these sectors already.

For example, the Belgian carpet industry comprises 11 companies of whom five are larger than the Irish leader (Exhibit 3.22). They are now gaining share in the UK market. Between 1966 and 1978, Ireland lost more than a third of its share of the UK clothing sector (from 11% to 7.2%) and two-thirds in footwear (from 9.6% to 3.4%). The fact that this trend continues despite the devaluation of the punt against the pound is significant.

As Ireland's share of its traditional market erodes, the factors which have protected some of its exports to the UK can often be barriers to further international expansion. These barriers may be in production (retooling for different measurement standards, set-up cost between runs), design (meeting different standards or different user requirements), or distribution (cost of initial advertising campaigns and sampling programs). In the case of electrical capital goods (circuit breakers, cables, transformers) overseas export markets have different standards requiring redesign, and may require a proportion of local value added, or even local participation. In a textile product, an Irish introduction into the German market would require retooling for a new automatic feed tufting machine (£200,000 cost), a sampling program to the contract carpet market (£180,000 cost), and two advertising programs per year at a total cost of £400,000. This requires initial expenditure of £800,000 (which does not include working capital or costs of adding a new sales force) compared with an annual sales level in the UK of IRE5 million after ten years of effort.

To be successful in complex-factor cost businesses internationally, Irish companies will face heavy investments. Very few traditional Irish companies have developed technology-based competitive advantage. One spent five years of research and development effort to convert from sisal ropes to polypropylene and to design an entirely automated line for polypropylene extrusion. The process is now patented and only two competitors in Europe are seriously investing in the same tech-

nology. Another company acquired a Swiss license for the manufacture of flat welded steel radiators and is now exporting to the UK. In general, however, the number of traditional Irish companies using technology as a means of attacking new markets or products is very limited.

The reasons for this relate both to the size of Irish exporting companies and the expense of developing new products. Even adapting or customizing a product for a new market can be extremely expensive. One Irish company had to hire an American designer to adapt to the requirements of the U.S. market in "fashion" leather shoes. The total investment for the company was around 240 thousand pounds between 1977 and 1980; this resulted in a current sales level of 450 thousand pounds in the U.S. after three years of effort. Another group had entirely to redesign its line of iron cookware with considerable design and retooling cost after a first unsuccessful product introduction in the U.S. Not many Irish companies have been willing or able to make the high-risk investments and accept the long payback horizons for new technologies or product redesigns of this type.

Irish companies have also had difficulty in developing marketing, technical selling and distribution advantage in export markets. Again, the rule is demonstrated by the ease with which one can name almost all of the exceptions.

Parts of the Irish woollen industry have been able to market effectively abroad through frequent presentations by managers and designers to fashion designers and large distribution and retail outlets. Some of the small Irish companies whose products fall within similar quality segments have cooperated in foreign markets; the woollen weavers coop has regrouped several Irish suppliers in this way. Recently, joint exhibitions in the U.S. by four indigenous companies have been organized. Customers of wool fabric and of clothing are often very quality conscious, and many Irish suppliers have set a good record for consistency.

Other companies in crystal, carpets and spirits have also promoted an Irish marketing image abroad. In these cases, investments to build and sustain brand image have remained high over almost two decades.

Overall, these efforts are exceptions. Successful international marketing-based advantage by Irish companies is rare. Even for the successful companies it is increasingly difficult and expensive to extend their brand image to new markets.

A similar and perhaps even more restricted series of successes has occurred in areas where technical selling is crucial to competitive success. Only two examples exist of companies which have achieved some success in selling technical products in selected export markets. These, however, are rare exceptions in Irish indigenous industry.

Finally, very few indigenous companies have built a distribution

system of their own outside Ireland in products where selling is largely based on broad store coverage, local advertising or efficient expediting and warehousing. One company in crystal now has a salesforce of 250 people around the world but it is an exception. The largest carpet companies have good distribution coverage only in the UK.

Building distribution can be very expensive. Investment in working capital, samples, dealers' promotions, and local salesforces can be very high. One company invested £200,000 just to set up an initial presence in the Western part of the U.S., letting an exclusive distributor bear the cost of distribution in the Eastern part. These distribution organizations require high initial investments in working capital and the ability to sustain losses for a number of years in the penetration period. Only a few companies, relatively large by Irish standards, have been able to do it.

The Difficulties of Adding Value in Packaged Food Businesses: An Example

An example of the difficulties faced by Irish firms in complex-factor costs businesses is the lack of success of the Irish food industry in developing exports in higher value added products.

A previous chapter has examined competition in commodity food products which depend essentially on the supply of raw materials, inasmuch as these represent the vast majority of the cost. In contrast, high value added food products show a complex cost structure (Exhibit 3.23) made up of various inputs and functions: ingredients (primary processed farm output such as flour, sugar, frozen meat, etc.), further processing, packaging and energy inputs, distribution and marketing. This complexity is related to the many cross linkages in the food industry (Exhibit 3.24). Each of these cost elements may offer an opportunity for competitive advantage for the Irish firm.

Much effort has been made to add more value to Irish farm output by developing further processing. Private and public resources have been applied towards that goal both in manufacturing (e.g., vac-pack, fish canning, packaged vegetables) and in distribution and marketing.

Most export success to date in processed foods, however, has been linked to foreign-owned enterprises whose UK and Irish factories are specialized by product line.

Exports by indigenous companies have resulted largely from EEC subsidy (e.g., casein). Overall, however, exports of non-commodity food products have not grown in volume and the vast majority is still directed towards the UK (Exhibit 3.25). Many reasons have been offered to explain this poor performance: inappropriate technologies, subscale operations, inadequate supply of materials, CAP regulations, lack of marketing expertise, additional transportation cost due to the remoteness of Ireland, etc. In the following section, we will seek to put these

reasons in a logical framework by addressing the issue of the Irish relative cost position for each stage of value added: manufacturing, packaging, energy, logistics, and marketing.

In most complex-factor cost food businesses, manufacturing value added by an individual processor is typically between 20% and 30%. This indicates that the manufacturing facility itself is unlikely to be the major competitive factor in processed food products, though competitive cost differences can exist at the manufacturing level. In Ireland, significant manufacturing investment has created competitive processing plants in some industries such as confectionery or distilling. In other instances, manufacturing investments have not succeeded in creating an adequate competitive cost position, such as in frozen food or sugar processing, where productivity is less than a third of German or Danish factories (Exhibit 3.26).

Packaging materials usually constitute a sizeable part of the total cost of secondary processed food, especially for the more elaborate "convenience food". These materials, such as cans, corrugated boxes, etc., are typically more expensive in Ireland than in competing countries. The upper limit of price is set by the price in other countries plus transportation costs to Ireland. Transportation costs are often relatively high for packaging materials, which are usually bulky relative to value. These high costs can be critical, as in the case of vegetable canning, for which packaging materials may represent almost half the finished product ex-factory cost (Exhibit 3.27), and in the case of packaged dry vegetables, where they represent almost 40% (Exhibit 3.28). It is not untypical for packaging material costs to be as high as total manufacturing costs in many packaged food businesses.

Energy can be a significant cost in processed foods also. Energy is more expensive in Ireland than in many competing countries. Within the EEC this has been particularly the case vis-a-vis Holland – because of its natural gas fields – and progressively so with the UK. Again, the importance of this penalty can be put in perspective by analyzing cost structures. Dehydration is a typical example of food processing for which the higher cost of Irish energy is a severe competitive penalty. Energy cost may represent some 20% of the total ex-factory cost of consumer packaged, dried vegetables (Exhibit 3.31). In instant dried rice, energy content is even larger, which explains a large part of the observed cost differential between processed rice in Ireland and in parts of the U.S. – ex-factory cost has been quoted at 18p/lb. in parts of the U.S. versus 46p/lb. in Ireland. Typical EEC duties on such products – 18% – will obviously not compensate for such a cost penalty.

Thus, the relative cost of packaging and energy is likely to be significant in determining the competitiveness of Irish non-commodity food products. These are likely to be at least as important as relative

manufacturing costs.

Logistics costs may also play a significant role in determining competitive position. This is especially true for imports of intermediate materials to Ireland. Processed soya, an ingredient for secondary meat processing, has to be imported from the UK which adds a transportation cost penalty relative to many European factories.

Logistics costs, i.e. the cost of physical transportation of either raw materials or finished products, have traditionally been considered a major obstacle for exporting Irish food products. There is a definite cost disadvantage relative to a foreign competitor serving a home market. Detailed analysis shows that this may not be a major penalty, however, compared to the cost differentials that have been commented on earlier. To measure the cost penalty for operating from Ireland, the logistics costs of an Irish processor may be compared with an equivalent UK operation.

For dried vegetables, a UK operation would probably incur logistics costs roughly equivalent to that of one Irish producer from its store in the British midlands, or 1.3p/lb. of product (Exhibit 3.30). Direct delivery from the Irish factory to the same average UK consumer amounts to some 2.3p/lb. Hence, the disadvantage for processing in Ireland is an estimated 1p/lb. This amounts to less than 1% of the ex-factory value of packaged dried vegetables.

If a two-step logistics cost is necessary – transport to the UK midlands, two-month buffer storage, and then shipment to the customer – the cost penalty relative to direct shipment from a UK factory rises to about 2p/lb., i.e. less than 2% of ex-factory value. However, this includes storage cost which would be incurred by a UK competitor if the same delivery service were adopted. Actually, a multi-factory UK competitor typically has central warehousing facilities in order to achieve single shipments for multi-products orders. In this case, the actual cost disadvantage of the Irish factory could be much smaller than the 1% of ex-factory value estimated above.

The same amount of additional cost, about 1% of product value, has been observed by Bord Baine for shipment of such products as butter or cheddar cheese from Ireland to Adam's Food facilities. Again, this is larger than the actual cost penalty for operating in Ireland, inasmuch as a British Coop also incurs a cost for shipment to a wholesaler when relying on an equivalent two-step logistic. Therefore, even for medium-value food products such as these, the actual transportation cost penalty from Ireland to the UK may be smaller, and is probably considerably less than 1% of value. Though it is not negligible, it is certainly a very limited obstacle compared to some of the cost disadvantages referred to above. The cost penalty versus other EEC countries should not be significantly different, inasmuch as sea transport cost is only marginally

affected by distance.

Shipment cost from Ireland to other countries is therefore not usually a serious competitive disadvantage. However, additional more serious cost disadvantages may occur within the foreign country. Scale effects may be observed in warehouse operations, and in trucking. The key variable determining logistic cost is usually the drop size. Typically the lower market share of an Irish importer translates into smaller drop size, hence higher logistic cost. At the extreme, a local competitor who is 10 times larger than the Irish importer may incur local logistic costs that will be only half that of the Irish importer. Some Irish exporters who operate their own distribution systems in the UK have been confronted with cost penalties of this kind. They typically amount to only a small percentage of product value, but the penalty may constitute a very large part of the importer's operation. To compensate, transfer prices are often set so that the UK wholesale operation is breakeven – which has been Bord Baine's policy toward Adam's Foods. This only transfers the cost penalty to the Irish side, leading to a lower price realization for export to the foreign subsidiary.

Some Irish operators have tried to alleviate the logistic scale penalty by adding other product lines to the local operations. Yet, this will only improve scale inasmuch as physical characteristics of products are sufficiently alike to be handled together. A thorough analysis of drop size and frequency is necessary to prevent inappropriate investments in foreign distribution or in the acquisition of uncompetitive local operations in other product ranges. Irish companies have not always viewed this issue correctly. Certain Irish exporters were forced out of such operations after incurring heavy losses. The larger the logistic cost in relative terms, the more important such analysis would be. In extreme cases, this cost may be nearly equivalent to manufacturing cost added.

Well established multinational firms do not encounter equivalent local logistic obstacles when exporting from Ireland, since logistics may be shared with their local existing businesses. This partly explains why most success stories for export of packaged food are related to foreign multinationals.

Successful experiences, many of them quite recent, have proven that an indigenous Irish food exporter may overcome the local logistic barrier, as a multinational would do, by relying on existing networks. This may be achieved through joint ventures (the recent mushroom project with a Dutch partner) or through a commercial agreement (a recent Coop's contract with a German cheese distributor). Then the sole logistic disadvantage will be the cost of shipment from the Irish factory to a foreign warehouse. As we have shown this is not typically a sizeable barrier. In addition, such cost penalties usually decline over

time as export of a specific product increases and more appropriate means of transportation are developed (special containers, direct delivery to large clients, etc.).

Marketing expenses are most linked to a specific geographical market, since each country has differences in language, distribution, structure and consumer taste. Advertising is typically purchased from advertising agencies, T.V. networks, and the press, rather than done in-house. Therefore, the absolute cost of any specific campaign tends to be the same, whoever has commissioned it. Hence, the marketing cost per unit sold reduces with increased market share in the specific area covered. This implies an obvious cost disadvantage for the entering Irish exporter who is small relative to existing competition.

For an indigenous Irish exporter, establishing a brand name typically requires a large, long payback investment before market share and price premium are obtained. In chapter 2 reference was made to the fact that the long efforts to establish Kerrygold as a premium brand in the UK have not yet paid off.

In summary, Irish firms have not developed significant exports in complex-factor cost food businesses because of a failure to overcome key competitive cost barriers. Significant investments have been made in manufacturing facilities, but these have sometimes resulted in sub-optimal plants (sugar and frozen vegetables). In other cases, manufacturing is not the most significant part of the competitive cost structure. Nor do extra transport costs appear to be the major cause of Ireland's competitive problem.

The most significant barriers to Irish exports lie in high packaging and energy costs, high internal logistics costs within foreign country markets, and the difficulty of creating a successful brand image in other countries. To date, efforts to acquire importers in market countries to overcome the logistics problem have met with limited success, as these importers could not achieve necessary scale and product coverage to be competitive themselves. Efforts to establish brand image price premiums have also been only minimally successful, although recent market research and initiatives in Germany give hope for overcoming this problem in the future.

As a result of these barriers, most Irish food exports are either in bulk beef and dairy commodities, or come from the Irish installations of multinational companies which can overcome the logistics and distribution problems through their elaborate networks abroad.

Summary: Traditional Complex Factor Businesses

Overall, trade liberalization has meant the demise of many Irish companies in complex-factor cost businesses. Many which have survived, and in some cases flourished, face continuing competitive difficulties.

Those that have focused exports on the UK will be facing increased competition from continental producers as that market becomes more integrated into the EEC.

Many Irish clothing and textile companies will require continued investment to automate their manufacturing processes, even in "fashion" segments, and will need to build better scale in marketing. Food producers will find it difficult to move into higher value-added products because of high packaging and energy costs, and because of the difficulties of building distribution in other countries.

Ireland's traditional industries have not invested the resources necessary to develop new processes and products, nor have they made the marketing and distribution investments necessary to penetrate new markets. This is being done in very few cases except for some efforts directed at the UK. In contrast to the low-wage businesses discussed earlier, where the loss of competitive position and jobs is inevitable, traditional Irish companies can expand and succeed in complex-factor cost businesses. However, serious investments are required to extend manufacturing efficiencies, product ranges and marketing and distribution networks. At present, these are being made only in exceptional cases.

Irish Companies in Local Non-Traded Businesses

In contrast to the difficulties encountered by indigenous companies in traded businesses, many large and small firms have prospered and grown very rapidly in local non-traded businesses. Local businesses can be defined by the relative importance of logistic costs to total value added; and the potential for economies of scale beyond the local market.

Logistics can create a non-traded business when these costs are too high a proportion of total cost. For example, the location of a cement factory will be determined, among other factors, by shipping costs from the quarries vs. shipping costs to final markets. The total production cost of cement will be determined by the process technology and the scale of plant. Typically, local demand (within the boundaries of a small country) can in itself justify a large-scale plant of about one million tons. In most cases very little will be gained by building a larger plant and serving more distant markets (or by building further from the quarry). Of course even "local economy" businesses can participate in international trade. Very large cement factories built near the water can export a certain proportion of their output to distant markets. However, these situations will usually be limited to temporary supply shortages or to cases where the final markets cannot support a minimum size plant.

In other instances it is clearly uneconomic or may even be unfeasible or dangerous to transport certain goods; hydrogen chloride is rarely

shipped further than 400 kms., and fresh milk (not UHT) has to be delivered locally.

Logistics barriers to trade include not only physical transportation, as in the case of low value-to-bulk ratio goods (concrete blocks, iron pipes, farm gates, corrugated boxes, plastic blow mouldings), but may also include cases where the cost of delivery to a fragmented customer base directly from a plant offsets the potential scale advantages of larger plants such as in steel tubes cut to order. A final type of local business includes those where it is important to keep a short lead time between customer's specification, supplier's drawings, customer approval, and final production. The requirements for short lead time, close contact with the customer, and quick service are found in many custom-made, service or fashion businesses.

The potential for economies of scale beyond the local market must be balanced against increased logistics cost. No business is totally protected from international competition. It is always possible to ship plastic bags, corrugated boxes or metal containers, but most often domestic companies will have a sufficient threshold of scale to make the added logistics costs prohibitive to the more distant, albeit larger, competitor. In commodity plastic moulding, increased volume simply requires more of the same machines, and the slight cost advantages in processing or in overhead cost amortization are not significant relative to the logistics cost.

"Local economy" businesses are not always supplied by local suppliers. In countries like Ireland which are close to more industrialized regions (UK midlands), certain goods will be imported which would be manufactured locally in other developed countries. This is because Ireland is small, and also because it lacks necessary skills and experience. In these cases, the trade-off of logistics against scale potential is not quite favorable enough to domestic suppliers.

Given the proximity of Ireland to the UK, it is not surprising to find a high proportion of imports from the UK in some items that in most countries would be "local economy" businesses. This is also true in reverse for certain exports such as cement going from Ireland to Northern Ireland.

Of course the definition of "local economy" evolves over time, and a competitor can find new ways to overcome logistics costs or increase its scale to offset them. One Irish company has been able to export excavator buckets across the Irish Sea to Wales and Scotland for use as replacement parts.

In contrast to the traded complex-factor cost and low wage-rate businesses discussed above, large companies in non-traded businesses such as cement, packaging, distribution and importing have experienced considerable growth over the last five to ten years. The eleven firms

listed in Exhibit 3.31, which represent the largest public Irish companies in this category, have had an average annual growth in earnings over the period 1973 to 1979 of 26% per year in current terms (approximately 12% annual growth in real terms). Although 1980 results have been generally lower than those for 1979, these companies are also very profitable. Their average return on equity in 1979 was 18%. Compared to an average U.S. corporate return of 10%. Moreover, their debt is low for their type of businesses. None of them had a debt-equity ratio higher than 0.89:1; their average debt-to-equity ratio was 0.56:1.

Many of these companies have invested abroad, either in the same sectors as their base businesses or in closely related sectors. Consistent with this, their exports as a proportion of sales have declined (Exhibit 3.32). One has not diversified significantly out of its base print and packaging businesses, but has made major changes in the geographical distribution of its sales. The proportion of its non-Ireland sales is now 77% of total sales (62% in 1973). Its sales outside the traditional markets of Ireland and the United Kingdom amount to 34% of total sales (4% in 1973) (Exhibit 3.33). Its exports declined from 6% of sales in 1974 to 4% in 1979. An engineering company it owns has diversified into many different sectors (Exhibit 3.34). Most have limited export possibilities.

Similarly, another has made investments outside Ireland in businesses closely related to its base cement and concrete business (Exhibit 3.35). Approximately one quarter of its sales are made by its subsidiaries outside Ireland and the United Kingdom. Its exports have declined marginally, from an estimated 8% of sales in 1974 to 7% in 1978.

Some of these companies have diversified into non-traded businesses in Ireland not related to their base businesses. One, for example, has made investments in the distribution of pharmaceutical products and print and packaging in Ireland, although its base tobacco business still accounts for three-quarters of its total sales (Exhibit 3.36).

Few of these companies have diversified out of non-traded businesses into traded businesses, although some have experience in manufacturing traded products. One, for example, founded the country's leading tool-making company, some years ago. The focus of its recent investment activities, however, has been in non-traded businesses in the United Kingdom such as plant hire, housebuilding and merchanting, businesses which have generally been more profitable and faster growing than manufacturing. About 51% of its sales are outside Ireland, mostly in the United Kingdom, compared with 49% in 1974.

In general, these firms may be said to have responded intelligently to risk-return signals from the market. Non-traded businesses tend to be less complex than traded manufacturing businesses and more profitable in the short term. Three Irish non-traded businesses that we analyzed,

for example, had returns on capital employed of 85%, 140% and 100% respectively.

The investment in marketing and distribution or research and development over a long period in order to build volume and gain a defensible competitive position against large, tough international competitors is not easy, and not within the experience of these companies. Furthermore, certain firms are highly industry specific. They have built up considerable expertise in their industries which may give them a competitive advantage. It is reasonable to believe that it is not in their shareholders' best interests that these skills be dissipated by investments in unrelated businesses.

From a national point of view, investment in non-traded businesses in Ireland has merit in certain cases. Importation of packaging or cement or large steel structurals is not only detrimental from the perspective of balance of payments and employment; the absence of competitive local packaging manufacturers may deter potential investors due to the added cost inconvenience of importing low-value items of this kind.

However, there is a structural dilemma in the Irish economy. At the same time that traditional Irish export industries are finding it difficult to muster the resources to build successful international businesses, most of the largest and strongest Irish companies are investing abroad in businesses only minimally related to Irish employment and export, and in local businesses at home which distribute imports or supply non-traded goods. From the national point of view this cannot be the best use of the managerial, financial and organizational capability of these companies.

Summary – Traditional Irish Industry

Traditional Irish industry has gone through a stormy period over the past decade. A number of companies in low-wage businesses have been forced out of business and others are barely viable today. A number of other companies in complex-factor cost businesses have been too small or technologically backward to survive against competition from other developed countries and have been forced to close or significantly decrease their activities.

Some Irish companies in traded businesses have built successful export businesses, particularly in the UK. However, many of them now face more serious competition from continental and U.S. companies and will require substantial investments to continue successfully. Overall, these companies suffer from being small and from the small size of their home market. Very few Irish companies have established true leadership based on manufacturing skills or cost advantage, or on

product and process development, or on marketing and distribution in these international businesses. We have presented some exceptions, but they are relatively few.

The majority of good-sized profitable, successful firms in Ireland are in non-traded businesses. They have grown rapidly and have invested abroad in businesses in the same fields as those in which they participate in Ireland and in unrelated non-traded businesses in Ireland itself. While these strategies are understandable from the point of view of the individual companies, from the point of view of the country, the absence of these companies from the effort to build a successful international export base is a serious problem.

In sum, the good news about traditional Irish industry is that the most serious shakeouts from trade liberalization are probably past. The bad news is that too few Irish companies have successfully made the transition to international exporting businesses, and many of those that have done so have limited their activities to the UK, where they will have a more difficult competitive environment in the coming years.

THE NEW INDIGENOUS INDUSTRIES

With free trade and the adoption of policies encouraging foreign investment, it was expected that new indigenous industries would emerge and progressively replace uncompetitive traditional ones. The presence of foreign multinationals in Ireland who would demand locally produced supplies and the access to new export markets in the EEC were seen as potential inducements to indigenous development. These new businesses would be established both by existing companies seeking to diversify and by new Irish entrepreneurs.

In the previous section we have seen that some established companies successfully restructured or created new non-traded businesses in response to the new economic environment, but that generally the large traditional corporate base has not been a significant contributor to Irish exports. In this section we will see that many new Irish businesses have been formed over the past decade but that they contribute far less to Irish exports than does traditional industry.

About 1,262 indigenous companies have been created since 1973, with a total employment of 21,850 in 1980. This is less than the 26,500 jobs created from new foreign-owned firms, and it has not offset the job losses of 22,915 from Irish owned company closures during the same period. About one quarter of these new jobs have been created in predominantly non-traded sectors like printing and packaging, building materials or wood and furniture. About 15% of the total new employment has been created in predominantly traded sectors such as textiles and clothing. The other 58% is attributable to heterogeneous

metals and engineering, 1000 of consumer goods and plastics (Exhibit 3.37).

Most of the new jobs in metals and engineering, which represent almost 60% of this last group, have come from general metal fabrication operations, metal bending and pressing, and welding and repair shops which typically serve a very local market, and from structural steel, where the economics also favors local suppliers. These businesses have been stimulated by plant construction, agricultural investments (in tanks, farm gates and farm buildings) as well as by general infrastructure expenditure. Some of these companies which fabricate and erect steel structures were founded in the mid-70s, and have now reached more than 200 employees. Other companies are expanding in steel erection and welding. None of these businesses are suitable for significant exporting. Some have acquired similar localized operations in the UK and have therefore diversified without providing additional employment or export opportunities for Ireland.

Among the hundreds of new metals and engineering firms established in the late 60s or early 70s, only fourteen have grown to employ more than 100 people. Of these firms, only two are exporting any significant amount – one in ambulances and the other in water treatment equipment. The other twelve firms have grown very fast – contributing about a quarter of total employment increase in metals and engineering – but they primarily serve the local market in plant construction and metal fabrication (Exhibit 3.38).

The dramatic increase in employment in the metals and engineering sector has mostly come from domestic demand. Since 1967, more than six hundred firms have been created in the sector and 110 are registered by CTT as exporting. Their overall exports, however, amounted to only £11 million in 1979, about 2% of total indigenous manufacturing exports and less than one tenth of one percent of total Irish exports.

The agricultural machinery industry illustrates the nature of the growth from new indigenous engineering companies. The industry has doubled employment over the last two decades (up to around 1,300 people) but most of it has come from local demand. There are now 56 firms in the industry (up from around 20 in the mid 60s) of which 42 produce only farm gates, trailers and storage tanks for a local market area. The other 14 manufacture implements and non-power driven machinery and account for two-thirds of employment and output. Only three, however, export outside Northern Ireland to any significant extent (Exhibit 3.39).

In textiles, clothing, leather, furnishings and consumer products, the major exporters (i.e., over 1 million £) are long established companies, as discussed earlier. The newly created indigenous companies represent only 8% of these larger companies (Exhibit 3.40) and 1.6% of total manufacturing exports. In chemicals and fertilizers, again, the

exports come from long established companies and only one new firm (in enzymes) is significantly involved in trade. Finally, in food, we have seen earlier how very few indigenous companies had succeeded in exporting packaged food products. New firms have not performed better than the larger established ones, with two small exceptions in mushrooms and spaghetti.

Furthermore, a few of the newly created businesses served the sub-supply needs of foreign firms in Ireland. Only 8% of the components and sub-assemblies used by the largest foreign sector, engineering, were sourced in Ireland in 1976. There is little indication that the situation has improved since 1976. Many products suitable for manufacture in Ireland continue to be imported.

Most newly created metals and engineering companies have a low skill profile. Net employment in the more skilled engineering businesses like precision machining and tooling, foundries or instruments has not increased and in some cases has declined. Ninety percent of the growth in employment in sub-supplying companies between 1973 and 1980 came from lower skill sub-supplies such as general welding or structural metal (Exhibit 3.41).

With this overview in mind, we will now look in more detail at the newly created companies, first discussing those created to serve foreign-owned companies in Ireland (indigenous sub-supply industries), and then at those created to cater directly to external markets.

Indigenous Sub-Supply Businesses

One of the chief reasons for attracting foreign manufacturing firms to Ireland is to encourage the development of Irish-owned industry through "linkage" effects, i.e., the flow of goods and services between Irish branches of foreign-owned firms and Irish suppliers.

These linkage effects fall into several categories. Foreign firms building plants in Ireland create demand for construction and engineering services, building materials and equipment. Once in operation they require raw materials, components and sub-assemblies, and industrial and commercial services such as transport, repair, insurance and utilities. New manufacturing businesses may also create opportunities for so-called "forward" linkages, the downstream processing of industrial or natural resource output for sale domestically or abroad.

The focus of our analysis has been on supply linkages for manufactured goods. Most service businesses (transport, repair, electricity, insurance, banking) are inherently localized and Irish businesses appear to have been successful in tapping this source of demand. Seventy-seven percent of service purchases by both Irish and non-Irish firms grant-aided under the IDA's New Industry Program in 1976 were purchased domestically.

The degree of forward linkage in sectors other than food has so far

been negligible. Ireland's small domestic market, its remoteness from major population and trade centers, and its relatively weak natural resource position have not favored investments in these industries.

Total expenditure in 1976 on manufactured supplies by Irish and foreign-owned firms grant-aided under the IDA's New Industries Program was estimated at £968.4M for all industrial sectors, or £483.9M excluding the food sector. Of the latter amount, only 16.4% were purchased in Ireland.

The percentage of supplies purchased domestically by Irish and foreign-owned firms is increasing at a very slow rate. Domestic purchases in 1974 were estimated at 14.7% for non-food sectors.* A 1978-79 survey of firms in this group suggests only a marginal increase, 0.5%, over 1976 levels of domestic purchases by these firms.** This is consistent with another survey which found that plants established in Ireland for a decade purchase only 2% more of their inputs in Ireland than do more recently established firms.***

There is considerable variation between different industrial sectors in the amount of domestically purchased inputs. The mostly Irish-owned food sector which is based on Irish resources, purchased 93.9% of its 1976 inputs in Ireland. The large metals and engineering sector, by contrast, purchased only 11.4% of its supplies domestically (amounting to £17.3M).

Packaging represents a large part of domestic purchases by the non-food sector (Exhibit 3.42). In metals and engineering, for example, domestically sourced supplies other than packaging and native raw materials amounted to £14.3M, only 9.4% of total expenditure.

Foreign firms purchase an even lower percentage of their supplies in Ireland than do Irish firms. In the metals and engineering sector, for example, foreign firms purchase just over 8% of their inputs in Ireland compared to 18% for Irish-owned firms. They import all their raw materials and 90% of their components. They do purchase over 90% of their packaging requirements in Ireland, but this represents less than 2% of their total purchases (Exhibit 3.43).

A comparison of the supply linkages in Ireland with similar linkages in Belgium, another country which has pursued an industrial development policy based on foreign investment, suggests that much more integration between foreign and indigenous businesses is possible. In 1976, U.S. firms in Belgium purchased 23% of their total raw materials and components in Belgium. In the metals and engineering sector U.S.

*O'Farrell and O'Loughlin (1980): An Analysis of New Industry Linkages in Ireland.

**O'Farrell (unpublished).

***McAleese and McDonald: Employment growth and the development of linkages in foreign-owned and domestic manufacturing enterprises.

firms purchased 24% domestically, compared with 8% for foreign-owned firms in Ireland (Exhibit 3.44).^{*} The higher degree of local sourcing in Belgium is probably attributable to a tradition of engineering and metal-working in that country, as indicated by the very high degree of local sourcing in Belgium by U.S. firms in the metal fabrication, machine construction and electro-mechanical sub-sectors (Exhibit 3.45).

In summary, Ireland's industry is only minimally meeting the supply requirements of foreign and domestic firms, and the proportion of necessary supplies bought in Ireland is increasing only marginally. In Belgium, a small country with a similar proportion of foreign-owned firms, indigenous firms are 3 times as successful in supplying the requirements of foreign-owned companies.

The Development of Sub-Supply Businesses

Businesses potentially involved in sub-supply are not a homogenous group and vary widely in their requirements for success. For a newly industrializing country with a small home market like Ireland, there is a substantial barrier to successful entry into many of these businesses, even when foreign-owned companies located in the country can provide a ready market.

This barrier relates to the skill levels required to produce a competitive quality and cost. The need for high concentration of skills, measured for example by the average number of years of in-house experience in significant parts of a business (direct or indirect manufacturing labor, industrial or design engineering,) creates a barrier to entry for the newcomer. Examples of sub-supply businesses requiring high degrees of skill are toolmaking, precision casting, and manufacture of cables for highly specialized uses such as seismic surveying.

Some countries build strength in particular high skill sub supply product categories and become major exporters. Examples include Switzerland in high precision micro plastic injection moulds, Germany in metalworking jigs, Belgium in special alloy castings, and Denmark in stainless steel valves. These competitive strengths are often built initially around local demand (the Swiss pharmaceutical industry, the German or Belgian metals industries, Danish agriculture) but expand abroad on the basis of a highly experienced labor force and in some cases manufacturing scale.

Competitive position in businesses such as these is related to experience-based skills, product development and quality control procedures. For

^{*} The comparison of U.S. firms in Belgium and foreign firms in Ireland is appropriate. Forty-two percent of employment in foreign firms in Ireland is in U.S.-owned firms. EEC firms located in Belgium purchase a lower percentage of their imports in Belgium than do U.S. firms since they have maintained links with their traditional suppliers elsewhere in Europe.

example, in precision plastic mould making, experience-based skills mean shorter set-up and processing times, leading to lower production costs and allowing toolmakers in high-wage countries such as Germany to compete with lower-wage toolmakers.

Specialist cable manufacturers work closely with customers to provide performance characteristics (e.g., heat/cold resistant) or dimensions for particular applications. This creates a high degree of reliance by customers on their cable suppliers. For example, one U.S.-owned specialist machine cable manufacturer in Scotland has six designers, all electrical engineering post-graduates with considerable work experience, engaged in cable design to meet customers' specific requirements.

Even in many non-traded businesses where local suppliers are favored either because close customer/supplier contacts are needed (e.g., computer software), or because transportation costs are high as a proportion of total value added (e.g., computer cabinetry), skill barriers can prevent local participants from competing successfully.

Customers often have stringent requirements for quality, price and delivery which represent major barriers for the new entrant. For example, the purchasing requirements for computer cabinetry demand price competitiveness, high tolerances, consistency of quality and adherence to agreed delivery schedules. Quality is assured by skilled production labor and well-developed quality control procedures.

Quality control procedures are often reflected in the firm's organization structure. A major British company which exports computer cabinets to Ireland is organized much differently than its Irish competitor. It maintains a separate quality assurance section with its own director and chief quality inspector. Quality control procedures are begun before production: drawings and materials are checked against specification by the chief inspector, who is also the senior programmer. Inspections are done at each critical production stage and a thorough final inspection is made. The Irish company, by contrast, relies on a single production manager, in charge of all production and quality control activities, which are minimal.

The implications of these differences are reflected in the relatively small quantity of computer cabinetry work handled by the Irish manufacturer; much of its volume is in large-volume and repetitive sheet-metal work for local banks and for one overseas manufacturer of filing systems. The UK firm, on the other hand, does much of its work in cabinetry for major computer manufacturers.

The skills required for product quality may not necessarily be at the production stage. For example, in making short run-length precision iron castings by non-automatic processes, pattern and mould design and strict metallurgical controls at the metal melting stage are critical, since they determine the ultimate quality of castings. Quality consistency

and low reject rates are the overriding demands of customers purchasing precision castings for further machining. One UK foundry which supplies castings to foreign firms based in Ireland has an internal scrap rate of 4-5% and a customer reject rate of less than 2%. The Irish company against whom it has been gaining market share has relatively lower mould design skills, resulting in an internal scrap rate of 10-15% and a customer reject rate of 10% or more.

The purchasing process followed by multinational manufacturing companies also creates barriers to potential high-skilled sub-supply manufacturers. It typically involves a request for quotation; vetting of potential suppliers' manufacturing, quality control and general business standards; supplier rating and trial order.

This process may require the supplier to adopt new procedures and acquire new machinery. Manufacturers may also require foreign standards certification which may be complex and costly to obtain. Computer firms manufacturing products for ultimate sale in the United States, for example, typically demand Underwriters' Laboratory (UL) certification for all cable supplied, which requires preproduction output and satisfaction of certain criteria.

Ultimate control of purchasing for the Irish branch of a foreign firm may be at parent company level outside Ireland, leading to additional costs and demands on management time for the Irish component manufacturer. Sub-supply competitors may have long and close ties with the parent company. Moreover, the performance, quality and safety of the purchaser's end product is dependent to a high degree on component quality. There is high risk and cost in switching from an established supplier, who is thus in a favorable position provided he remains competitive on quality, price and delivery. Established suppliers may preserve this close relationship by establishing affiliates abroad as their customers set up branches overseas.

Ireland's Sub-Supply Industry

A number of foreign-owned companies interviewed during the study told of trying to use Irish toolmaking, foundry, cabinetry and other firms, and finding them unable to meet quality, delivery or cost specifications. One mechanical engineering company had tried four Irish toolmakers, two of which went out of business, one of which could not meet quality standards, and one of which could not meet volume and delivery targets. He now buys tools from Germany and Great Britain. Two others interviewed were currently purchasing machined parts in Ireland but were being forced to stop by European Headquarters because of high defect rates. Many companies interviewed wanted to use Irish sub-suppliers because they were paying high penalties for importing from the U.S., Germany, Belgium or Great Britain, but could not find any

"reliable" sources.

This is not to say that there have not been successes in the sub-supply sector. One Irish plastics injection company successfully supplies overseas companies in Ireland and exports to customers in the United States. Some Irish toolmakers are exporting plastic moulding tools to Germany, having established their reputations with German-owned companies in Ireland. Two Irish engineering firms have built up successful businesses as manufacturers of semi-standard components (pulley wheels in one case and hydraulic components in the other which are the exceptions which prove the rule.

Despite these successes, overseas companies interviewed frequently complained of difficulties in sourcing products in Ireland, either because of poor quality or lack of cost competitiveness. Computer cabinetry is still being mostly imported into Ireland from sub-contractors in the UK at high cost to manufacturing companies in Ireland. Manufacturing companies are also importing precision iron castings and precision moulded plastic parts due to the shortage of high-quality producers in Ireland.

The development of an indigenous component industry in Ireland has hardly started. Many products suitable for manufacture in Ireland are still imported, which means both added logistics costs for the importer and a negative balance of payments flow for Ireland. This is a result both of the type of foreign investments in Ireland and of the failure of existing Irish indigenous companies to adapt to the stringent requirements of a competitively traded sector. It contrasts significantly with the Belgian situation, where competitive sub-suppliers have developed around the automobile and mechanical engineering industries. Exhibit 3.46 gives a sample of some of the main indigenous Belgian automotive sub-suppliers which are now exporting as well as successfully serving foreign companies at home.

Industrial sub-supplies for the foreign-owned exporting sector have mostly developed in packaging, simple metal fabrication and other non-traded businesses. Large Irish companies have been major investors in these low-skilled, non-traded sub-supplies. In sub-supply businesses with high skill and marketing barriers, however, investment has almost all been by owner-managers with limited resources and growth potential.

For sub-supplies to the agricultural sector, the injection of FEOGA funds and the dramatic increase in production capacity for beef and dairy commodities up to 1979 has created a new market for mostly "local economy" businesses such as construction, storage tanks, farm gates and fences, and machine repair shops.

With the agricultural downturn of 1979-1980, many of these businesses, for the most part small workshops, had to close down due to a general overcapacity in this sector of sub-supply. Very few had been set up to

exploit sub-supply opportunities in regionally or internationally traded businesses. For example, most of the stainless steel valves and fittings required for dairy refrigeration equipment are still imported.

The rare exceptions of precision engineering agricultural supply businesses have been cases where large organizations have committed funds and management time over a number of years. In general, the spinoffs of the agricultural boom to the indigenous engineering industries have been limited to low-skill metal-forming businesses, with little or no development of tradeable products. This stands in contrast to Denmark, another small agricultural country, which has built up a number of tradeable engineering businesses related to the dairy industry.

The skills demanded for marketing, quality control, and design and production high skilled engineering businesses are not present in most of the indigenous Irish companies interviewed during the course of our study. Irish sub-supply firms are frequently small (less than 40 people). They have limited management resources. Owner-managers frequently handle production management and scheduling, design, quality control and marketing functions. They are therefore unable to devote sufficient time to marketing or to design development, and the hiring of additional staff is frequently beyond their means.

Though it is difficult to use broad industry categorizations to describe skilled or traded businesses, a review of the new metals and engineering firms created by the IDA between 1978 and 1980 shows a very small proportion of firms in precision engineering, and most in simple fabrication (Exhibit 3.47).

A more complete picture results from arraying different sub-supply businesses according to the skill levels required to participate successfully in the business and the extent to which the business is protected by significant logistic barriers against foreign competitors. Logistics barriers can mitigate the cost penalties arising from poorer skills, but they cannot help a local producer who lacks the skills or organization to produce a product of acceptable quality or to deliver on schedule.

Exhibit 3.48 presents different sub-supply businesses arrayed according to these dimensions of logistics cost and skill level. Logistics costs involve the physical transportation of product; travelling and communications between sub-supplier and purchasing plant staff; and holding inventory at the purchasing plant level. High logistics costs usually means that a business is non-traded. Skill levels are measured by length of training (including general education and on the job work) required to perform the business activities.

Exhibit 3.49 shows sub-supply firms in the metals and engineering and precision plastics sectors which received grants from IDA in 1979 and 1980 on the "skill-logistics" matrix. Of the 63 firms formed, 25% were in low-skill, non-traded businesses; another sixty percent

were in higher-skilled but non-traded businesses. Only about 15% of these firms were in high-skill traded businesses, predominantly tool-making, precision machining and some precision plastic injection moulding businesses.

On the one hand, this is quite natural; it is easier to form businesses where the skill barriers are low and the logistics barriers for foreign competitors are high. On the other hand, it helps to explain why Ireland is not taking advantage of the opportunities presented by foreign firms.

Perhaps even more important than the number of firms approved in traded sub-supplies is the likelihood of those firms succeeding. As our previous discussion has indicated, many difficulties exist for the new Irish company in these businesses.

Businesses in the upper left quadrant of the skill-logistics matrix are generally not suitable for Ireland. Because of the unskilled nature of their output and the low logistic entry barriers, they are subject to low wage competition. In the upper right-hand corner, in addition to skill level barriers, scale barriers can also exist.

In businesses as diverse as appliance motors, standard fasteners and ball bearing production, the scale necessary for competitive production costs may require high investment and a market much larger than Ireland's. In this case export markets must be developed at the same time as the local sub-supply market, or the company must invest heavily and sustain considerable losses until adequate volume could be established to fill the plant.

This becomes even more difficult when the need for production scale is accompanied by the need for distribution scale, as in certain spare parts businesses (e.g., hydraulic valves and cylinders for industrial applications). Distribution systems of this kind take a long time to build, and reinforce the defensibility of scale-based manufacturing.

To date, no Irish producers have succeeded in a skilled, traded, high-scale sub-supply business. The only successes in skilled businesses have occurred in a few small-scale tool and machine shops, and the only successes in scale-sensitive businesses have been in non-traded businesses such as cement.

Overall, Irish companies have been successful only in low-skill non-traded products. Very few examples exist of successful Irish companies in traded, skilled sub-supply businesses, and many imports are still occurring in skilled supply businesses which should be locally sourced because of high logistics cost. The problem is intensified in certain high-skill traded businesses by scale requirements which are particularly difficult for the new entrant with a small home market. It will not be easy to improve upon this record. Yet, the success of Ireland's strategy of industrialization through international integration

and attraction of foreign firms depends upon the development of a more successful sub-supply industry.

Newly Created End Product Businesses

New indigenous companies which have successfully developed end product businesses fall into two broad categories: those who first developed a business base in Ireland and later expanded to Northern Ireland and Great Britain; and those who export internationally to Continental Europe, the U.S. or to other parts of the world. We will call the first group "Regional Businesses" and the latter "International Businesses". Exhibit 3.50 shows the major new exporting companies in each of these groups.

Regional Businesses

Several indigenous firms created over the past two decades have successfully exploited export opportunities in Northern Ireland and the UK. These companies were typically founded by individual entrepreneurs and have financed their growth primarily from internally generated cash flows. They gained dominant market shares in Ireland and were then able to begin selling in the UK. Their success is generally based on a cost advantage in production or distribution (or both) within a trading zone which includes all of Ireland and Great Britain, because of similarities between the Irish and British markets as well as economics of transportation which favor a "regional" supplier.

Although these businesses vary in many ways, their success is based on the same two strategic factors: the specifications for the products they make are similar in the two countries; and it is possible to use a common production and spare parts system for both countries.

One Irish company has been able to capture about a third of the British ambulance market by using the same design and the same assembly plant to serve its British and Irish customers. It started in 1967 with a dozen employees. It now employs 350 people and exports 82% of its production.

Another company set up in 1978 to produce an original domestic heat recovery system, has selected the UK as its first export target because of similar consumer tastes and heating habits. Solid fuel burners, for which its design is particularly well-suited, are more common in the UK than on the continent.

In 1970 an Irish engineering firm began producing a wide range of excavator buckets for the replacement market. Quick delivery is crucial for gaining share in this market. It created regional depots in Scotland and Wales as well as in Ireland, supplying them from a central plant which has allowed it to gain enough volume to automate more fully than its competitors. Shipments are made in full truckloads, reducing

transportation costs to a few pence per bucket.

Another engineering firm has adopted a similar strategy. Its UK distributors have agreed to purchase a fixed number of wheelbarrows per month, sufficient for it to invest in a large-scale automated production facility in order to lower production costs. Shipments to the UK can be made in large quantities, with low transportation costs per unit.

When an Irish agricultural implements company began exporting its beet and vegetable harvesters to the UK in 1970, it concentrated on regions with soil conditions and farming practices similar to those in Ireland. Its machinery line is suited to smaller farms with light soil and would be less suitable for the South East of England, Northern France or Northern Germany. In 10 years this company has developed an export business of £3 million and captured about 30% of the British market. It has its own UK salesforce and dealer network, and maintains the spare parts network which is crucial for assuring full machine utilization by customers. All production, however, is centralized in Ireland, providing low production costs through scale.

Another agricultural machinery company has a wholly-owned subsidiary in the UK which assembles and distributes its products. Similarly, a third one has an established UK distribution network of agents and associated companies.

Despite these successes in penetrating British markets, very few of these companies have become international on a wider scale. The very factors that have enabled them to penetrate the British market represent barriers to other markets in Europe and the U.S. For example, beet harvesting in France, Belgium or Germany requires a different lifting device from the one used in Ireland or the UK. Foreign competitors, such as Herriau (France), have designs and distribution networks suited to the regions they serve.

The Irish company would find it difficult to adapt its product line to soil conditions and farming practices different from those in Ireland and the UK. The necessary investments in design and prototypes could be beyond its means. Exports are therefore limited to the UK (Exhibit 3.51), which represents a declining portion of the total EEC agricultural equipment market.

Irish ambulance design, suitable for both Ireland and the UK, may not be appropriate for continental Europe, with its different customer and legislative requirements. Furthermore, transportation economics become quite different in more distant markets, and certain products are not truly tradeable internationally for that reason. The cost penalty incurred by Ireland's bucket exporter in shipping its buckets in containers to Belgian or French ports, for example, could not be offset with economies of scale in production.

International Businesses

We have shown that relatively few new Irish companies are exporting at all, and that of the exporting companies, most export only to the local "British zone". Only a few companies have entered truly international export businesses. Those of any significance are so limited in number that we can briefly mention all of them.

Aside from their small number, the most significant aspect of these Irish exporters is the means by which they were able to enter the international market. In most cases, they were aided either by public purchasers or by the overseas experience gained by company founders.

In every developed country, public procurement has helped the growth of new indigenous industries. The U.S. space and defense contracts helped create leading U.S. companies in many industries including aircraft, integrated circuits, lasers, and microwave. The French public electricity procurement policy has helped the international competitive position of many French suppliers of high-voltage switchgear and nuclear reactors. In telecommunications, almost all European countries, including smaller ones like Belgium and Sweden, have directed procurement policies toward helping local manufacturers.

In Ireland, the potential impact of public capital expenditures on indigenous companies is limited by its very small market. However, examples exist of successful spinoffs from public enterprises.

In railway equipment C.I.E. has assisted the growth of small companies, one of which exports railway bolts to the UK and another of which now exports most of its shunting locomotives worldwide.

The P&T is making rather large capital expenditures in telecommunications as the country moves to digital switching and refits its whole telephone network. Perhaps the most significant indigenous company formed through public purchasing, has been assisted by the P&T. It was formed in 1960 by an Austrian with a post office engineering background to import private telephone exchanges from Germany. The company gradually began to sell transmission equipment to the Irish Post Office, which now represents 80% of its sales. This domestic base helped the company move into export markets (20% of output is currently exported, half of it to the UK).

The company has remained technologically competitive through a series of licensing agreements. In 1976, it began making a new line of transmission (PCM) equipment under a licensing agreement. In total, five or six technology agreements have been signed; these now represent 40% of total volume.

Finally in 1978, it began a major diversification into switching equipment and won from the Post Office about half its expected purchases in digital switching for the next five years. Again, technology and, in this case, manufacturing expertise, was derived from a foreign

source in France.

This company's development route is worth noting: from a distribution business, the company turned to manufacturing to meet import substitution demand from public bodies, finally diversifying into export with significant aid from foreign technologies.

Starting with three people in 1960, it now employs 800 and expects to reach 1,400 around 1984. It employs the largest pool of electronic engineers in the country and has already been a source of a few spinoffs.

Public procurement contracts have helped other new businesses to form and compete internationally. The Irish Army provided the initial market for Ireland's armoured car producer. Aer Rianta helped their expansion into fire trucks which use the same type of axle systems. This company is in fact now using its design experience in special-purpose vehicles to develop a component business in axles for export to body assemblers. Arrangements of this kind have been made in Belgium and are being negotiated in other countries.

Irish procurement needs are sometimes insufficient to provide a large enough base for international competitive position, however. One electronics firm established in 1978 by a former post office engineer has not expanded as fast as expected despite an initial contract of £700,000 for new digital tariffing equipment for the P&T. It has to spend several man years on each new application design, while having only thirty employees in total. To attain sufficient revenues between P&T contracts, it has to do sub-contract electromechanical assembly work.

There is a widely-held belief in Ireland, as in many other countries, that wide open opportunities exist for exploiting inventions and other new product ideas. However, very few Irish entrepreneurs have been able to do this outside the British zone, or without government procurement support. In this section we will briefly review the conditions that have made some successes possible and analyze why growth in international businesses is not simply a function of "the right man with the right idea".

The few cases of new entrepreneurial businesses have originated from individuals who had gained extensive experience abroad in process technologies, distribution, or application engineering.

One of the fastest growing and most competitive companies in this category was established in 1970 by two biochemists with experience in Canadian and British breweries who identified the need for special-purpose enzymes for the brewing and distilling industries. They had no previous background in enzyme production but knew very well the economics of a brewery: its operational procedures, raw material composition, fermentation processes etc. Just as Novo, the leading Danish enzyme producer, grew out of the local beef slaughtering and dairy

market, this Irish company grew out of its founders' experience in brewing. Despite fierce competition from Novo, and from U.S., Dutch and German competitors, the new Irish company carved out a dominant position in a small segment by specializing in enzymes for breweries and distilleries which make up 75% of its sales.

Paradoxically there was almost no support from the domestic beer industry until the past couple of years; the company grew to £6 million in sales exclusively because of exports. This strategy required considerable working capital investment. The total cash losses that had to be sustained over a three-year start-up period amounted to £250,000 for each of its six manufacturing plants. We have found very few entrepreneurs in Ireland willing or able to take this kind of financial risk over an extended period.

A new Irish producer of precision taps and dies for export, was established by three brothers who had had considerable experience in the UK with companies such as GKN.

Another new Irish electronics firm designs telephone answering equipment and special purpose color TV monitors. It was created by a telecommunications engineer who had gained experience with Bell in the U.S. as well as with an Irish firm. It employs 75 people at the moment but plans to expand to 128 people over the next 5 years, with half its output expected to be exports.

An Irish pottery firm was rescued from receivership by a German national with extensive experience in the ceramic business. It has now reached a volume of about 2 million £ and exports 70% of its output.

An Irish mechanical engineering firm was set up in 1977 in partnership with a Swedish engineer who had gained experience with Coles, a leading truck-mounted crane manufacturer. It now has a significant share of a small European segment of hydraulic aerial work platforms.

Another new company was created in 1976 by a former employee of Boart to produce holders for de Beers rock drilling bits. However, it sells mainly to the Irish mining industry and has not yet had significant export success.

Apart from the success stories of a few Irish entrepreneurs who returned from abroad with application engineering or technical knowledge, there has been only limited development of purely Irish-grown new product ideas in international markets.

One company has designed a new laser machine for scanning bottles when they return to bottling plants. It has not fully developed the machine for long run-length production or for reliability in the field, however. Another company has designed a new palletizing system for bottling lines but it has yet to market the product against larger competitors that may copy its design.

Unlike other small countries such as Sweden, Denmark, Finland, or

Belgium, very few engineered products used in Ireland's resource industry are manufactured in Ireland. There is only one significant skilled engineering workshop in the country; it sells to agricultural applications and is trying hard to export dairy equipment and stainless steel fittings. It faces very large competitors, however, such as Alfa Laval, which has a very high market share in dairy plants worldwide. Bord na Mona has developed a harvesting machine for peat but has not had significant exports so far. A few Irish entrepreneurs have developed timber and thinning harvesting equipment, but again no significant export has yet resulted.

While one hears of many new firms being created in Ireland, our overall impression is that individual entrepreneurs and investors have rarely been able to develop significant export businesses beyond the "British zone" and that most successes in both regional and international new businesses have required some form of continuing external support from public procurement or direct transfer of human skills from abroad.

Summary – New Indigenous Industry

Over the past fifteen years, a significant amount of employment has been created in new indigenously-owned industries. Most of this growth has been in non-traded businesses, stimulated by plant construction, agricultural investments and infrastructure expenditures. In these areas, several new companies have emerged which now employ several hundred people. They are engaged in construction, mechanical and electrical contracting, industrial imports and installation, metal fabrication, and similar activities which do little to promote Irish exports.

Most high-skill supplies required by foreign companies in Ireland must still be imported, sometimes at a high transportation cost penalty, and no sub-supplier of Irish origin has yet developed an export business based on serving multi-national companies in Ireland.

A few companies have established end product export businesses. Most of them, however, are limited to exploiting customer or distribution similarities between Ireland and the UK and find it difficult to export to Europe or beyond. Others, which have a truly international base, have typically been supported by public procurement or were established by foreign nationals or by Irish men with considerable experience abroad.

Little spinoff has occurred from multi-nationals in Ireland, and Irish individuals have not succeeded in developing competitive positions from new product ideas. It is unclear whether those few that are now trying will succeed.

STRUCTURAL IMPEDIMENTS TO THE INDIGENOUS INDUSTRY DEVELOPMENT

The problems of developing an indigenous sub-supply and export sector are enormous for a small country like Ireland which began industrializing at a late stage. In the case of Ireland, however, those problems have been compounded by the lack of an adequate corporate base with sufficient resources and time horizon to undertake the investments necessary to overcome the obstacles to growth in internationally traded businesses.

The indigenous sector in Ireland is still characterized by a dual structure derived from the protectionist period. Many small- or medium-size firms struggle in traded businesses while the larger more profitable firms mainly use their resources for local non-traded businesses.

The performance of the larger established companies in non-traded businesses provide a striking contrast with the traded products group. Companies mainly concentrating on local demand and engaged in non-tradeable activities such as packaging, distribution, and building materials have grown into very large concerns by Irish standards and have in several cases generated more cash than was required by their base business. This was made possible by their very high market shares in their respective businesses (Exhibit 3.52), translating into high return on capital employed (Exhibit 3.53). This surplus cash has typically been invested in other non-traded businesses in Ireland, or in local businesses abroad. Overall, the larger indigenous companies in Ireland are not exporting very significantly, compared to their counterparts in other small countries like Denmark (Exhibit 3.54).

In non-traded businesses, the performance of new indigenous companies has also been impressive. Growth has been stimulated by the construction boom in plants for overseas firms, infrastructure development, and beef and dairy capacity increases. This has helped the formation of large "local" companies in construction, in mechanical and electrical contracting, in general metal fabrication, and in other fields. Importing companies have grown very fast to supply, install and service the needs of the local market for industrial and agricultural equipment. Many of these companies are now very large by Irish standards, employing several hundred people, and are quite profitable. Because of the nature of their activities, however, they have not contributed significantly to exports.

The thrust of current industrial activities in Ireland is toward the creation of new small companies to expand employment and export. Small firms are currently the focus of much attention not only in Ireland but also in many other countries. A U.S. study is often quoted*

* "The Job Generation Process", Burch (MIT), 1979, and "America's Small Business Economy, Report to the President 1980".

in Ireland to show that small firms are an essential part of job creation, that they survive recessions more easily than large firms, that they innovate frequently, and that their working conditions are much more stimulating.

This study fails to point out that the growth in small firms has occurred mainly in the service and distribution sectors and in non-traded manufacturing businesses in most countries. Recent studies have made this point.* Small companies can indeed be a source of innovation, but bringing innovations to competitive business success often requires the assistance of entities with larger pools of resources. Many of the successful small companies in Germany, Belgium, Sweden and Japan work primarily as subcontractors to bigger exporting firms.

This is not to say that only large firms can successfully develop worldwide leadership in a business. In fact, in other small countries at a more advanced stage of industrialization, many companies dominate small international segments as is the case in Sweden (Exhibit 3.55). This may constitute the basis for a defensible high-income economy. Finland in wood-working and forestry machinery, Denmark in food technology, Belgium in casting or wool processing present many similar examples.

However, even in these cases one must be careful to distinguish small- from medium-sized companies. The leading indigenous engineering companies in Belgium or Denmark, while often classified as small- or medium-sized, in fact may have several thousand employees (Exhibit 3.56) while Ireland has only one firm with more than 1,000 people, primarily engaged in services (Exhibit 3.57). Overall, the metals and engineering sector in Belgium is largely a medium-sized company sector (200 employees or more), while in Ireland it remains a small or a very small company sector (Exhibit 3.58). The small companies (below 50) in more industrialized countries develop primarily due to the external benefits they can derive from large firms. Small sub-suppliers in Belgium, Sweden or Denmark would, for example, be financed by prepayments, be constantly trained by interacting with large customers' engineers, and have guaranteed markets near their plants provided by the purchasing companies. Irish small companies have no indigenous base of medium- to large-size companies to provide these opportunities.

The key goal for Ireland is to develop firms which can overcome the barriers to complex-factor cost traded businesses.

For sub-supply businesses, it takes a stronger corporate structure than is typically found in Ireland to promote a skilled foundry, computer cabinet operation, or tool-maker. Individual entrepreneurs and

*See "Job Generation and Small Firms Policy in Britain", Storey, 1980.

small companies, although filling necessary market demands, are unable structurally to respond to all of the problems they face. They cannot invest more cash over a long period than they can generate, especially when initial market entry means price cutting, high reject rates or extra staffing (as in computer cabinetry or castings). They mostly concentrate on shorter-run production where flexibility and low investment are possible. In longer runs, where process technology or automation are critical variables, they lack either the capital or the access to technology or both (as in high volume PCBs, stainless steel valves, or hydraulic cylinders). Small companies are typically manager-owned by the original founder, with little additional professional assistance. Developing a sophisticated sub-supply business for computer manufacturers, for example, requires extensive time for travelling abroad to central headquarters, negotiating, making sure the orders are followed through, etc. Either through lack of time or training, these entrepreneurs spend little time outside their plant and have no one to send to meet these customer demands.

Small companies cannot afford to hire many apprentices. Continuous skill development, however, is crucial for many precision engineering sub-supplies. Allowances for leave, inefficiencies, higher reject rates and instructors' time have to be planned. The rare indigenous companies which have such programs, are already larger and are long established. They have also been supported by larger firms.

Finally, getting onto a multinational company's list of regular suppliers requires a stable company, capable of surviving downturns and occasional losses of major bids, and guaranteeing continuity of delivery as well as timeliness. Many purchasers of the foreign companies we interviewed have had to make trial orders with new suppliers several times due to repeated bankruptcies (in castings, for example).

For direct exporting industries it often takes a firm of larger than 50 employees to export, service and maintain overall defensibility in many businesses. As is illustrated in the case of the agricultural machinery industry, a professional organization which would have all the main functions in-house — sales, production and engineering — is out of reach for "small" (i.e., very small) Irish firms (Exhibit 3.59).

In a survey of 400 Mid-West firms done by SFADCo in 1978, only 40 exported, 40 others had some "export potential" (as defined by SFADCo), 120 sold throughout the Republic, and 200 sold primarily to the local and regional market. Out of the 40 exporters, a number exported products exclusively to the UK, most of which could not be termed "internationally tradeable" (Exhibit 3.60).

Large manufacturing firms in Ireland are between three and six times smaller than their counterparts in Belgium or Denmark (Exhibit 3.61). In Sweden, the main corporate successes have been built on export

strategies and small segment dominance. The major firms make an essential contribution to exports. In the engineering and chemical sectors of Sweden, 28 firms account for 75% of exports and 55% of employment (Exhibit 3.62). They are all very large by Irish standards. Furthermore, their success promotes the growth of many smaller sub-contractors which can generally not export directly. In an analysis conducted in southern Sweden in 1978, we found that small engineering firms were mainly sub-contracting for larger firms and that their direct exports represented only 6% of sales versus 40% to 65% of sales for medium or large firms (Exhibit 3.63).

In non-manufacturing activities, large firms in other small countries participate in traded businesses, either indirectly or directly, much more than in Ireland. Large non-manufacturing firms in Ireland are typically in domestic distribution or construction (Exhibit 3.64), while in Denmark, and to a lesser extent in Belgium, they tend to be in trading (both ways) or services (Exhibit 3.65).

Danish engineering firms, acting as turnkey plant suppliers, serve as a very efficient marketing channel for many small Danish sub-contractors (Exhibit 3.66). As we have seen earlier, large Irish companies do not participate in traded businesses or in sub-supplies having a high skill content. The larger indigenous corporations in Ireland have not significantly committed either their resources or their management expertise to sub-supply businesses, other than non-traded businesses like packaging, cement or steel tubes. Few have significant export businesses.

One larger Irish company has set up a plastics operation but it is used mainly for captive applications like crates or bottles. More recently, it has invested in an Irish electronics firm, which has a guaranteed base market from P&T. Another large Irish group has diversified into computer software, car assembly and printed cards, but does not export outside its basic crystal businesses.

The largest involvement in skill development and export revenue probably comes from Aer Lingus, whose engine overhaul business alone represents 20% of all indigenous engineering exports. The operation is undergoing an extensive expansion program at the moment and will probably become the largest skilled engineering operation in the country.

A few investment companies have been created by private interests or public companies, but again, most of their resources have gone to "local economy" opportunities.

Small firms can alleviate some of the problems of size by cooperation and external "linkages". Industries such as wool processing, for example, have developed in regions where small firms have remained independent but have combined their resources to share cost and expertise. In Yorkshire (UK) or in the Prato region (Italy), firms have developed

common services such as wool buying and scouring, small lot dyeing or cloth finishing. In knitting, French firms in Troyes and Roannes, or British firms in Leicester, have spun off service activities for the whole industry like machine maintenance or card punching services for V-Bed machines. Similarly, in garment manufacture a small local cluster can be economical when many small firms combine to support services like folders and attachment making, or a computer pattern service.

Ireland has enjoyed a few of these "regional clusters" of industry-wide expertise and scale economies as in the case of the furniture industry in Navan. By and large, however, the small domestic market and the traditional regional dispersion of firms across the country makes those clusters too small. It means among other things higher travelling costs for maintenance and longer delivery lags for inputs. This makes it all the more difficult for the small isolated firm to compete internationally.

There is no one appropriate size for a firm. Different businesses require different minimum sizes. In Ireland, the investment and skill barriers necessary to succeed in most traded complex-factor cost businesses, however, cannot be met by the small firms now existing.

SUMMARY – INDIGENOUS INDUSTRY

Irish indigenous industry faces a number of threats from increased foreign competition, but it also has unexploited opportunities open to it. The threats come primarily from newly industrializing countries in some of the low-wage businesses still present in the country, and from increased competition from continental producers in the UK market, still the key focus of Irish indigenous exports. The former is an inevitable development; the latter must be countered by investments to "internationalize" Irish products rather than depending on regional similarities between Great Britain and Ireland.

The opportunities for Irish industry lie in better exploiting the market provided by multinational companies currently in the country, and in expanding current industries now serving only Ireland and the UK to serve the whole Common Market and beyond.

The barriers to the realization of these opportunities are adequate skill levels to produce engineered products of sufficient quality; resources to sustain long-term investments in product design, marketing, distribution and price-cutting necessary to penetrate new markets; and a sufficient organization (either within a single company of adequate size or within a cluster of related small companies) to provide adequate efficiency, reliability and financial viability.

Currently, the large companies in Ireland which are strong enough to surmount these barriers are occupied with non-traded businesses.

Most of the successful newly-created companies in Ireland are also engaged in non-traded businesses. While these companies all provide valuable economic functions, in the long run Ireland must build a strong group of companies in traded businesses to improve the living standards of the Irish people. Recent industrial developments in Ireland have not brought this about, and it is unlikely that a continuation of current industrial policies will do so in the future.