Review of Industrial Performance and Policy 2003

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Foreword

This review of industrial performance and policy by my Department provides an analysis of the evolution of the Irish economy, enterprise sector and enterprise environment over the past decade, and also contains an account of the policies and programmes of the enterprise development agencies.

Great progress was made over this period in tackling the problems of unemployment and emigration and in raising per capita incomes in Ireland to a level above the European Union average.

The environment for enterprise, globally and domestically, is now markedly less favourable than in the boom years of the late 1990s. In this changed context, the challenge is to consolidate our recent gains while we seek to lay solid foundations for longer-term prosperity.

As the Review makes clear, we should not underestimate the scale of this challenge. A number of the factors that underpinned the advances of the past decade — such as a large-scale labour surplus and a relatively low-cost environment — are increasingly less applicable. We have a good deal of ground to make up if we are to match the record of the best-performing economies in key areas such as innovation.

This Review examines the evolution of enterprise policy, but does not set a new direction for policy or propose any specific policy changes. As the example of the Culliton Review Group of the early 1990s shows, policy formulation in this field benefits greatly from the involvement of experienced businesspeople and persons with business-related expertise.

With this is mind I recently established an Enterprise Strategy Group under the chairmanship of Eoin O'Driscoll to advise and make recommendations on enterprise strategy for growth and employment in the period to 2010. This Review of Industrial Performance and Policy will be a valuable contribution to the work of the Group and to the wider debate on this vital topic.

Mary Harney T.D.
Tánaiste and Minister for Enterprise, Trade and Employment

Executive Summary

Preface

This Review has been prepared in compliance with section 13 of the Industrial Development Act 1993 which provides for the preparation of triennial reviews of industrial performance and policy. It follows previous reviews such as *Shaping our Future* (Forfás 1996), *Growing our Employment: Sharing our Growth* (Department of Enterprise, Trade and Employment 1997), and *Enterprise 2010* (Forfás 2000).

The Review contains a detailed analysis of the main facets of enterprise performance in recent years. Though it surveys policy developments, it does not enunciate any major policy changes or set out a new direction for enterprise policy. The Tánaiste and Minister for Enterprise, Trade and Employment has recently announced the initiation of work on a new medium-term enterprise strategy. The strategy is to be prepared by an expert group chaired by Mr Eoin O'Driscoll and supported by Forfás and the Department of Enterprise, Trade and Employment.

Chapter 1 — Enterprise Performance and Policy in Ireland

Chapter 1 examines the intertwined evolution of the enterprise sector and enterprise policy in Ireland. It outlines how membership of the European Union and the adoption of an outward-looking, export-oriented enterprise strategy contributed to the progressive modernisation of the Irish enterprise sector. Though this did not provide a basis for sustained growth in incomes and employment in the 1970s and 1980s, the 1990s proved a period of remarkable economic expansion that saw the Irish economy double in size. Since 2001 the downturn in the global economy and the effects of a prolonged period of record growth on a number of dimensions of competitiveness have created a climate of greater uncertainty and challenge.

Under the impetus of the Culliton Review Group on Industrial Policy which reported in 1992 and other influences, the key development in enterprise policy over the past decade has been the progressive shift from a narrow approach based on the provision of subsidies to firms and sectors towards an approach that emphasises the critical importance of the broad environment for enterprise.

Chapter 2 — The Era of Record Growth and After

Chapter 2 considers the period of record growth during the 1990s and the onset of slower growth from 2001. It identifies a number of key factors underpinning the exceptional growth performance of the 1990s, including:

External	Domestic
The positive effects of the growth in global trade and the expansion of the US economy.	The strategic policy decisions to improve human capital and encourage foreign investment.
The growth of foreign direct investment globally in the 1990s, and in Europe under the impetus provided by the Single Market.	The enhancement of the enterprise environment created by reform of the public finances, reductions in taxation, and wage moderation under the partnership agreements.
Broadly favourable exchange rate trends up to 2002.	Demographic trends that ensured that labour supply did not act to limit growth potential.

While the Irish economy benefited in the 1990s from a conjunction of favourable national and international trends, it now faces the challenge presented by a confluence of less favourable conditions at home and abroad. These include

- Rising costs across a range of factor inputs;
- Significant appreciation of the euro against the dollar and sterling;
- Continued uncertainty in global markets and consequent damage to investor confidence;
- Increased competition for foreign direct investment from Central and Eastern Europe, Scandinavia, and Asia.

Chapter 3 — The Enterprise Sector in Ireland

Chapter 3 profiles the main constituents of the enterprise sector in Ireland: (i) foreign-owned enterprise in manufacturing and internationally traded services; (ii) Irish-owned enterprise in manufacturing and internationally traded services; and (iii) the domestic services sector.

Foreign-Owned Enterprise in Manufacturing and International Services

Foreign-owned enterprise plays an important part in the Irish economy, accounting for three-quarters of manufacturing output, nine-tenths of manufacturing and services exports, and around half of total employment in manufacturing and international services. Much of the sustained growth in output and exports of the 1990s was accounted for by overseas firms — and US firms in particular — in high-technology sectors.

The foreign-owned sector in Ireland has undergone a major evolution over the past two decades, and now numbers most of the leading global companies in the ICT and chemicals/pharmaceuticals sectors. Important new fields of activity have emerged in the areas of international and financial services, and an advanced biotechnology industry is now emerging. The educational levels of employees in the electronics and chemicals

sectors in Ireland compare favourably with those in other EU member states, while a growing number of foreign-owned firms have gradually added strategic corporate functions to their Irish operations.

With some important exceptions, however, much of the foreign-owned sector is, by global standards, still positioned at a relatively low point in the value chain. The research and development, marketing and other capabilities that underpin the competitive strength of these enterprises are not for the most part located in their Irish operations. Research and development spending by foreign-owned firms in manufacturing and international services grew from €228m. in 1993 to €598m. in 2001, more than doubling in real terms. This lagged the exceptional output growth among these enterprises and, expressed as a share of output, R&D spending halved from 1.2 per cent to 0.6 per cent over the period, well below the level in leading advanced economies.

An analysis of enterprise survival rates among grant-aided overseas and indigenous firms that commenced operations between 1980 and 1994 revealed that foreign-owned firms were more likely to be still in existence in 2000 than their Irish-owned counterparts. From 1981 to 2000, the rate of job loss in manufacturing and international services firms was consistently higher in Irish-owned firms. In 2001, the rate of job loss in overseas firms exceeded that in indigenous firms, while in 2002 it was similar. In view of the greater resources and market power of foreign-owned firms, however, their survival and job retention rates could reasonably be expected to be higher than those of domestically-owned businesses.

The expansion of foreign-owned enterprise during the 1990s led to a substantial increase in their spending on domestically-sourced goods and services. This totalled €11.76bn. in 2000, with the expenditure of foreign-owned manufacturing companies on goods and services purchased in Ireland exceeding that of indigenous manufacturing firms for the first time. Between 1991 and 1999, the Irish share of materials' purchases by foreign-owned manufacturing firms rose from 31.4 per cent to 43.7 per cent. Though the companies supplying goods and services sourced in Ireland include some foreign-owned firms as well as many indigenous ones, this is indicative of a greater integration of overseas firms into the Irish economy and an improved performance by Irish sub-suppliers.

Indigenous Enterprise in Manufacturing and International Services

Following a difficult decade in the 1980s, the 1990s saw a notable turnaround in the performance of the indigenous enterprise sector. Most sectors recorded steady output growth and strong employment growth. Though there was a modest increase in the number and employment share of large and medium-sized indigenous manufacturing establishments during the 1990s, Irish-owned enterprise remains predominantly small in scale. As productivity, export propensity and investment tend to increase in line with

firm size, there remains a need for enhanced scale among domestically-owned enterprises. A study undertaken for Enterprise Ireland indicated that productivity in indigenous manufacturing firms was below that in the majority of other countries surveyed.

The performance of different sectors of Irish-owned enterprise showed significant variation over the past decade:

- Food, drink and tobacco remains the largest sector of indigenous manufacturing industry, but its output share fell from 56 per cent in 1991 to 43 per cent in 2000, while its employment share declined from 29 per cent to 26 per cent.
- Employment in indigenous metals and engineering firms increased by over 40 per cent between 1991 and 2000. Though the majority of these jobs were in low-to-medium technology activities, there were significant increases in employment, if from a low base, in high-tech sectors such as electronics, medical devices, and pharmaceuticals.
- The most impressive growth performance came from indigenous firms in international and financial services. These recorded a more than fivefold increase in employment from 4,469 in 1990 to 25,583 in 2001. The software sector registered particularly strong growth, with the number of firms increasing from 290 in 1991 to 770 in 2000, while employment grew from 3,800 to 14,000 over the same period.

The emergence of high-tech niches in the indigenous enterprise sector contributed to a greater commitment to research and development. R&D spending by indigenous manufacturing and international services firms more than doubled during the 1990s, increasing from €118m. in 1991 to €281m. in 1999 to €318m. in 2000. The share of output devoted to R&D by Irish-owned firms in these sectors rose from 0.7 per cent in 1993 to 0.9 per cent before falling back to 0.8 per cent in 2001. The number of indigenous firms spending €1.3m. or more on research and development grew strongly from 25 in 1997 to 43 in 1999 to 46 in 2001.

The main features of the export performance of Irish-owned firms in the 1990s included:

- Indigenous manufacturing exports rose from €4.3bn. in 1991 to €6.7bn in 2000;
- The export sales of indigenous services companies grew strongly, reaching €1.7bn in 2000.
- In the second half of the 1990s, export growth tended to lag the rise in output and the share of output accounted for by exports fell from 35.9 per cent in 1995 to 31.3 per cent in 1999, before increasing to 33.2 per cent in 2000.

- The proportion of indigenous manufacturing exports going to the British market declined slightly from 41.9 per cent in 1991 to 40.2 per cent in 2000, while the share going to other European Union member states rose from 28.3 per cent to 33.8 per cent over the period.

A striking feature of the performance of indigenous enterprise in the 1990s was the rapid growth in outward direct investment — this rose from an average of around €400m. per year in 1988-93 to an annual average of €4,150m. in 1998-2000. Though the bulk of this investment came from large established firms in manufacturing and banking, a number of newer technology firms also began to make significant overseas investments in this period.

The Domestic Services Sector

While the 5,000 or so manufacturing and international services enterprises supported by the enterprise agencies are critical to our economic performance, they represent a relatively small proportion of the Irish enterprise sector. Though authoritative data on the number of enterprises are not available, VAT and income tax registrations suggest that there are in the region of 250,000 businesses in Ireland.

The 1990s saw strong growth in the number of domestic services sector businesses. The number of employers registered with the Revenue Commissioners rose by over 50 per cent from 114,471 in 1991 to 176,051 in 2001, while the number of businesses registered for VAT increased from 117,817 in 1990 to 204,032 in 2000, an increase of 75 cent. The great body of micro, small and medium enterprises in the services sector made a major contribution to the record jobs growth of the second half of the 1990s, with almost 60 per cent of the increase in employment between 1994 and 2002 occurring in private sector services.

Over the period from 1995 to 2000, Ireland recorded the second highest level of new business births in the European Union. The rate of new business generation and the findings of OECD studies of regulatory barriers to entrepreneurial activity suggest that the environment for enterprise formation in Ireland was a positive one in this period. Ireland compares less well however for entrepreneurial activity among women.

Chapter 4 — The Enterprise Environment in Transition

As the period ahead is set to see a progressive slowdown in the rate of labour force expansion, productivity growth will be critical to future increases in output and living standards. Productivity depends on both the value of a nation's goods and services and the efficiency with which they can be produced. The challenge for enterprise policy and the enterprise sector in Ireland is both to produce goods and services more efficiently and to increase the value of the goods and services that we produce. Achieving these

improvements in value and efficiency will require the complementary strengthening of business enterprises and the business environment.

The need now is to ensure that we have in place a business environment and infrastructure capable of ensuring that we can sustain our position as one of the best performing economies globally in the long term. The scale of this challenge should not be underestimated. The results of European Union and OECD benchmarking analyses of the performance of different economies on a range of indicators related to economic performance and enterprise competitiveness underline that, despite our excellent performance in recent years, we still have a considerable way to go in a number of key areas if we are to match the best-performing economies.

There are risks for Ireland during this transition period. Rising costs at home and increased competition from lower-cost locations abroad could put a sizeable part of our existing enterprise base, both foreign and Irish owned, at risk before we have fully put in place the R&D and skills capabilities and advanced infrastructure needed to sustain a world-class economy. If we are to avert this risk and manage the transition process successfully, we must preserve the strengths that underpinned the progress made during the 1990s — a disciplined approach to wage determination, a competitive cost base generally, and a low rate of corporate taxation — while we seek to develop new sources of advantage in areas such as innovation and infrastructure.

Science, Technology and Innovation

There is general agreement that knowledge and innovation are now vital factors in economic growth and development. Despite Ireland's distinguished scientific tradition, investment in research and development by both government and business remained at a low level over most of the period from the foundation of the state.

The 1990s saw a significant improvement in our performance on a number of key indicators related to science, technology and innovation. These improvements occurred before the large increase in public funding for research and development provided for in the National Development Plan 2000-2006. Annual expenditure on industry-related R&D is scheduled to average almost €350m. between 2000 and 2006 compared with around €80m. between 1995 and 2000. The main innovation in the Industry Programme of the National Development Plan is the provision of €646m. for the Technology Foresight Fund administered by Science Foundation Ireland.

If this increased expenditure is to be fully effective, strong links and networks will need to be fostered between the research community and the enterprise sector. Science Foundation Ireland, IDA Ireland, and Enterprise Ireland and other bodies are actively engaged in seeking to develop such links and to ensure that the enhanced research

effort now underway leads, over time, to a steady stream of new products, services and enterprises.

Education and Skills

Universal second-level education and the expansion of third-level education occurred later in Ireland than in a number of other industrialised economies. As a result, the level of educational attainment among the population as a whole is, on some measures, below that in the majority of European Union member states.

The expansion of second-level education from the 1960s and of third-level education from the 1980s has led to a sustained improvement in rates of educational attainment. The marked rise in educational participation at third level saw Ireland ranked 4th of 26 OECD economies at the end of the 1990s for the proportion of persons aged 25-34 with third-level education. As there is an upward trend in third-level participation internationally, this progress will need to be sustained in the period ahead.

From the point of view of the enterprise sector, the main requirement of the educational system at first and second-level is that it should produce students with levels of proficiency up to the best international standards in the key areas of literacy, mathematics, science and languages. A recent OECD study of educational standards among fifteen-year-old second level students ranked the reading literacy of Irish students as 5th of 27 countries surveyed. Our performance on preliminary assessments of mathematical and scientific literacy was at, or a little above, the OECD average.

Over the past decade, Ireland has consistently been at or near the top of EU and OECD rankings for the proportion of science and engineering graduates among the graduate and young adult populations. This has been vital to our success in developing a strong high-technology sector. Though the trend is not confined to Ireland, the fall in the number of students taking physics and chemistry at second level or studying science and technology courses at third level is a matter of serious concern. An Implementation Group is due to be appointed to progress the implementation of the recommendations of the Task Force on the Physical Sciences which reported in 2002 on ways of achieving a world class system of science education in Ireland.

The fall in the numbers entering second and third level education and the continual acceleration in the pace of technological and market change require increased emphasis to be put on enhancing the knowledge, skills and competences of the workforce on an ongoing basis. A number of important steps have recently been taken to put planning and provision for lifelong learning on a new footing, including the establishment of the National Adult Learning Council and the publication of the report of the Task Force on Lifelong Learning.

Infrastructure

The adequacy and quality of infrastructure and the cost of utilities and services in areas such as transport, energy and telecommunications are matters of critical concern to enterprise.

(i) Transport

While the share of goods transported by road in Ireland is the highest in the European Union, the proportion of the road network accounted for by motorways is among the lowest. In order to tackle long-running inadequacies in the road and transport networks and help relieve the growing burden of congestion, the National Development Plan 2000-2006 makes provision for record levels of investment in transport infrastructure. While implementation of this investment programme has been affected by planning delays and cost increases, the effective delivery of the infrastructural goals of the Plan remains critical to the enterprise sector's competitiveness in the short term and growth potential in the longer term.

(ii) Energy

The record growth of the past decade has put considerable strain on the electricity network in particular, and the margin between electricity supply and demand is finely balanced and does not offer a satisfactory level of security of supply. The Commission for Energy Regulation is currently holding a competition for a contract for the supply of capacity to ESB from 2005, the outcome of which is expected to be announced in October 2003.

As well as addressing the issue of capacity in the short to medium-term, there is a need to ensure long-term security of supply. Following detailed consultations, the Commission has recently undertaken a major review of market trading arrangements in the electricity industry, and set out new wholesale market arrangements to replace the existing transitional arrangements from 2005.

While gas costs for industrial consumers are among the lowest in the European Union, electricity costs for business customers in Ireland are above the EU average, and the need for additional investment in the industry is likely to exert continued upward pressure on prices. Close attention will need to be paid in the period ahead to the effect of electricity costs on Irish competitiveness.

(iii) Telecommunications

Broadband connectivity is the infrastructural foundation of the information society. Compared with most other OECD economies, the rollout of broadband in Ireland has been slow to date. The announcement by the main telecoms operators in April 2003 of

new packages halving the cost of broadband services represents a much-needed step forward.

With worldwide eBusiness revenues projected to rise from €319bn. in 2000 to €3.5 trillion in 2004, the development of eBusiness capabilities and awareness is vital for the Irish enterprise sector. As well as being integral to sectors such as software and financial services in which Ireland has a strong presence, eBusiness can deliver increases in value and efficiency across a wide range of sectors and activities.

While there is significant room for improvement, studies undertaken for the European Union suggest that the eBusiness capabilities of Irish enterprise compare reasonably well on the whole with those in most other member states. As broadband provision improves and the cost of broadband access comes down, this offers a solid platform for the future development of eBusiness here.

Competition and Regulation

Concern about high levels of inflation and rapid increases in prices for goods and services in Ireland have focused attention on the role of competition policy and regulatory reform in removing obstacles to competitiveness. A number of important steps have been taken in the recent past to promote greater competition and better regulation:

- The strengthening of the legal framework for competition policy under the Competition Act 2002, and the enhancement of the resources of the Competition Authority;
- The establishment in 2003 of the Irish Financial Services Regulatory Authority as a single regulator for the financial services sector with responsibility for both prudential supervision and consumer protection;
- The establishment of an independent office, the Office of the Director of Corporate Enforcement, with responsibility for the enforcement of company law;
- The planned comprehensive reform of the Companies Acts following the report of the Company Law Review Group;
- The provision in the Companies (Audit and Accounting) (Amendment) Bill 2003 for the establishment of an independent regulatory body for the audit and accountancy profession.

Among the main issues to be addressed in the period ahead are:

- Effective implementation of the programme for insurance reform announced by the Tánaiste and Minister for Enterprise, Trade and Employment in October 2002 to reduce the cost of insurance for individuals and businesses, including the establishment of the Personal Injuries Assessment Board;

- The publication of the forthcoming national policy statement on better regulation;

- The publication of the final reports of the Competition Authority's studies of competition in the professions, banking and insurance, and the implementation of any recommendations arising from these studies.

Regional Development

Though all parts of the country benefited from the record economic expansion of the past decade, there were significant spatial variations in the nature and pace of development over the period. The promotion of more balanced regional development and the reduction of regional disparities in output and income are among the core objectives of the National Spatial Strategy.

The Strategy identifies a national framework of 'gateways' and 'hubs' designed to provide the necessary scale of infrastructure and services to enhance the economic and social development of the regions and drive their future development. By developing these gateways and hubs, it aims to broaden the number of areas that can offer a viable location for sophisticated, internationally competitive enterprise.

Sustainable Development

Following consultations with a wide range of interests and bodies, the Department of Enterprise, Trade and Employment launched its first sustainable development strategy to cover the period from 2003 to 2005. The aim of the strategy is to promote a framework within which the enterprise sector and the Department itself can develop more environmentally and socially responsible and sustainable ways of doing business. Four priority areas have been selected under the Strategy: (i) climate change; (ii) competitive sustainability; (iii) corporate social responsibility; and (iv) departmental sustainability.

Chapter 5 — The Enterprise Development Agencies

Chapter 5 deals with the role and functions of the enterprise development agencies under the aegis of the Department of Enterprise, Trade and Employment:

- Forfás, the advisory body for enterprise and science, technology and innovation which is charged also with co-ordinating the activities of IDA Ireland and Enterprise Ireland;

- IDA Ireland which has responsibility for foreign-owned enterprise in manufacturing and internationally traded services;

- Enterprise Ireland which caters for Irish-owned enterprise in manufacturing and internationally traded services;
- Shannon Development which has a broad developmental mandate for the Shannon area and Mid-West with particular emphasis on enterprise and tourism development;
- Science Foundation Ireland, which is set to be established on a statutory basis as an agency of Forfás, is charged with funding investment in science and technology, with particular emphasis on information and communication technology and biotechnology;
- City and County Enterprise Boards which deal with micro, or very small, enterprises;
- The National Standards Authority of Ireland which provides services in the areas of standards development, certification, and legal metrology.

In addition to these national and regional bodies, InterTrade Ireland has been set up under the agreement on North-South Implementation Bodies between the Government of Ireland and the Government of Great Britain and Northern Ireland to exchange information and co-ordinate work on supporting trade, business and related matters in a cross-border context.

With the establishment of Enterprise Ireland, Science Foundation Ireland, and InterTrade Ireland, the period since 1998 has seen a notable degree of change and innovation in the organisational framework of the enterprise agencies. The priority now is to maximise the agencies' contribution to enterprise development, and consideration of changes to their structure has not formed part of the present Review.

Ireland's transition in the 1990s from a low growth, high unemployment economy to a high growth, full employment economy led, in tandem with other factors, to a re-evaluation of the role of the enterprise agencies. Enterprise strategy could no longer assume the availability of a plentiful supply of relatively low-cost labour, but had instead to focus on the development of new capabilities that would enable the Irish economy and enterprise sector to make the shift to higher value, more knowledge-intensive activities.

New European Union state aid rules drawn up for the period from 2000 to 2006 following a detailed analysis of national and regional economic performance imposed significant restrictions on the level of grant aid that could be provided to enterprises in regions outside the Border, Midlands and West. Unless there is a dramatic reversal of our comparative economic performance in the period immediately ahead, it is prudent

to anticipate further restrictions on the level of aid permissible in all regions of the country from 2007.

Foreign-Owned Enterprise and the Role of IDA Ireland

Following a major review of policies and programmes, IDA Ireland's medium-term strategy for the period from 2000 to 2003 gives priority to three main areas of activity:

(i) enhancing the quality of new inward investments, and developing the existing base of overseas firms by working to raise skill and value levels and to enhance the strategic position of Irish subsidiaries by the addition of key corporate functions such as research and development, marketing, and supply chain management and logistics;

(ii) contributing to more balanced regional development generally, and securing increased foreign direct investment for the Border, Midlands and Western region in particular;

(iii) working with other bodies at national and regional level to influence the agenda and actions required for the development of a high-quality business environment and infrastructure.

The enterprise outlook is now considerably less favourable than that obtaining when the strategy was drawn up. Despite the difficult climate, IDA Ireland reported significant progress in 2001 and 2002 on the targets set in relation to enterprise and job quality and regional development. Though conditions remain difficult, the agency has expressed cautious optimism about the outlook for 2003. It has warned however that inward investors are again focusing on city locations as their preferred locations and that this may make it difficult to achieve its target for the regional spread of new greenfield jobs.

Indigenous Enterprise and the Role of Enterprise Ireland and Shannon Development

Enterprise Ireland's Business Plan 1998-2001 identified increases in sales, exports and employment in client companies as the agency's core objectives, and set targets for a number of performance 'drivers' related to these objectives, including increases in the number of high potential start-ups, first-time exporters, and significant R&D performing companies. The various targets set under the Plan were exceeded.

In the agency's Business Plan for 2001-2004, exports have replaced sales as the key measure of output, while productivity features for the first time among EI's core aims. Improving the export performance of indigenous firms is the most effective way of overcoming the scale limitations set by the size of the home market and of improving enterprise performance through competition in demanding markets. With the competitiveness of Irish-owned enterprise affected by increasing domestic costs and the rise in

the value of the euro, raising productivity is critical for both the short-term health and long-term development of the indigenous enterprise sector. Enterprise Ireland has recently announced the introduction of a competitive scheme that will provide financial support to companies for measures to improve productivity.

The growth of new indigenous enterprise in high-technology sectors such as software was a notable feature of the past decade. Because of the difficulties faced by start-up companies in accessing finance, Enterprise Ireland has a dedicated funding package for new enterprises with high growth potential under which the agency takes a modest level of equity participation in return for financial support in the high-risk early stages of business development. A number of dedicated programmes are also in place to provide support for academic personnel who wish to commercialise their research findings.

Under the Operational Programme for Industrial Development 1994-1999, Enterprise Ireland successfully participated with private interests in the establishment of a number of venture capital funds. Under the National Development Plan 2000-2006, fifteen funds have been established which have made €416m. available for investment, to which Enterprise Ireland has committed €99m. The funds are aimed at start-up and early stage businesses, with over half of the available monies having a regional or sectoral focus. Their investments to December 2002 totalled €40.4m., of which EI has contributed €8.2m.

The strategy for the development of the indigenous international services sector adopted by Enterprise Ireland in 2000 identified informatics, digital media, eBusiness, and health sciences as sectors with particular growth potential, and set targets for increases in sales, exports and employment in the period to 2007. Optoelectronics has been identified as a further sector with growth potential.

Enterprise Ireland and Shannon Development are actively engaged in an enabling role at regional level with local authorities, higher education institutions, and other bodies with a view to strengthening regional enterprise environments. EI has developed an initiative termed Webworks aimed at providing high quality office facilities in the regions for technology-based enterprise. Phase one of the initiative involving the development of facilities in Cork, Galway, Waterford, and Sligo is at an advanced stage, with construction tenders set to issue before the end of 2003.

Micro-Enterprise and the City and County Enterprise Boards

The great majority of business enterprises in Ireland are not among the client base of IDA Ireland, Enterprise Ireland, or Shannon Development. This gap in enterprise support structures was one of the main reasons for the establishment of the City and County Enterprise Boards in 1993. The micro-enterprises that form the client base of the Boards

face the resource and management limitations associated with small and very small businesses, difficulties aggravated by the more difficult trading conditions that have emerged since 2000.

The role of the Boards is to stimulate micro-enterprise and economic activity at local level through the provision of financial aid and a range of non-financial supports, principally information, advice, and management training and development. The micro-enterprise sub-measure of the Local Enterprise Development Operational Programme 2000-2006 has brought about a shift from financial to non-financial supports and from grant aid to repayable forms of financial assistance.

Preface

Background

This Review has been prepared in compliance with section 13 of the Industrial Development Act 1993 which provides that:

> The Minister [for Enterprise, Trade and Employment] shall, within three years from the passing of this Act, and in every third year thereafter, prepare a review of national industrial performance in respect of the previous three years and of national industrial policy and shall cause the review and the conclusions arising therefrom to be laid before the Houses of the Oireachtas.

This provision replaced section 6 of the Industrial Development Act 1986 which provided that a review of industrial performance should be undertaken on a three-yearly basis; reviews in furtherance of the requirement in the 1986 Act were published in 1987 and 1990. The broadening of the statutory reviews to include industrial policy resulted from a recommendation of the Culliton Review Group on Industrial Policy which reported in early 1992. The Culliton Group considered that 'good policy formulation is a continuing process, requiring constant adjustment to a changing world.'[1] In its view, the previous practice whereby in-depth policy reviews tended to be undertaken by expert groups established from time to time on an *ad hoc* basis was not an adequate foundation for effective policy formulation. The Review Group further contended that the scope of industrial policy need to be broadened from the traditional focus on grants, corporate tax incentives and the enterprise agencies to embrace all of the main factors affecting the environment for, and performance of, enterprise such as infrastructure, education and skills, and science and technology. Both contentions met with general acceptance and have had a pivotal influence on the subsequent evolution of enterprise policy.

Changed Context of Enterprise Policy

As a result of the report of the Culliton Review Group and other developments, the institutional framework now in place for enterprise policy differs in crucial respects from that in force prior to the enactment of the Industrial Development Act 1993. That Act also established Forfás as the national policy and advisory board for enterprise, trade, science, technology and innovation. In carrying out its role of monitoring trends and developments and providing advice in these areas, Forfás draws on the specialist assistance of the following expert bodies which operate under its aegis:

- The Irish Council for Science, Technology and Innovation which provides advice on all matters relating to the strategic direction of science, technology and innovation policy;

[1] Industrial Policy Review Group. 1992. **A Time for Change: Industrial Policy for the 1990s** (Dublin: Stationery Office), p. 79.

- The Expert Group on Future Skills Needs which identifies skills requirements generally and in particular sectors and makes recommendations on the measures required to address any needs and gaps that are identified;
- The National Competitiveness Council which analyses the full range of factors affecting the competitiveness of Irish enterprise and identifies areas requiring corrective action.

Forfás is also the body in which legal powers for industrial promotion and development are vested and through which these powers are delegated to IDA Ireland and Enterprise Ireland. Through their first-hand knowledge of needs and trends in the overseas and indigenous sectors and their central role in enterprise development, IDA Ireland and EI make an important contribution to the process of policy development.

The first review of industrial policy and performance undertaken subsequent to the requirement in section 13 of the Industrial Development Act 1993 was ***Shaping our Future*** which was published by Forfás in 1996. This offered a comprehensive assessment of the enterprise sector and enterprise environment in Ireland and set out a long-term plan and policy for their future evolution. Two major reports prepared by the Department of Enterprise and Employment in 1996 also dealt with issues with a major bearing on enterprise performance and policy: ***Growing and Sharing our Employment: A Strategy Paper for the Labour Market,*** and the ***White Paper on Science and Technology***. Forfás followed ***Shaping our Future*** with ***Enterprise 2010*** which was published in 2000. Again this comprised an in-depth analysis of the performance and prospects of each of the main segments of the enterprise sector, and outlined a wide-ranging strategy for improving enterprise capabilities and strengthening the enterprise environment so as to support more innovative and higher-value activity. It was preceded in 1999 by the publication of the ***Technology Foresight Report*** of the Irish Council for Science, Technology and Innovation which recommended that enterprise and innovation policy should give priority to the development of world-class capabilities in niche areas of information and communications technology (ICT) and biotechnology.

Though the establishment of Forfás has been the most important influence for change in the conduct of enterprise policy, other developments have also played a significant part. Since the late 1980s, the medium-term framework for enterprise support and for investment in areas of direct concern to the enterprise sector such as infrastructure has largely been determined by the provisions of National Development Plans. The Industrial Development Operational Programme of the National Development Plan 1994-99 and the Productive Sector Operational Programme of the National Development Plan 2000-06 have set out a detailed template for the types of intervention to be made, and assistance to be provided, to promote enterprise development. Because of European Union support and the need to comply with EU state aid rules, enterprise support

measures are the subject of detailed consultation with the European Commission. European Union influence on policy-making has also assumed increasing importance in a number of areas relevant to enterprise such as environmental policy.

Under the impetus of the Strategic Management Initiative and the Delivering Better Government programme, the policy process in the Department of Enterprise, Trade and Employment [DETE] is now also more systematic than a decade ago. Like all government departments, DETE is required to set broad strategic goals, complemented by more detailed objectives, for each of its main areas of responsibility. The overall strategic goal in the Department's Strategy Statement 2003-2005 is to 'work for Government and the people to equitably grow Ireland's competitiveness and quality employment.' In the enterprise policy area, this goal is to be advanced by objectives and actions in a range of areas such as science, technology and innovation; competitiveness; regional balance; developments in respect of an all island economy; and sustainable development. The goals and objectives in the Strategy Statement form the basis of detailed annual business plans prepared by the Department over the time frame of the Strategy. Progress in respect of the goals and objectives are subject to formal review on a regular basis. The enterprise development agencies similarly prepare strategies and business plans on a regular basis and systematically monitor their implementation and outcomes. In 1999 the IDA initiated a wide-ranging review of its policies and programmes that led to the adoption of a new strategy *IDA 2000+* to cover the period from 2000 to 2003. Enterprise Ireland which was established in 1998 formulated an initial three-year business plan in 1999 and a follow-up plan in 2002.

As dedicated structures now exist for enterprise policy and the monitoring of policy is now undertaken more systematically, policy initiatives of a major and minor kind are more common now than in the past. The past five years have seen a number of important developments affecting enterprise policy, including:

- The establishment of Enterprise Ireland in 1998 as a new agency for the support of indigenous enterprise incorporating Forbairt, an Bord Tráchtála and some of the activities of FÁS;
- The restructuring of corporation tax to provide for the phased introduction of a standard 12.5 per cent rate with effect from 2003;
- The establishment of Science Foundation Ireland in 2000 to administer the Technology Foresight Fund set up to support world-class research in niche areas of information and communication technology [ICT] and biotechnology;
- The imposition of significant restrictions on the level of enterprise support that can be provided to firms in regions outside the Border, Midlands and West under European Union State Aid rules for the period 2000-2006;

- The establishment of InterTrade Ireland to exchange information and co-ordinate work on supporting trade, business and related matters in a cross-border context;
- The adoption of the National Spatial Strategy in 2002 to provide a long-term framework for strategic planning and development at regional level.

Individually, each of these represents a significant development. Cumulatively they amount to a major re-orientation of enterprise policy.

At agency level, the past five years have also seen significant developments and shifts in policy in response to changing conditions and emerging needs. The more favourable labour market situation in the late 1990s led the IDA, for example, to give greater emphasis to job quality as opposed to job numbers in evaluating new projects. In response to the funding needs of growth-oriented firms, Enterprise Ireland has become increasingly involved, in partnership with the private sector, in the provision of venture capital. IDA Ireland and Enterprise Ireland both now give a higher priority to regional development and to the promotion of closer links between the enterprise sector and the research community than in the past.

Focus of Review

The present Review of performance and policy, the first to be undertaken directly by the Department of Enterprise, Trade and Employment in furtherance of the requirement under section 13 of the Industrial Development Act 1993, offers an assessment of the main facets of enterprise performance over the past decade. Chapter 2 examines the domestic and external factors that underlay the remarkable growth record during the period from 1994 to 2000 and shows that some of these factors now apply to a lesser extent, if at all. Chapter 3 offers a detailed analysis of foreign-owned enterprise in manufacturing and internationally traded services, indigenous enterprise in these sectors, and indigenous enterprise in locally traded services. It notes the progress made in the main constituents of the enterprise sector over the past decade and assesses some of the weaknesses that need to be addressed if that progress is to be sustained and built on in the future. Chapter 4 looks at a number of key aspects of the environment for enterprise — research and development, education and skills, infrastructure and utilities, competition and regulation — and identifies the ground that needs to be made up in a number of areas if we are to match the best-performing economies.

The Review also examines enterprise policy. Chapter 1 sketches the long-term evolution of policy towards industry and enterprise. Chapter 2 looks, among other things, at the contribution of policy measures and other factors to Ireland's economic recovery from the late 1980s. Chapter 4 considers policy developments and needs over the broad agenda of the enterprise environment — research and development; venture capital;

education and skills; science and technology education; lifelong learning; transport infrastructure; electricity supply; broadband provision; competition in non-traded sectors; and corporate governance. Chapter 5 surveys the policies and programmes of the enterprise development agencies.

Though this report surveys policy developments, it does not enunciate any major policy changes or set out a new direction for enterprise policy. As noted above, there is now a well-developed framework for policy formulation in this area and recent years have seen a steady stream of important initiatives. Enterprise policy is now increasingly complex and in some areas highly technical, spans a wide range of fields, embraces a broad span of interests and viewpoints, and has a sizeable European and international dimension. In the light of these requirements, it is not considered that a review undertaken solely within the Department of Enterprise, Trade and Employment offers an adequate basis for assessing and deciding on future policy options and directions. In an increasingly globalised economic world in which Ireland aspires to world-class standing in key areas, there is a need to draw on the best possible expertise nationally and internationally from the enterprise sector, third level and research institutions, and other organisations.

The analysis in the Review, however, clearly reveals the need to keep the competitive requirements of the enterprise sector and enterprise policy under continuing close scrutiny. It underlines that the policy formula based on the twin advantages of a plentiful supply of good quality, relatively low-cost labour and a low rate of corporation tax that served us well over the past decade will not suffice for the coming decade. Labour supply is not now in surplus; wage levels and expectations have risen; and other countries have, or are likely to introduce, corporate tax rates close to the level in this country. New foundations are needed for enterprise policy and these must centre on creating the conditions that can support a sustained shift to higher skill, higher value, knowledge-intensive activities. This will not be easily or automatically achieved. With some significant exceptions, much of foreign-owned enterprise in Ireland is still positioned at a relatively low point in the value chain. The research and development, marketing, and other capabilities that underlie the competitive strength of these firms are not for the most part located in their Irish operations. Irish-owned enterprise in manufacturing and international services performed well in the second half of the 1990s, but firms remain predominantly small with productivity levels below those in a majority of other European Union economies. Rising wage and non-wage costs and the appreciation of the euro against sterling and the dollar pose a considerable threat to many Irish-owned firms. While indigenous firms recorded strong growth in a number of high-tech areas, notably software, over the past decade, firms in these sectors are currently facing difficult trading conditions and a number have contracted or ceased operating.

The analysis in the Review further shows that Ireland lags behind other advanced economies on a number of the key foundations of a knowledge-intensive economy. This is

in large part a legacy of successive decades of economic under-development and the resultant under-investment in science and technology, education and training, and infrastructure. Progress towards bridging the gap between Ireland and leading knowledge-based economies will have to be made at a time when the prospects for the world economy remain uncertain and the position of the public finances is less favourable. There are undoubted risks for Ireland during this transition period. Rising costs at home and increased competition from lower-cost locations abroad could put a sizeable part of our existing enterprise sector at risk before we have fully put in place the R&D and skills base and quality infrastructure needed to support an advanced, world-class economy.

In order to help manage this transition process as effectively as possible and to provide a strong medium-term foundation for the future development of the enterprise sector, the Tánaiste and Minister for Enterprise, Trade and Employment recently announced the initiation of work on a new enterprise strategy for the period 2004-2010 to be undertaken by an expert group chaired by Mr. Eoin O'Driscoll. The group's terms of reference are:

To develop a medium-term strategy to propose and prioritise national policy responses which will:

(i) strengthen the competitiveness of Ireland's enterprise environment;

(ii) promote the emergence of an innovation and knowledge driven economy;

(iii) sustain, where feasible, those industries already providing significant employment;

(iv) underpin the industries of the future in which Ireland is, or can become, a substantial player with particular reference to segments of the ICT, life sciences, food, financial services, and internationally traded services sectors;

(v) encourage business start-ups and companies with growth potential; and

(vi) examine the scope for increasing the value of sectors to the Irish economy.

Review of Industrial Performance and Policy 2003

Part I

Chapter 1 — Enterprise Policy and Performance in Ireland

I Introduction

1.1 The 1990s, and in particular the period from 1994 to 2000, was a time of unprecedented expansion for the Irish economy. Our growth rate during the second half of the 1990s was over twice that of the United States — itself enjoying a prolonged period of high growth in these years — and almost four times that of the European Union average. The OECD commended the economy's 'peerless performance' in this period, and termed Ireland 'a world leader in a number of aspects of economic performance'.[1]

1.2 2001 proved a turning-point, however, for the world and Irish economies. Ireland's GNP growth of 3.8 per cent in 2001 was a little over one-third of the growth rate of 10.2 per cent recorded in 2000. Real GNP in 2002 was just 0.1 per cent above its 2001 level cent due, among other factors, to a decline in overseas earnings by firms headquartered in Ireland. GDP grew by 6.9 per cent in 2002, driven mainly by foreign-owned enterprise, particularly in the chemical sector. With the prospects for recovery in the US and world economies remaining uncertain, growth forecasts for the Irish economy in 2003 and 2004 have been cut significantly. As one of the most open economies in the OECD, the Irish economy faces new challenges in this changed economic context. These challenges have been compounded by the effects of a prolonged period of strong growth on a number of dimensions of our competitiveness.

1.3 Later sections of this Review discuss these challenges, and how they might be met, in more detail. We can only comprehend where we are now if we understand how we got there. This chapter briefly sketches the evolution of the Irish economy and enterprise sector, and the development of enterprise policy, from the 1920s to the 1980s and notes the relative underperformance of the Irish economy over most of this period. The next chapter examines the very different experience of the 1990s and outlines how a number of the critical factors that underlay our exceptional performance over the decade apply now to a lesser extent, if at all.

II The Evolution of Enterprise and Economy 1920s-1980s

> The new Irish state in 1922 consisted of a small, late-industrialising, peripheral economy with a long-standing labour surplus.
>
> K.A. Kennedy, former Director, ESRI.[2]

[1] OECD. 1999. **Economic Surveys 1999: Ireland,** pp. 25 & 29.
[2] K.A. Kennedy et al. 1988. **The Economic Development of Ireland in the Twentieth Century** (London: Routledge): 130.

1.4 At independence, the newly-formed Irish state was small, rural and agricultural. Over half of the workforce was engaged in agriculture, and around two-thirds of the population lived in the countryside. Trade was almost wholly with Britain which accounted for over 90 per cent of exports and around 80 per cent of imports. Manufacturing accounted for only around one-in-ten of the workforce compared with one-in-four in other small European economies such as Denmark, Sweden, and the Netherlands. Manufacturing activity was heavily concentrated in food and drink which accounted for two-thirds of output in 1926 and, with live animals, for almost nine-tenths of exports. The Irish economy had virtually no presence in more technologically developed industries areas such as chemicals and electrical engineering or in the developing industries of motor vehicles, telecommunications, and consumer durables.

1.5 In the succeeding decades, a wide range of policies was pursued to stimulate enterprise and create a strong industrial base in Ireland. Box 1 outlines the main developments in enterprise policy from the 1930s to the 1990s. The record of these policies was to show that the difficulties and dilemmas of late industrialisation were not easily resolved. The task of creating sustainable employment and raising living standards proved elusive in the face of factors such as the small size of the home market and the resultant lack of economies of scale; the weakness of the scientific and technological base; the proximity of a much larger and more developed industrial economy in Britain; and the high level of inherited dependence on a slowly-growing product — food — and a slowly-growing market — Britain.

The Protectionist Era 1930s-1950s

1.6 From the early 1930s, a range of protectionist measures were adopted both from a belief in the merits of self sufficiency, and in an attempt to encourage import substitution and stimulate output and employment in native industry. The policy proved effective in the short term. Around a thousand new factories were established throughout the country between 1932 and 1938, while industrial employment rose by over 50,000, around half the total at the start of the decade.

1.7 This initial expansionary surge was not sustained however. Most of the new firms were small and confined to a limited range of activities — 40 per cent of the additional jobs generated were in the clothing industry. Efficiency and productivity were generally low. By the 1950s the limits of protectionism were apparent with the Irish economy's poor performance in providing employment and raising living standards contrasting graphically with the post-war boom in the rest of Western Europe. By the end of the decade, the need for a fundamental change in economic strategy was widely acknowledged.

Box 1: The Evolution of Enterprise Policy		
1930s-1950s	1960s-1980s	1980s-1990s
1932 — Large increases in tariffs on a wide range of imported goods.	1961 — Application made to join the European Economic Community.	1986 — Industrial Development Act provides new statutory framework for enterprise support.
1932-34 — Control of Manufactures Act restricts foreign ownership of new Irish factories.	1963 — EEC application withdrawn after collapse of talks between Britain and EEC.	1987 — Financial Services Act establishes International Financial Services Centre (IFSC). Profits from eligible activities undertaken in the Centre qualify for 10% tax rate until 2005.
1933 — Establishment of Industrial Credit Corporation to provide finance for native industry.	1965 — Anglo-Irish Free Trade Area Agreement requires phasing out of tariffs on most British Goods within 10 years.	1987 — Programme for National Recovery negotiated between Govt. and social partners.
1950 — Establishment of Industrial Development Authority to promote industrial development.	1969 — Industrial Development Act merges the IDA and An Foras Tionscail.	1987 — First Minister of State for Science and Technology appointed, and Science and Technology Development programme initiated.
1952 — Establishment of An Foras Tionscail to give grants of up to 100% of cost of land & buildings and 50% of cost of machinery to companies setting up in under-developed areas of the country.	1969 — Export profit tax relief extended to 1990.	1989 — First EU-funded Industry Operational Programme launched.
1956 — Industrial Grants Act provides that grants of up to 2/3rds of cost of land & buildings can be given for new industry in all parts of the country.	1973 — Ireland joins EEC. Tariffs on imports of almost all manufactured goods from EEC member states to be phased out over five years.	1993 — Single Market in goods, services, capital and labour takes effect in European Union.
1956 — Finance Act gives 50% remission on tax on profits from exports. Finance Act 1958 increases export tax relief to 100%. Finance Act 1960 extends export tax relief for 15 years with tapering relief for a further five years.	1981 — Industrial Development (No. 2) Act enables grants to be paid for designated internationally-traded services. IDA establishes International Services Programme.	1993 — Industrial Development Act establishes 3 Agencies: IDA Ireland for overseas industry; Forbairt for indigenous industry; and Forfás as an advisory and coordination body.
Economic Development 1958: 'sooner or later protection will have to go and the challenge of free trade be accepted'.	1981 — Export tax relief replaced by a 10% tax on all profits in manufacturing sector, but remains in force until 1990 for companies already qualifying.	1998 — Agreement with European Commission on 12.5% standard corporation tax rate from 2003.
1958 — Easing of restrictions on foreign ownership of industry in Control of Manufactures Acts 1932 & 1934. Acts repealed in 1964.	1982 — Review of industrial policy by Telesis criticises excessive reliance on foreign industry. Proposes reduction in grant aid to foreign firms and greater emphasis on building up strong indigenous firms.	1998 — Industrial Development Act establishes Enterprise Ireland as a new development agency for indigenous industry incorporating Forbairt, An Bord Tráchtála and some activities of FAS.
1959 — Shannon Free Airport Development Company (SFADCO) established to promote industrial development in the Shannon Area.	1984 — White Paper on Industrial Policy proposes greater focus on developing indigenous industry.	1999 — Commencement of Economic and Monetary Union (EMU) and euro. Changeover to € to be completed by February 2002.
		2000 — Government approves €646m Technology Foresight Fund and sets up Science Foundation Ireland to manage it.
		2000 — Establishment of InterTrade Ireland to promote all-island trade and enterprise development.

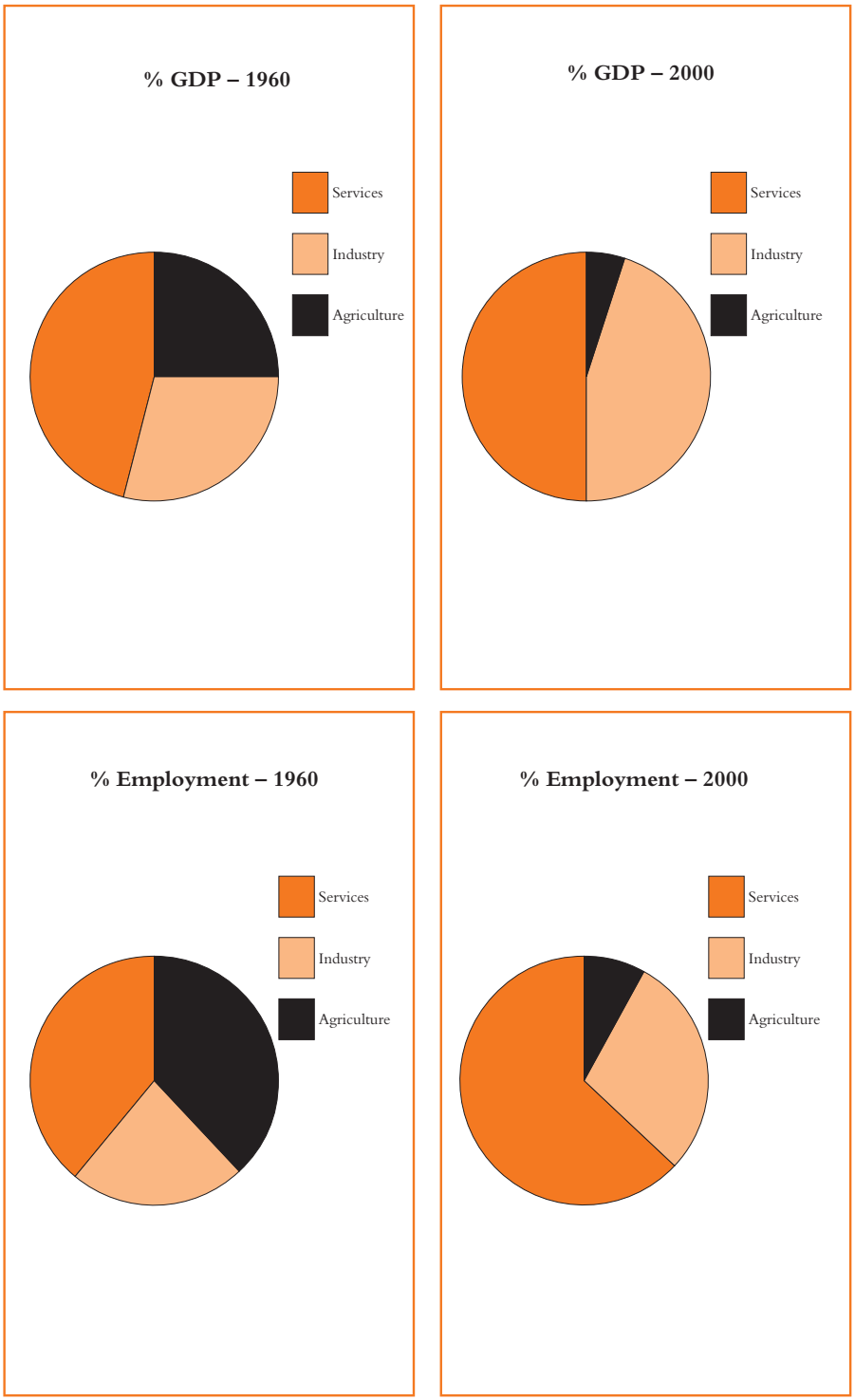
The Transformation of the Economy 1960s-1980s

1.8 In the four decades from the 1920s to the 1950s, economy and industry in Ireland changed relatively little in their fundamentals. Over the next four decades, both would be transformed under the impetus of a new policy direction which saw (i) a shift from self-sufficiency to economic openness, and from the substitution of imports to the promotion of exports; (ii) the encouragement of foreign firms to set up plants in Ireland through the provision of tax incentives and grants; and (iii) the dismantling of the import tariffs and other barriers that had insulated domestic producers from international competition. Figure 1 outlines the structure of the economy in 1960 and 2000 and shows how agriculture's share of GDP steadily declined while, in contrast to most other European economies, that of industry continued to rise. Agriculture's share of total employment also fell sharply, while that of the services sector grew strongly.

1.9 The pattern of Irish trade also underwent major change in these decades. Over this period, Ireland became the second most open economy in the OECD, with merchandise exports rising from 27 per cent of GDP in 1960 to 75 per cent in 2000. Figure 2 outlines the changing composition of Irish trade in 1960 and 2000 and shows the large decline in the share of exports accounted for by live animals, food, drink and other primary goods and the corresponding rise in the share of manufactured goods. It reveals also the related shift in the geographical focus of Irish trade from Britain to other countries of the European Union and to the United States, with Britain's share of Irish merchandise exports falling from three-quarters in 1960 to just over one-fifth in 2000.

1.10 The policy shift of the late 1950s from import substitution to export orientation, and from reliance on native industry to encouragement of foreign investment, contributed to sustained growth in industrial output and productivity over the succeeding two decades. From 1979 to 1986, however, output growth slowed and manufacturing employment fell, with a loss of almost one-fifth of jobs in Irish-owned industry. Employment in overseas firms also declined as inward investment fell, and closures increased among older foreign firms in sectors such as textiles and engineering. Productivity growth accelerated in this period, however, due among other factors to the shift from traditional industries to modern sectors such as electronics and pharmaceuticals. Irish industrial structure took on an increasingly segmented character with a foreign-owned sector dominated by firms in high-tech industries producing predominantly for export existing alongside an indigenous sector mainly made up of firms in traditional industries focused on the home and British markets.

Figure 1: Sectoral Composition of GDP and Employment 1960 and 2000



Source: CSO.

1.11 Over the period from the 1970s to the 1990s, these changes in industrial structure saw output levels per employee in Ireland gradually move closer to the European Union average. This did not provide a springboard, however, for improved economic and employment performance more generally. In 1960, GDP per head of population in Ireland was 61 per cent of the average among the fifteen countries that currently comprise the European Union. At the time of our accession to the European Community in 1973, this had fallen slightly to 59 per cent, and by 1986 had risen to just under 64 per cent.

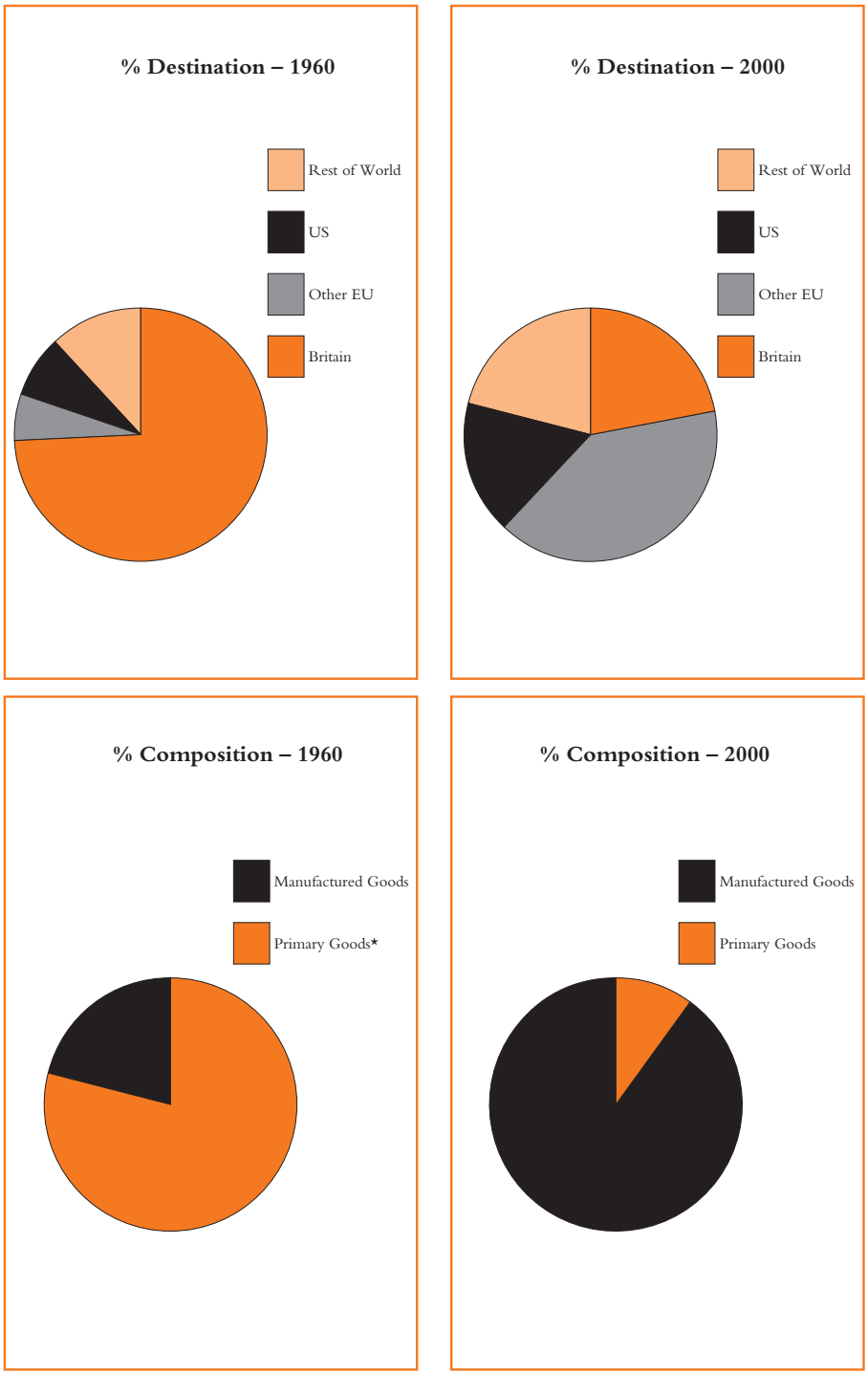
1.12 There were three main reasons for the relative lack of progress over the quarter-century from 1960. First, notwithstanding the shift to foreign direct investment, the legacy of past protectionist policies was an industrial base that was uncompetitive in European and global markets. Second, Ireland's dependency ratio — the ratio of the non-working-age population to the working-age population — rose sharply from the 1970s to the mid-1980s. Because this country's baby boom lagged that in other industrial economies, persons of working age made up a significantly smaller proportion of the total population in Ireland than in any other EU or OECD member state until relatively recently. Third, the macro-economic climate over much of the period was not conducive to the achievement of sustained growth. Inflation and government debt were at a high level for much of the 1970s and 1980s. Wage and price inflation became locked in a spiral that adversely affected competitiveness and employment. High government borrowing led to an increased tax burden, particularly on labour, which in turn had a negative effect on employment and economic activity. For much of the 1980s in particular, the Irish economy found itself in a vicious circle, escape from which proved very difficult.

III The Evolution of Enterprise Policy

1.13 Debates about the direction of enterprise policy in recent decades have inevitably been influenced by the fluctuations in the fortunes of the Irish economy. Though even in the 1970s and 1980s the enterprise sector did not perform particularly badly in comparative terms, its employment performance fell far short of the need presented by rapid workforce growth and high levels of unemployment. The severe economic and employment difficulties of the 1980s and early 1990s led to searching assessments of enterprise strategy, and in particular of the emphasis on foreign investment and the provision of extensive tax incentives and grants. The first such review was conducted by the Telesis consultancy group for the National Economic and Social Council and published in 1982.[3]

[3] National Economic and Social Council. 1982. **Review of Industrial Policy: A Report Prepared by the Telesis Consultancy Group** (Dublin: NESC).

Figure 2: Destination and Composition of Merchandise Exports 1960 and 2000



*Food and live animals; beverages and tobacco; crude materials; mineral fuels; lubricants and related materials; animal and vegetable oils; fats and waxes.
Source: CSO.

1.14 The Telesis group concluded that, with few exceptions, foreign-owned firms in Ireland were manufacturing satellites that did not embody the key competitive activities of the businesses in which they were involved; did not employ significant numbers of skilled workers; and generated relatively little downstream activity among domestic sub-supply firms. Its report was critical of existing policies for indigenous industries, particularly the provision of re-equipment grants and the excessive willingness on the part of the industrial development agencies to encourage the establishment of large numbers of firms lacking the scale to become viable. Telesis recommended that a more selective approach should be taken to the attraction of foreign industry and that there should be a shift in emphasis towards building up strong indigenous companies in export and sub-supply activities. It proposed that the share of the industrial development budget devoted to indigenous companies in traded activities should rise from 40 per cent at the start of the 1980s to 75 per cent by 1990. The White Paper on Industrial Policy 1984 set out the Government's response to the Telesis report. Though the White Paper did not accept all elements of the Telesis analysis, it endorsed the need for greater emphasis on the development of indigenous industry. It was followed by the Industrial Development Act 1986 which put in place a new statutory framework for enterprise support and the industrial development agencies. From the mid-1980s, a number of steps were taken to give greater support to indigenous industry and to promote the integration of foreign firms with the domestic economy. Box 2 outlines the main such measures.

Box 2: Measures to Promote Indigenous Industry in 1980s

1985 — National Linkage Programme established 'to develop a strong competitive sub-supply base in Ireland that will maximize local purchases of Irish materials, components, and services by overseas firms based here.'

1985 — Inter-agency Company Development Programme established to assist in the strategic planning and development of selected, mainly indigenous companies considered to have growth potential.

1988 — Industrial Development Authority re-organised to give separate divisions responsibility for overseas and indigenous firms.

1988 — IDA policy statement indicates that proportion of resources devoted to domestic industry to increase from 40 to 50 per cent.

Review Group on Industrial Policy

1.15 In 1991, an expert group under the chairmanship of Jim Culliton was appointed to review and make recommendations on industrial policy in Ireland and on public policy generally as its affected industrial development. Central to the Group's thinking was the view that industrial policy should go beyond a narrow concern with grants, tax incentives, and the role of the industrial development agencies to consider the broad

range of factors affecting the environment for enterprise. The Review Group made a number of wide-ranging recommendations designed to strengthen the environment for enterprise, among them that:

- A systematic programme should be undertaken to lower the cost and improve the quality of infrastructure and public utilities — telecommunications, energy, roads, and ports — through additional investment and greater competition;
- There should be a fundamental reform of the tax system, including the 'oppressive and unfair' personal income tax system;
- There should be a refocusing of the educational system to give greater priority to the acquisition of usable and marketable skills and to reduce the bias towards the liberal arts and the traditional professions.

1.16 As well as dealing with the overall environment for enterprise, the Review Group also considered a number of more specific issues affecting enterprise policy. It concluded that, despite the undoubted benefits from foreign investment, the attraction of overseas firms to this country would not provide a sufficient basis for the development of the kind of strong national advantage in advanced industries necessary to sustain high levels of employment and income. In the Review Group's view, industrial growth through dependent branch plants of foreign firms would only take us a limited way towards achieving these goals. Though Irish firms were more likely to be better integrated into the Irish economy than overseas companies, the degree to which a company undertook core business functions from an Irish base, rather than simply origin of ownership, should in future be the critical distinction for policy purposes. The main recommendations of the Culliton Group on enterprise development policy and the enterprise development agencies are outlined at box 3.

Box 3: Recommendations of the Culliton Industrial Policy Review Group

- The grant-aid budget for internationally mobile investment should be squeezed further even at the risk of losing costlier projects.
- The 10 per cent corporation tax rate had been more valuable to foreign-owned than to Irish-owned industry. No indication should be given of any continuance of the rate beyond 2010 and the range of activities to which it applied should not be extended.
- Among indigenous firms, the widespread availability of grants had encouraged a hand-out mentality, instead of fostering the market-led, production-oriented enterprise that was needed. There should be a decisive shift away from grants for indigenous industry in favour of an expansion of the equity and venture capital activities of the State agencies.
- In assessing which sectors should be accorded priority in the future, the industrial development agencies should be guided by the desirability of fostering clusters of related industries which could build upon leverage points of national advantage, such as in the food sector. A change was needed from the existing over-emphasis on high-tech sectors such as electronics and pharmaceuticals, neither of which built on pre-existing Irish strengths and national advantages.
- The industrial development agencies should be restructured with one body devoted to the attraction of internationally mobile investment and a second charged with the development of indigenous industry.

1.17 Because of the breadth of the Review Group's recommendations, the Government decided in January 1992 to set up a Task Force under the chairmanship of Dr. Patrick Moriarty to consider their implementation and any further measures considered appropriate. The Task Force's recommendations were published in 1993 together with the Government's decision on these recommendations and on those of the Review Group on Industrial Policy.[4] The Culliton Review Group's analysis and prescriptions had considerable influence on policy developments in a range of areas such as the increased investment on infrastructure and human capital under the National Development Plan 1994-99, the re-organisation of the industrial development agencies, and the greater emphasis placed by the agencies on repayable forms of financial support. On other issues, such as the long-term continuance of a low rate of corporation tax, a different view was taken to that counselled by the Group.

The Focus of Enterprise Policy

1.18 The Culliton Review Group widened the traditional agenda of industrial policy to embrace issues such as the quality of infrastructure, the cost of utilities, and the orientation of the education system. The persistence of high levels of unemployment during the 1980s and much of the 1990s led also to a broadening of the scope of policy from the established focus on manufacturing and internationally-traded services enterprises to a new emphasis on small and micro business, and the non-traded services sector. Amidst concern about 'jobless growth', the view gained ground that mainstream manufacturing and international services enterprise, whether foreign or Irish-owned, would not generate the level of either enterprise or employment needed by the Irish economy. Greater attention should be paid to other, hitherto neglected sectors which had the potential both to create jobs and to contribute to objectives such as the creation of an enterprise culture, the promotion of more balanced regional development, and the reduction of social exclusion.

1.19 Following the report of the Task Force on Small Business (1994)[5], a number of initiatives were taken to assist small business such as loan schemes providing long-term finance at attractive rates and a reduction in the rate of corporation tax on profits below a specified threshold. In the micro-enterprise field, a period of institutional innovation from 1993 saw the establishment of City and County Enterprise Boards to support micro-enterprise throughout the country, Leader Groups to stimulate rural development, and Area-Based Partnerships to promote development in areas of disadvantage. Box 4 outlines the role and scope of these bodies.

[4] **Employment Through Enterprise: The Response of the Government to the Moriarty Task Force on the Implementation of the Culliton Report.** 1993. (Dublin: Stationery Office).
[5] **Report of the Task Force on Small Business.** 1994. (Dublin: Stationery Office).

Box 4: Micro-Enterprise Supports

Agency	Number	Objectives	Scope	Supports Provided
City and County Enterprise Boards	35	To develop indigenous potential & stimulate activity at local level	National	— Business Information & Advice — Preparation of Business Plans — Mentor Services — Management Development — Grants: employment, fixed asset, training, product development, management development
Leader	29.5*	To stimulate innovative measures in all sectors of rural activity	Designated rural areas nationwide	— Information/Advice — Grants: capital, marketing, training, employment — Interest/Rent Subsidies
Area-Based Partnerships	33.5*	To counter disadvantage through support for communities making a collective effort to maximise their development potential	Designated areas of disadvantage nationwide	— Information/Advice — Mentoring — Grants: Start-up Finance — Loans/Loan Guarantees — Training — Incubation Units — Secretarial Back-up

*There are 9 joint Leader/Partnership Groups which are treated as $\frac{1}{2}$ of a centre for the purposes of this outline.

Policy Developments Post-Culliton

1.20 In 1997, the Government published *Growing our Employment, Sharing our Growth* which presaged the introduction of the standardised low rate of corporation tax on trading income and called for a streamlined, client-centred approach to indigenous industrial development. Under the aegis of the European Union Structural Funds, a range of evaluations were also published on various components of the Industry Operational Programmes.

1.21 The establishment of Forfás in 1993 has provided a significant impetus to the development and analysis of enterprise policy. Forfás has established a number of advisory bodies with representation from business, academia and other fields — the National Competitiveness Council; the Expert Group on Future Skills Needs; and the Irish Council for Science, Technology and Innovation — to provide expert guidance on

specific aspects of its remit. Forfás and the advisory bodies under its auspices have produced a wide range of reports in recent years on key aspects of enterprise strategy. These include ***Shaping our Future*** (1996), ***Enterprise 2010*** (2000) which analysed in detail the needs and challenges facing the enterprise sector over the current decade, and the ***Technology Foresight*** report of the Irish Council for Science, Technology and Innovation which underlined the need to build a strong knowledge base in niche areas of ICT and biotechnology. The Expert Group on Future Skills Needs and the National Competitiveness Council have produced a range of in-depth reports on skills and competitiveness issues, while Forfás conducts annual and bi-annual surveys of employment, business impact, research and development, and trade and investment. Whereas enterprise developments and trends were once largely subject only to periodic review, there is now an ongoing process of monitoring and analysis. This Review has drawn substantially on this ongoing work of research and analysis within Forfás, the bodies and agencies under its aegis, and the Department of Enterprise, Trade and Employment.

Chapter 2 — The Era of Record Growth and After

I A Decade of Growth

2.1 The scale of the economic growth recorded during the 1990s marks it out from all previous periods in our economic history. The growth rate during the period from 1994 to 2000 was around twice the trend rate of around four per cent per annum achieved — the first half of the 1980s apart — over the period from the 1960s to the early 1990s. Because growth in the latter part of the 1990s was both high and prolonged, it had a major impact on many measures of economic and social performance. Within the space of a few years, sustained progress was made in tackling problems previously thought to be intractable or to be remediable only over a time-span of decades. The next section briefly surveys the progress made in the areas of (i) employment and unemployment; (ii) living standards and (iii) taxation and the public finances.

Employment and Unemployment

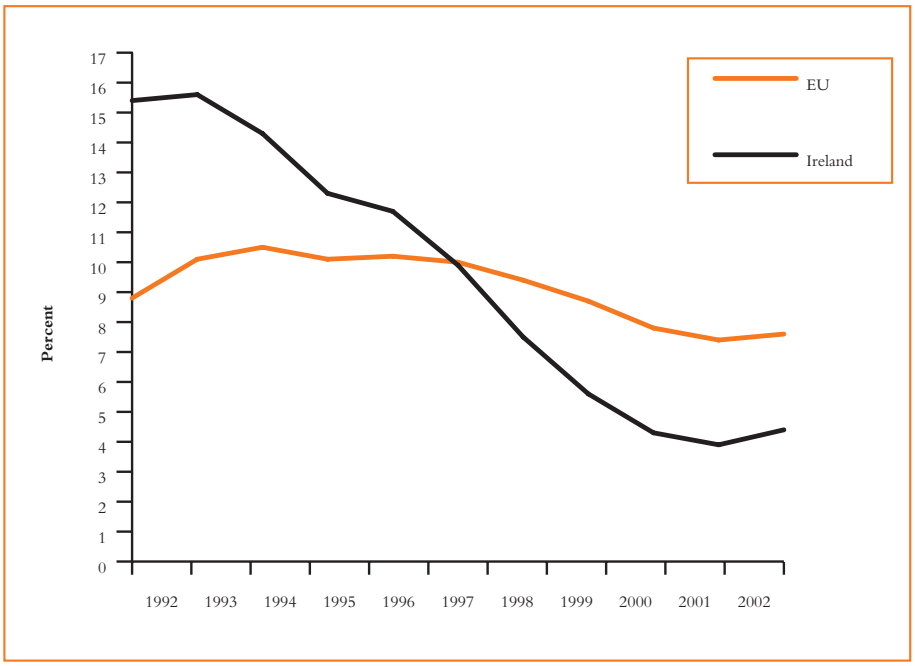
> The outstanding policy success of the last 20 years, indeed of the whole post-Independence era, ... was the increase in employment between 1993 and 2000 and the corresponding huge reductions in unemployment and emigration.
>
> J.W. O'Hagan, Associate Professor of Economics, Trinity College.[1]

2.2 In little more than half a decade during the 1990s, the Irish economy went from a state of large-scale labour surplus to one of labour shortage. In 1993, unemployment as measured by the Labour Force Survey stood at 220,000, almost 16 per cent of the workforce. By the first quarter of 2001, it had fallen to a low of 65,000, just 3.7 per cent of the workforce. Figure 3 outlines unemployment rates in Ireland and the European Union from 1992 to 2002. Over this period, Irish unemployment went from 180 per cent of the EU average to under 60 per cent of that average. In the process, Ireland went from having the second highest level of unemployment among the fifteen EU member states to having the fourth lowest. Major progress was also made in tackling the problem of long-term unemployment. In 1994, there were 128,000 long-term unemployed, close to one-in-ten of the workforce. In the second quarter of 2002, there were 21,600 long-term unemployed, little more than one-in-a-hundred of the workforce.

2.3 The reduction in unemployment does not adequately capture the scale of the job creation achievement of the past decade. Figure 4 outlines the rise in the number of persons in employment from the late 1980s. The number at work increased from 1,111,000 in 1989 to 1,750,000 in the second quarter of 2002, an increase of 639,000, or close to 60 per cent. Over the two preceding decades from 1966 to 1986, by contrast, the net rise in employment amounted to just 25,000. Rapid growth in employment,

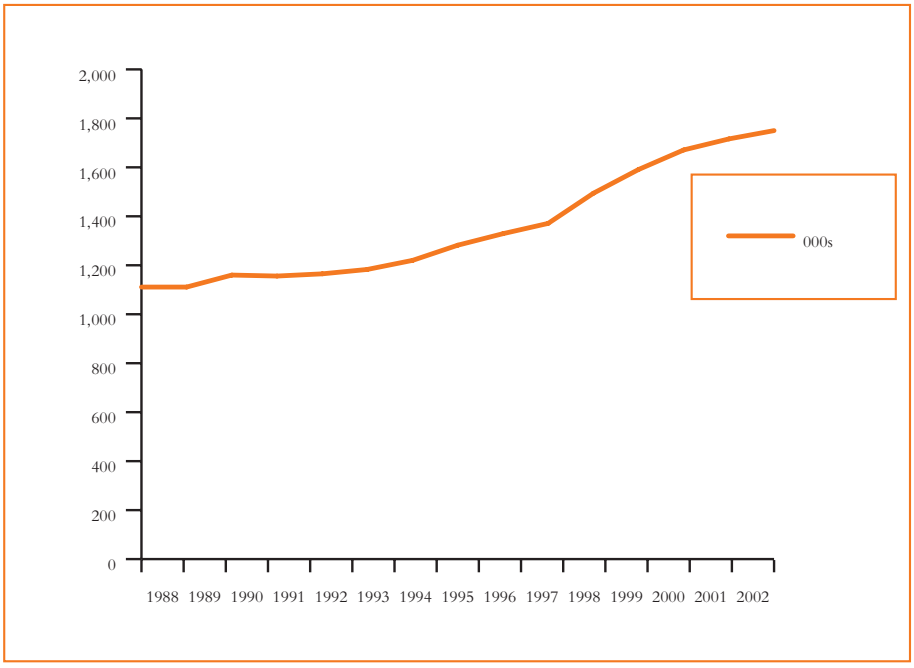
[1] J.W. O'Hagan. 2000. 'Population, Employment and Unemployment' in O'Hagan, J.W. (ed). **The Economy of Ireland (Eighth Edition): Policy and Performance of a European Region** (Dublin: Gill and Macmillan): 176.

Figure 3: Standardised Unemployment Rate in Ireland and the EU 1992-2002



Source OECD.

Figure 4: Persons at Work 1988-2002*



Source: CSO.
Figures from 1988 to 1997 from Annual Labour Force Survey.
Figures from 1998 from Quarterly National Household Survey and relate to March-May period.

together with changes in Irish demographic structures, brought about a major improvement in our traditionally high dependency ratio. In 1991, there were 2.1 persons unemployed or outside the labour force for every one person at work, but by 2000 there were just 1.2 persons not in the labour force or at work for every one person in employment. The transformation of the labour market also brought an end to the high level of involuntary emigration that marked the 1980s. From 1983 to 1990, net *outward* migration averaged 25,000 per year. From 1997 to 2002, there was an estimated average net *inward* migration of almost 22,000 per year. This was among the factors which contributed to the rise in population to an estimated 3.917 million in 2002, the highest level recorded since 1871.

2.4 Since the second half of 2001, however, labour market conditions have been less favourable. Notified redundancies in 2001 reached 19,828 in 2001, the highest level since 1987, and an increase of almost 50 per cent on the figure of 13,316 in 2000. In 2002, notified redundancies rose further to 25,358, an increase of 28 per cent on the number in 2001. As measured by the Quarterly National Household Survey, seasonally adjusted unemployment rose by almost 20,000 between the first quarters of 2001 and 2003, with the unemployment rate rising from 3.7 to 4.6 per cent. Though the number of persons in employment rose in 2002, the increase was markedly lower than in preceding years; employment grew by 1.4 per cent compared with 2.9 per cent in 2001, 4.7 per cent in 2000, and 6.3 per cent in 1999. Almost all of the growth in jobs in the year to the first quarter of 2003 occurred in predominantly public sector activities such as health, education and public administration, while industrial employment fell by over 7,000. Despite the increase in the number at work, the total number of hours worked in the economy also fell slightly in 2002. Projections for 2003 suggest that the number in employment will remain broadly unchanged or increase marginally, while unemployment is likely to rise to over 5 per cent. This rate of unemployment would compare favourably with past levels of unemployment in Ireland and current and projected levels of unemployment in most other European Union economies. As the ESRI and the OECD have cautioned, however, a continued loss of competitiveness in the Irish economy would lead to a higher and more sustained rise in unemployment.

Living Standards

2.5 According to the Household Budget Surveys conducted periodically by the Central Statistics Office, average disposable household income rose from €357.96 in 1994-95 to €551.57 in 1999-2000, an increase of 54 per cent.[2] As the cumulative rise in consumer prices in this period was in the region of 12 per cent, most households enjoyed a substantial rise in living standards.

2.6 The exceptional growth performance in these years also saw Irish living standards, traditionally among the lowest in the European Union, converge rapidly on the EU

[2] CSO. **Household Budget Survey 1999-2000.**

average. Measured on a GDP per capita basis, Irish output levels stood at 123 per cent of the euro area average in 2001. GDP, however, gives an inflated impression of Irish output as it includes the substantial profits and royalty, licence and management services' payments repatriated by the Irish operations of multinational enterprises to their parent companies. In 2000, Irish GDP was around twenty per cent higher than GNP, a margin unique among advanced economies. For this reason, the alternative measure of Gross National Product [GNP] — GDP plus income accruing to domestic residents from abroad less income earned in the country and transferred abroad — is generally regarded as a more reliable guide to the resources available for consumption and investment. In 2001, GNP per capita in Ireland was estimated to be around 103 per cent of the euro area average.

Public Finances and Taxation

2.7 The acceleration of growth from the mid-1990s contributed to a marked turn-around in the public finances. 1998 saw the attainment of a surplus on the Exchequer Balance — the balance on the current budget plus that on the Exchequer's borrowing for capital purposes — for the first time since the 1940s. In 2000, this surplus reached almost €3.05bn, some 3.5 per cent of GNP, while the surplus on the General Government Balance — the fiscal outcome for all arms of government — reached €4.57m. In 1986 by contrast, the deficit on the Exchequer Balance stood at around 13 per cent of GNP, having peaked at 16 per cent of GNP in 1982. A combination of lower than projected tax receipts and increased public expenditure led to a deterioration in the exchequer and general government balances in 2001 and 2002. A small exchequer balance of €95m. was recorded in 2002, with the general government balance estimated to be in deficit to the sum of €397m. The Budget of December 2002 projected that these deficits would to rise to €1869m. and €885m. respectively in 2003, but a shortfall in tax receipts may see these projections exceeded.

2.8 The improvement in the public finances during the 1990s enabled rapid progress to be made in tackling Government debt. The debt/GDP ratio which rose to a peak of over 120 per cent in 1987, and stood at 96 per cent in 1993, fell to 34.1 per cent in 2002. Despite the recent deterioration in the public finances, this remains the second lowest debt/GDP ratio in the European Union. In the process, the debt service burden on the Exchequer has been substantially reduced. In 2002, 7.8 per cent of tax revenues went to service the national debt compared with 27.9 per cent of receipts in 1990.

2.9 The improvement in the public finances during the 1990s facilitated a substantial reduction in the tax burden, particularly in the tax burden on labour that was identified by the Culliton Group and others as a major impediment to job creation. Over the period from 1979 to 2001, the fall in the combined burden of income tax and employee social security contributions in Ireland was the highest in the European Union and the

second highest in the OECD.[3] In 2001, the tax rate on low-wage earners — defined as income tax plus employer and employee social insurance contributions less cash benefits as a percentage of the labour cost for a single person earning two-thirds of average production worker earnings — was the lowest in the EU at 17.3 per cent compared to an average of 37.8 per cent across all member states.[4] For employees in a wide range of family circumstances and earnings bands, the tax rate on earnings in Ireland is similarly among the lowest in the EU and OECD.

II Accounting for Irish Economic Growth

> Through a combination of good luck, good timing, and good policies, Ireland caught the crest of a geographical and technological wave, and has ridden it to a prosperity nobody expected.
>
> Paul Krugman, Professor of Economics, MIT.[5]

2.10 Though there are differences of view about the precise weight to be accorded specific causes, there is broad agreement that the unprecedented economic advances of recent years resulted from the interaction of a range of different, and in some cases mutually reinforcing, factors.[6] Some of these factors were long-term, others short-term; some domestic, others external; some amenable to control or influence by Government and social partners, and others not amenable to such control or influence. Box 5 outlines the main contributory factors. The key long-term foundations of our progress were the adoption of a strategy of economic openness through integration with the European Union and the encouragement of foreign investment, and the improvements in the educational qualifications and human capital of the workforce that resulted from the introduction of free secondary education in the 1960s and the expansion in third-level participation from the mid-1980s.

2.11 From the mid-1980s, a number of important steps were taken domestically to tackle impediments to the realisation of the economy's growth potential. These actions included the achievement of greater macro-economic stability, in particular low inflation; the start of the process of correcting the imbalance in the public finances; and the initiation of the agreements between government and social partners which contributed to wage moderation and industrial peace. The decision taken earlier in the decade to tackle the poor quality of the telephone network and install a fully digital system nationwide by the mid-1980s also proved important, particularly in helping to attract inward investment.

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[3] OECD. 2002. **Taxing Wages** (Paris: OECD), tables 1-17 et passim.

[4] Eurostat. 2002. 'Tax Rate on Low-wage Earners'. www.europa.eu.int/comm/eurostat/datashop/06/12/2002.

[5] Paul R. Krugman. 1997. 'Good News from Ireland: A Geographical Perspective' in A.W. Gray (ed) **International Perspectives on the Irish Economy** (Dublin: Indecon), p. 53.

[6] For accounts of the origins and causes of the 'Celtic Tiger' see, among others: F. Barry (ed). 1999. **Understanding Ireland's Economic Growth** (London: Macmillan); J. Fitzgerald et al. 1999. 'Interpreting the Recent Irish Growth Performance' in J. Fitzgerald et al, **National Investment Priorities for the Period 2000-2006** (Dublin: ESRI), pp. 29-41; OECD. 1999. **Economic Surveys 1999: Ireland**, pp. 25-62; D. Duffy et al. 2001. 'Growth in the 1990s' in D. Duffy et al, **ESRI Medium Term Review 2001-2007** (Dublin: ESRI), pp. 6-24; C. O'Gráda. 2002. 'Is the Celtic Tiger a Paper Tiger?' in **ESRI Quarterly Economic Commentary Spring 2002**, pp. 51-60; P. Clinch, et al. 2002. **After the Celtic Tiger** (Dublin: O'Brien Press);. P. Honohan and B. Walsh. 2002. 'Catching Up with the Leaders: the Irish Hare', **Brookings Papers on Economic Activity 2002** (1), pp. 1-78.

Box 5: Factors Contributing to Irish Economic Growth	
DOMESTIC	EXTERNAL
Long-Term Foundations	***Long-Term Foundations***
Potential for less-developed economies such as Ireland to achieve convergence with wealthier ones through technology transfer, domestic investment etc.	Globalisation, reduction in barriers to trade, increase in flows of foreign investment.
A demographic structure which ensured a plentiful supply of labour by virtue of the age structure of the population, increases in labour force participation and the return of emigrants.	Shift in structure of advanced economies to sectors such as electronics and pharmaceuticals.
Investment and growth in human capital from 1960s.	Growth in internationally-traded services sector facilitated by innovations in technology and telecommunications and regulatory change.
Commitment to economic openness and integration with the European Union.	
Long-term encouragement of, and provision of tax and other incentives for, foreign investment and indigenous enterprise. Strategic focus on electronics, pharmaceuticals and internationally traded services.	
English-speaking country, historical links with United States.	
Medium-Term Catalysts	***Medium-Term Catalysts***
Achievement of macro-economic stability from mid-1980's. Low inflation, falling interest rates.	Expansion of EU in mid-1980's. Single European Market Programme announced in 1986 for completion by end-1992. Resultant boost to US investment in EU.
Stabilisation of public finances from mid-1980's. Steady reductions in levels of government expenditure and taxation.	Aid from EU Structural and Cohesion Funds.
Contribution of successive partnership agreements to wage moderation, orderly pay determination, and stable industrial relations.	Rapid growth of ICT sector during the 1990s.
Improvements in infrastructure and telecommunications. Reductions in relative cost of telecommunications, electricity and other utilities for Irish enterprise.	
Progress towards peace in Northern Ireland.	
Short-Term Boosts	***Short-Term Boosts***
Devaluations of Irish pound in 1986 and 1993.	
Depreciation of punt/euro 1997-2001.	

2.12 The economic expansion that got underway in the late 1980s was first manifest in the export-oriented manufacturing sector. Demand was boosted by economic recovery in export markets, while Irish competitiveness was strengthened by low inflation, devaluation, and the moderate wage terms of the first partnership agreement negotiated in 1987. These improvements coincided with a number of external developments which offered opportunities that played to Ireland's strengths. Global trade and investment flows grew strongly because of factors such as the reduction in barriers to cross-border trade under World Trade Organisation agreements, improved global communications links, and the growth in internationally traded services. Following recovery from the effects of the Gulf War, world trade grew at an annual average rate of almost 7 per cent during the 1990s, twice the rate of growth in real GDP. Global flows of foreign direct investment are estimated to have increased fourfold from $200bn. in 1990 to $814bn in 1999. The establishment of the European Single Market from 1993 spurred increased interest among U.S. firms in setting up production bases in Europe. The European market also grew significantly in size in the decade from the mid-1980s with the accession of Spain, Portugal and Greece in 1986 and Sweden, Finland, and Austria in 1995. The ICT (information and communication technology) sector underwent unprecedented expansion, particularly in the second half of the 1990s, in response to rapid product change in areas such as personal computers and mobile telephones, and developments such as the emergence of the Internet and eBusiness, and concerns about Y2K. From 1995 to 2000, corporate IT spending in the United States grew by 25 per cent per annum, while capital spending by telecommunications service providers globally on communications and networking equipment grew by around the same amount. These developments helped to fuel a new wave of overseas investment by US hardware and software producers. This was further boosted by the prolonged expansion of the US economy — the period from 1992 to 2000 was its longest period of growth on record.

2.13 Because of our long-term commitment to the attraction of overseas industry, our favourable demographic structure, our historic links and common language with the United States, and our efforts to raise the educational level of young people entering the workforce, Ireland was able to attract a larger share of the increased volume of US investment flows to Europe. Annual flows of foreign direct investment into Ireland increased from an annual average of around $140m. in the 1980s to $790m. in the first half of the 1990s and $2,700m. in the second half of the decade. Though Ireland accounts for just one per cent of the population of the European Union, over one-in-ten of all foreign-owned green-field manufacturing projects coming into Europe during the 1990s located here. The fact that a sizeable cohort of young people possessed the education and skills required in high-tech industries proved of particular importance in attracting overseas firms. The number of third-level graduates in science and technology more than doubled over the decade from the late 1980s. By the mid-1990s, science and

technology graduates formed a higher proportion of the population aged 20-29 in Ireland than in any other EU member state, the US or Japan. The 1998 World Competitiveness Report ranked Ireland first in the world for the 'fit' between the educational system and the needs of the economy.[7] The flexibility and adaptability of the Irish workforce and work environment also proved a major asset in attracting and retaining foreign direct investment.

2.14 A number of key overseas investments secured or consolidated from the late 1980s made a critical contribution to the growth of output, employment, and exports. Success in winning these investments established our credibility as a destination for inward investment and helped to maintain the expansionary momentum of the foreign-owned sector. Over the course of the decade, Ireland achieved the second highest rate of growth in export volumes in the OECD, recorded the highest share of high-tech products in manufacturing exports in the OECD, and became the world's leading software exporter. Assisted by rapid technological and regulatory change, the internationally-traded services sector also registered strong growth, particularly in the latter part of the 1990s. Employment in the International Finances Services Centre established in 1987 rose to 8,500 by 2000.

2.15 The rapid expansion of foreign-owned enterprise had a positive impact on the rest of the economy as overseas firms' expenditure on domestic materials and services grew strongly. Indigenous industry also benefited from the improved economic and business climate and, with other parts of the enterprise sector, from stable or declining charges for utilities and other inputs. In contrast to the 1970s and 1980s, Irish-owned manufacturers recorded significant employment and output growth. A sizeable indigenous software industry emerged and grew rapidly to account for half of total software employment. High-potential indigenous firms also emerged in other growth sectors such as electronics, medical devices, and consumer foods. The tourism sector also experienced sustained growth in visitor numbers.

2.16 The upsurge in economic activity and employment strengthened government finances which, in turn, made possible reductions in personal and corporate taxation which then gave a further stimulus to employment and economic activity. Aid from the European Union structural and cohesion funds enabled investments in infrastructure and human resources vital to maintaining the economy's growth momentum to be made without putting a strain on the public finances. From the mid-1990s, domestic demand, driven by rising employment and falling interest rates and personal taxation, grew strongly. Private consumption grew by almost 8 per cent per year from 1995 to 2000

[7] **IMD World Competitiveness Yearbook 1999,** table 10.

and contributed to the rapid rise in employment in the retail, personal services, and hotel and catering sectors.

2.17 As growth rates accelerated in the mid-1990s, the dividend from a demographic structure markedly different from that in most other European countries made itself felt. Demographic and labour market characteristics that had been a burden in the 1980s proved a boon in the very different economic circumstances of the 1990s. The record growth of recent years could not have been sustained without the large increases in labour supply made possible by the natural increase in the workforce resulting from the 'baby boom' of the 1970s, the relatively low rate of labour force participation among women, the high level of unemployment, and the existence of a sizeable pool of emigrants willing to return home as employment opportunities became available. For most of the past decade, this growth in labour supply, together with the partnership agreements, also helped to moderate wage increases and maintain competitiveness. In the final years of the decade, favourable exchange rate movements helped to sustain the momentum of export growth, though at the cost of some increase in inflationary pressures. Over the period from its launch at the beginning of 1999 to the end of 2001, the euro depreciated by around 26 per cent against the dollar and by around 13 per cent against sterling.

2.18 In summary, therefore, Ireland's economic success during the 1990s was strongly influenced by the conjunction of a broadly favourable external environment; a supportive demographic structure; strategic policy choices taken in recent decades to improve human capital, encourage foreign investment, and develop indigenous enterprise; the work begun in the 1980s to achieve macro-economic stability and correct the public finances; and a disciplined approach to pay determination which, though providing steady growth in real earnings, ensured that much of the dividend from growth was realised in additional employment.

III The Changing External Environment

2.19 Given the exceptional openness of the Irish economy, the slowdown in the US and world economies that began in the second half of 2000 has inevitably had a marked impact on our economic performance. US growth fell from 3.8 per cent in 2000 to 0.3 per cent in 2001, while that in Japan declined from 2.6 per cent to -0.3 per cent over the same period. In the European Union, growth decreased from 3.5 per cent in 2000 to 1.6 per cent in 2001. World trade fell by 1 per cent in 2001, the first year of negative growth since 1982, and a sharp contrast with the 11 per cent increase recorded in 2000.[8] Preliminary estimates indicate that it grew by 2.5 per cent in 2002, but this aggregate

[8] World Trade Organisation. 2002. **International Trade Statistics 2001** (Geneva: WTO), pp. 1-4 & 39-42. World Trade Organisation. 2003. 'World Trade Figures 2002', 23 April 2003.

increase masked a sluggish trade performance in many regions, including Western Europe. While the global economy appeared to be on the road to recovery in early 2002, it faltered thereafter as business and consumer confidence failed to gain momentum. A gradual improvement in world economic conditions is expected from the latter half of 2003, but this could be affected by a range of downside risks. 2001 and 2002 were very difficult years in particular for the ICT sector whose prolonged growth during the 1990s played a critical part in Ireland's economic expansion. US high-tech exports in 2001 were $189bn. compared with $223bn. in 2000, a drop of 15 per cent.[9] The global value of semi-conductor sales fell by almost 30 per cent in 2001, while unit sales of personal computers fell for the first time in 15 years and sales of mobile phones stagnated globally and declined in Europe. As discussed in chapter 3, this downturn in the ICT sector led to a sizeable fall in employment in Ireland. Any revival in the computer sector in 2003 is likely to be modest, and there is little sign of an upturn in the fortunes of the communications sector.

2.20 The downturn in the world economy since 2000 led to a substantial fall in foreign direct investment (FDI) worldwide. Between 2000 and 2001, FDI inflows in the OECD area fell from $1.27 trillion to $566 billion, a decline of 56 per cent.[10] According to OECD estimates, direct investment flows of all kinds into Ireland fell from $24.1bn. in 2000 to $9.8bn in 2001. As outlined in chapter 3, new jobs in IDA-supported foreign-owned companies declined substantially in 2001 and 2002, with the fall being most pronounced in the electronics and engineering sector. Competition for inward investment has also intensified as a result of increased globalisation and other developments. In Asia, the emergence of China as a major economic power and the greater openness of the Indian economy have seen both economies, and China in particular, become increasingly important destinations for foreign investment. In Europe, the scheduled accession of ten countries from Eastern and Central Europe to the European Union in May 2004 has had a major impact on investment patterns. In anticipation of EU accession, inward investment in the candidate countries grew substantially from the mid-1990s, rising from 6.5bn ECU in 1995 to €19bn. in 2000.[11] Over this period, Ireland's share of new green-field projects in Europe declined, while the share going to Central and Eastern European economies, particularly Hungary, Poland and the Czech Republic, grew substantially. A number of these countries currently have, or plan to introduce, relatively low rates of corporation tax in order to attract inward investment; the rate in Hungary is currently 18 per cent, in Poland it is set to drop to 24 per cent in 2004, while in Estonia a zero rate applies.[12] The accession to the EU in 1995 of Sweden, Finland, and Austria — countries with a strong technological and research base

[9] American Electronics Association. **Cyberstates 2002.** www.aeanet.org/pressroom/idmk–cs2002–US.
[10] OECD. 2002. 'Trends and Recent Developments in Foreign Direct Investment' in **International Investment Perspectives 9/2002** (Paris: OECD), pp. 1-3 et passim.
[11] Eurostat. 2002. **The Evolution of FDI in Candidate Countries 1995-2000.**
[12] KPMG. 2002. Corporate Tax Rate Survey: www.us.kpmg.com/microsite/global–tax/taxfacts.

and excellent infrastructure — has also led to increased competition for high technology inward investment. Sweden's share of investment within the EU in particular has grown strongly in recent years, while the return on US investment in Finland was, after Hungary and Ireland, the third highest over the period from 1995 to 1999.

IV The Changing Domestic Environment

2.21 Labour supply was pivotal in two main ways to the regeneration of the Irish economy from the late 1980s. First, the availability of a plentiful supply of young, well-educated labour was, in a context of increasingly ageing populations in other European economies, a key advantage in securing inward investment. Surveys of foreign-owned firms operating in Ireland undertaken in recent years have shown that over half ranked this as the factor that most influenced their decision to invest here. Second, the growth momentum that originated in the foreign-owned export sector could not have been sustained and broadened without the existence of large-scale sources of under-utilised labour. These additional sources of labour were available because of our historically low level of female labour force participation and high levels of unemployment and emigration.

2.22 Though Ireland does not immediately face the prospect of labour force decline that is already affecting a number of European economies, we will not see a continuation of the rate of workforce expansion experienced over the past decade. First, the effects of the steady fall in the birth-rate from 1980 to the late 1990s will lead to a drop in the annual inflow of young people to the workforce in the years ahead. The number of students enrolled full-time in second-level schools is projected to fall from around 370,000 in 1996/97 to 320,000 in 2006/07, while FÁS and the ESRI have estimated that the annual inflow of 15-24 year-olds to the labour force will decline from approximately 59,000 per year in 2000 to 54,000 in 2005.[13] Second, the rapid rise in female labour force participation in recent years has taken Irish participation levels to the EU average and is thus likely to constrain the future rate of growth from this source. Women not currently in the workforce are concentrated in older age groups and in unskilled categories, while demand is likely to be highest for younger, more highly-skilled workers. Since 1999, the contribution of rising participation rates to labour force growth has fallen significantly.

2.23 The third main source of increased labour supply in recent years has been migration. In the second half of the 1990s, rising levels of inward migration and falling levels of emigration were responsible for almost one-quarter of the growth in labour

[13] J.J. Sexton et al. 2001. **Estimating Labour Force Flows, Job Openings and Human Resource Requirements 1990-2005** (Dublin: FÁS/ESRI), table IV.a.

supply. Since 1999, annual immigration levels have been relatively stable, averaging around 45,000, with a decline in the number of returning Irish emigrants and migrants from Britain and other EU member states being offset by a large rise in the number of migrants from other parts of the world. Persons of non-Irish, British, EU or US origin comprised 35 per cent of immigrants in 2002 compared with around 10 per cent in 1999. There has been a related rise over this period in the number of work permits granted to persons from outside the European Economic Area — the 15 EU member states plus Norway, Iceland and Lichtenstein. This figure rose from 6,000 in 1999 to 18,000 in 2000, 36,500 in 20001, and just over 40,000 in 2002. A sizeable number of applications in 2002, however, were for renewals of existing permits, 16,562 compared with 6,485 in 2001. In January 2003, it was announced that the procedure for issuing work permits was being tightened in response to changing labour market conditions. Where it is determined on the basis of experience and local labour market analysis that there is a sufficient supply of labour with requisite skills, employers will be advised that applications for work permits will not be considered. Operating arrangements to give effect to the changes in work permit procedures were announced in April 2003. Under these arrangements, the Department of Enterprise, Trade and Employment will, after consultation with FÁS, announce on a quarterly basis the occupational sectors ineligible for work permits. A number of occupational sectors were declared ineligible for permits for the quarter from April to June 2003.

2.24 As a result of demographic and other factors, the annual rate of growth in labour supply has been declining since 1999; the labour force increased by an estimated 1.9 per cent in 2002 compared with increases of 2.5 per cent in 2001, 3.3 per cent in 2000, and 4.0 per cent in 1999. Table 1 outlines the ESRI's projections of annual labour force growth over the period to 2015. It can be seen that growth in 2000-05 is projected to be around two-thirds of that in 1995-2000, while the rise in 2005-10 is projected to be just half the level a decade earlier. This decline in workforce growth has two main implications for enterprise strategy. First, Ireland is no longer in a position to offer foreign investors the large-scale labour surplus available in the past and must develop other sources of comparative advantage. Second, future economic growth will depend more on increasing productivity than on expanding the labour force.

Table 1: Projected Growth in Labour Supply

1995-2000	3.4%
2000-2005	2.2%
2005-2010	1.7%
2010-2015	0.7%

Source: ESRI.

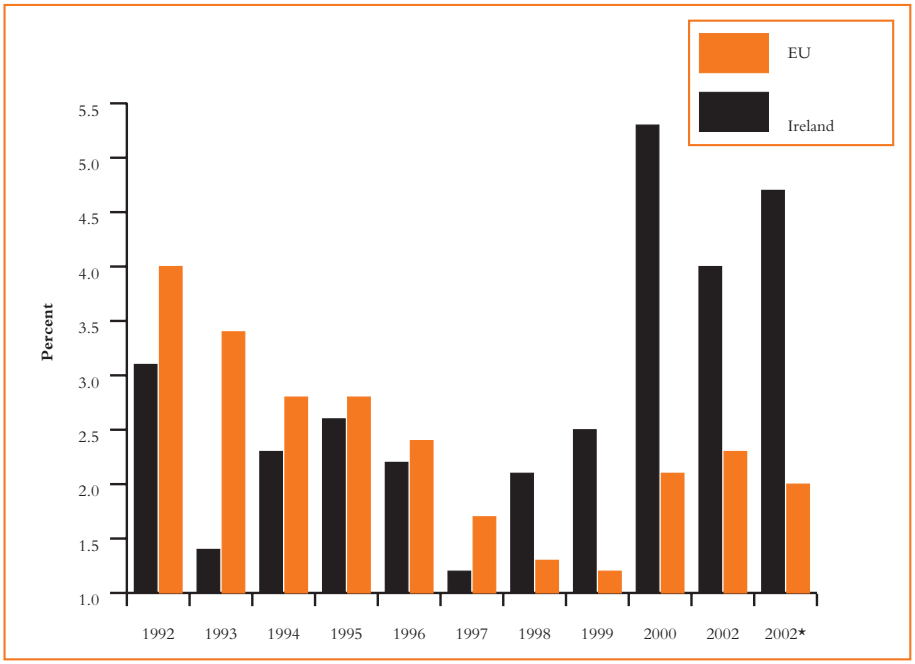
Cost Competitiveness

Prices

2.25 The improvement in Ireland's economic performance that got underway in the second half of the 1980s went hand in hand with the gradual achievement of greater macro-economic stability. Inflation was reduced to a level at or below the average in other EU and OECD economies; the Programme for National Recovery and its successor Programmes provided for relatively modest increases in nominal wages; and government borrowing declined steadily as a proportion of GNP. Figure 5 outlines annual inflation in Ireland and the European Union on a harmonised basis from 1992 to 2002. In the period to 1997 the Irish inflation rate was consistently below the EU average, but since 1999 it has typically been twice or more the average level in other member states, and is projected to remain well above the EU average in 2003 and 2004. While the gap between Irish and EU inflation rates narrowed somewhat in 2001, it widened again in 2002.

2.26 In the period from 1998 when Irish inflation first began to drift upwards, increases in the price of imported goods caused by the depreciation of the euro vis-à-vis sterling and the dollar played a significant part. Since 2000, however, inflationary pressures have been greater in mainly non-traded sectors of the Irish economy. Table 2 shows the rate of inflation for the main categories of goods and services in Ireland and the EU for the year to December 2002. The rate of price inflation in Ireland in this period was substantially higher in the case of goods and services that are mainly provided and sourced domestically such as health, education, restaurants and hotels, recreation, and miscellaneous services. The gap between Irish and EU price movements was also greater for these categories of expenditure. The price of education rose by 11.6 per cent in the year to December 2002, more than twice the European Union average. Health inflation in Ireland over the period was 7.7 per cent, more than twice the EU average; the cost of recreational and cultural services in Ireland increased by four times the European average; while the Irish inflation rate for miscellaneous goods and services was more than twice the European Union mean. Over the course of 2002, there was some moderation in services sector inflation in Ireland with a decline from a peak of around 9 per cent at the start of the year to under 6 per cent by its end. This was mainly as a result of an easing of price pressures in private sector services. The rate of inflation in administered services such as education and health that are subject to direct or indirect Government control averaged around 10.5 per cent during 2002. In the first quarter of 2003, the rate of inflation edged upwards, but by the second quarter of the year there were signs of an easing in inflationary pressures. In May 2003, the annual rate of inflation as measured by the consumer price index fell to 3.7 per cent, the first time it had gone below 4 per cent since December 1999. This was due largely to externally-driven factors such as falling fuel prices and interest rates, and the rise in the value of the euro; if the rise in the euro is sustained, it should contribute to a continued downward trend in Irish inflation. Price rises for a range of domestically provided services remain high, however, compared with those in most other European Union economies.

Figure 5: Harmonised Index of Consumer Prices Ireland and European Union 1992-2002



Source Eurostat.

Table 2: Main Categories of Harmonised Index of Consumer Prices: Annual Changes to December 2002
%

	Ireland	EU-15*
Food and non-alcoholic beverages	2.8	1.3
Alcoholic beverages and tobacco	10.0	3.6
Clothing and footwear	–5.5	0.5
Housing, water, electricity, gas & other fuels	3.7	1.9
Furnishings, household equipment, & household maintenance	0.2	1.2
Health	7.7	3.1
Transport	4.3	3.6
Communications*	0.6	–0.9
Recreation and culture	4.1	1.0
Education	11.6	5.0
Hotels, cafés & restaurants	7.1	4.4
Miscellaneous goods & services**	6.8	2.9
Total	4.6	2.2

*Post and telecommunications.
**This covers a wide range of expenditure items including hairdressing; personal goods such as grooming products and jewellery; childcare and other social protection services; insurance, financial services, and legal and professional services.

Source: Eurostat

2.27 The comparatively high rate of inflation in Ireland in recent years has inevitably had an effect on the relative price of Irish goods and services. An analysis undertaken by the Central Bank found that the price level in Ireland relative to the average for the euro area fell in the first half of the 1990s, but rose thereafter from around 95 per cent of the average in Eurozone economies in 1995 to around 112 per cent in early 2003.[14] A study prepared for Forfás and published in 2002 concluded that Ireland was, after Finland, the second most expensive country in the Eurozone for consumer goods and services.[15] A follow-up study published in May 2003 found that Ireland had almost reached price parity with Finland and was set to become the most expensive country in the Eurozone in the very near future. In 1995, by contrast, Ireland ranked only as the eighth most expensive of the then twelve EU member states. In addition to the effect of high Irish inflation, the Forfás study found that other factors responsible for the cost of goods and services here included rates of indirect taxation; retail structures; geographical location and market size; regulatory factors and competition; and national preferences. *Sustaining Progress: the Social Partnership Agreement 2003-2005* underlines the need to reverse the recent deterioration in some dimensions of competitiveness in order to enable the economy to consolidate and build upon the advances of the past decade. It provides that proposals for action to slow down the present rate of domestically generated inflation will be co-ordinated by a specially convened group which will draw up a detailed action plan and monitor its progress.

Wages

2.28 Wage trends over the past decade show similarities with price movements. Figure 6 charts the annual increase in nominal wage compensation per employee in the business sector in Ireland, the EU and the euro area over the period from 1991 to 2002. During the first half of the 1990s, wage increases in Ireland were generally below the average in other EU economies. Since 1997, however, wages have been rising at a much faster rate in this country, approximately twice to two-and-a-half times the average level across the European Union. The Department of Finance have estimated that, over the five years from 1998 to 2002, cumulative wage increases in Ireland totalled around 42 per cent compared with an average of 13 per cent in the euro area and 16 per cent in the EU as a whole.[16] Economic bodies nationally and internationally — including the Central Bank, ESRI, OECD, IMF and the European Commission — have expressed serious concern about the implications of this trend for competitiveness and employment. Though the past year has seen a gradual decline

[14] Central Bank. **Quarterly Bulletin Spring 2002,** chart A.1.; **Quarterly Bulletin Spring 2003:** 6.
[15] Forfas. 2002. **Comparative Consumer Prices in the Eurozone and Consumer Price Inflation in the Changeover Period.**
[16] Address by Mr Charlie McCreevy T.D., Minister for Finance to PPF Plenary, 31 October 2002.

in the rate of wage growth in Ireland, particularly in distribution, business services and among clerical and managerial employees in industry, in most cases it remains well above the level of increase in other European countries.

Figure 6: Increases in Nominal Compensation per Business Sector Employee in Ireland, the EU and the Euro Area 1991-2002

Source Eurostat.

2.29 In response, it has been contended that productivity gains in the Irish economy in recent years have been strong enough to permit historically low Irish wage rates to be brought up to the level in other European economies without damaging our competitiveness. It is certainly the case that Irish wage levels, particularly in manufacturing, have historically been at the lower end of the EU range. The most recent EU data on labour costs relate to 2000 and indicate that hourly labour costs in Ireland at that time were, after Portugal, Greece and Spain, the fourth lowest in the European Union.[17] The above-average growth of Irish wage rates since 2000, however, would have altered our relative position somewhat. The comparatively low rate of Irish employer social security contributions also contributed significantly to the labour cost gap between Ireland and other economies. These contributions accounted for 12.4 per cent of total labour costs in manufacturing and services in Ireland in 2000 compared with an EU average of 21.5 per cent and a high of 29.6 per cent in Sweden.

[17] Nobre, A. 2001. **EU Labour Costs 1999.** Eurostat. Statistics in Focus: Population and Social Conditions Theme 3 — 3/2001.

While hourly manufacturing labour costs in Ireland were around 60 per cent of those in Sweden in 1999, for example, hourly employee remuneration was around 75 per cent of the Swedish level. It is also the case that, at the aggregate level, productivity growth in manufacturing during the 1990s was well in excess of earnings growth with the result that unit labour costs fell steadily. In 2000, unit wage costs across the manufacturing sector as a whole were around 30 per cent below their 1995 level, a performance well ahead of that in competing economies.

2.30 Because of the significant sectoral disparities in Irish industry, however, caution needs to be shown in drawing conclusions on the basis of aggregate cost and output trends. Analysis of productivity data for the last decade reveals large variations in the performance of different sectors. A small number of high-tech sectors have recorded exceptional rises in output and productivity — notably the chemicals sector which has seen annual productivity growth of around 25 per cent per annum since 1996. Because these sectors account for a large proportion of output in Ireland, their performance has significantly skewed the aggregate data. In order to correct for this factor, the IMF undertook an alternative analysis of trends in Irish unit labour costs in recent years in which different manufacturing sectors were weighted by their shares of manufacturing employment rather than output.[18] The IMF analysis found that, measured on this basis, gains in competitiveness in the period from 1995 to 2000 were relatively limited with unit labour costs being broadly stable over the period. In 2001, manufacturing sectors with the exception of chemicals and pharmaceuticals suffered a deterioration in their competitive position. There was, moreover, considerable variation in the competitive performance of different sectors over the period from 1995. The chemical and pharmaceutical industry registered the strongest competitive gains. Within the electronics sector, there was considerable divergence, with the office machinery and communication equipment sector losing ground and the electrical machinery and medical and other instruments sectors gaining ground over the half decade. Unit labour costs in the food, drink and tobacco sector were broadly stable over the period. A separate analysis by the Central Bank found that, when the contribution of the chemicals sector was excluded, unit labour costs decreased at a more modest rate relative to other economies during the late 1990s, and have increased sharply since 2000.[19] The outlook for a decline in wage inflation in 2003 have been improved by the terms of the wage increases provided for under *Sustaining Progress*. The phasing of the pay increases under the partnership agreement implies an annualised increase of around 3.5 per cent in private sector pay in 2003, a relatively low rate of increase compared with the terms of the preceding agreement.

[18] IMF. July 2002. 'How Competitive is Irish Manufacturing?' in **Ireland: Selected Issues,** pp. 5-13.
[19] Central Bank. **Quarterly Bulletin Spring 2003,** pp. 54-55 & chart 5.

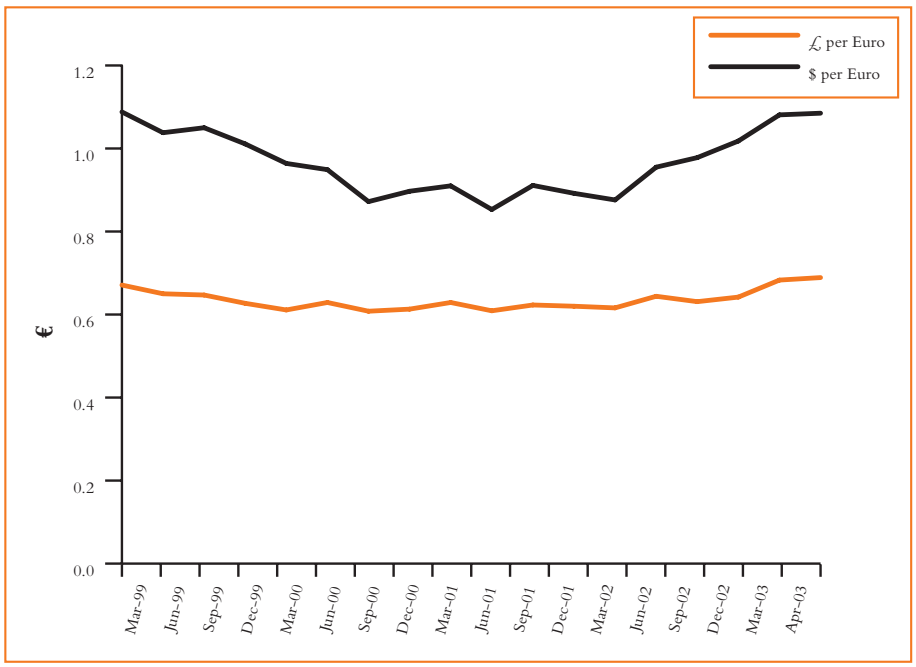
2.31 Figures are also available on economy-wide annual earnings and labour costs in the EU. These data include all forms of employee compensation (including private pension contributions, benefits-in-kind etc) in all sectors of the economy, and are thus more broadly based than figures for manufacturing earnings. Table 3 presents figures for average earnings and labour costs in 14 EU member states in 2002 prepared by NESC on the basis of Eurostat data. The figures indicate that, across the economy as a whole, earnings in Ireland were the third highest in the European Union. Irish earnings were over twenty per cent higher than those in countries such as Germany, Sweden, the Netherlands, and France, traditionally seen as high-wage economies. They were 50 per cent higher than earnings in Italy and two-thirds higher than earnings in Spain. Gross labour costs in Ireland were the fifth highest in the European Union but, because of lower than average employer social security contributions in Ireland and other factors, the gap between Irish labour costs and those in the majority of other member states was significantly smaller than the earnings gap.

Table 3: Average Employee Earnings and Labour Costs in EU 2002

Country	Average Employee Earnings €	Gross Labour Costs €
Luxembourg	57,580	62,572
Denmark	36,299	38,763
Ireland	33,273	35,644
United Kingdom	32,349	37,687
Belgium	31,202	41,547
Austria	27,294	34,340
Germany	26,651	33,010
Sweden	26,311	35,323
Finland	26,207	33,109
Netherlands	26,160	32,640
France	26,111	35,599
Italy	21,781	30,030
Spain	19,929	25,108
Greece	15,925	20,496
Portugal	n/a	n/a

Source: National Economic and Social Council. 2003. **Investment in Quality: Services, Inclusion and Enterprise**, table 6.5.

Figure 7: Euro Dollar and Sterling Exchange Rate 1999-2003



Source: European Central Bank.

Exchange Rates

2.32 The deteriorating competitive position of some sectors of the Irish economy from 2000 was masked for a time by favourable exchange rate trends. Over the three years from 1999 to 2001, the dollar appreciated by over a quarter against the euro while sterling appreciated by around one-eighth. Since the start of 2002, however, these trends have been reversed as the euro has strengthened appreciably against both currencies; figure 7 charts the exchange rate trends over the period from January 1999 to April 2003. Over the year to April 2003, the euro appreciated by almost one-quarter against the US dollar. This effectively brought about a deterioration of close to 25 per cent in the price competitiveness of the Irish subsidiaries of US firms relative to that of their American operations. It has had a similar impact on the price competitiveness of Irish firms selling onto US markets, including the sizeable number of indigenous software companies which have worked to develop markets in the US in recent years. In more recent months, sterling has also depreciated significantly against the euro. Over the year to April 2003, the euro rose in value by almost 12 per cent against sterling, adding to the competitive difficulties faced by indigenous manufacturing firms on both the home and British markets as well as by businesses in traded services such as tourism. In May 2003, the euro rose by a further 10 per cent against the dollar and 5 per cent against sterling, hitting record highs against

both currencies. While the euro has since fallen somewhat against the dollar and to a lesser extent sterling, it remains at significantly higher levels than those prevailing from 2000 to mid-2002. This will create undoubted difficulties for many Irish enterprises, in the short-term at least, and, in a context of rising domestic costs, almost certainly have a negative impact on employment.

Non-Labour Costs

2.33 The enterprise sector has also been affected by rising non-wage costs in a number of areas. This applies particularly to insurance costs which have risen sharply in recent years. A survey of over 200 companies undertaken by IBEC in mid-2002 showed that the cost of employers' and public liability insurance had doubled on average between 1999 and 2002.[20] In 2002, the general increase in premiums was in the region of 60 per cent, with increases in the region of 100 per cent sought in some cases. Almost half of respondent companies reported that rising insurance costs had caused trading difficulties, with almost one-fifth of businesses describing these difficulties as major. Surveys undertaken by ISME found that insurance costs among respondent member companies increased by 52 per cent in 2003, 71 per cent in 2002, and 50 per cent in 2001.[21] The compound increase over the period from 2001 to 2003 was 290 per cent so that a business paying €10,000 in insurance premia in 2001 faced charges of €39,000 in 2003. One-in-five ISME member companies indicated in 2002 that they had reduced their employment levels as a result of insurance increases. 2002 and early 2003 also saw increases in electricity, fuel, postage and other costs. As part of its overall remit to assess factors relevant to competitiveness, the National Competitiveness Council monitors trends in non-wage costs. In its report for 2002, the Council found that, though the picture was mixed with Ireland faring well on some indicators and less well on others, overall Ireland's comparative ranking in terms of non-labour costs had deteriorated.[22]

Congestion

2.34 The increased economic activity and employment of the past decade have given rise to a growing problem of traffic congestion throughout the country but particularly in Dublin and other major urban centres. The number of new private cars registered for the first time almost quadrupled from 60,792 in 1993 to 225,269 in 2000. Estimates of the cost of congestion range from 2 to 8 per cent of GDP. Its practical effects include added costs for business, increased travel-to-work times for employees, and the impairment of the efficient functioning of the economy in a wide variety of ways. A survey of 180 firms by IBEC found that 85 per cent nationally

[20] IBEC. **Insurance Survey Results,** 1 October 2002.
[21] ISME. 27 December 2002. **End of Year Statement**, & 2 April 2003, 'Insurance Costs Continue to Rise'.
[22] National Competitiveness Council. 2002. **Annual Competitiveness Report 2002,** pp. 13-16.

and over 90 per cent in Dublin reported that traffic congestion had an adverse impact on their business.[23] The most significant impacts were, first, on delivery scheduling and haulage costs with 87 per cent of respondent firms indicating a negative effect on these aspects of their operations. The other main impact was on personnel performance and costs. Table 4 outlines the findings of the survey in this area.

Table 4: % of IBEC Member Firms Reporting Adverse Impact of Traffic Congestion on Staffing Issues

	Punctuality	Labour Costs	Recruitment	Turnover	Absenteeism
Dublin	94	83	72	69	62
Rest of Country	68	51	35	30	29

Source: IBEC.

2.35 The evidence suggests that the problem of traffic congestion is a good deal worse in Dublin than in most other major cities. The Small Firms Association has published data on the average speed of business deliveries for specified journeys in eight capital cities, including Dublin, London, Paris, Berlin, Tokyo, and Washington DC.[24] Ireland was ranked last of the eight countries with an average delivery time of 57 minutes followed by Berlin at 53 minutes. All of the other cities surveyed had far lower average delivery times, ranging from 13 minutes in London to 18 minutes in Washington DC. In summary, therefore, there is little doubt that the rise in congestion in recent years, and the infrastructural deficits of which it is both cause and effect, has had an adverse impact on the business sector, and impinges negatively on efforts both to attract new overseas enterprise and to promote new indigenous enterprise.

Ireland's International Competitive Standing

2.36 The rise in wage and non-wage costs in recent years and the growing evidence of congestion and infrastructural inadequacies have affected Ireland's competitive standing internationally. Two main comparative studies are published annually which assess national competitiveness on a range of quantitative indicators supplemented by surveys of leading business personnel — the IMD World Competitiveness Yearbook and the World Economic Forum's Global Competitiveness Report. Following steady improvements in the late 1990s, Ireland's competitiveness ranking has slipped in both studies since 2000. Our position in the World Competitiveness Yearbook rankings of countries

[23] IBEC. 10 April 2002. **Traffic Congestion Survey**.
[24] Small Firms Association 26 February 2001. 'Speed of Business Deliveries in Dublin'.

with a population of less than 20 million has fallen from 5th in 2000 to 11th in 2003, while that in the Global Competitiveness Report declined from 11th in 2001 to 24th in 2002.[25] While specific aspects of the methodology or results of these studies can be queried, there is little doubt that these findings are broadly in line with business evaluations at home and abroad of recent trends in Irish competitiveness.

[25] World Economic Forum. 2002. **Global Competitiveness Report 2002-2003**, chapter 1.1. IMD. 2003. 'World Competitiveness Scoreboard 2003' in **World Competitiveness Yearbook 2003.**

Review of Industrial Performance and Policy 2003

Part II

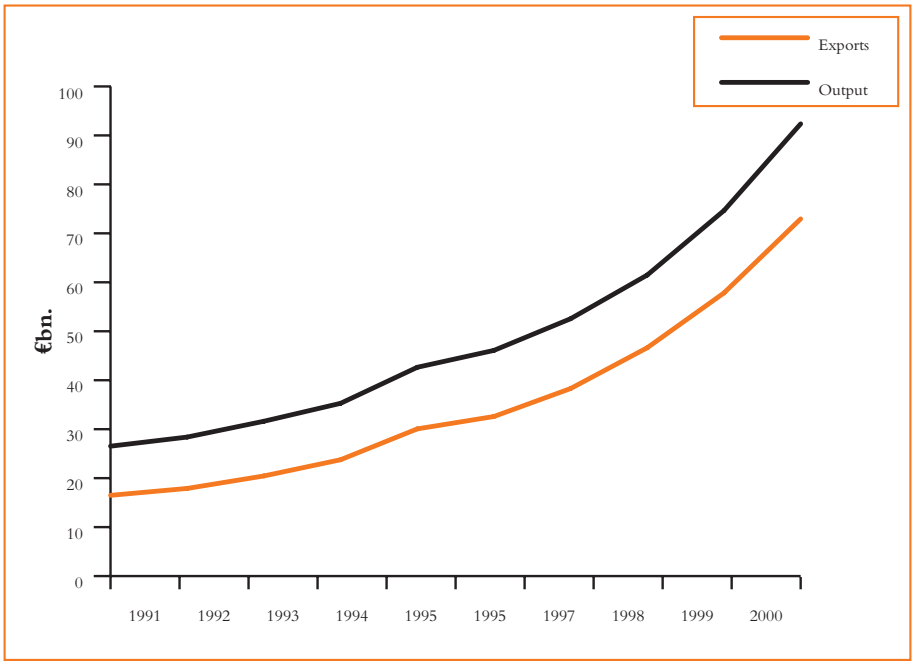
Chapter 3 — The Enterprise Sector in Ireland

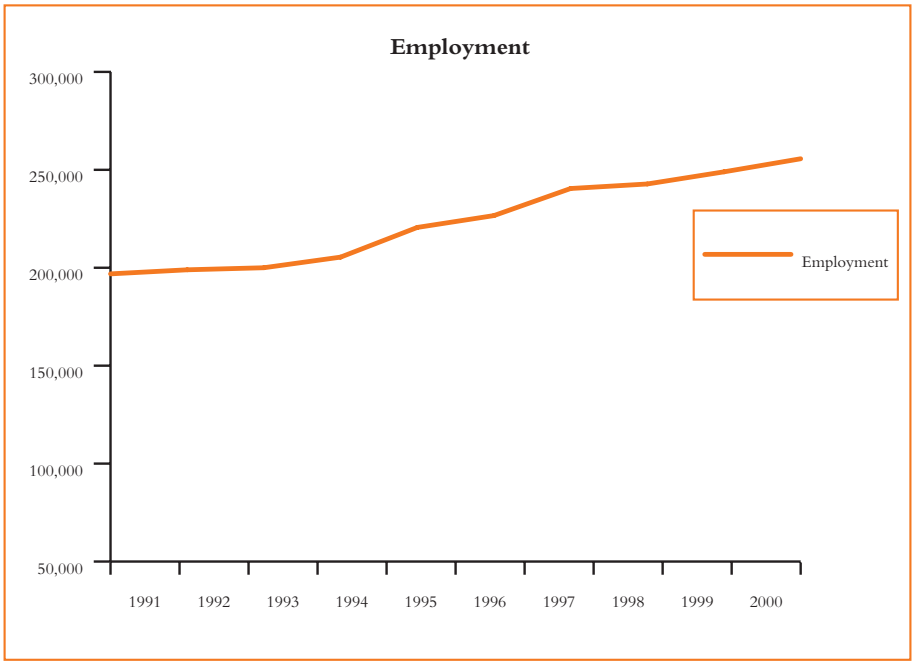
I Overview

3.1 The enterprise sector in Ireland comprises a mix of businesses of different size, origin, and complexity engaged in a diverse range of activities. For the purposes of enterprise policy, two distinctions are of particular importance. First, that between enterprises producing internationally traded goods and services — those that can be provided to buyers in one country by firms in another — and enterprises engaged in locally traded services — those provided by firms or other bodies within national boundaries. International trade was once almost exclusively confined to goods but, due to factors such as improved communications and greater liberalisation, trade in services has increased significantly over the past two decades. IDA Ireland and Enterprise Ireland focus their efforts on export-oriented enterprise in manufacturing and international services, while other support structures such as the City and County Enterprise Boards serve small and micro-enterprises engaged in locally traded activities. The second significant distinction is between Irish-owned and foreign-owned enterprise. Because of the distinctive profiles and needs of indigenous and overseas enterprise, dedicated support structures have been in place for each since 1992. IDA Ireland is charged with the development of foreign-owned enterprise, while Enterprise Ireland, Shannon Development and Udaras na Gaeltachta have responsibility for the development of domestically-owned enterprise. This chapter surveys in turn (i) foreign-owned enterprise in manufacturing and international services; (ii) Irish-owned enterprise in manufacturing and international services; and (iii) indigenous enterprise in locally traded services. Sectors such as food and tourism that are the primary responsibility of departments and bodies other than the Department of Enterprise, Trade and Employment and the development agencies under its aegis are not discussed in detail in this Review.

3.2 Before considering the main constituents of the enterprise sector, it is worth noting a number of key aggregate trends in manufacturing and international services over the past decade. Three developments stand out: (i) the very strong growth in manufacturing output; (ii) the concentration of output growth in foreign-owned high-technology sectors and the sharp consequential rise in their share of total manufacturing output and, to a lesser extent, employment; and (iii) the sustained increase in employment and output in both foreign and Irish-owned enterprise in internationally traded services. Figure 8 charts the growth in manufacturing output, exports, and employment from 1991 to 2000. Output rose more than three-fold from around €26bn. in 1991 to €92bn. in 2000. This was, by a wide margin, the highest rate of output growth in the European Union. Manufacturing employment also grew significantly in these years, increasing from 196,878 in 1991 to 255,644 in 2000, a rise of thirty per cent.

Figure 8: Output, Exports and Employment in Manufacturing Local Units 1991-2000





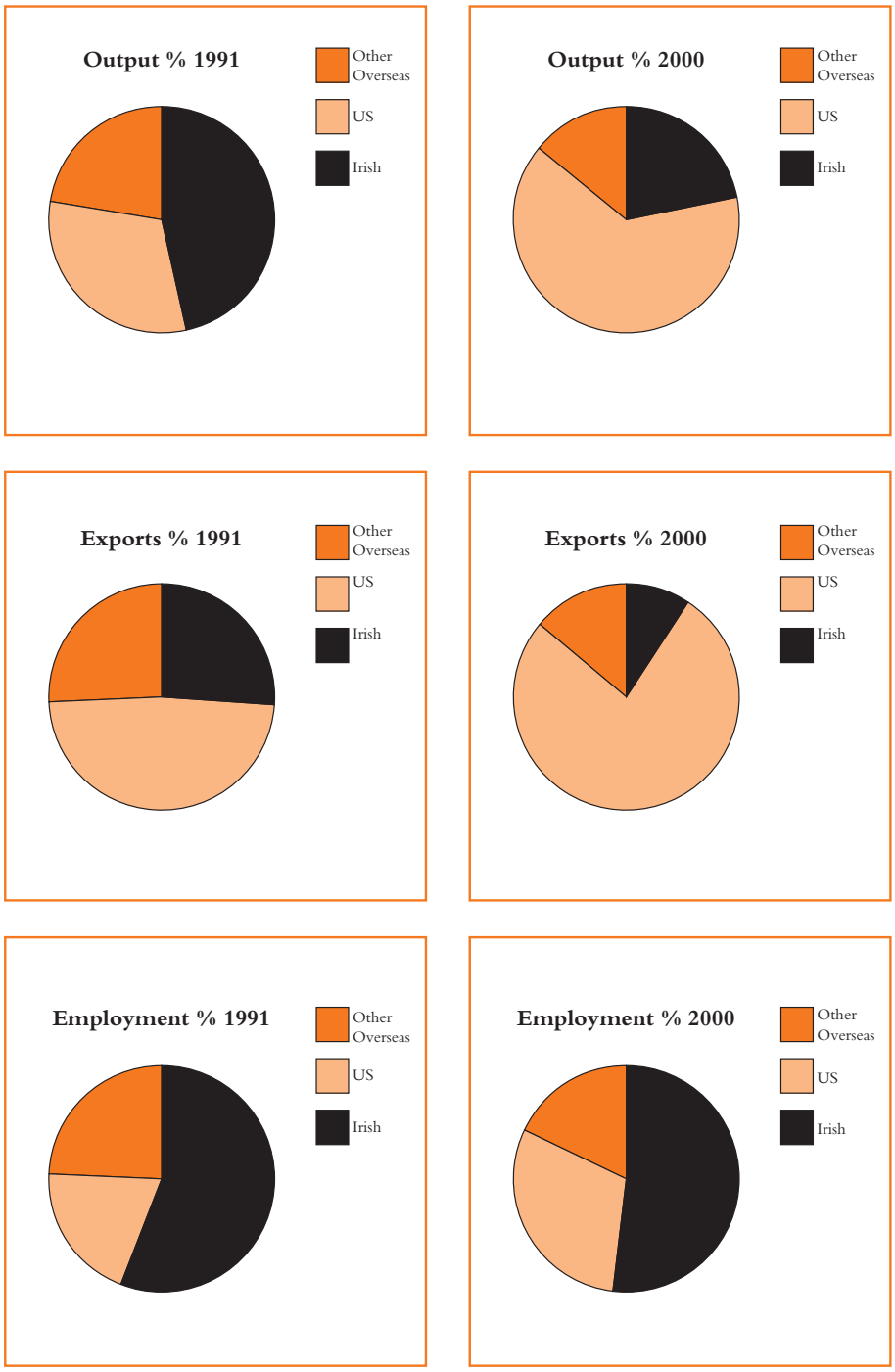
Source: CSO Census of Industrial Production 1991-2000.

3.3 Though output continued to rise, if at a slower rate in 2001 and 2002, industrial employment fell, on a seasonally adjusted basis, by 26,000, or just over 10 ten per cent, from a peak of 255,200 in March 2001 to a preliminary estimate of 229,200 in March 2003. This decline was most heavily concentrated in the electrical and optical machinery sector in which employment fell by 17,000 over the period. The aggregate rise in output, however, concealed major sectoral variations. Total manufacturing output is estimated to have increased by 8.4 per cent in 2002, compared with 10.2 per cent in 2001. Output growth in 2001-2002 was driven by the chemicals sector which recorded an increase of almost 24 per cent in output in 2002. Excluding the chemicals sector, manufacturing output declined by just over 4 per cent in 2002. In the ICT sector, output declined by over 5 per cent in 2002. Output in the food and drink sector grew by 3.7 per cent as the industry recovered from the foot-and-mouth outbreak and other difficulties experienced in 2001. There was an aggregate decline of 7.6 per cent in other sectors of manufacturing industry. Monthly or even quarterly figures for industrial production need to be treated with caution, but those for the first quarter of 2003 show continued sluggishness with output rising in the first two months followed by a decline in March. Data on industrial turnover — which measure the value of sales and not just the volume of production — showed that turnover in the first quarter of 2003 was down 6.4 per cent on the preceding three months, while that in March was 12.4 per cent lower than in March 2002. This is an indication of the increased intensity of the price competition now faced by Irish manufacturers.

3.4 Over the past three decades, foreign-owned firms in sectors such as electronics and chemicals have assumed an increasingly prominent position in Ireland's industrial structure, and this trend intensified during the 1990s. Figure 9 shows the share of manufacturing output, exports, and employment in indigenous, US and other overseas firms in 1991 and 2000. Over this period, the output share of foreign-owned firms grew from 53 to 78 per cent; their share of exports increased from 74 to 91 per cent; while their share of total employment rose more modestly from 44 to 48 per cent, having fallen from 49 per cent in 1999. The expansion of the overseas sector was dominated by US firms. Between 1991 and 2000, their share of output rose from 31 to 64 per cent; their share of exports grew from 48 to 77 per cent; and their share of employment increased from 20 to 30 per cent.

3.5 The rise in output and employment over the past decade was also strongly concentrated in the chemicals and ICT (information and communication technology) sectors. Figure 10 charts the contribution of a number of sectors to total industrial output and employment growth from 1995 to 2000. The chemicals and ICT sectors accounted for 90 per cent of the increase in both output and employment over the period, with most of the output growth occurring in chemicals firms and most of the employment growth occurring in ICT firms. The chemicals sector in Ireland comprises roughly 200 firms,

Figure 9: Output, Exports, Employment in Irish, US and other Overseas-Owned Manufacturing Units

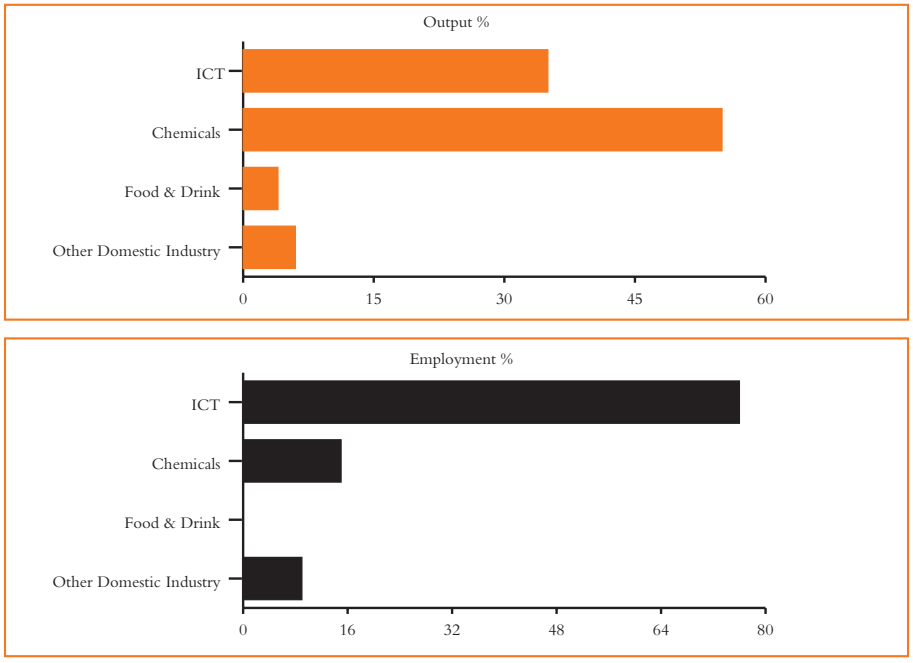


Source CSO. Census of Industrial Production 1991 and 2000.

and had a workforce of around 23,000 employees in 2000. It has two main sub-sectors, pharmaceuticals (proprietary, generic, and bulk-active ingredients), and specialty chemicals. The pharmaceutical sub-sector is the larger of the two, accounting for around two-thirds of total employment in the sector. The specialty chemicals sub-sector manufactures finished products such as adhesives, coatings, printing and photographic materials; additives for food and other industries; and intermediate products for the pharmaceutical industry. There is also a sizeable medical equipment industry which employed approximately 13,000 people in 2000 and is sometimes grouped with the pharmaceuticals industry as part of a broader healthcare sector. The ICT sector in Ireland has four main segments: computer assembly; the manufacture of electronic components; the manufacture of telecommunications equipment; and software. According to data from the Census of Industrial Production 2000, there were around 80 enterprises employing around 20,000 workers engaged in computer assembly; around 35 firms employing 9,500 engaged in the manufacture of electronic components; and around 15 firms employing 4,500 workers engaged in the manufacture of communications equipment. Estimates from the National Software Directorate suggest that there were close to 800 firms in the software industry in 2000 producing packaged software or supplying software services and with a total employment of around 30,000. Since 2000, employment in the ICT sector is estimated to have declined by over 15,000.

Figure 10: Contribution of Selected Sectors to Output and Employment Growth 1995-2000

% Contribution to Output and Employment Growth 1995-2000



Source: Central Bank, *Quarterly Bulletin Autumn 2002*, table 1.

3.6 The rapid growth of the chemical and ICT sectors has had a marked impact on Irish industrial structure. Table 5 outlines the sectoral composition of manufacturing output and employment in 1991 and 2000. The share of total output accounted for by the electrical and optical equipment and chemicals sectors virtually doubled from just over 30 per cent in 1991 to 60 per cent in 2000, while their employment share rose from 24 per cent to 36 per cent. This trend has continued, with provisional estimates for 2001 showing that the two sectors were responsible for over 70 per cent of output and around 40 per cent of employment. The main decline in output share during the 1990s occurred in the food, drink and tobacco sector, once the dominant sector in Irish manufacturing; its share of output halved from 37 per cent in 1991 to 17 per cent in 1999, though its employment share declined far less sharply. The three largest sectors — chemicals, electrical and optical, and food and beverages — accounted for over three-quarters of total manufacturing output in 2000, a relatively high degree of industrial concentration. The only other sector whose output share exceeded 10 per cent in 2000 was printing and publishing. This sector grew strongly over the past decade, driven by the expansion of packaged software. As table 4 shows, traditional sectors dominated by indigenous firms continue to account for a substantially greater share of employment than output. Over sixty per cent of manufacturing employees in 2000 were in sectors such as food and beverages, paper and publishing, metals and metal products, machinery and equipment, and other manufacturing that are generally characterised as low-to-medium technology activities.

Table 5: Structure of Manufacturing Output and Employment 1991 and 2000

	1991		2000	
	Output %	**Employment %**	**Output %**	**Employment %**
Food, Drink and Tobacco	37.4	22.7	17.2	18.8
Electrical and optical equipment	18.4	16.5	33.8	27.0
Chemicals	12.8	7.5	26.3	9.1
Clothing, textiles, footwear, leather	3.9	11.3	0.9	4.3
Paper and printing	7.9	8.5	10.8	9.3
Metals, machinery and equipment	7.7	12.8	4.0	12.2
Other	12.0	20.7	7.0	19.3

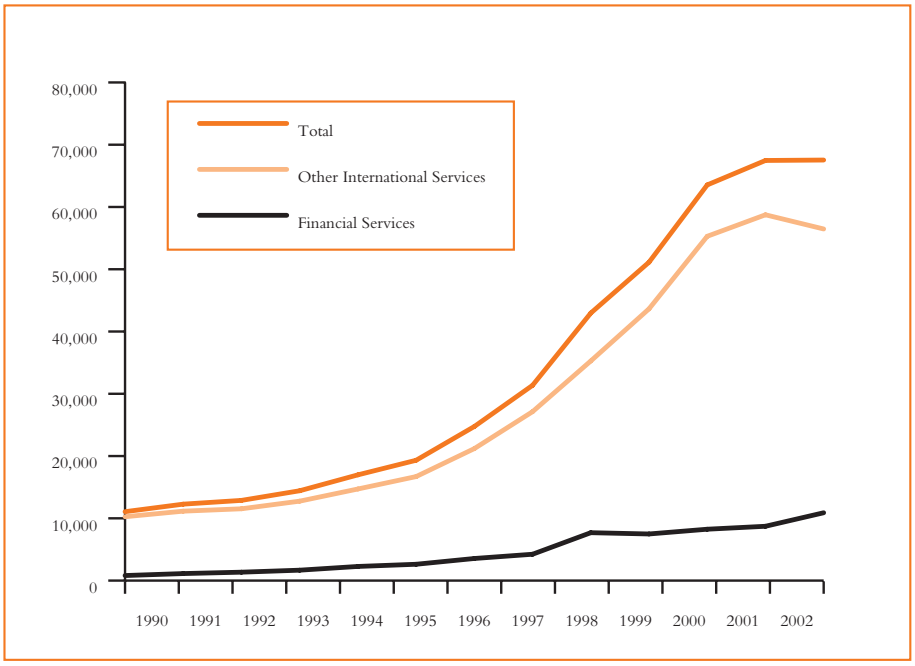
Source: CSO Census of Industrial Production 1991 & 2000.

3.7 The third noteworthy development in the enterprise sector over the past decade has been the sustained growth of the international and financial services sector. Figure 11 charts the six-fold rise in employment from around 11,000 in 1990 to 69,000 in 2001. Employment in internationally traded service activities such as software, telemarketing, and shared corporate services rose from 10,255 in 1990 to 58,476 in 2001, before decreasing by over 2,000 in 2002 in the first reversal of more than a decade of unbroken growth. Under the impetus provided by the International Financial Services Centre, employment in financial services grew tenfold from under 1,000 in 1990 to almost 11,000 in 2002. Around 63 per cent of total employment in international and financial services in 2001 was in foreign-owned firms. This was only slightly up on their employment share in 1990 with Irish-owned firms more or less matching the rate of job growth among overseas enterprises over the decade. Output data series for international services are less readily available, partly because of the difficulties in measuring services output. The most recent Forfás survey of business impact estimates that total sales in international service companies supported by the enterprise development agencies amounted to €17.5bn. in 2000, with over three-quarters of this figure accounted for by foreign-owned firms. Total service exports in 2001 were €23.8bn, up significantly from €20bn. in 2000, with foreign-owned firms accounting for 88 per cent of service exports in the latter year. Figure 12 outlines the composition of services exports in 2000. Computer services, mainly software delivered electronically, accounted for almost one-third of total exports. The next largest contributors to service exports were other business services, tourism and travel, and financial services.

3.8 The manufacturing and international services sectors in Ireland underwent rapid expansion and development over the past decade; during the period from 1995 to 2000, the rate of change in the structure of the Irish manufacturing sector was the most rapid in the European Union.[1] The results of this process of adaptation have been positive for the Irish economy. As figure 13 shows, the high-tech share of manufacturing value-added in Ireland was the highest in the European Union in 1999 and on a par with the United States. Most of the leading global companies in the ICT and chemicals/pharmaceuticals sectors now have operations in Ireland. In software, Ireland has become the European manufacturing and distribution centre for many of the world's leading firms, accounting for over 40 per cent of all packaged software and 60 per cent of all business software sold in Europe. In 2000, Ireland was also the leading global exporter of software services.[2] On a per capita basis, total Irish services exports were the highest in the European Union in 2001 and, after Hong Kong and Singapore, the third highest in the world. The strong performance and real progress to which these figures attest should not deflect attention however from significant underlying weaknesses in both the overseas and indigenous enterprise sectors. These are discussed in the next sections.

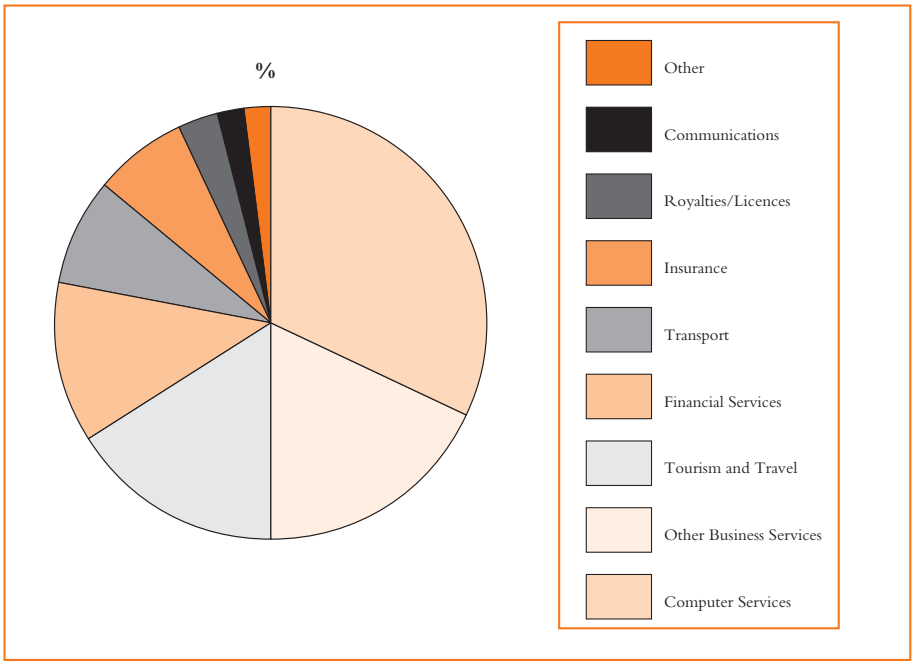
[1] Eurostat. 2002. **The EU's Business Economy,** p. 31.
[2] **OECD Information Technology Outlook 2002:** pp 6-7.

Figure 11: Employment in International and Financial Services 1990-2002



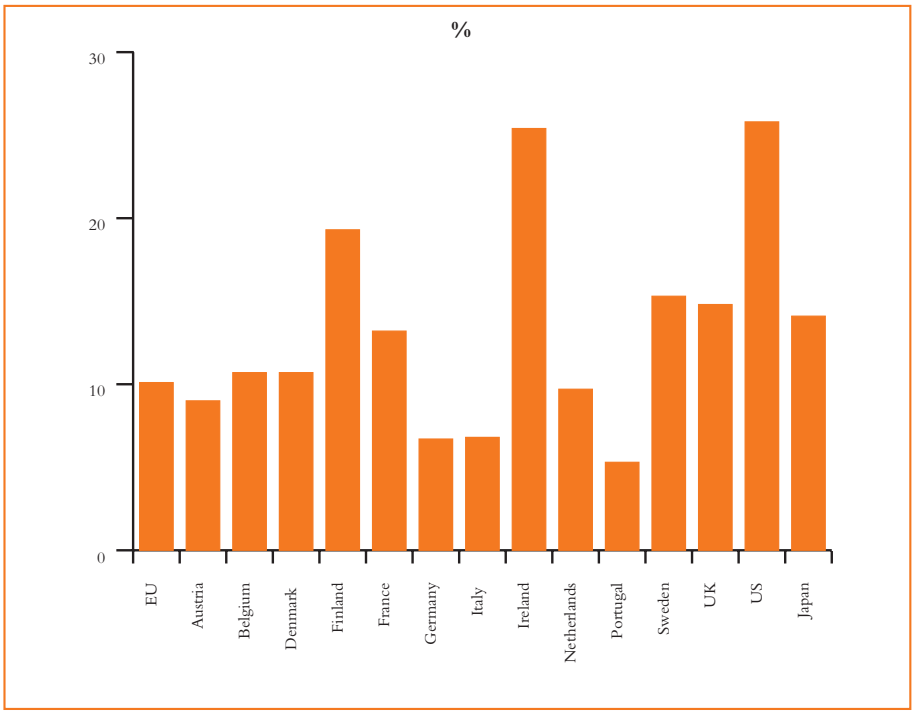
Source: Forfás.

Figure 12: Composition of Service Exports 2000



Source CSO.

Figure 13: High-Tech Share of Manufacturing Value-Added 1999



Source: European Commission. *European Innovation Scoreboard 2002*.

II Foreign-Owned Enterprise in Manufacturing and International Services

> In the late 1980s and early 1990s, even the most ardent supporters of branch plant industry would have conceded that they were 'second best', and that industrial policy should concentrate on the development of indigenous industry ... But renewed success with multinational investors in the mid-1990s would again temper that view.[3]
>
> Cormac O'Grada, Associate Professor of Economics, UCD

3.9 Foreign-owned enterprises play an important role in the Irish economy, accounting for around three-quarters of manufacturing output and nine-tenths of exports, and a little over half of total employment in manufacturing and international services. The OECD and other independent observers have generally concluded that the presence and growth of a large, high-technology, export-oriented foreign-owned sector was the single most important factor in Ireland's economic success over the past decade. The development of indigenous enterprise remains a core objective of enterprise policy and, as this chapter will show, significant progress was made in this area over the past decade.

[3] O'Gráda, C. 1997. **A Rocky Road: the Irish Economy since Independence** (Manchester: Manchester University Press), p. 122.

In an ever more globalised economic environment, the key distinction, as the Culliton Group observed, is less that of the national origin of firms operating in Ireland than that of the quality of the enterprise and employment they bring to the Irish economy and the extent to which they are embedded in this country. The profile of the foreign-owned sector that follows, therefore, focuses mainly on these aspects of the operation of overseas enterprise.

3.10 In tandem with the increased presence of foreign-owned firms, sectoral concentration has also become a more pronounced feature of Irish manufacturing industry. Though the increased domination of our manufacturing base by the chemicals and ICT sectors carries risks, these must be seen in context. A small domestic market such as ours will find it difficult to support a highly differentiated industrial base and will tend to specialise in a limited number of sectors. Sectoral concentration is not a new feature of the Irish economy; as late as 1960, food and drink accounted for three-quarters of Irish exports. The modernisation of the Irish economy has also substantially lessened the vulnerability that resulted from our past over-dependence on the British market. While 75 per cent of exports went to Britain up to the 1960s, no single national market now accounts for more than 25 per cent of Irish exports.

Profile of Foreign-Owned Enterprise in Ireland

3.11 The foreign-owned sector in Ireland underwent a major evolution over the past two decades. Leading global companies in the field of information technology such as Intel, Microsoft, and IBM established operations here. The chemicals/pharmaceuticals sector expanded rapidly, while an advanced biotechnology industry is now emerging. Major new fields of activity developed in the areas of international and financial services. These three sectors have increasingly come to dominate foreign-owned enterprise in Ireland; the combined employment share of the chemicals, metals and engineering, and international services sectors increased from 44 per cent in 1980 to 55 per cent in 1990 to 78 per cent in 2000.

3.12 Though few dispute the contribution that foreign-owned firms have made to the Irish economy, concerns continue to be expressed that their undertakings here consist mainly of branch plants carrying out routine assembly-type operations. While the evidence is not conclusive, the available data on the composition of the workforce in foreign-owned firms do not support any such blanket characterisation of overseas enterprise. Table 6 sets out the proportion of technical and administrative staff in different sectors of manufacturing industry in 2000. In the modern sectors in which foreign-owned firms accounted for three-quarters or more of employees (chemicals; office machinery and computers; radio and communication equipment, and medical and precision instruments), the skill level of the workforce was significantly higher than in traditional sectors in which Irish firms preponderate. Between 19 and 29 per cent of

Table 6: Composition of Employment in Selected Manufacturing Sectors 2000		
Sector	**% Employees in foreign-owned firms**	**% Employees in administrative/ technical jobs**
Chemicals & chemical products	77.0	26.1
Office machinery & computers	88.3	28.8
Electrical machinery & apparatus	62.3	16.8
Radio, tv & communication equipment	85.3	23.8
Medical, precision etc instruments	84.7	18.6
Food, drink, tobacco	27.4	13.5
Textiles	34.5	10.1
Wood and wood products	17.8	10.2
Paper, publishing, printing	31.3	18.0
Metals & fabricated metal products	21.0	11.3
Non-metallic mineral products	14.2	12.9
Machinery & equipment	44.7	13.5
Transport equipment	55.8	12.3
Other manufacturing	25.5	10.4
Total	48.1	16.8
Source: CSO Census of Industrial Production 2000.		

workers in sectors in which overseas firms were predominant were in technical or administrative jobs compared with between 10 and 14 per cent in most of the sectors dominated by indigenous firms. Educational levels were also markedly higher in modern sectors in which foreign firms account for the bulk of the workforce.[4] Over one-in-five employees in the chemicals sector and around one-in-six in the electrical and optical equipment sector in 2000 had a university-level education compared with fewer than one-in-ten workers in most other sectors. As the higher skill and educational levels of their workforce would suggest, wages were also higher in foreign-owned manufacturing firms. In 2000, average wage and salary payments in overseas firms (€28,009) were almost 25 per cent higher than in indigenous concerns (€22,620). Foreign-owned firms

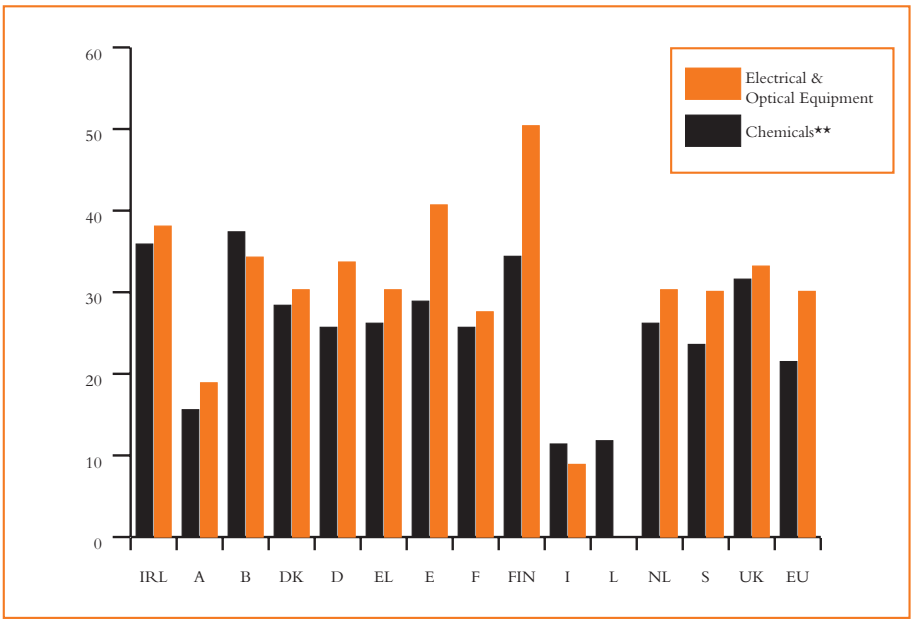
[4] Based on unpublished data provided by the CSO from the Quarterly National Household Survey on persons at work classified by economic sector and highest educational attainment.

also devoted greater resources to training and staff development. In 2000, overseas manufacturing enterprises spent an average of €900 per employee, or approximately 2.5 per cent of total payroll costs, on training compared to an average of €400, or 1.5 per cent of payroll costs, by Irish firms.[5] While the dominant influence on these disparities may be that of sector rather than country of origin, the evidence suggests therefore that a sizeable proportion of employment in foreign-owned firms is not routine or low-skilled in nature.

3.13 The limited cross-national data available on workforce composition and educational attainment in high-tech sectors in Ireland and other countries do not give a clear-cut picture of our relative standing. Figure 14 sets out the proportion of employees in the chemicals, and electrical and optical equipment sectors with higher educational qualifications in Ireland and other EU countries. In the chemicals sector, the proportion of Irish workers with third-level qualifications was the second highest of the fourteen countries surveyed and was substantially above the EU average. In the electrical and optical equipment sector, the proportion with higher qualifications in Ireland was the third highest in the EU, though the gap with other countries was generally smaller than in the case of pharmaceuticals. Ireland also lagged well behind the best performing member state, Finland. Though the chemicals and ICT sectors in Ireland fare reasonably well on these comparative indicators, this may partly reflect the fact that the industries concerned were established relatively recently in Ireland and have a younger workforce. A different picture of the relative sophistication of foreign-owned plants in Ireland is conveyed by the data in figure 15[6] which show the proportion of employees categorised as operatives in the chemicals, pharmaceuticals, electrical and optical equipment, and office machinery and equipment sectors in Ireland and Britain. The operative share of employment was higher in Ireland in all four industries, suggesting that the Irish high-tech sector is less advanced in skill and value terms than its counterpart in Britain.

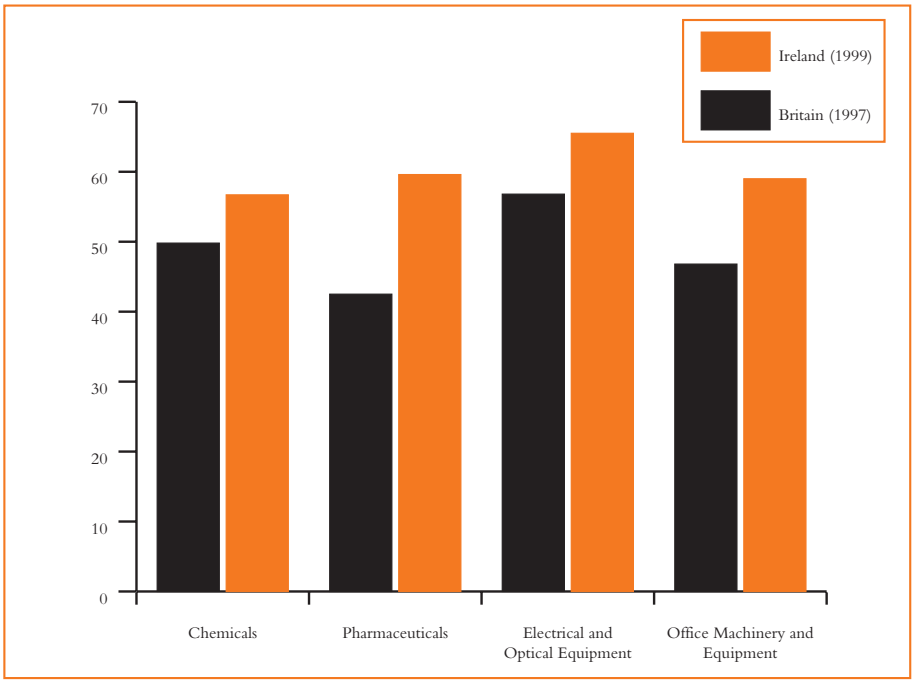
[5] Expert Group on Future Skills Needs. 2000. **Report in In-Company Training**.
[6] O'Gráda, C. 2002. 'Is the Celtic Tiger a Paper Tiger?' in **ESRI Quarterly Commentary Spring 2002,** table 2.

Figure 14: % of Employees in High-Tech Sectors with Higher Education*



* 1997 for IRL and EU average; 2000 in all other cases.
**includes rubber and plastics.
Sources: Eurostat 2000. *Enterprises in Europe*, tables 6.1 and 11.5.

Figure 15: Operatives as % of Total Employment in High-Tech Sectors in Britain and Ireland



Source: O'Grada, 2002 and CSO, *Census of Industrial Production 1999*.

Strategic Functions in Foreign-Owned Enterprise

3.14 As well as looking at the composition and characteristics of the workforce in foreign-owned industry, it is necessary to survey the enterprises themselves and to assess the extent to which they are engaged in the kind of high value, high innovation activities now prioritised by enterprise policy. There is limited direct data on this question, but the bi-annual surveys of business research and development (R&D) expenditure undertaken by Forfás provide extensive information on this key business function. Table 7 outlines trends in business expenditure on research and development [BERD] by foreign-owned firms from 1993 to 2001.

Table 7: BERD by Foreign-Owned Firms 1993-2001

	1993	1995	1997	1999	2001
€ million	228	311	400	500	598
% change from previous period — current prices		+36	+29	+25	+20
% change from previous period — constant 2001 prices		+32	+29	+25	+11

Source: Forfás.

Research spending by overseas companies rose from €228m. in 1993 to €598m. in 2001, more than doubling in real terms. The rate of growth in R&D expenditure was markedly higher, however, in the earlier part of the period. Between 1999 and 2001, spending rose by a little over 5 per cent per annum in constant price terms compared with annual increases of around 15 per cent between 1993 and 1997.

3.15 As outlined earlier, the period from 1993 to 2001 saw very strong output growth among foreign-owned firms. Table 8 gives details of R&D spending in the main sectors for overseas companies in both money terms and as a proportion of output in 1993, 1997, and 2001. Despite the substantial rise in research spending in these years, it lagged the growth in output. In manufacturing as a whole, the share of output devoted to research and development by foreign-owned firms halved from 1.2 per cent in 1993 to 0.6 per cent in 2001. The decline was most marked in the pharmaceuticals and chemicals sectors; in the former, the proportion of output spent on R&D declined from 7.2 per cent in 1993 to just 1.2 per cent in 2001, while in chemicals it fell from 0.4 to 0.1 per cent over the same period. In both sectors, R&D spending in money terms was lower in 2001 than in 1999, an unwelcome development in view of their importance to the Irish economy. In electronics, spending on R&D continued to grow between 1993 and 2001, albeit at a slower rate in the second half of the period, but did not match the rise in output. In the medical and precision instruments sector, expenditure on research

almost doubled between 1999 and 2001, though the share of output accounted for by this expenditure remained lower than in the period from 1993 to 1997. The most dramatic rise in research activity occurred in software and other services in which expenditure increased more than tenfold from €11.3m. in 1993 to €128.4m. in 2001. Almost all of this increase occurred among firms in software and computer services.

3.16 Comparative data underline the relatively low level of R&D undertaken by foreign-owned firms in Ireland. Table 9 gives details of research intensity — expenditure on R&D as a proportion of output — among foreign and Irish-owned firms in the main R&D performing sectors in Ireland in 2001, and compares it with the OECD average and with the performance of the best performing OECD economy in 1997, the most recent year for which comparative figures are available. As can be seen, R&D spending by overseas firms in the electrical and electronic equipment sector in Ireland amounted to just 1.2 per cent of gross output compared with an OECD average of 5.6 per cent and a figure of 9.8 per cent in the best performing OECD member country, Finland. In pharmaceuticals, the share of output by foreign companies operating in Ireland was less than one-quarter of the OECD average; it lagged the best-performing OECD member state, Sweden, by over twenty percentage points. As table 7 also shows, the share of output devoted to R&D by foreign-owned companies in high-technology sectors and in manufacturing as a whole was lower than that in indigenous firms. In the electrical and electronic equipment sector, the share of total output devoted to R&D by Irish-owned businesses was over three times greater than that of overseas firms, while in the pharmaceutical sector it was almost twice as high. It is relevant to point out, however, that the performance of foreign-owned firms on this particular measure of research intensity is influenced by their very high output levels. An alternative measure, such as R&D expenditure per employee, shows that foreign-owned firms in all sectors had a higher level of research expenditure than their Irish-owned counterparts. In manufacturing and international services as a whole, overseas firms spent €123,889 per full-time equivalent employee on R&D in 2001 compared with a figure of €74,306 in indigenous firms, a gap of around 40 per cent.

3.17 While this qualification needs to be kept in mind, it does not substantially alter the overall picture of the relatively low research orientation of the foreign-owned sector in Ireland. In all, sixty-five overseas firms spent €1.3m (IR£1m) on R&D in 2001, up from fifty-five in 1999 and fifty in 1997. This comprised approximately five per cent of the total number of foreign-owned enterprises in manufacturing and international services supported by the enterprise agencies. The majority of foreign-owned firms in Ireland are in knowledge-intensive, high-tech sectors, and their output is based on high levels of sophisticated research and development. All of the available evidence indicates however that, with a limited number of exceptions, this R&D is being carried out on a small scale, if at all, in Ireland.

Table 8: BERD by Foreign-Owned Firms by Sector 1993, 1997 and 2001

Sector	1993		1997		2001	
	€m	% of output	€m	% of output	€m	% of output
Electrical/electronic equipment	102.1	1.6	206.1	1.5	290.3	1.2
Pharmaceuticals	57.8	7.6	70.1	3.8	62.1	1.2
Medical/precision etc instruments	16.9	1.7	23.4	1.5	51.1	1.2
Chemicals	14.2	0.4	15.2	0.2	15.1	0.1
Total Manufacturing	216.2	1.0	362.2	1.0	464.8	0.6
Software/Computer & Other Services	11.3	n/a	37.9	n/a	133.2	n/a
Total Business Sector	227.5	n/a	400.1	n/a	598.0	n/a

Source: Forfás.

Table 9: R&D Expenditure By Sector as % of Gross Output in Ireland 2001 and OECD 1997

Sector	Irish Industry		OECD average	Best Performing Country
	Indigenous	Foreign		
Pharmaceuticals	2.3	1.2	11.5	22.6
Chemicals	0.4	0.1	3.2	N/A
Electrical/electronic equipment	4.2	1.2	5.6	9.8
Medical etc Instruments	1.8	1.2	7.0	N/A
Food, drink, tobacco	0.3	0.2	0.3	0.7
Total Manufacturing	0.8	0.6	2.4	3.7

Source: Forfás.

3.17 The scale of the discrepancy between Ireland's high-technology enterprise base and its knowledge base is evident from table 10. This shows the research intensity — R&D expenditure in manufacturing as a proportion of total manufacturing output — of fifteen advanced economies together with the high-technology share of their manufacturing exports. As can be seen, the high-tech share of exports in Ireland was greater than in any other country, a full ten percentage points higher than in the United States. Our research intensity however was, after Spain and Italy, the lowest of the fifteen countries surveyed and was no more than one-quarter to one-third of that in the more knowledge-intensive countries covered by the survey. These figures underline the validity of the recent observation by the Tánaiste and Minister for Enterprise, Trade and Employment that: 'In the past thirty years Ireland ... became very good at making products invented and developed by others ... To use an analogy from the entertainment industry, we have for thirty years been like the gifted musician playing the tune ...'[7] Though no comparable quantitative data exist on the extent to which other core business functions are carried out by foreign-owned firms in Ireland, the evidence suggests that, with some exceptions, these also are mainly undertaken outside Ireland. In the case of marketing, for example, the fact that the majority of the sales of foreign-owned firms are to other branches of their parent corporations has restricted the development of marketing expertise within Irish subsidiaries.

3.18 The relative absence of strategic functions such as R&D from the Irish operations of overseas firms lends support to the assessment of the National Microelectronics Research Centre that most foreign-owned firms in the ICT sector in Ireland are at a relatively low point in the value chain, using mature technology that has mainly been developed elsewhere.[8] The Chemical and Pharmaceutical Panel of Technology Foresight Ireland concluded that, although there was a significant level of original process development work in plants producing bulk active ingredients and some development of formulation and delivery systems, the pharmaceutical sub-sector carried out little or no drug discovery in Ireland. The Panel found similarly that the specialty chemicals sub-sector had invested little in R&D and that this was limiting its growth potential.[9] It should be borne in mind, however, that the foreign-owned sector is characterised by considerable diversity and that levels of innovation and sophistication differ markedly among enterprises. Within the computer assembly sector, for example, operations range from straightforward assembly to sophisticated integrated assembly and direct sales operations.[10] Manufacturing activity in the components sub-sector ranges from highly

[7] Address by Mary Harney T.D., Tánaiste and Minister for Enterprise, Trade and Employment to Opening Session of the Ireland-US Business Summit, Washington, 5 September 2002.
[8] National Microelectronics Research Centre. 2001. **Shaping the Future:** 9.
[9] Technology Foresight Ireland 2000. **Report from the Chemical and Pharmaceutical Panel:** 6.
[10] Bradley, J. 2001. 'The Computer Sector in Irish Manufacturing', paper presented to the Statistical and Social Inquiry Society of Ireland.

advanced microchip processors to relatively basic components. As outlined in chapter 5, IDA Ireland is committed to assisting foreign-owned enterprises to add strategically important functions to their Irish operations and can point to a significant number of cases in which this has occurred to date. Achieving this progression is vital for the maintenance of high levels of employment and income over the long term. Building up the innovative capacity of the Irish enterprise sector, and encouraging multinational companies to base regional headquarters and key corporate functions here, would also help to generate a vital income stream for this country. In 2001, outflows from Ireland on royalties and related payments totalled almost €10bn., while inflows came to just €241m. — substantially down on the figure of €492m. recorded in 2000. There was a further outflow of just over €10bn. on miscellaneous business services, largely accounted for by payments from the Irish subsidiaries of multinational companies to their parent corporations or other subsidiaries for accounting, marketing, legal and general management functions and services.

Table 10: R&D Intensity and Export Specialisation in High-Technology Industries 1997-1999*

	R&D Intensity	Export Specialisation in High-Tech Industries
Canada	1.24	13.03
United States	1.24	38.30
Japan	3.18	30.73
Korea	1.29	34.15
Denmark	1.85	18.75
Finland	2.64	24.11
France	2.19	23.10
Germany	2.66	18.52
Italy	0.79	10.63
Netherlands	1.59	25.14
Norway	1.25	10.66
Spain	0.57	9.29
Sweden	3.85	27.00
United Kingdom	2.06	33.28
Ireland	0.80	49.20

* R&D intensity = R&D expenditure in manufacturing as a % of manufacturing output. High-technology industries = pharmaceuticals; office machinery and computers; radio television and communication equipment; medical, precision and optical instruments; & aircraft and spacecraft. Export specialisation = high-tech exports as a % of total manufacturing exports. Figures for Japan, Denmark, France, Spain, Sweden, and the United Kingdom refer to 1997; figures for the Netherlands and Norway refer to 1998. Figures for other countries refer to 1999.

Source: OECD. **Science, Technology and Industry Scoreboard 2001: Towards a Knowledge-Based Economy**, tables D.7.2.1. and D. 7.2.3.

Durability of Foreign-Owned Enterprise

3.19 There has been considerable flux among the population of foreign-owned enterprises over the past two decades. Between 1980 and 2000, for example, there were around 1,850 start-ups and 1,200 closures among grant-aided foreign enterprises. Table 11 presents data on survival rates among cohorts of grant-aided foreign and domestic firms that commenced operations between 1980 and 1984, 1985 and 1989, and 1990 and 1994 respectively. 34 per cent of foreign-owned firms that started up between 1980 and 1984 were still in existence in 2000 compared with 31 per cent of Irish firms. The differential in survival rates among foreign-owned and Irish-owned enterprises was greater in the two succeeding cohorts. 49 per cent of foreign-owned start-ups between 1985 and 1989 were still in existence in 2000 compared with 34 per cent of their Irish counterparts. Among firms that started between 1990 and 1994, 63 per cent of foreign-owned firms were still in existence in 2000 compared with 51 per cent of indigenous firms.

3.20 The stability of employment in foreign and Irish owned enterprise can also be measured. Figure 16 outlines the rate of job loss — the number of permanent full-time jobs lost in a particular year as a proportion of the total number of such jobs at the start of that year — in foreign and Irish-owned firms from 1981 to 2002. Throughout the 1980s and 1990s, the job loss rate was higher every year — in many years significantly so, particularly in the second half of the 1980s — in Irish-owned enterprises. 2001 marked a break with this trend with the job loss rate in overseas firms, driven by the global downturn in the ICT sector, exceeding that in indigenous firms for the first time. In 2002, the rate of job loss in overseas and indigenous firms was similar. Job losses in foreign-owned firms totalled 17,865 in 2002, down from 19,506 in 2001. Among Irish-owned firms, job losses increased from 14,335 in 2001 to 17,244 in 2002.

3.21 Though the data on enterprise survival and job loss rates should dispel the view that foreign-owned enterprise is inherently transitory, they also give pause for thought. Given the greater resources and market power of the foreign subsidiaries of multinational firms, their survival and job retention rates could reasonably be expected to be higher than those of indigenous firms. Even with the advantages of established products and markets, foreign-owned firms have shed significant numbers of jobs and shut down a sizeable number of plants. Further analysis of employment data for the past two decades shows that, compared with Irish firms, a higher proportion of job losses in foreign-owned establishments have resulted from plant closures than from plant contractions. This is consistent with a greater readiness on the part of overseas firms to quit unprofitable operations rather than persist with them in an attempt to improve their performance.

Table 11: Survival Rates of Cohorts of Grant-Aided Foreign and Irish-Owned Manufacturing and International Services Start-Ups 1980-94

Foreign-Owned Firms

Start-ups 1980-84		Closures 1980-84		Closures 1985-89		Closures 1990-94		Closures 1995-2000		Surviving firms	
No.	% of total	No.	% of total	No.	% of total	No.	% of total	No.	% of total	No.	% of total
394	100	54	13.7	110	27.9	56	14.2	39	9.9	135	34.3

Start-ups 1985-89		Closures 1985-89		Closures 1990-94		Closures 1995-2000		Surviving firms	
No.	% of total	No.	% of total	No.	% of total	No.	% of total	No.	% of total
368	100	60	16.3	87	23.6	42	11.4	179	48.6

Start-ups 1990-94		Closures 1990-94		Closures 1995-2000		Surviving firms	
No.	% of total	No.	% of total	No.	% of total	No.	% of total
426	100	60	14.1	99	23.2	267	62.7

Irish-Owned Firms

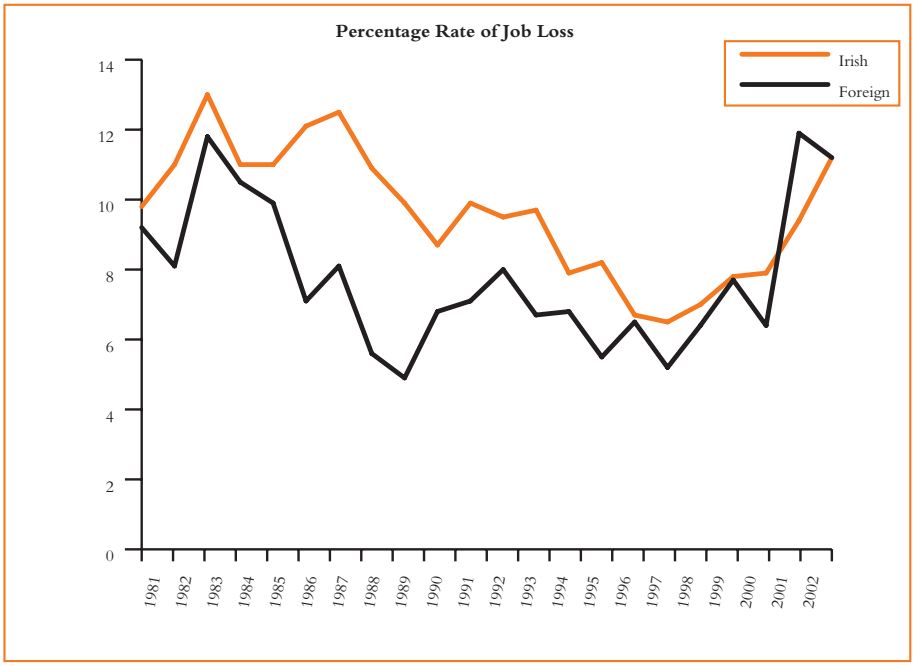
Start-ups 1980-84		Closures 1980-84		Closures 1985-89		Closures 1990-94		Closures 1995-2000		Surviving firms	
No.	% of total	No.	% of total	No.	% of total	No.	% of total	No.	% of total	No.	% of total
2,832	100	310	10.9	989	34.9	390	13.8	257	9.1	886	31.3

Start-ups 1985-89		Closures 1985-89		Closures 1990-94		Closures 1995-2000		Surviving firms	
No.	% of total	No.	% of total	No.	% of total	No.	% of total	No.	% of total
3,190	100	688	21.6	985	30.9	426	13.4	1,091	34.2

Start-ups 1990-94		Closures 1990-94		Closures 1995-2000		Surviving firms	
No.	% of total	No.	% of total	No.	% of total	No.	% of total
2,127	100	390	18.3	655	30.8	1,082	50.9

Source: Forfás.

Figure 16: Rate of Job Loss in Foreign and Irish Owned Firms in Manufacturing and International Services 1981-2002⋆



⋆Permanent full time jobs lost during year as % of total number of permanent full time jobs at the start of that year.
Source: Forfás.

Integration with the Irish Economy

3.22 In the past, reliance on overseas firms has been criticised for creating self-contained enclaves which imported most of their inputs, exported virtually all of their output, repatriated their profits, and generated little downstream activity for Irish firms. In order to address these concerns, a national linkage programme was established by the IDA in 1985 with the aims of increasing the purchase of local materials and services by overseas firms and of developing a strong indigenous sub-supply base. The spectacular growth of foreign-owned industry in the 1990s has contributed to a substantial increase in the volume of their spending on Irish goods and services and, in consequence, in their impact on the rest of the economy. Table 12 outlines the expenditure in 2000 of overseas and indigenous companies engaged in manufacturing and international services on materials and services sourced in Ireland. The expenditure of foreign-owned firms on Irish goods and services totalled €11.76bn. in 2000, with the spending of overseas manufacturing firms exceeding that of Irish-owned firms for the first time. The expenditure of overseas companies on domestically sourced services was significantly higher than that of their Irish counterparts. As services' expenditure typically has a higher employment content than spending on materials, this enhances the wider economic impact of foreign-owned firms. The figures at table 12 exclude firms with fewer than twenty employees however and, as indigenous businesses account for most enterprises of this

size, slightly understate the contribution of the domestic sector. The companies supplying goods and services sourced in Ireland include some foreign-owned firms as well as many indigenous ones.

3.23 Indigenous manufacturing firms source a higher proportion of materials in the home market than their overseas counterparts. According to data from the Census of Industrial Production, 71 per cent of total materials' purchases by Irish manufacturers in 2000 originated in Ireland compared with 44 per cent for foreign-owned firms. A substantial part of this disparity, however, results from differences in the sectoral composition of Irish and foreign-owned manufacturers. The high domestic share of materials' purchases by Irish companies was influenced in particular by the large food and drink sector which is materials-intensive, and sources those materials mainly in Ireland. If this sector is excluded, Irish manufacturers sourced 49 per cent of materials in Ireland in 2000 compared with 42 per cent for foreign-owned firms. Table 13 outlines the proportion of materials sourced in Ireland in a number of industrial sectors. As can be seen, foreign-owned firms in textiles, printing and publishing, and electrical and optical equipment sourced a higher proportion of materials in Ireland than did Irish-owned firms in these sectors.

Table 12: Irish Materials and Services Expenditures 2000*
€bn

	Foreign-Owned Manufacturing	**Irish-Owned Manufacturing**
Expenditure on Irish Materials	6.28	7.16
Expenditure on Irish Services	3.08	1.97
Total expenditure	9.36	9.13
	Foreign-Owned International Services	**Irish-Owned International Services**
Expenditure on Irish Materials	1.23	0.62
Expenditure on Irish Services	1.17	0.52
Total expenditure	2.40	1.14
	All Foreign-Owned	**All Irish-Owned**
Expenditure on Irish Materials	7.51	7.78
Expenditure on Irish Services	4.25	2.49
Total expenditure	11.76	10.27

*Enterprises employing twenty or more.
Source: Forfás, Annual Business Survey of Economic Impact.

Table 13: Proportion of Materials Purchased in Ireland in Selected Manufacturing Sectors 2000

%

	Food, Drink, Tobacco	Textiles	Printing & Publishing	Chemicals	Metals & Metal Products	Machinery & Equipment	Electrical & Optical Equipment	Total Manf	Total Non-Food
Irish	89.7	29.3	56.0	39.3	53.6	56.9	33.9	70.6	49.1
Foreign	70.2	33.2	70.0	11.5	23.8	28.4	49.3	43.7	41.8

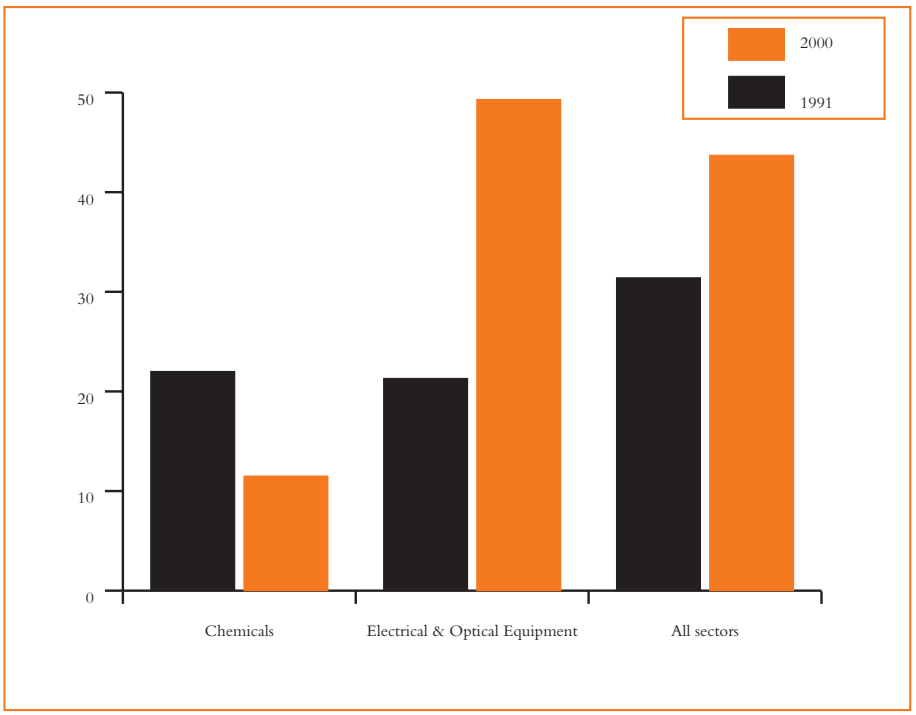
Source: CSO. Census of Industrial Production 2000.

3.24 Figure 17 charts the Irish-sourced share of total material purchases in 1991 and 2000 by foreign-owned firms in the two largest sectors of chemicals and optical and electrical equipment as well as in manufacturing as a whole. Overall, the Irish share of total materials' purchases by overseas firms rose from 31.4 to 43.7 per cent over the period, indicating a significant improvement in the level of integration of the foreign-owned sector in the Irish economy. This rise was driven by a strong performance in the electrical and optical equipment sector in which domestically-sourced purchases more than doubled from 21.3 per cent of total materials' inputs in 1991 to 49.3 per cent in 2000. Sub-sectoral analysis shows that this was attributable mainly to an increase in Irish purchases by US firms in the computer and office machinery sub-sector. Though no data are available, the likelihood is that a substantial proportion of these materials were produced by other US manufacturers with operations here. In the textiles and printing and publishing sectors similarly, the high domestic share of materials purchases by foreign-owned firms was generally attributable to US firms; in printing and publishing, a strong indigenous sub-supply base developed to serve the software sub-sector over the decade. In the chemicals sector, by contrast, the Irish share of expenditure on materials by foreign-owned companies almost halved during the 1990s.

3.25 Promoting the greater integration of foreign-owned firms with the Irish economy is important for two reasons. First, the benefits in terms of increased economic activity and employment are substantial. An analysis undertaken in the mid-1990s found that 62 vertically related jobs — 46 in services and 16 in manufacturing — were generated for every 100 jobs in foreign-owned industry.[11] This compared with 51 spin-off jobs in Irish-owned industry — 34 in services and 17 in manufacturing. The promotion of employment opportunities in sub-supply activities was the main impetus behind the initial efforts to strengthen commercial links between overseas and domestic firms.

[11] O'Malley, E. 1995. **An Analysis of Secondary Employment Associated with Manufacturing Industry.** ESRI General Research Series Paper no. 167.

Figure 17: Irish Raw Materials Purchases by Foreign Manufacturing Firms as % of their Total Raw Materials Purchases 1991 and 2000



Source: CSO, *Census of Industrial Production 1999 and 2000*.

3.26 The fostering of closer links between firms in the same or related industries is also seen as a way of contributing to what are known as external economies, agglomeration effects, or spillovers. A first type of external economy arises where the existence of several producers in a particular activity generates a labour market for the specialised skills needed by the industry and leads to the emergence of a pool of suppliers specialising in the materials, parts or services required by the industry concerned. An enlarged market of this kind has advantages for employers and workers, producers and suppliers, all of whom stand to benefit from the existence of a larger pool of buyers or sellers for their services. In time, this can create a growth dynamic as other firms, employees, and suppliers are attracted to the area, or persons employed in the industry set up their own enterprises. This essentially is the process by which industry clusters emerge. A second type of spillover occurs where the existence of a group of firms and suppliers specialising in a particular activity begins to generate exchanges of knowledge and to bring about a situation in which firms learn from one another and the tempo and scope of innovation increases.

3.27 Over the past two decades, the establishment of Irish operations by leading firms in sectors such as information technology and pharmaceuticals, the 'demonstration effect' of their decision in encouraging others to follow in their wake, the gradual development

of a pool of workers, suppliers, and service providers with the specialised skills required in these sectors, have all played a part in the gradual emergence of agglomeration effects.[12] Concentrations of firms engaged in similar or related activities have emerged in, for example, financial services and software in Dublin, electronics in West Dublin/Kildare, pharmaceuticals in Cork, and medical devices in Galway. The strong growth in the domestically sourced share of materials for the computer industry is evidence of this development, as is the expansion of the indigenous software industry. A study undertaken in 1996 found that one-third of domestic software firms had half or more of sales going to overseas firms operating in Ireland; the majority reported that the demanding standards set by overseas firms had strengthened their capabilities and performance, helping in the process to develop their ability to compete in export markets.[13] One-third of software entrepreneurs had worked for overseas electronics firms immediately prior to starting up, while two-thirds had worked for such firms at some point in their careers.

3.28 The development of agglomeration or spillover effects of this kind has an important role to play in building comparative advantage for the Irish enterprise sector. As we saw in part I, basing national advantage solely on low rates of wages or corporation tax — or other factors that can readily be emulated or bettered by competitor countries — does not offer a secure foundation for long-term prosperity. A sounder strategy is to build sources of advantage that are more complex and less easy to replicate. Pre-eminent among these are the kind of interlocking clusters of excellence and expertise involving business enterprises, third-level and research institutions, venture capital firms and business service providers that have underpinned the success of areas such as Silicon Valley in ICT or Scandinavia in mobile telephony. Though Ireland is some way from achieving this objective, it informs the strategy and approach of Science Foundation Ireland and the enterprise development agencies. These are discussed further in chapter 5.

III Indigenous Enterprise in Manufacturing and International Services

3.29 The 1980s was a difficult decade for indigenous enterprise. Between 1980 and 1987, employment in Irish-owned manufacturing firms fell by 28,000, or around one-fifth. The period from the late 1980s to 2000, and the years from 1994 to 2000 in particular, proved far more positive for Irish manufacturing and internationally traded service firms. Most sectors recorded steady output growth, while a sizeable cadre of new export-oriented indigenous firms emerged in high-tech sectors such as software. Full-time employment in Irish-owned firms in manufacturing and international services rose

[12] Green. R. et al. 2001. 'The Boundaryless Cluster: Information and Communications Technology in Ireland' in OECD. **Innovative Clusters: Drivers of National Innovation Systems** (Paris: OECD), pp. 44-61.
[13] O'Gorman, C. et al. 1997. **The Irish Indigenous Software Industry: An Application of Porter's Cluster Analysis.** National Economic and Social Council, Research Series Paper no. 3.

from 116,000 in 1991 to 155,000 in 2001, an increase of one-third. This was a considerable achievement when measured against either the past record of indigenous enterprise or the performance of other developed economies over the same period. Because of the global economic downturn and a rising domestic cost base, the period since 2000 has been a more difficult one for Irish-owned enterprise. Job losses in indigenous manufacturing and international services firms in 2001 were at their highest level since 1987, though continued strong job gains resulted in a small rise in total employment. In 2002 job losses increased and job gains declined, leading to a net decline in employment in indigenous enterprise for the first time in over a decade.

3.30 Past analyses of Irish-owned enterprise have found that performance and potential have been hampered by a number of inter-related factors, principally small scale and low productivity; over-concentration in traditional sectors and on the home and British markets; and low levels of innovation and research and development. Among the questions that now arise for consideration are whether and to what extent these weaknesses still apply to the indigenous enterprise sector, or if the progress made during the 1990s marked a permanent shift to a higher level of capability and performance. The analysis that follows focuses on these issues.

Size Profile of Indigenous Enterprise

3.31 Because of the small home market, late industrialisation and other factors, Ireland has traditionally been an economy of small firms. While small firms remain an important source of enterprise, employment and new products and services in all modern economies, they must generally contend with a range of challenges stemming from their lack of scale and relative scarcity of financial and management resources. Table 14 shows net output and investment per employee, together with the export share of output, in Irish-owned manufacturing units in a range of employment size bands in 2000. Though the determinants of productivity are complex, there is a well-established tendency, but not a consistently linear one, for it to rise in line with plant size. As can be seen from table 14, net output per head in plants employing between one and two hundred people was roughly two-thirds greater than that in plants employing fewer than fifty. Though output per head in the next size band — two to five hundred employees — was lower than that in plants with 100-200 employees, it was still well above that in establishments with fewer than fifty workers. There is also an association between enterprise size and investment levels. As table 14 shows, investment per employee in manufacturing enterprises with over one hundred employees was almost twice that in enterprises with fewer than twenty workers, and close to one-quarter to one-third higher than that in firms employing between twenty and one hundred workers. Finally, as the table also reveals, export propensity was markedly more pronounced in large manufacturing units. Plants with between one and five hundred employees exported twice as great a proportion of output as those employing fewer than fifty employees. Though export levels in the small number of plants that employed over five hundred workers were lower than in medium-sized plants, they were substantially higher than in those with fewer than fifty employees.

Table 14: Net Output per Head, Investment per Employee, & % of Output Exported by Plant Size in Irish-Owned Manufacturing Units 2000*

No. of Persons Engaged	No. of Units	Net Output Per Employee €000	Investment Per Employee €000	% of Gross Output Exported
<20	2,795	49.5	5.6	15.4
20-49	987	54.3	8.1	20.5
50-99	328	60.0	8.6	34.2
100-199	204	85.2	10.7	39.1
200-499	60	69.0	8.1	47.9
>500	17	85.2	14.7	38.9
Total	4,391	65.3	9.0	33.2

*Figures on investment per employee relate to manufacturing enterprises.

Source: CSO. Census of Industrial Production 2000.

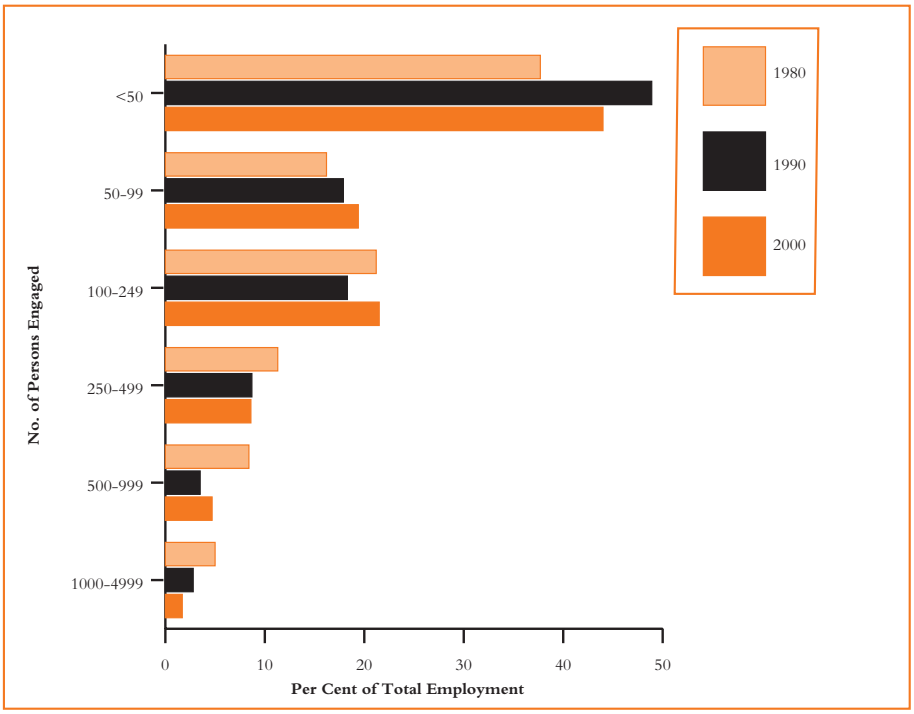
Table 15: Size Profile of Irish-Owned Manufacturing and International Services Establishments

Size Band	1980		1990		2000	
	No. of Establish-ments	% of Total	No. of Establish-ments	% of Total	No. of Establish-ments	% of Total
<50	4,691	88.2	6,203	92.4	6,411	90.0
50-99	349	6.6	315	4.7	440	6.2
100-249	207	3.9	154	2.3	223	3.2
250-499	49	0.9	31	0.5	39	0.5
500-999	18	0.3	7	0.1	11	0.2
1,000-4,999	5	0.1	2	0.0	2	0.0
Total	5,319	100	6,712	100	7,126	100

Source: Forfás.

3.32 The European Commission defines small enterprises as those with fewer than 50 employees, medium-sized firms as those employing between 50 and 250 workers, and large firms as those with over 250 employees. Other economies like the US and Germany define large firms as those with over 500 employees. Viewed in the context of these definitions, the size profile of Irish-owned manufacturing and international services establishments at table 15 and figure 18 underlines the predominantly small scale of indigenous enterprise. Ninety per cent of indigenous establishments in these sectors, over six thousand in number, had fewer than fifty employees in 2000, and these establishments employed 44 per cent of the workforce in Irish-owned manufacturing and international services enterprise. There were 663 medium-sized establishments employing between 50 and 249 employees, and their share of aggregate employment was around 40 per cent. There were only 52 establishments, less than 1 per cent of the total, with 250 or more employees in 2000, and their share of overall employment was 15 per cent in both 1990 and 2000 compared with almost 25 per cent in 1980. At just thirteen, the number of establishments with over 500 employees was barely into double figures and these accounted for around 6 per cent of employment. If the data related to enterprise rather than establishment size, the size profile of Irish-owned manufacturing and international services enterprise would change somewhat but not to a marked extent.

Figure 18: Employment Distribution in Irish Owned Manufacturing and International Services Establishments



Source: Forfás.

3.33 Though the broad size contours of the indigenous enterprise sector did not alter greatly over the two decades from 1980 to 2000, there were some significant changes over the period. The number of small establishments grew strongly during the 1980s and their share of total employment in manufacturing and international services also increased significantly. The number of establishments in all other size categories declined over the decade, with the total employing over 500 decreasing sharply from twenty three in 1980 to nine in 1990. The employment share of large establishments (those with over 250 employees) registered a corresponding decline from 25 to 15 cent. The 1990s has seen a partial reversal of these trends. The number of medium-sized establishments (those employing between 50 and 249) increased by almost two hundred, around 40 per cent, while their share of total employment also rose. There was also a rise in the number of large establishments, particularly among businesses employing between 250 and 499 workers, though their employment share was unchanged. As noted later, outward investment by Irish firms grew strongly during the 1990s and employment growth in a number of large Irish firms may have occurred mainly outside Ireland. Small establishments recorded the smallest proportionate increase between 1990 and 2000, and their share of employment in indigenous manufacturing and international services fell from 49 to 44 per cent.

Achieving Scale

3.34 The need to increase scale among Irish-owned firms has long been recognised but, as the above size profile of the indigenous enterprise sector shows, has not proved easy to achieve. This is borne out by the findings of an analysis that tracked the employment growth path of cohorts of indigenous firms still in existence in 2000 that had started up in 1980-84, 1985-89, and 1990-94 respectively. The businesses tracked were engaged in manufacturing and international services and had received support from the enterprise development agencies. Their employment level at the end of the year in which they were first grant-aided served as the baseline against which their level of employment in 2000 was measured. The results of the analysis presented at table 16 show that, as already noted, there was no shortage of start-up businesses during this period, particularly in the 1980s. The high mortality rate among these businesses, however, meant that just 31 per cent of 1980-84 cohort, 34 per cent of the 1985-89 cohort, and 51 per cent of the 1990-94 cohort were still in existence in 2000. As more of the firms established in the most recent period could be expected to be still in existence, the higher survival rate of the 1990-94 cohort may not be indicative of a greater long-term survival propensity.

3.35 A relatively small proportion of firms that survived to 2000 had achieved and sustained a rate of employment increase associated with fast growth firms. Of the cohort of 2,832 firms that started up between 1980 and 1984, seventeen enterprises that had fewer than 50 employees in their start-up phase had grown to employ 100-249

employees in 2000, while one had achieved an employment level of over 250. A further seven firms that started up with between 50 and 99 employees in 1980-84 had expanded to employ 100-249 employees in 2000, while one had grown to employ over 250. Finally, one firm with 100-249 employees in its start-up phase in 1980-84 had over 250 employees in 2000. It is of course likely that a number of other firms that commenced between 1980 and 1984, or in the two later five-year periods, recorded significant employment growth in succeeding years but were no longer in existence in 2000, or had experienced a subsequent decline in job numbers.

3.36 The cohort of 3,190 firms from the 1985-89 period produced a greater number of enterprises that had achieved significant employment growth by 2000. A total of eighty six firms with fewer than 50 employees in their start-up phase in the second half of the 1980s had a workforce level in excess of this figure in 2000; twenty three of these firms had between 100-249 employees in 2000, while three employed over 250 people. Eight firms that started with between 50 and 99 employees in 1985-89 employed over 100 in 2000, with three having a workforce of over 250. This is consistent with the changes in the size profile of the enterprise sector that occurred during the 1990s and is almost certainly attributable in some part to the more favourable business environment in this period.

3.37 The cohort of 2,127 firms that started up in 1990-94 generated a smaller number of firms showing significant employment growth. When the smaller number of start-ups in this cohort is taken into account, however, the proportion of fast-growing firms is broadly in line with that in the earlier periods. As these firms had had a shorter timespan in which to expand, it is possible that a similar analysis carried out five or ten years hence would, depending on business conditions and other factors in the intervening period, show an increase in the number of fast-growth businesses. The indications are that the period since 1995, which was too recent to be covered in this analysis, saw an increase in the number of fast-growth companies. Economic conditions were conducive, while rapid growth in sectors such as software and international services provided a favourable context for the emergence and development of new businesses. Since 2000, however, these businesses, particularly those in the ICT sector, have faced a far more difficult environment and there have been a number of company failures among new enterprises that expanded rapidly in the second half of the 1990s.

Table 16: Sustained Fast-Growth Indigenous Manufacturing and International Services Firms	
No. of Start-Ups 1980-84	2,832
No. Still in Existence 2000	886
No. of Start-Ups 1985-89	3,190
No. Still in Existence 2000	1,091
No. of Start-Ups 1990-94	2,127
No. Still in Existence 2000	1,082
Start-ups 1980-84 with <50 employees & with higher job levels in 2000 Employment Size in 2000	
50-99	49
100-249	17
>250	1
Start-ups 1985-89 with <50 employees & with higher job levels in 2000 Employment Size in 2000	
50-99	63
100-249	23
>250	3
Start-ups 1990-94 with <50 employees & with higher job levels in 2000 Employment Size in 2000	
50-99	42
100-249	11
>250	2
Start-ups 1980-84 with 50-99 employees & with higher job levels in 2000 Employment Size in 2000	
100-249	7
>250	1
Start-ups 1985-89 with 50-99 employees & with higher job levels in 2000 Employment Size in 2000	
100-249	5
>250	3
Start-ups 1990-94 with 50-99 employees & with higher job levels in 2000 Employment Size in 2000	
100-249	4
>250	—
Start-ups 1980-84 with 100-249 employees & with higher job levels in 2000 Employment Size in 2000	
>250	1
Start-ups 1985-89 with 100-249 employees & with higher job levels in 2000 Employment Size in 2000	
>250	—
Start-ups 1990-94 with 100-249 employees & with higher job levels in 2000 Employment Size in 2000	
>250	3
Source: Forfâs.	

3.38 The results of this analysis underline the difficulties encountered in fostering a substantial cadre of Irish-owned enterprises capable of sustained expansion. A little over one-third of firms that started up between 1980 and 1994 were still in existence in 2000. Of these, fewer than ten per cent had grown from a lower employment level in their start-up phase to employ fifty or more in 2000, while just 14, or around 0.5 per cent, had grown to employ over 250 in 2000. Though a greater number of fast growth firms may have emerged in the second half of the 1990s, some of the gains of that period have already been reversed. It is still to be determined if a sizeable number of the new firms established in the recent past can sustain their expansion over the longer term.

3.39 These findings are broadly consistent with the results of a separate analysis of 239 high-potential start-ups that received grant assistance under the Enterprise Development Programme between 1978 and 1992.[14] As these firms were selected for the Programme on the basis of their perceived growth potential, they could be expected to feature a higher proportion of fast-growth businesses. The study found that just 9.2 per cent of these enterprises met the requirements laid down for fast growth — defined as firms that had 25 or fewer employees at the time of their establishment and which employed more than 50 people in 1994. This minority of firms, however, created over 60 per cent of the total employment in the firms surveyed, illustrating why considerable importance is attached to fast-growth businesses.

Sectoral Profile of Irish-Owned Enterprise

3.40 There was no dramatic change in the sectoral composition of Irish manufacturing industry during the 1990s, but there were a number of significant developments. In the services area, the emergence of a sizeable indigenous software industry marked a major breakthrough. Table 17 provides a sectoral profile of output and employment in Irish-owned manufacturing industry in 1991 and 2000. The food, drink and tobacco sector remained, by a wide margin, the largest constituent part of indigenous manufacturing industry. Its output share fell significantly over the decade however, though the fall in its share of total employment was less marked. Over one-in-four workers in Irish-owned manufacturing industry were employed in the sector in 2000. Though the consumer food segment of the industry grew strongly over the past decade, meat and dairy products still account for the bulk of the food sector's output. During the 1990s, the textile sector continued to decline in importance and, though some niches within the sector can continue to thrive, its share of output and employment is set to fall further in the period ahead.

[14] Hogan, T. & Foley, A. 1996. **Fast Growth Firms in Ireland: an Empirical Assessment.** Dublin City University Business School Research Papers 1995-96: no. 5.

3.41 Though a range of sectors recorded steady growth in output and employment during the 1990s, the performance of the metals and engineering sector was noteworthy. Data from Forfás employment surveys show that full-time employment in indigenous metals and engineering firms rose from 25,749 in 1991 to 36,329 in 2000, an increase of over 40 per cent. The sector's share of indigenous manufacturing employment rose accordingly from 22.7 per cent in 1991 to 29.1 per cent in 2000. Compared with other industrial economies, Irish manufacturing industry has traditionally been relatively weak in metals and engineering. Though the majority of jobs in indigenous firms in the sector are in low-to-medium technology activities, there were substantial increases in employment in high-tech niches such as office machinery and computers; radio, television and communication equipment, and medical and precision equipment. Figure 19 charts the rise in employment in these industries and in pharmaceuticals from 3,553 in 1991 to 8,990 in 2000. Though the total numbers employed remain relatively modest and the indigenous ICT sector has encountered significant difficulties since 2000, the growth in these areas is a promising development. The consolidation and further expansion of these high-tech niches within indigenous manufacturing industry is a core goal of Enterprise Ireland.

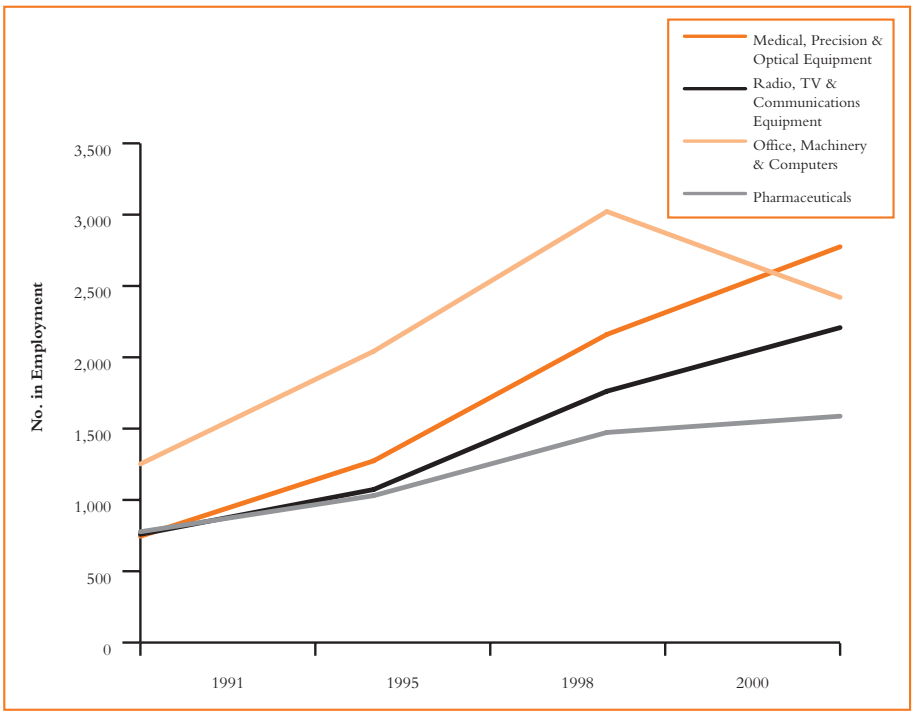
Table 17: Sectoral Composition of Irish-Owned Manufacturing Industry 1991 & 2000*

Sector	% Share of Gross Output of Irish-Owned Manufacturing		% Share of Total Employment in Irish-Owned Manufacturing	
	1991	2000	1991	2000
Food, Beverages, & Tobacco	55.9	43.4	29.2	26.3
Textiles & Textile Products	3.4	2.0	10.4	5.0
Wood & Wood Products	1.8	2.9	3.5	3.9
Paper and Publishing	8.5**	9.0	12.5**	12.3
Chemicals	4.7	4.9	3.0	4.0
Rubber & Plastic Products	2.3	3.7	3.4	5.2
Non-Metallic Mineral Products	4.7	6.0	7.5	7.2
Metal and Metal Products	5.0	6.8	8.4	10.0
Electrical & Optical Equipment	2.6	8.7	4.7	9.9

*The breakdown of output and employment between Irish and foreign-owned plants was unavailable for a number of sectors (leather and leather products; coke and petroleum products; machinery and equipment; transport equipment; and other manufacturing).
**1992.

Source: CSO. Census of Industrial Production 1991, 1992 & 2000.

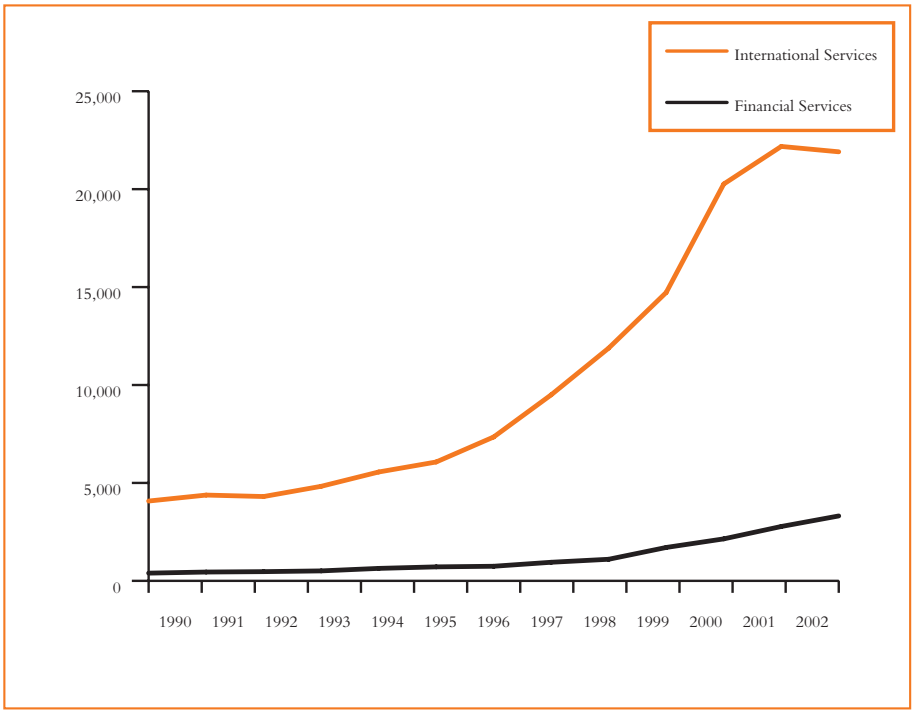
Figure 19: Growth in Indigenous High-Tech Manufacturing Employment 1991-2000



Source: *Census of Industrial Products 1991, 1995, 1998 and 2000.*

3.42 The most sustained growth performance of the 1990s came from the international and financial services sectors. Figure 20 charts employment in these sectors over the course of the decade and reveals the more than fivefold growth in job numbers from 4,469 in 1990 to 25,221 in 2002. In the latter part of the decade, employment growth averaged around 30 per cent per annum. Among traded sectors, employment in international services is now exceeded only by that in food, beverages and tobacco, and metals and engineering. Sales in the sector reached an estimated €3.91bn. in 2000, equivalent to over 20 per cent of total output in the indigenous manufacturing sector. Though part of this growth in revenues may reflect improved survey coverage, there is no doubt that the sector expanded dramatically during the 1990s. 2002 saw a slight fall in employment in international services, though job numbers in financial services continued to increase.

Figure 20: Employment in Indigenous International and Financial Services Firms 1990-2002

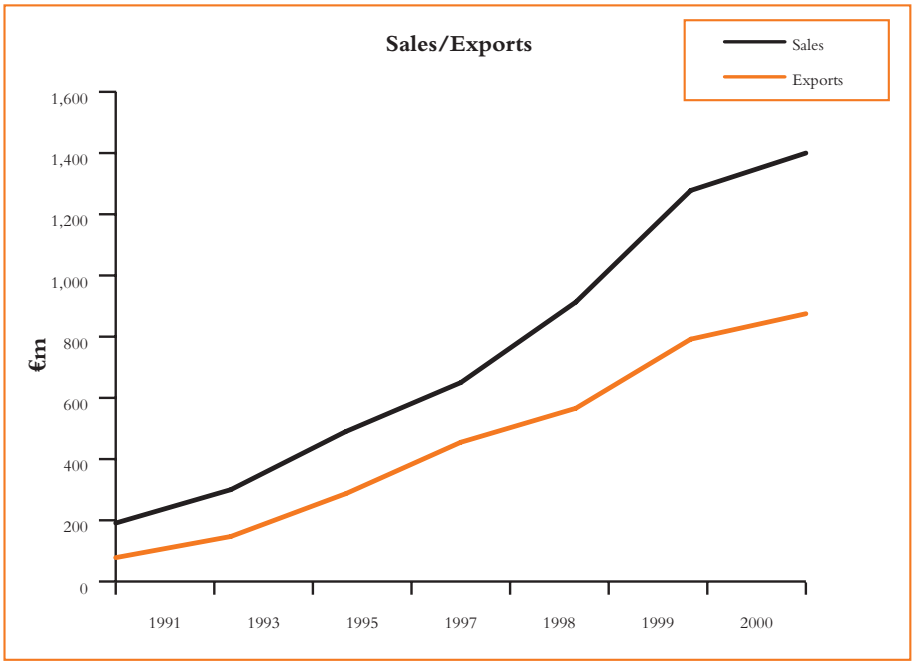


Source: Forfás.

3.43 If international traded services was the fastest growing sector of indigenous enterprise, software was the fastest growing sub-sector of internationally traded services. Though software straddles both manufacturing and international services, the greater part of the output of Irish-owned firms is categorised as services. The number of indigenous software firms is estimated to have risen from 290 in 1991 to around 770 in 2000. Figure 21 charts the growth in employment, sales and exports in these firms over this period. Employment more than trebled from 3,800 in 1991 to 14,000 in 2000, while revenues increased from €191m. to €1.4bn. The industry has had a strong export orientation from the outset and exports accounted for over 60 per cent of revenues in 2000. Though many of the firms in the industry are small, it is estimated that around 70 per cent of indigenous software companies are engaged in exporting. The period since 2000 has been a difficult one for the industry, and it is estimated that employment in indigenous software firms fell by around 10 per cent in 2002. According to a recent study of the sector, however, new businesses continue to be formed at a significant rate, while more companies reported profits in 2002 than in the two preceding years.[15] Sizeable levels of venture capital also continue to be available for investment in the sector.

[15] HotOrigin. 2003. **Ireland's Software Cluster 2003**.

Figure 21: Indigenous Software Industry 1990-2000



Source: National Software Directorate.

Research and Development

3.44 The emergence of high-tech niches in the indigenous enterprise sector contributed during the 1990s to a greater commitment to, and expenditure on, research and development. Table 18 outlines trends in business expenditure on research and development by Irish-owned firms from 1993 to 2001. Research spending grew strongly over the period but, as can be seen, this growth was concentrated in the period from 1993 to 1999 and tailed off significantly between 1999 and 2001. While spending increased in constant price terms at an annual rate of around 15 per cent between 1993 and 1999, this declined to around 2.5 per cent per annum between 1999 and 2001. Though the exceptional growth rates recorded in the mid-1990s may have been hard to sustain, the rate of expansion between 1999 and 2001 is lower than might have been expected.

Table 18: BERD by Irish-Owned Firms 1993-2001

	1993	1995	1997	1999	2001
€million	118	156	209	281	319
% change from previous period — current prices		+32	+34	+34	+14
% change from previous period — constant prices		+28	+34	+31	+5

Source: Forfás.

3.45 Table 19 gives a sectoral breakdown of research and development expenditure among Irish-owned firms engaged in manufacturing and international services in 1993, 1997, and 2001. While research expenditure increased as a proportion of manufacturing output between 1993 and 1997, it declined between 1997 and 2001. In ten of the thirteen sub-sectors for which data are available, R&D spending accounted for a lower share of output in 2001 than in 1997. The aggregate share of output devoted to R&D in the indigenous manufacturing sector rose from 0.7 in 1993 to 0.9 per cent in 1997, before falling back to 0.8 per cent in 2001. This contrasts with an OECD average of 2.4 per cent for manufacturing in 1997, the most recent year for which figures are available. The research intensity of Irish-owned manufacturing firms exceeded the OECD average in just two sectors — clothing and textiles and wood products.

Table 19: Expenditure on Research and Development in Irish-Owned Enterprise 1993, 1997 & 2001

Sector	1993 €m	% of Output	1997 €m	% of Output	2001 €m	% of Output
Electrical & electronic equipment	15.4	3.7	44.1	5.1	53.6	4.2
Medical, precision etc instruments	1.8	2.4	4.9	3.3	8.2	1.8
Pharmaceuticals	4.4	6.5	4.8	4.8	8.6	2.3
Chemicals*	2.3	0.5	3.5	0.5	4.1	0.4
Food, drink, tobacco	33.8	0.5	26.8	0.3	33.7	0.3
Machinery and equipment	6.6	1.9	11.5	1.9	12.7	1.8
Transport equipment	3.1	0.9	5.1	1.0	3.0	0.7
Basic & fabricated metals	5.4	0.9	8.6	0.9	7.1	0.6
Non-metallic minerals	4.4	0.7	7.1	0.8	7.3	0.6
Wood and wood products	0.3	0.2	2.8	0.8	5.1	1.0
Textiles, clothing, leather	3.2	0.8	7.9	1.7	3.1	0.7
Paper, print, publishing	3.0	0.2	4.9	0.3	3.4	0.2
Other manufacturing	1.4	0.2	2.5	0.3	3.2	0.3
Total Manufacturing	87.7	0.7	142.2	0.9	161.8	0.8
Software & Computer Services	11.3	n/a	53.4	n/a	123.9	n/a
Other International Services	12.7	n/a	13.6	n/a	33.0	n/a
Total Business Sector	111.7	n/a	209.2	n/a	318.7	n/a

*Excluding pharmaceuticals.

Source: Forfás.

3.46 Research spending by Irish-owned firms engaged in software and computer services recorded particularly strong growth, increasing more than tenfold from €11.3m. in 1993 to €123.9m. in 2001. R&D spending by indigenous companies engaged in other international services more than doubled from €13.6m. in 1997 to €33.0m. in 2001. Research by services firms accounted for half of R&D expenditure by Irish-owned companies in 2001, compared with just over one-fifth in 1993. These are positive trends and demonstrate a commitment to innovation on the part of indigenous firms in these sectors. It should be borne in mind however that, as the output levels of Irish-owned firms are generally substantially smaller than those of firms in larger economies, the resources devoted to research and development are relatively modest in absolute terms in many cases. Despite the constraints imposed by small scale, however, the number of large-scale R&D performers in the indigenous enterprise sector grew strongly in the latter part of the 1990s. In 2001, forty-six Irish-owned firms engaged in manufacturing and international services spent €1.3m. or more on research and development, up from forty-three in 1999 and twenty-five in 1997.

Exports

3.47 Since the 1950s, public policy has put a high priority on encouraging export growth among indigenous firms. Because of the small size of the home market, selling into larger markets abroad has been seen as the key to achieving the required growth in production volume and enterprise scale. Policy has also sought to broaden the export base and to diversify export destinations in order to reduce the traditional dependence on the food sector and on the British market. Between 1991 and 2000, manufacturing exports by indigenous firms grew from €4.3.bn to €6.7bn in current prices, a rise of over 50 per cent. The growth in manufacturing exports in the second half of the decade, however, lagged the growth in output. The share of output devoted to exports fell from 35.9 per cent in 1995 to 31.3 per cent in 1999. The decline was broadly based, occurring in seven of the ten sectors for which figures are available. In 2000, however, the export share of indigenous manufacturing output rose to 33.2 per cent. Table 20 gives details of manufacturing exports as a proportion of gross output in different manufacturing sectors in 1991 and 2000. As exports from foreign-owned manufacturing firms grew very rapidly over the course of the decade, the indigenous share of total manufacturing exports fell from around 26.1 per cent in 1991 to 9.2 per cent in 2000. As noted earlier, exports of internationally traded services by indigenous firms grew strongly over the decade, reaching $1.7bn in 2000.

Table 20: Exports as a % of Gross Output in Irish-Owned Manufacturing Firms 1991 & 2000		
Sector	**1991**	**2000***
Food, Drink & Tobacco	38.5	37.1
Textiles & Textile Products	42.2	41.9
Wood & Wood Products	14.4	8.5
Paper and Publishing	14.4	14.9
Chemicals	35.6	41.9
Non-Metallic Mineral Products	22.4	15.7
Metals and Metal Products	35.0	26.2
Machinery and Equipment	40.3	45.7
Electrical and Optical Equipment	51.9	52.9
Total	34.8	33.2

Source: CSO Census of Industrial Production 1991 and 2000.

Table 21: Destination of Indigenous Manufacturing Exports 1991 & 2000

Sector	Export Destinations 1991*				Export Destinations 2000			
	% of total				% of total			
	UK	Other EU	USA	Else-where	UK	Other EU	USA	Else-where
Food, drink, tobacco	37.7	31.4	6.9	24.2	41.0	34.9	6.8	17.3
Textiles & textile products	71.3	15.4	9.0	4.3	51.3	21.9	15.5	11.3
Wood and wood products	86.5	4.4	0.0	9.0	80.5	9.8	3.6	6.1
Paper and publishing	73.2	18.4	5.1	3.4	57.9	19.5	15.6	7.0
Chemicals	54.5	37.1	1.5	7.0	32.7	44.8	9.4	13.1
Non-metallic mineral products	28.5	3.8	40.8	26.9	31.5	8.8	55.3	6.5
Metals and metal products	55.7	41.1	1.1	3.2	65.0	25.6	5.6	3.8
Electrical & optical equipment	35.0	46.4	7.1	11.5	29.2	35.3	33.2	9.9
Total	41.9	28.3	8.2	21.5	40.2	33.8	12.5	13.5

*Figures for paper and publishing are for 1992.

Source: CSO Census of Industrial Production 1991, 1992, & 2000.

3.48 In terms of export composition, the dominance of indigenous manufacturing exports by the food sector was significantly reduced over the past decade. In 1991, the food, drink and tobacco industries accounted for 62 per cent of manufacturing exports, but by 2000 this had fallen to 49 per cent. The largest increase in export share occurred in the electrical, electronic, and optical equipment sector. Overseas sales in these industries rose from 3.9 per cent of total indigenous manufacturing exports in 1991 to 13.8 per cent in 2000. Table 21 outlines the main destinations for indigenous manufacturing exports in 1991 and 2000. As can be seen, there was a slight decline in the proportion of indigenous manufacturing exports going to the British market. This stood at 41.9 per cent in 1991, increased slightly to 42.1 per cent in 1995, but fell back to 40.2 per cent in 2000. The share of exports going to other EU countries rose from 28.3 per cent in 1991 to 33.8 per cent in 2000. There is clearly considerable scope for further increases in exports to European Union member states other than Britain. Though these states have a population roughly four times that of Britain, the British market still takes a larger share of Irish exports. Enterprise Ireland's initiatives to encourage greater exports to Eurozone countries are outlined in chapter 5.

3.49 There are a number of possible explanations for the decline in the export intensity of indigenous manufacturing enterprise in the latter part of the 1990s. The strength of the home market during this period almost certainly played some part. A small number of Irish-owned firms active in exporting were taken over by overseas firms and their exports reclassified as deriving from foreign-owned enterprise. Some indigenous firms may have availed of increased opportunities for sub-supply to multi-nationals operating in Ireland, or for import substitution, as alternatives to selling into export markets. The rise in export intensity in 2000 was helped by favourable currency movements and may also have reflected the influence of Enterprise Ireland's efforts to increase export sales among client companies.

3.50 The decline in export intensity during the 1990s may also be attributable in part to increased levels of outward direct investment by Irish-owned firms. Globally, the sales of foreign affiliates of multinational companies are now almost twice the level of aggregate world exports, suggesting that overseas investment and international production are now more important than exports as a vehicle for the delivery of goods and services to foreign markets. Though Irish-owned firms historically have had low levels of overseas investment, this has changed decisively in recent years.[16] The total stock of outward direct investment by Irish firms grew from $202m in 1985 to $15,096m in 1999, a rise of over two thousand per cent in fifteen years.

3.51 This growth in overseas investment by Irish-owned firms accelerated markedly in the final years of the 1990s. The average level of outward direct investment was

[16] Forfás. 2001. **Report on Outward Direct Investment,** tables 2.3-2.5.

around $400m per annum from 1988 to 1993, around $750m per year from 1994 to 1997, and approximately $4150m per annum from 1998 to 2000; the level of investment in 2000, though far higher than in the earlier part of the decade, was below that recorded in 1998 and 1999. Most of this overseas investment has been concentrated in the United States and Britain. In 1999, Irish-owned firms employed an estimated 65,000 people in the United States; this compares with around 100,000 employed by US firms in Ireland. The bulk of overseas investment by Irish enterprise has come from 10-15 long-established firms in manufacturing and banking, but a small number of newer high-technology firms in sectors such as ICT and pharmaceuticals began to make significant overseas investments in the second half of the 1990s. Research by Forfás suggests that overseas investment by Irish firms has helped create new high-skilled jobs at head offices in Ireland. Over time, such investment will see the increasing replacement of exports of finished goods by exports of high value-added intermediate goods and the provision of headquarter services to affiliate companies overseas.

Irish-Owned Enterprise in Comparative Perspective

3.52 Cross-national comparisons of manufacturing and international services in Ireland with these sectors in other countries are invariably based on data relating to the activities of all companies in these sectors in Ireland. As much of the output of these sectors is now accounted for by overseas firms, it is difficult to compare the performance of the indigenous enterprise sector in Ireland with that in other countries. Table 22 which is derived from a study undertaken for Enterprise Ireland, gives details of gross output per head and of value-added per head in manufacturing industry in Ireland and a number of other European Union member states, the U.S.A. and Japan in 1998.[17] Given the difficulties of interpretation and measurement that affect cross-country comparisons of output performance and productivity, the findings should be seen as a broad guide to differences in national performance. As can be seen, output per head in indigenous manufacturing industry in Ireland was on a par with that in Denmark and Italy, slightly lower than that in Britain, and significantly lower — by a margin of a third or more — than in Finland, France, Germany, the U.S.A. and Japan. With the exception of France and Italy, value-added per head in domestic Irish industry was lower than that in the other EU member states surveyed by a margin of around twenty per cent. In general, where output levels were lower in Ireland than in other countries, this held across most sectors and size ranges. In the food, drink and tobacco sector, however, output per head in Ireland was at or above the levels in the other EU countries covered by the survey. In the more difficult trading environment now facing indigenous enterprise, achieving sustained rises in productivity will be the key to enterprise survival and growth. As discussed in chapter 5, productivity growth is now one of Enterprise Ireland's key performance indicators and targets.

[17] Goodbody Economic Consultants. 2001. **An International Comparative Analysis of the Performance of Irish Manufacturing Industry.**

Table 22: Gross Output and Value-Added per Capita in Irish Owned Manufacturing and in Selected Countries 1998		
	Gross Output per Capita €000	**Value-Added per Capita €000**
Irish-Owned Industry	133.5	48.3
Britain	142.9	58.4
Germany	184.6	59.7
Denmark	130.1	57.1
France	183.1	48.3
Finland	178.6	59.7
Italy	131.5	36.8
Japan	211.8	—
USA	190.5	—
Source: Enterprise Ireland.		

IV The Domestic Services Sector

3.53 The manufacturing and international services enterprises supported by the enterprise development agencies number around 5,000 in total and employ around one-third of a million employees. Though these firms are of pivotal importance for our economic well-being, they account for fewer than 5 per cent of the total number of businesses in Ireland and less than 20 per cent of the Irish workforce. As no regular census is undertaken of the entire enterprise sector, estimates of the number of enterprises have to be made on the basis of disparate data compiled for other purposes, principally the registers of employers and businesses maintained by the Revenue Commissioners for tax purposes. At end-2001, there were 204,032 businesses registered for VAT purposes with the Revenue Commissioners, while 176,051 employers were registered for the purposes of income tax in the 2000-2001 tax year. As a significant number of enterprises are not registered for VAT or do not have employees, these figures suggest that the total number of businesses in Ireland is probably in the region of a quarter of a million.

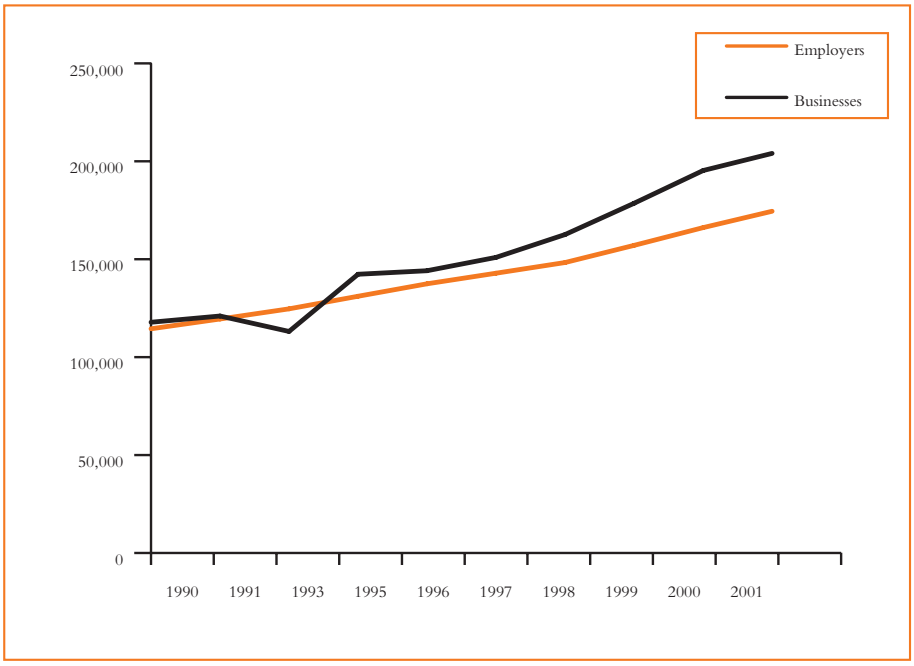
3.54 Though we do not have a detailed breakdown of these enterprises, a reasonable amount is known about their composition. While there are no precise figures available, there are probably in the region of 100,000 single-person businesses or partnerships that are run solely by their proprietors and have no employees. Of businesses with employees,

it is estimated that over 90 per cent employ fewer than ten people, while over 98 per cent have fewer than fifty employees. Businesses with fewer than ten employees are generally referred to as micro-enterprises, while those with more than ten but fewer than fifty workers are termed small businesses. In terms of sectoral composition, the majority of businesses are engaged in various service activities. These can broadly be divided into *producer or business services* (those such as financial services that are supplied mainly to business customers); *distributive services* (those concerned with distributing goods from producers to consumers such as transport and wholesale retail distribution), and *consumer services* (those such as hotels, catering and entertainment that are supplied mainly to personal consumers). These categories obviously overlap to varying extents as enterprises engaged in activities such as finance and tourism may cater for both business customers and individual consumers. While the internationally traded services sector experienced sustained growth over the past decade, most service enterprises are engaged in non-traded activities and do not compete with firms from outside Ireland on either the home or export markets. Many operate in local markets in which both customers and competitors are drawn from a limited geographical area.

3.55 Table 23 gives a sectoral breakdown of businesses registered for VAT at the end of 2001. As can be seen, around two-thirds of businesses were engaged in business, distributive or consumer services, with financial and professional services and distribution being the largest categories. Around 20 per cent of enterprises were in the construction sector, with just over five per cent engaged in agriculture, forestry and fishing. There were almost 20,000 manufacturing businesses registered for VAT, almost 10 per cent of the total. This contrasts with the 4,862 manufacturing enterprises covered by the 2000 Census of Industrial Production; the large difference in coverage is due mainly to the fact that the Census is confined to establishments with three or more persons. The strong growth performance in manufacturing and international services during the 1990s was mirrored in the wider enterprise sector. Figure 22 charts the number of employers and businesses registered with the Revenue Commissioners from 1990 to 2001. The number of employers on the Revenue register rose from 114,471 in the 1990-91 tax year to 176,051 in the 2000-01 tax year, an increase of 54 per cent. The number of businesses registered for VAT rose from 117,817 at the end of 1990 to 204,032 at the end of 2001, an increase of 75 per cent, with most of the rise concentrated in the latter part of the period.

Table 23: Sectoral Composition of Businesses Registered for VAT at end-2001		
Sector	**Number**	**% of Total**
Agriculture, Fisheries and Forestry	10,829	5.3
Manufacturing	19,569	9.6
Construction	40,562	19.9
Distribution	36,222	17.8
— wholesale	10,972	5.4
— retail	25,250	12.4
Hotels, Catering, Publicans, Entertainment	16,466	8.0
Financial & Professional Services	40,551	19.9
Transport Services	8,309	4.1
Repairs of Vehicles & Other Goods	6,078	3.0
Other Services	22,340	10.9
Other/Miscellaneous	3,106	1.5
Total	204,032	100.0

Figure 22: Employers Registered with Revenue Commissioners and Business Registered for VAT 1990-2001



Source Revenue Commissioners.

3.56 The great body of medium, small, and micro-enterprises in the services sector made a major contribution to the record rise in employment from the mid-1990s. At 1,145,000, total employment in the services sector in the second quarter of 2002 was almost identical to that in the entire economy in 1992. Table 24 outlines employment growth in the main sectors of the economy between 1994 and 2002. Almost four-fifths of the net additional employment of 531,000 over this period occurred in service activities. Of these additional services jobs, almost three-quarters were in private sector services, with the remaining one-quarter in the predominantly public sector areas of public administration, education and health. Employment growth was particularly strong in financial and business services; transport, storage and communication; and hotels and restaurants.

Table 24: Employment by Sector 1994 and 2002*

	1994	2002	% growth	% share of total job growth
	000s			
Agriculture, forestry and fishing	146.8	120.7	–17.8	–4.9
Manufacture, mining & quarrying	251.9	302.9	+20.4	9.6
Construction	91.5	181.1	+89.6	16.9
Wholesale & retail distribution	168.9	245.9	+45.6	14.5
Hotels and restaurants	68.2	104.8	+53.6	6.9
Transport, storage & communication	55.8	110.2	+97.5	10.2
Financial & other business services	114.1	229.1	+100.8	21.7
Public administration & defence	66.3	89.2	+34.5	4.3
Education	80.4	110.0	+36.8	5.6
Health	100.9	157.0	+55.6	10.6
Other services	74.1	99.0	+33.6	4.7
Total	1,218.8	1,749.9	+43.6	

* Figures for 1994 from Labour Force Survey conducted in April 1994; figures for 2002 from Quarterly National Household Survey for Mar-May 2002.

3.57 In addition to their job creation role, the host of small and micro enterprises engaged in mainly service activities play a vital part in the economic life of the country in other ways. They are a breeding ground for new business ideas, help to extend competition and consumer choice and, because of their flexibility and adaptability, are often well placed to seize new business opportunities. As well as strengths, small businesses face a range of handicaps. Precisely because these businesses are small, regulatory and governance requirements can have a disproportionately onerous impact on them. Equally, they can be lacking in the range of management skills needed to optimise

efficiency; can face particular problems in accessing finance; and may have greater difficulty, particularly in a tight labour market, in competing for the skill sets they require. Since the publication of the report of the Task Force on Small Business in 1994, Ireland has sought to take explicit account of the needs of the small business sector. The majority of the more than 140 recommendations made by the Task Force have been implemented. The Department of Enterprise, Trade and Employment has established a Round Table for SMEs which acts as a focal point for consultation with small business on the full range of enterprise issues. The improved performance of small and micro enterprises during the 1990s suggests that, in tandem with the greatly improved business climate, this policy commitment to small business has paid dividends.

3.58 Data from Eurostat indicate that, over the period from 1995 to 2000, Ireland recorded the second highest rate of new business 'births' in the European Union.[18] Ireland also ranks fifth of the fifteen EU member states for the proportion of the workforce that is self-employed. Ireland compares less well however for entrepreneurial activity among women. Labour force survey data show that the proportion of women among the self-employed in industry and services in Ireland in 2001 was the lowest of the fifteen EU member states.[19] Around 20 per cent of the self-employed in Ireland were women compared with 30 per cent or more in Austria, the Netherlands, Finland and Portugal. In response to the relative lack of entrepreneurial activity among women in Ireland, the City and County Enterprise Boards have developed special programmes to assist women considering self-employment or setting up a business.

3.59 The rate of new business generation in Ireland in recent years and a range of fiscal and regulatory adjustments that have taken place suggests that the environment for enterprise in Ireland is a broadly positive one for enterprise formation. An OECD analysis of regulatory barriers to entrepreneurship found that Ireland ranked fourth lowest of the 21 economies surveyed.[20] The formalities for establishing a company in Ireland were ranked as joint sixth of 17 countries surveyed in terms of the administrative and cost burdens involved. European Commission opinion surveys show that the proportion of Irish respondents reporting administrative, or informational barriers to entrepreneurial activity was significantly below the European Union average, while the proportion reporting financial barriers was slightly below the EU average.[21] Surveys have similarly found the propensity to self-employment and entrepreneurship in Ireland to be comparatively strong. The Global Entrepreneurship Monitor [GEM] study for 2002 — a cross-national analysis of entrepreneurial activity — ranked Ireland as the twelfth most

[18] European Commission. 2002. **Benchmarking Enterprise Policy: Results from the 2002 Scoreboard,** pp. 37-40.
[19] ibid, pp. 42-43.
[20] European Commission. 2002. **Benchmarking Enterprise Policy: Results from the 2002 Scoreboard,** pp. 45-48. OECD. 2001. **Science, Technology and Industry Outlook,** pp. 98-101.
[21] Goodbody Economic Consultants. 2002. **Entrepreneurship in Ireland,** pp. 38-43.

entrepreneurial economy of the thirty-seven countries surveyed.[22] The rate of entrepreneurial activity in Ireland was well ahead of that in most other European economies and was one of the highest among developed economies.

3.60 Small and micro-enterprises in the services sector now face a tougher trading environment. Those engaged in the provision of business services must contend with the adverse impact of the downturn in the international economy and its knock-on effects on manufacturing and international services firms in Ireland. Enterprises providing services to consumers that benefited from rapid rises in employment and incomes in recent years must come to terms with less buoyant demand. Rising costs have affected businesses in all areas of activity, while the problems resulting from increased congestion have hit many enterprises in urban centres. There are also a number of longer-term challenges and threats stemming from developments such as the pace of technological change; the process of globalisation and the emergence of greater competition in previously protected sectors; the growth in the knowledge economy; and the need to respond to changing and more demanding customer requirements. The emerging framework for small business development policy will reflect Ireland's commitment, along with other EU member states, to the European Charter for Small Business. The key principles of the Charter include commitments to:

- Strengthening the spirit of innovation and entrepreneurship to meet emerging challenges;
- Achieving a regulatory, fiscal, and administrative framework conducive to entrepreneurial activity and to improving the status of entrepreneurs;
- Ensuring access to markets on the basis of the least burdensome regulatory requirements consistent with overriding public policy objectives;
- Facilitating access to research and development;
- Improving access to finance throughout the life cycle of enterprises;
- Listening to the views and concerns of small business and ensuring access to good quality business supports.

The support structures for small and micro-enterprises are discussed in chapter 5.

Conclusion

3.61 While the enterprise sector has made real advances over the past decade, there is a need to be clear-sighted about what has and has not been achieved. There has been

[22] Fitzsimons, P. et al. 2003. **How Entrepreneurial is Ireland? — The Global Entrepreneurship Monitor 2002: The Irish Report.**

remarkable growth in output, exports and employment, and the modernisation of Ireland's enterprise base has made major strides. With some important exceptions, however, much of the foreign-owned sector in Ireland is, by global standards, still positioned at a relatively low point in the value chain. The research and development, marketing, and other capabilities that underlie the competitive strength and success of these firms are not for the most part located in their Irish operations. As long as these characteristics continue to be true of significant parts of the foreign-owned sector, they remain vulnerable to competition from lower-cost economies for existing jobs and future investments.

3.62 Irish-owned enterprise in manufacturing and international services performed well over the past decade, but firms remain predominantly small with productivity levels below those in the majority of other European Union economies. Unit labour costs have increased in most sectors dominated by indigenous firms and a sustained rise in the value of the euro relative to sterling would pose a threat to a sizeable number of Irish-owned firms. There has been impressive growth in a number of high-tech areas, notably software, but firms in these sectors are currently facing difficult market conditions and a number have contracted or ceased operating. While for the first time in our history we now have a core of knowledge-based Irish-owned enterprises on which to build, the large-scale development of an indigenous high-tech sector must be seen as a long-term project. The years from 1995 to 2000 also saw strong enterprise growth and employment expansion in a range of service activities that are mainly locally traded. The challenge in the period ahead is to preserve those gains in the less favourable trading conditions that now confront these enterprises.

Chapter 4 — The Environment for Enterprise in Ireland

I The Enterprise Environment in Transition

4.1 There are two main ways in which an economy can achieve growth. First, by increasing productivity so that workers produce more. Second, by putting a larger proportion of the population to work, whether by reducing unemployment, increasing labour force participation among those of working age, or by a rise in the proportion of the population of working age. While both factors contributed to the record Irish growth performance of the 1990s, the decisive impetus was provided by the unprecedented increase in the number at work. It has been estimated that 38 per cent of total output growth between 1993 and 2001 was due to increased productivity, with 20 per cent attributable to a rise in the population of working age and 42 per cent attributable to an increase in employment levels among the working age population.[1] As outlined in part I, the period ahead will see a slowdown in the rate of labour force expansion and we will have to rely increasingly on productivity growth to increase output and raise living standards.

4.2 Michael Porter has deftly delineated the importance of productivity and its components to national economic prosperity[2]:

> A nation's standard of living is determined by the productivity of its economy, which is measured by the value of goods and services produced per unit of the nation's human, capital, and natural resources. Productivity depends both on the ***value*** of a nation's products and services, measured by the prices they can command in open markets, and the ***efficiency*** with which they can be produced. True competitiveness then is measured by productivity. Productivity allows a nation to support high wages and attractive returns to capital and with them a high standard of living.

This encapsulates the twin challenges for enterprise policy and the enterprise sector in Ireland. We need both to produce goods and services more efficiently and to raise the value of the goods and services we produce. Achieving these gains in value and efficiency will require a mutually reinforcing upgrading of business enterprises and the enterprise environment. The strength and sophistication of business enterprises may be the ultimate determinant of an economy's success, but enterprises require a supportive national environment in areas such as science and technology, infrastructure, and education and training if they are to progress up the value and innovation chains. High-quality knowledge and physical infrastructures will not provide a foundation for rising income and employment levels without a sophisticated enterprise base possessing the capabilities to turn

[1] Clinch, P. et al. 2002. **After the Celtic Tiger** (Dublin: O'Brien Press), pp. 45-46.
[2] Porter, M.E., 2002. 'Building the Microeconomic Foundations of Prosperity: Findings from the Microeconomic Competitiveness Index' in **World Economic Forum, Global Competitiveness Report 2002-03:** 25.

ideas and innovations into marketable goods and services. If we are to make the progress we aspire to in the next decade and beyond, therefore, we must create and sustain conditions in which ongoing improvements in the quality of the environment enterprise will strengthen businesses' capacity to raise value, innovation and efficiency and *vice versa*.

4.3 The analysis of the enterprise sector in chapter 3 outlined the kinds of improvement needed in order to enable firms in Ireland to make real progress in raising value and efficiency. In the foreign-owned sector, the challenge is to maintain competitiveness in terms of productivity, while also increasing the value of goods and services by building up enterprise capabilities in areas such as research and development, sales and marketing, and logistics and supply chain management. In many cases, these enterprises are producing goods and services high in value and innovation, but the sources of that value and innovation lie predominantly outside Ireland. In Irish-owned enterprise, there is a need both to increase value and to improve efficiency. Increasing the value of goods and services will require both strengthening capabilities and sophistication at firm level and ensuring the continued development of established high technology sectors such as software and embryonic ones such as biotechnology. In traditional sectors of indigenous enterprise, there is a clear need to improve efficiency and increase labour productivity. Opportunities to raise value levels should be systematically pursued, but there may be constraints on the ability of small firms in traditional sectors to build up capability in areas such as research, design, or marketing. The strategies and programmes put in place by the enterprise development agencies to assist in the attainment of these objectives are discussed in chapter 5.

4.4. The focus of this chapter is on a number of aspects of the enterprise environment in Ireland that are critical if businesses are to strengthen their capabilities to raise value, innovation and efficiency: (i) research and development; (ii) education and skills; (iii) infrastructure; and (iv) competition and regulation. The analysis that follows assesses Ireland's comparative performance on a range of indices related to these aspects of the business environment and notes the actions and initiatives that are underway to strengthen them. The European Commission and the OECD now undertake regular analyses comparing the performance of different economies across a wide range of indicators related to research, innovation and other aspects of enterprise and economic performance. The annual reports of the National Competitiveness Council similarly provide a detailed assessment of Ireland's relative standing in respect of over 200 performance indicators with a bearing on competitiveness. Benchmarking exercises such as these are of great benefit in providing an independent, evidence-based guide to our comparative performance. It should be borne in mind however that cross-national comparisons can be subject to methodological or statistical limitations. The data in such

analyses generally also relate to a period several years before their publication and, in areas subject to rapid change, may not always be an accurate guide to current trends.

4.5 As will be apparent, the results of the benchmarking analyses undertaken by the European Union and the OECD underline that, despite our excellent economic performance during the 1990s, we still have a considerable way to go in a number of key areas if we are to create a knowledge-intensive economy centred on high-value, high-innovation goods and services. While our performance has been that of a world-class economy, key aspects of the environment and infrastructure for enterprise are well below world-class level. This should not come as a surprise. Long-established characteristics of Irish economy and society — such as the generally weak scientific and technological base, infrastructural deficiencies, and the historically low levels of human capital stemming from factors such as the comparatively late provision of universal secondary education — have left a legacy that will take time to tackle. Seven years of outstanding performance could not realistically be expected to reverse the effects of seventy-five years of relatively poor performance.

4.6 The progression to a more advanced stage of economic development — an economy centred on high value activities and characterised by a strong and widespread commitment to innovation — may well prove more difficult and protracted than the advances achieved in recent years. The record growth of the 1990s was in many respects a long-delayed progression to income and employment levels that the majority of European Union economies had enjoyed for a number of decades. As we saw in part I, it was also facilitated by a particularly favourable conjuncture of domestic and external factors. The challenge for the period ahead is to ensure that we have in place a business infrastructure and environment capable of ensuring that we can sustain our position as one of the strongest and best-performing economies in the European Union and OECD in the long term. There are risks for Ireland during this transition period. Rising costs here and increased competition from lower-cost locations abroad could put a sizeable part of our existing enterprise base, both foreign and Irish-owned, at risk before we have fully put in place the R&D and skills capabilities and quality infrastructure needed to sustain an advanced, world-class economy. If we are to avert this risk and manage the transition process successfully, we must preserve the strengths that underpinned the progress made during the 1990s, in particular a disciplined approach to wage determination, a competitive cost base generally, and a low rate of corporation tax. These core elements of competitiveness remain vital while we work to develop new sources of advantages in areas such as research and development and infrastructure. Of no less importance is the pursuit of greater efficiency at both firm level and at the level of the wider business environment through more widespread competition, improved infrastructural provision, and other means.

II Science, Technology and Innovation

> For decades, scientists in this country have worked against the tide, struggling to keep research programmes afloat when the resources and national commitment were not there. I believe the tide has now turned. This does not mean that all the necessary resources are now available or that the infrastructure is near where it must be. But it does mean that the public, through the government, has found in recent economic growth the will to make science and innovation national priorities.
>
> Mary Harney T.D., Tánaiste and Minister for Enterprise, Trade and Employment.[3]

4.7 There is widespread agreement that knowledge and innovation are critical sources of economic growth and development. All industries generate or exploit new technology to some degree, but some such as the ICT and pharmaceuticals sectors do so more systematically and to a greater extent. Over the past decade, trade in high-technology industries has accelerated and their share in total world trade has grown significantly. Between 1990 and 1999, trade in high-tech manufacturing goods in OECD economies increased by 3.3 per cent per annum while that in low and medium-low technology industries declined by 1.4 and 2.6 per year respectively.[4] Over this period, the high-tech share of total manufacturing trade in the OECD rose correspondingly from 18.8 to 25.3 per cent.

4.8 Despite Ireland's distinguished scientific tradition, investment in science and technology by both government and business has been at a low level for most of the period since the foundation of the state. Though we now have a strong presence in research-intensive sectors such as information technology and pharmaceuticals, most of the research that underpins the activities of foreign-owned firms operating here is carried out outside Ireland. Figures 23-28 summarise the findings of comparative analyses of the performance and capabilities of European Union member states, the US and Japan on a number of key indicators related to research and development and innovation. The data relate to various years from the mid-1990s to 2001. Because of the sizeable difference between Irish GNP and GDP, GNP is used as the output denominator for Ireland and GDP for other countries. Broadly speaking, EU member states fall into three distinct groupings in terms of the level of development of science and technology capabilities. First, the southern European economies — Greece, Portugal, Spain and Italy — which consistently lag other member states by a considerable margin on innovation-related indicators. Second, the Scandinavian countries — Finland, Sweden and to a lesser extent Denmark — which consistently outperform other member states, generally by a substantial margin. Third, a middle group comprising over half of member states in which Ireland is generally towards the lower end of the group range and in which Germany

[3] Address by Mary Harney T.,D., Tánaiste and Minister for Enterprise, Trade and Employment, to Royal Irish Academy, 20 January 2003: 9.

[4] OECD. 2002. **Science, Technology and Industry Scoreboard 2001: Towards a Knowledge-Based Economy,** section D.7.1.

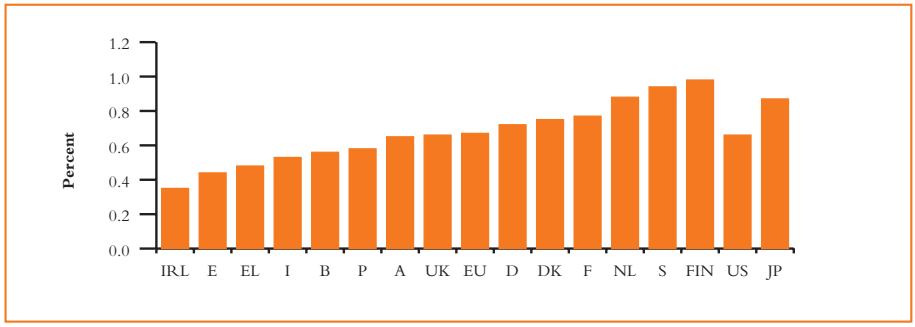
and the Netherlands are generally at the upper end, with other economies occupying fluctuating positions in between.

4.9 The results of these analyses indicate that our overall performance on the research and development and innovation indicators covered by the EU and OECD studies can validly be summarised as poor to middling. Our ranking on individual measures was as follows:

- Public expenditure [government and higher education] on R&D as a proportion of GDP — lowest of sixteen countries, slightly over half the EU average.
- Business expenditure on R&D as a proportion of GDP — 5th lowest of 16 countries, around three-quarters the EU average.
- High-tech applications to the European Patent Office per million population — 8th of 17 countries, slightly below the EU average.
- High-tech patent applications to the US Patent Office per million population, 12th of 17 countries, half the EU average.
- Number of researchers per 100,000 in the workforce — joint 7th of 16 countries, marginally above the EU average.
- Proportion of manufacturing firms engaged in collaborative R&D with universities or other public research bodies — 3rd lowest of 9 countries.

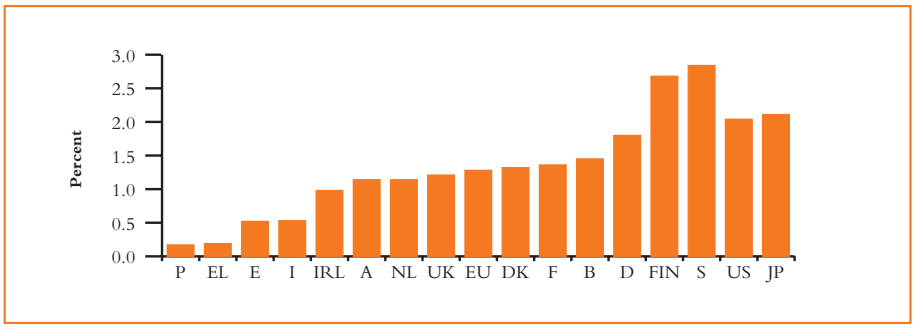
These findings underline that Ireland starts from a relatively underdeveloped science and technology base and has a considerable way to go before we compare with the best-performing economies such as Sweden and Finland. Even on a measure on which our industrial structure might have been expected to give us an advantage — high-tech applications to the US patent office — our performance was relatively poor. This underlines the point made in chapter 3 about the generally low level of R&D among US companies operating in Ireland.

Figure 23: Public Expenditure on Research and Development as a Proportion of GDP*



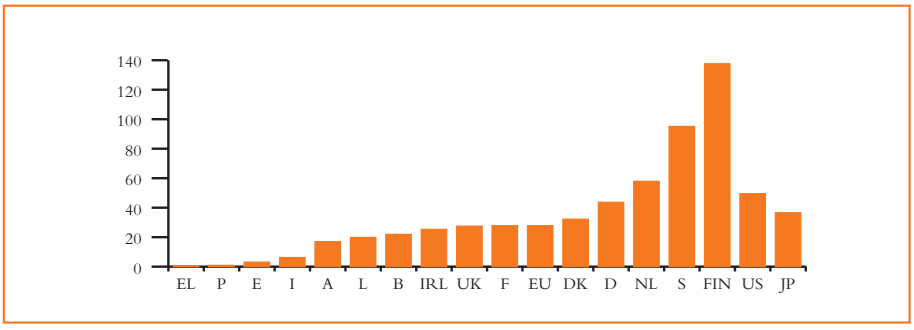
1998: A
1999: B EL I NL P S
2000: DK F US IRL JP
2001: DK FIN UK
*GNP in case of Ireland.
Source: Forfás and European Commission: *European Innovation Scoreboard 2002.*

Figure 24: Business Expenditure on Research and Development as a Proportion of GDP*



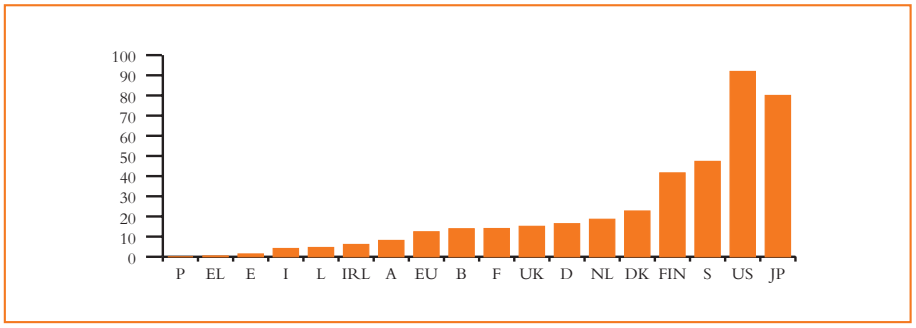
1998: A
1999: EL NL P UK
2000: B DK F US JP
2001: D E FIN I UK
*GNP in case of Ireland.
Source: Forfás and European Commission: *European Innovation Scoreboard 2002.*

Figure 25: High-Tech Patent Applications 2000 to European Patent Office per Million Population



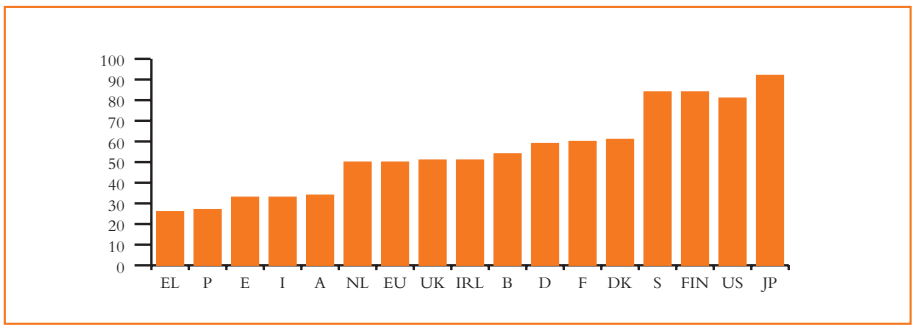
Source: Frank, S. Patent Applications to the EPO 1990-2001 .
Eurostat *Statistics in Focus, Theme 9 - 3/2003.*

Figure 26: High-Tech Patent Applications 2000 to US Patent Office per Million Population



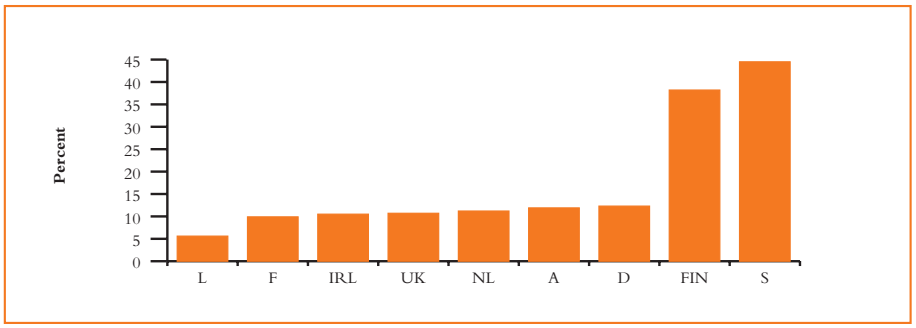
Source: European *Commission European Innovation Scoreboard 2002.*

Figure 27: Researchers per 10,000 Labour Force 1997*



* Austria 1995.
Source: OECD. *Science, Technology and Industry Scoreboard 2001.*

Figure 28: Proportion of Manufacturing Firms with Collaborative Arrangements with University/Government Research Institutions 1995-96



Source: OECD. *Science, Technology and Industry Scoreboard 2001.*

4.10 The data presented at figures 23-28 offer a snapshot of the performance of different countries at a particular point in time, but say nothing about whether that performance is improving or deteriorating. In Ireland's case, performance trends were generally on an upward curve during the 1990s and convey a more positive picture. This reflects the growth and changing sectoral dynamics of the enterprise sector as well as the fact that the policy focus on R&D gained momentum from the late 1980s. Over the period from 1991 to 1997, the rate of growth in total Irish R&D expenditure was the highest in the OECD, while that of business R&D expenditure was the third highest in the OECD and the highest in the European Union.[5] As noted in chapter 3, however, the rate of growth in business spending on research fell back between 1999 and 2001, particularly among indigenous firms. In the second half of the 1990s, the rate of growth in high-tech patent applications in Ireland was the third highest in the European Union, while the average annual growth rate in the number of researchers from 1991 to 1999 was the third highest in the OECD. This improvement occurred moreover before the substantial increase in public funding for scientific research provided for under the National Development Plan 2000-2006. Table 25 outlines the allocation for research, technological development and innovation [RTDI] under the Productive Sector Operational Programme of the Plan and compares it with those under the Industry Operational Programmes of the Plans covering the periods from 1989 to 1993 and 1994 to 1999. Expenditure on industry-related R&D is scheduled to average almost €350m. per annum between 2000 and 2006 compared with around €80m. per annum from 1995 to 2000. The EU's share of this expenditure is set to fall from over 50 per cent in the second half of the 1990s to under 10 per cent in 2000-2006.

Table 25: Industry-Related Science and Technology Expenditure 1989-2006

	Total	EU		Government		Private Sector	
	€m	€m	%	€m	%	€m	%
Operational Programme for Industry 1989-93	387.8	140.6	36.3	193.9	50.0	53.3	13.7
Operational Programme for Industry 1994-99	502.0	269.0	53.6	56.0	11.2	177.0	35.2
Productive Sector Operational Programme 2000-06	2,430.9	230.9	9.5	1,339.2	55.0	861.8	35.5

Source: Forfás.

[5] OECD. 2002, op. cit., tables A.2.1.2 and A.4.1.1.

4.11 The main innovation in the Industry RTDI programme under the National Development Plan 2000-06 is the provision of around €646m. for the Technology Foresight Fund, administered by Science Foundation Ireland, to support world-class research in strategic niches of ICT and biotechnology. The Plan also makes provision for other significant expenditures aimed at improving research and development capabilities, in particular the Programme for Research in Third-Level Institutions [PRTLI] established to support a wide range of research in the higher education sector with the aim of building a world-class research base in Irish universities and colleges. Since 2000, more than 800 researcher positions have been created in higher education institutions as a result of PRTLI funding. Despite budgetary constraints, the 2003 Budget Estimates provided for increased research funding for Science Foundation Ireland. Though the Government restated its commitment to the Programme for Research in Third Level Institutions, 2003 will see a slowdown in capital investment in third level education because of the greater pressures on the public finances.

4.12 At the Lisbon Summit in 2000, the European Council agreed the European Research Area [ERA] project as a contribution to the goal of making the European Union the most competitive knowledge-based economy globally by 2010. At Barcelona in 2002, the Council set an EU-wide target that gross expenditure on R&D should increase from 1.9 per cent to 3 per cent by 2010, two-thirds of which should be funded by business. In Ireland, gross expenditure on R&D was 1.38 per cent in 2001 and, in the context of the EU's 3 per cent target, there a need to determine what contribution Ireland can make to its achievement. In January 2003, the Tánaiste and Minister for Enterprise, Trade and Employment announced the establishment of a high-level steering group to assess the implications of key emerging ERA policy initiatives, and to prepare action plans for progressing priority areas, including the 3 per cent target.

4.13 In the interests of long-term economic development, it is vital that the increased expenditure on research is used effectively to further the development of a knowledge-based economy. As discussed further in chapter 5, this will require a strong emphasis on ongoing monitoring and evaluation of all science and technology-related expenditures. In 2002 the Government established a Commission under the auspices of the Irish Council for Science, Technology and Innovation in order to ensure that effective mechanisms exist to oversee the major increase in research spending and activity. The Commission has recently reported on ways and means of improving the framework, structures and mechanisms for research policy development in Ireland. Increased public investment in research and development needs to be complemented by a higher level of business research and development expenditure. The enterprise agencies are working to promote the development of research-intensive niches and enterprises and to encourage a greater commitment to research among client companies generally. A proposal for a research

and development tax credit designed to stimulate greater business expenditure on R&D, that was developed by Forfás in conjunction with IDA and Enterprise Ireland, is being examined by relevant Government departments.

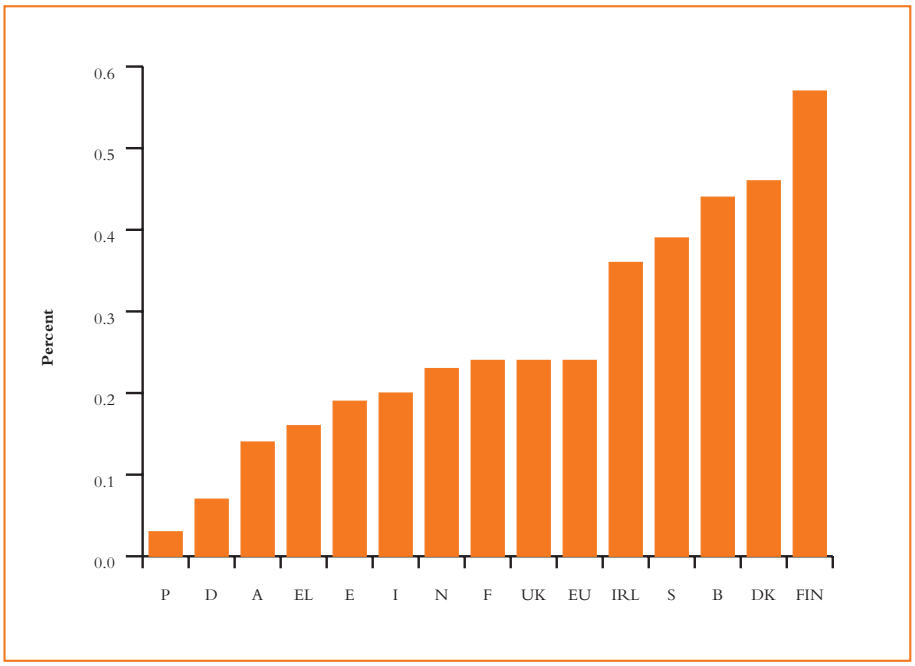
4.14 One aim of recent policy initiatives is to foster Irish counterparts of the kind of strong research-industry networks found in Silicon Valley and the 'Miracle Mile' which links Harvard, MIT, and Boston University. These have generated numerous high-tech start-ups as well as major global companies such as Microsoft and Sun Microsystems. It is estimated that MIT graduates alone have started some 4,000 companies throughout the United States, and over 1,000 in Massachusetts where such businesses account for an estimated 25 per cent of the state's manufacturing output. There are many highly respected research centres, however, that have not had a remotely comparable impact on their local or national economies. This underlines the need to put a high priority on the development of strong links and networks between the research community and the business sector. Science Foundation Ireland's Centres in Science, Engineering and Technology [CSET] programme is designed to create centres formed by clusters of internationally recognised researchers from the third level sector and industry. These centres will link scientists and engineers in partnerships across academia and industry to address crucial research questions, foster the development of new and existing Irish-based technology companies, attract industry that could make an important contribution to Ireland and its economy, and expand educational and career opportunities in Ireland in science and engineering. Science Foundation Ireland has also indicated its intention to work with Columbia University's International Innovation Initiative — a recognised leader in technology transfer — in order to put in place the most effective possible mechanisms for promoting collaboration between researchers and business enterprises and ensuring that research findings are commercialised. In addition to efforts to encourage a greater commitment to research and development by their client companies, IDA Ireland, Enterprise Ireland and Shannon Development are, as discussed in chapter 5, actively working to build partnerships and closer links between business enterprises and third-level institutions.

4.15 As well as co-operative research between third-level institutions and business enterprises, the other key mechanisms of technology transfer include the patenting and licensing of new products and processes by academic researchers and their institutions, and the establishment of spin-off campus companies to commercialise their research. Following reports by the Irish Council for Science, Technology and Innovation on 'Utilising Intellectual Property for Competitive Advantage' and 'Commercialisation of Publicly Funded Research', a national code of best practice is being developed in the area of commercialisation. Best practice approaches and well resourced commercialisation functions in third-level institutions working closely with the enterprise development agencies will be important for successful commercialisation. Enterprise Ireland's

Campus Companies programme and its other initiatives to support academic entrepreneurs are outlined in chapter 5.

4.16 Because of the greater risk element in research-based enterprise and the often long lead-in time before new products make it to market, the ready availability of adequate levels of venture capital is a critical requirement for these and other high-technology enterprises. Recent years have seen an improvement in the provision of venture capital in this country. The level of high-tech venture capital in Ireland was, as figure 29 shows, the fifth highest in the European Union in 2000.

Figure 29: High-Tech Venture Capital as a Proportion of GDP* 2000



* GNP in case of Ireland.
Source: European Commission. *European Innovation Scoreboard 2002.*

4.17 The substantial inflow of funds from outside the country is a particular feature of venture capital provision in Ireland. In the latter part of the 1990s, external sources of venture capital were more than four times greater than those supplied by domestic providers.[6] The difficulties in the ICT sector have inevitably had an impact on the availability of funding, but the evidence suggests that the decline in Ireland has been smaller than in other European Union countries or the US.[7] In 2002, it is estimated that

[6] Baygan, G. & Freudenberg, M. 2000. **The Internationalisation of Venture Capital Activity in OECD Countries.** STI Working Paper 2000/7 (OECD: Paris).
[7] Goodbody Stockbrokers 2002. **Goodbody Technology Research SummiT2002. Irish Times,** Business This Week, 14 February 2003: 7.

10 per cent of high-tech venture capital investment in Europe was invested in Ireland even though we account for just 1 per cent of European GDP. Enterprise Ireland has become increasingly active in recent years in seeking to address funding gaps for growth-oriented companies and is engaged in a number of venture capital partnerships with private sector interests. Its activities in this area are discussed in chapter 5.

4.18 Though the establishment of the Technology Foresight Fund and Science Foundation Ireland and the large increase in public funding of R&D represent major initiatives, they need to be kept in perspective. Ireland will not become a world-class research performer overnight. Just as small countries face problems of scale in the enterprise sphere, so also can they expect to encounter scale handicaps in the research field. The monies committed to the Technology Foresight Fund are unprecedented by Irish standards and are certainly sizeable enough to have a major impact on our research performance. It will nevertheless require careful management and focusing of resources to ensure that critical mass is achieved and opportunities for commercialisation exploited.

III Education and Skills

Educational Participation and Attainment

4.19 Education and skills are paramount assets for knowledge-based economies. If Ireland is to make the transition to a high-value, high-innovation economy, we will need people with advanced capabilities in a range of scientific and technological fields. The achievement of greater efficiency right across the economy will also be aided by high standards of general educational attainment as well as a greater and continuing commitment to training. Awareness of the importance of education and skills for economic development took time to emerge in Ireland. Universal second-level education occurred later here than in many other industrialised economies. As a result, the level of educational attainment among the population as a whole in Ireland is, on some measures, below that in the majority of other European Union member states. Table 26 shows the proportion of the population aged 25-64 that has attained at least upper secondary education in Ireland, other European Union member states, the US and Japan. It can be seen that the proportion of the working-age population in Ireland with this level of educational attainment is below that in the countries of Northern Europe and Scandinavia, and in the United States and Japan.

Table 26: Proportion of the Population Aged 25-64 With At Least Upper Secondary Education 2001*

	%
Austria	76
Belgium	59
Denmark	80
Finland	74
France	64
Germany	83
Greece	51
Ireland	58
Italy	56
Luxembourg	53
Netherlands	65
Portugal	20
Spain	40
Sweden	81
United Kingdom	63
United States	88
Japan	83
OECD	64

*2000 for Austria, Belgium & the Netherlands.

Source: OECD Education Database.

Table 27: Proportion of Age Cohort with at Least Upper Secondary Education Ireland and the OECD 2001

% of cohort with at least upper secondary education

	25-34	35-44	45-54	55-64	25-64
Ireland	73	62	48	35	58
OECD	74	68	60	49	64

Source: OECD Education Database.

4.20 The expansion of second-level education from the 1960s led to a marked improvement in rates of educational attainment. As we saw in part 1, there is general acceptance that this improvement in human capital was an important factor in our economic resurgence from the late 1980s. Table 27 shows the proportion of the population in different age-cohorts in Ireland with upper secondary education and compares it with the OECD average. As can be seen, the proportion of the population in the 25-34 age-group that remained in education to upper second-level is around twice that in the 55-64 age group. Whereas the proportion of persons with upper second-level education in the older age-group in Ireland was fourteen percentage points below the OECD average, the figure for the younger age group was almost identical to the OECD average. Despite the great progress made in recent decades, however, the evidence of a number of studies indicates that a significant minority of young Irish people have not benefited to the extent that they should from the educational system. The problem is most pronounced among young people, and young males in particular, from disadvantaged socio-economic groups in Dublin and other cities. Participation to leaving certificate for males and females is around 70 per cent in Dublin, the lowest level in the country. With the decline in the number of entrants to second-level education, there is now both greater need and opportunity to address this issue. The National Anti-Poverty Strategy includes a target that participation rates to upper second level or equivalent should increase to 90 per cent by 2006. *Sustaining Progress* provides that initiatives will be implemented to prevent and address early school-leaving taking account of the framework set out in the National Economic and Social Forum report on Early School Leavers.

4.21 The expansion of educational provision and participation at third-level in recent decades has been particularly striking. The number of full-time students in third-level education rose from 23,143 in 1968-69 to 116,548 in 1998-99. In 1965, the total annual intake into third-level colleges was equivalent to 11 per cent of 17 year-olds, but by 1999 this figure had risen to 56 per cent. This has markedly improved Ireland's ranking in comparative analyses of participation rates in higher education. Table 28 shows the proportion of the population in different age-groups in Ireland and the OECD with tertiary-type B qualifications (broadly certificates or diplomas) and tertiary-type A qualifications (broadly primary and higher degrees). As can be seen, the proportion of the population with third-level qualifications compares well with the OECD average, particularly among the 25-34 age group and for type-B qualifications. Though these figures are an encouraging sign of the educational progress made in Ireland, this is no warrant for complacency. A recent OECD study observed that a new educational paradigm was emerging in which 'participation in some form of tertiary education may be expected to become the norm in our society'.[8] In this situation, any country that does not continue to improve its performance will sooner or later find itself falling behind.

[8] Cited in Clancy, P. 2002. **College Entry in Focus: A Fourth National Survey of Access to Higher Education** (Dublin: Higher Education Authority), pp.170-71.

Table 28: Proportion of Age Cohort with Tertiary Education Ireland and the OECD 2001

	% with tertiary-type B education					% with tertiary-type A education				
	25-34	35-44	45-54	55-64	25-64	25-34	35-44	45-54	55-64	25-64
Ireland	28	23	18	13	22	20	14	11	8	14
OECD	10	9	7	6	8	18	16	14	10	15

Source: OECD Education Database.

Standards

4.22 From the point of view of the needs of the enterprise sector, the chief requirement of the educational system at primary and secondary level is that it should produce students with levels of proficiency in the key areas of literacy, mathematics, science, and languages that are up to the best international standards. Among the sciences, physics and chemistry are particularly important in view of their role as a foundation for other disciplines. Like the international benchmarking studies of performance in areas such as innovation, comparative analyses of educational standards are now regularly undertaken. One such study, the International Adult Literacy Study [IALS] conducted in 18 countries in 1994 and subsequent years, found that 23 per cent of Irish persons of working age, the second highest level in the European Union, were at the lowest of five defined literacy levels, equivalent effectively to functional illiteracy.[9] Among 16 to 25-year-olds, 17 per cent were found to be functioning at the lowest literacy level.

Table 29: Programme for International Study Assessment [PISA] 2000 (Assessment of 15 year-olds in secondary education in 27 countries)

	Reading Literacy	Mathematical Literacy	Scientific Literacy
Irish Score	526.7	502.9	513.4
OECD Average	500	500	500
Irish Ranking	5th	15th	9th
Highest Ranking Country	Finland	Japan	Korea
Score of Highest Ranking Country	546.5	556.6	552.1

Source: OECD.

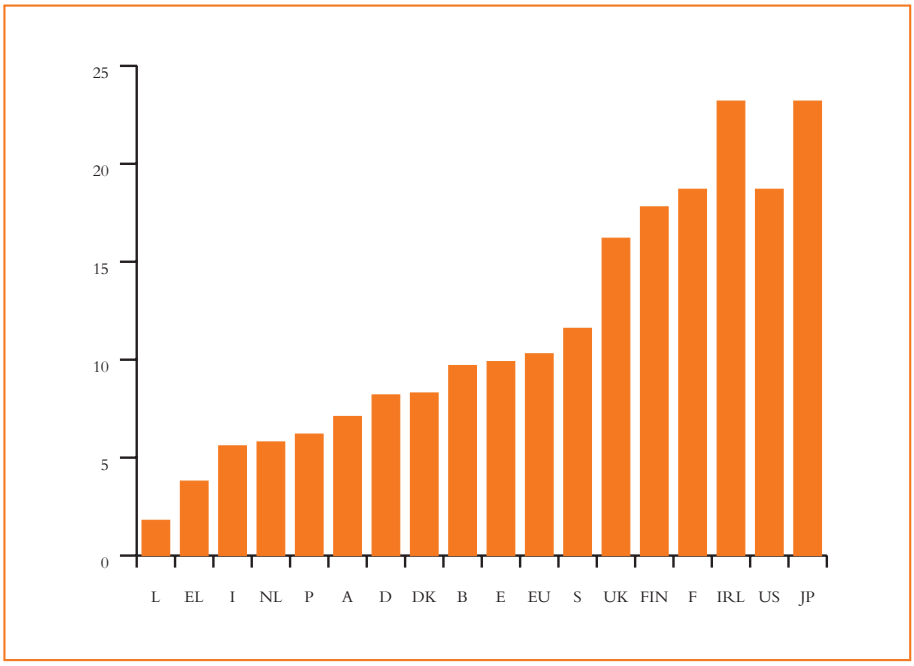
[9] Morgan, M. et al. 1997. **International Adult Literacy Survey: Results for Ireland** (Dublin: Stationery Office).

4.23 The IALS study has been subject to considerable criticism on methodological grounds by academic commentators.[10] In 2000, the OECD launched a new research project, the Programme for International Study Assessment [PISA] which sought to compare student performance on a basis that would command greater authority and acceptance.[11] The first phase of the project involved a detailed assessment of reading literacy among 15 year-old second-level students in twenty-seven countries, along with preliminary assessments of mathematical and scientific literacy. The results for Ireland outlined at table 29 give quite a different picture to that of the IALS findings. Irish students' score on reading literacy was significantly above the OECD average and ranked fifth of the twenty seven participating countries. Seven countries had mean scores which were not significantly different from Ireland's, while only one, Finland, had a score which was markedly above that for this country. Given the divergent results of earlier studies, future rounds of the PISA study and other similar research projects will provide further important information on the comparative reading literacy of Irish students. The National Anti-Poverty Strategy includes a target to halve the proportion of pupils with serious literacy difficulties by 2006.

4.24 As table 29 shows, Ireland's performance on the preliminary assessments of mathematical and scientific literacy in the first PISA analysis was at or a little above the OECD average, but was less impressive than that on reading literacy. Students in the best-performing countries performed significantly better than their Irish counterparts. More comprehensive assessments of mathematical and scientific literacy are to be undertaken in 2003 and 2006 respectively. In view of the importance of proficiency in mathematics and science for future skills needs, careful attention should be paid to the findings and implications of these studies. While encouragement can be taken from the first-round results of the PISA study on reading, mathematical and scientific literacy, the performance of the Irish educational system leaves room for improvement in one important area — proficiency in foreign languages. The evidence of a number of studies suggests that the foreign language proficiency of Irish students is an issue that requires to be addressed.[12] In view of the importance of boosting trade with EU member states other than Britain, sustained improvement in this facet of educational performance would be beneficial.

[10] Nolan, B. 2002. 'Why does Ireland still do so badly on the UN's Human Poverty Index?', **ESRI Quarterly Economic Commentary Autumn 2002,** pp. 43-45.
[11] Shiel, G. et al. 2001. **Ready for Life?: The Literacy Achievements of Irish 15-Year-Olds with Comparative International Data** (Dublin: Educational Research Centre).
[12] National Competitiveness Council. **Annual Competitiveness Report 2002,** pp. 26 & 97.

Figure 30: Science and Engineering Graduates per 100,000 Persons Aged 20-29 in Labour Force



Source: European Commission. *European Innovation Scoreboard 2001.*

Table 30: % of senior-cycle students in second-level schools taking science subjects

	1983-84	1993-94	1999-2000	2000-2001
Chemistry	20.8	14.3	10.6	12.0
Physics	20.1	19.5	13.5	16.4
Biology	51.5	50.8	42.0	43.7
Physics and Chemistry (Combined)	3.7	2.8	1.7	2.0
Agricultural Science	3.5	4.0	4.7	5.7

Source: Department of Education and Science.

Education for Science and Technology

4.25 Ireland's success in attracting high-technology inward investment and developing indigenous technology companies has been due in considerable part to our capacity to turn out large numbers of science and technology graduates with the skills required by businesses in sectors such as information technology and pharmaceuticals. Over the past decade, we have consistently been at or near the top of European Union or OECD rankings for graduate levels in science and engineering. Figure 30 outlines the proportion of science and engineering graduates per 100,000 persons aged 20-29 in the workforce in the European Union, the United States and Japan between 1997 and 1999. As can be seen, Ireland was well ahead of all other countries; the proportion of science and engineering graduates among persons aged 20-29 in the Irish labour force was over twice the EU average. After Finland, Ireland also ranked second highest in the European Union for the proportion of scientists and engineers in the workforce.[13]

4.26 Our leading position on this indicator is at risk however from a decline in the number and/or proportion of students taking science subjects at second and third level. At junior cycle in second level, the proportion of students taking science subjects has remained fairly constant at just under 90 per cent over the past twenty years. The number of students taking these subjects, however, has been falling since the mid-1990s because of the decline in the number of students entering secondary school caused by demographic changes. In 1994, there were 187,548 students taking science subjects at junior cycle, but by 2001 this had fallen to 159,929. At senior-cycle in second-level, the proportion of students taking science subjects has been falling for most of the past two decades. Table 30 outlines the proportion of senior cycle students taking science subjects in 1983-84, 1993-94, 1999-2000, and 2000-2001 respectively. The proportion of students taking chemistry at senior cycle halved between the mid-1980s and the late 1990s, while the proportion studying physics fell by around one-third. While there was a slight rise in the number of students taking physics and chemistry in the Leaving Certificate in 2003, there is a need for a much more substantial increase.

4.27 In a society that has been profoundly shaped by science and an era that continues to be transformed by scientific advances and technological innovations, it is unsatisfactory that just one-in-six senior cycle students study physics and just one-in-eight study chemistry. As the subjects that students study at senior cycle in second level influence their choices at third level, the long-term decline in the number of secondary school students opting for science subjects has almost certainly had an impact on the numbers pursuing science and technology courses at third level. Whereas in 1986, around one-third of entrants to higher education had taken chemistry (35%) and/or physics (33%), these

[13] OECD. **Science, Technology and Industry Scoreboard 2001: Towards a Knowledge-Based Economy,** section A.9.1.

figures had fallen to 17 per cent and 22 per cent respectively by 1998. In total, 2,923 primary science degrees were awarded in 1999 compared with 2,141 in 1995. There was also a sharp rise over this period in the number of students awarded degrees or diplomas in computing and information technology. The number of first preference applications for degree courses in science peaked, however, at 6,027 in 1998 and declined to 4,848 in 2003, while the number of first preference applications for diploma/certificate programmes fell from 4,649 in 1997 to 4,535 in 2003. Acceptances to science, engineering, and technology courses have also been declining as a proportion of total third-level acceptances. For degree courses, the share fell from 33 per cent in 1999 to 30 per cent in 2001, while for certificate/diploma courses, it dropped from 51 per cent in 1997 to 46 per cent in 2001. The problem of declining student numbers has been compounded by significant levels of non-completion of degree and diploma courses. In both universities and institutes of technology, non-completion rates are generally higher in science, engineering and technology subjects.

4.28 Ireland's enterprise strategy — and indeed a key part of our entire economic strategy — is centred on developing world-class capabilities in knowledge-based sectors such as ICT and biotechnology. Though a similar decline has occurred in a number of other countries, the long-term fall in the number and/or proportion of students taking physics and chemistry at senior cycle in second level, or applying for third-level courses in science and technology, is a development with serious implications. IDA Ireland has warned that it threatens its efforts to attract high-tech firms to Ireland, while Enterprise Ireland has expressed concern at the effects on the emerging indigenous high-tech sector. Effective action is needed to increase the number of students taking physics and chemistry at second level and science, engineering and technology degrees and diplomas at third level. The Task Force on the Physical Sciences, appointed to examine the reasons for the decline in the take-up of science subjects and to suggest ways of reversing it, reported in 2002. Its report contains a comprehensive strategy and a detailed set of recommendations designed to achieve a world-class system of science education in Ireland. An Implementation Group is due to be appointed to progress the implementation of the Task Force's recommendations as resources permit.

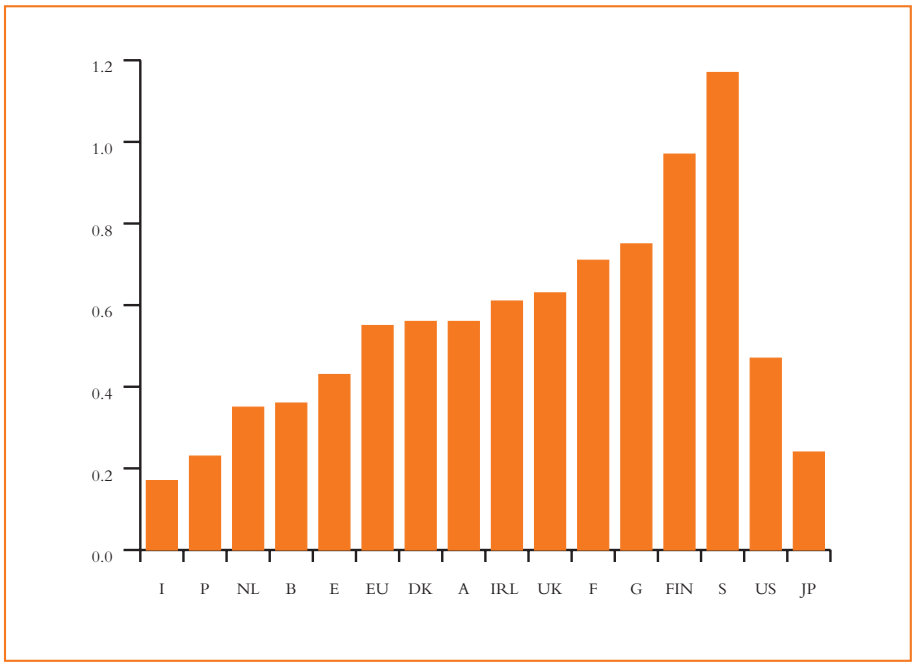
Post-Graduate Education in Science and Technology

4.29 The policy of promoting knowledge-intensive, science-based enterprise will require a strong advanced research capability, and in particular an adequate supply of post-graduate and post-doctoral researchers, or what is sometimes termed fourth-level education. Though this was not traditionally one of the strengths of the Irish educational system, the past decade has seen an improvement in this regard. In the late 1990s, an analysis of the number of new PhDs in science and technology per 1,000 population in European Union member states, the United States and Japan found that Ireland ranked sixth of the 15 countries surveyed. The findings are summarised at figure 31 and show

that our PhD output was slightly above the EU average, but well below that of Finland and Sweden, the best performing countries on this as on many other science and technology and human capital indicators.

4.30 The large increase in investment on science and technology under the National Development Plan 2000-2006 has led to increased demand for post-graduate and post-doctoral researchers and this demand is projected to increase further between now and 2006. The Expert Group on Future Skills Needs has estimated that the number of post-graduate researchers receiving support under existing and planned programmes of research support could rise from under 600 in 1999 to 1800 in 2005 and 2006, while the number of post-doctoral researchers receiving support could rise from around 150 in 1999 to almost 750 in 2005 and 2006. Current output levels of Masters' and PhD degrees are inadequate to match the projected demand. The Expert Group has undertaken a study of needs in this area and made a number of recommendations aimed at increasing the number of Irish post-graduate and post-doctoral researchers and at attracting researchers from other countries. The Group, with Forfás, will continue to monitor needs in this area. In line with a recommendation of the Expert Group, a working group with representatives from third-level institutions, the enterprise agencies and other bodies, has been established by the Higher Education Authority in order to devise new strategies to increase the number of researchers.

Figure 31: New Science and Technology PhDs per 1,000 Population 1999⋆

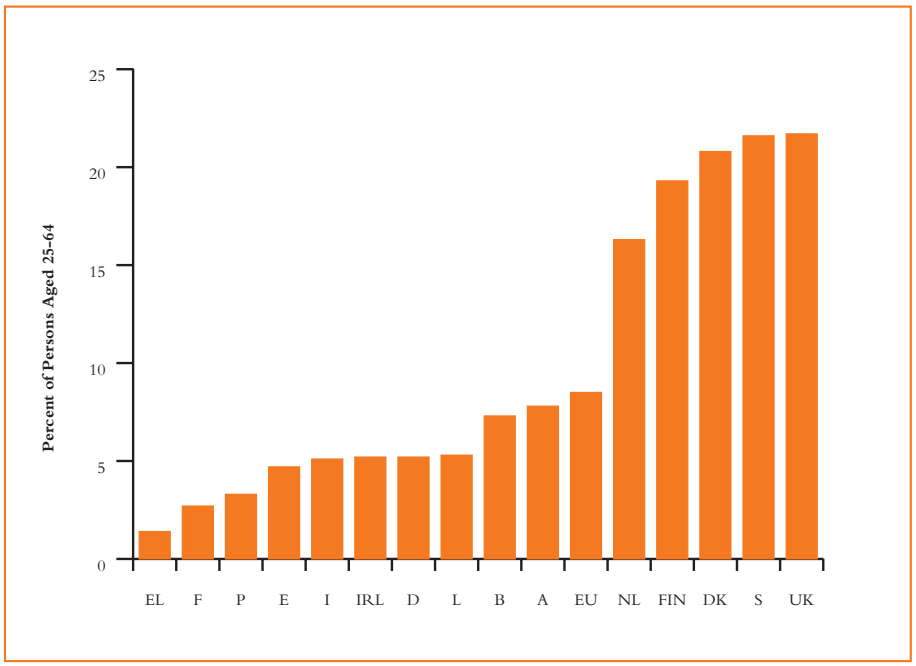


⋆ Italy 1997. France, Spain and UK 1998.
Source: National Competitiveness Council. *Annual Competitiveness Report 2001,* table 8.

Lifelong Learning

4.31 The fall in the numbers entering second and third level education, and the related decline in the rate of workforce growth, mean that greater emphasis will have to be placed in future on improving the education and skills of those already in employment. The accelerating pace of technological and market change also requires that the knowledge, skills, and competences of the workforce be enhanced on a continuous basis. Partly because of the preponderance of younger age cohorts in our demographic structure in recent decades, provision for lifelong education and training has been relatively under-developed in Ireland. Educational provision for, and participation by, mature students remains low by international standard. In 1998, 90.1 per cent of new full-time entrants to higher education were aged nineteen or younger, little changed from the figure of 92.2 per cent in 1980, while fewer than five per cent were over twenty three. Figure 32 outlines the findings of a European Union survey of participation in lifelong learning — defined as participation in any type of education or training among persons of working age in the four weeks prior to the survey period. Defined on this basis, Irish participation rates ranked at joint ninth of the fifteen member states. As is apparent, the gap between Ireland and the best performing countries was substantial. In Ireland, 5.2 per cent of the population of working age had been engaged in some form of education and training around the time of the survey period compared with 21.6 per cent in Sweden.

Figure 32: Participation in Life-Long Learning 2001⋆



⋆ Ireland and Austria 1997.
Source: European Commission. *European Innovation Scoreboard 2001.*

4.32 The Irish data in this study relate to 1997 and there is evidence of a rise in the level of training since then. Though Irish enterprise has not traditionally been noted for its commitment to human resource development, a recent study of in-company training among firms engaged in traditional manufacturing sectors and construction undertaken by the Expert Group on Future Skills Needs found that there had been a 'dramatic increase' in the level of training carried out by the firms surveyed.[14] Ireland also came out comparatively well in a European study of continuing vocational training at enterprise level in 1999. The findings of the study are summarised at tables 31 and 32 and show that the share of training hours in total working hours in Ireland was the fifth highest of the twelve countries surveyed. As can be seen from table 31, small firms employing between ten and forty nine employees registered a particularly strong training performance in Ireland. Table 32 shows the number of training course hours per participant, an indicator of the intensity of training programmes. Irish enterprises, particularly small firms, also performed well on this measure. Training intensity here was higher than in all of the countries with higher aggregate levels of training time than Ireland — Sweden, Finland, Norway and the Netherlands. These findings would appear to show an increasing commitment to training on the part of Irish enterprise, and it is to be hoped that this will be maintained in the more difficult trading environment that now faces many businesses.

4.33 A number of important steps have recently been taken to put planning and provision for lifelong learning on a new footing. In March 2002, the National Adult Learning Council was established as an executive agency of the Department of Education and Science. It comprises representatives of the key interests involved in the area and is charged with promoting the development of adult learning and ensuring that a co-ordinated strategy is followed by the relevant sectors and agencies. In November 2002, the Government approved the publication of the report of the Taskforce on Lifelong Learning and the setting up of a high-level steering committee to oversee the implementation of its recommendations. The Task Force's report provides a comprehensive strategic framework for the future development on lifelong learning in Ireland. It contains a substantial number of recommendations dealing with the full range of issues encompassed by lifelong learning. The degree to which lifelong learning becomes a practical reality will depend in large measure on the implementation of the Task Force's recommendations and on securing the necessary resources and structural, cultural, and organisational change that this entails. *Sustaining Progress* provides that work on implementing the recommendations of the Task Force will be progressed as a strategic priority, as resources permit, and will be overseen by a steering committee chaired by the Department of Enterprise, Trade and Employment.

[14] Expert Group on Future Skills Needs. 2001. **Report on In-Company Training:** pp. 13 & 17.

Table 31: Training Hours per 1000 Working Hours by Enterprise Size 1999				
	10-49 employees	**50-249 employees**	**>250 employees**	**All enterprises**
Belgium	5	8	11	8
Denmark	12	14	14	14
Germany	3	5	6	5
Spain	3	5	10	6
Ireland	8	8	12	9
Luxembourg	4	5	13	6
Netherlands	7	10	13	10
Austria	4	4	6	5
Portugal	1	3	8	4
Finland	8	8	13	11
Sweden	9	8	14	12
Norway	8	8	13	10

Source: Nestler, K. & Kailis, E. 2003. **Working Time Spent on Continuing Vocational Training in Enterprises in Europe**. Eurostat, Statistics in Focus: Population and Social Conditions Theme 3-1/2003.

Table 32: Training Course Hours per Participant by Enterprise Size 1999				
	10-49 employees	**50-249 employees**	**>250 employees**	**All enterprises**
Belgium	36	32	29	31
Denmark	37	44	41	41
Germany	23	31	27	27
Spain	54	41	40	42
Ireland	48	36	39	40
Luxembourg	40	27	45	39
Netherlands	29	35	42	37
Austria	28	26	31	29
Portugal	37	38	39	38
Finland	43	34	34	36
Sweden	30	26	32	31
Norway	28	27	40	33

Source: ibid.

4.34 A new national framework for training provision was also put in place at the end of 2000 with the establishment of the National Training Fund. The Fund, which is financed by an 0.7 per cent wage levy on class A and H employers collected through the PRSI system serves to support a range of schemes aimed at raising the skills of those in, or seeking, employment. The various training and development bodies — FÁS, Enterprise Ireland, IDA Ireland, and Shannon Development among others — are currently supported by the Fund. Enterprise-led initiatives on the part of Skillnets and the Institution of Engineers in Ireland are also being supported. The establishment of the National Training Fund is significant in that is represents a substantial funding source, renewed annually, which is dedicated solely to skills development; receipts into the Fund totalled around €200m. in 2001. Given the need to raise productivity levels in indigenous enterprise, the National Training Fund is an important resource which should be used to the fullest possible effect for this purpose. In its Strategy Statement for 2002-2005, FÁS has also indicated its intention to give a higher priority to the provision of training and skills development for businesses and those in employment. In 2003, it will launch a Competency Development Programme, with a budget of €4.5m., focused on the needs of persons in employment.

4.35 A Training Networks Programme was established in 1999 to improve workforce training at enterprise level, particularly among SMEs. The Programme which is administered by Skillnets, an independent company whose board includes employer, union and state representatives, encourages companies to identify and address training needs on a collaborative basis. An evaluation of the Programme undertaken in 2001 found that, since 1999, over 2,300 companies and 12,800 employees had participated in training and skills development schemes supported by Skillnets. Almost three-quarters of participating companies had fewer than fifty employees and a sizeable proportion of them had not previously engaged in formal workforce training. In 2002, the Programme was extended with funding of €15m. approved over three years. The Programme's new mandate provides for an enhanced focus on the needs of the lower-skilled and on the dissemination of best practice among enterprises.

IV Infrastructure

4.36 The adequacy and quality of infrastructure, and the cost of utilities and services in areas such as transport, energy, waste, and telecommunications, are matters of vital and abiding concern to enterprise. These inputs are a significant — and in some cases a major — element in the cost base of the enterprise sector, and have a direct impact on firms' ability to function efficiently and on their capacity for growth and development. It would generally be accepted that Ireland's record in providing a high-quality, competitively priced business infrastructure has been variable and that, overall, this has not been one of the strengths of our enterprise environment. In the 1980s and 1990s, good-quality infrastructure in areas such as telecommunications coexisted with inadequate

provision in areas such as the road network. Though expenditure on transport and other infrastructure increased substantially from the mid-1990s, it struggled to keep pace with the increased demand resulting from record economic expansion. New infrastructural needs also emerged in fields such as broadband in which, despite progress on some fronts, widespread availability at competitive price levels has lagged that in other economies. In the electricity sector, traditionally a settled element of infrastructural provision in Ireland, increased demand allied to changing regulatory and market structures have given rise to concerns about the adequacy of generating capacity. Forfás closely monitors infrastructural provision and needs on an ongoing basis in all areas relevant to enterprise. It is not proposed to deal in detail in this Review with what are often highly technical issues. Its focus is instead on a number of key infrastructural requirements in the areas of roads, electricity, waste management, and broadband that need to be addressed in the period ahead.

Box 6: Ireland's Transport Infrastructure in Comparative Perspective

	Number of Countries Ranked	Ireland's Rank	Ireland's Ranking by Quartile	Top Three Countries
Percentage of total goods transported by road 1999	15	1	Q1	Ireland Italy Spain
Percentage of total goods transported by rail 1999	10	9	Q4	Sweden Finland France
Length of motorway per 1000 km 1997	28	23	Q4	Belgium Netherlands Luxembourg
Composite indicator of rail infrastructure (length of network relative to area & population density) 1998	10	8	Q3	Germany France Sweden
Percentage of rail lines electrified 1999	10	10	Q4	Sweden Netherlands Italy
Average per capita investment in transport infrastructure 1990-96	15	13	Q4	Luxembourg Germany France

Source: National Competitiveness Council. **Annual Competitiveness Report 2001 and 2002.**

Transport Infrastructure

4.37 Box 6 summarises some of the key findings of comparative analyses of Ireland's transport infrastructure. Ireland is heavily dependent on its road network; the proportion of goods transported by road is the highest in the European Union and that transported

by rail the second lowest. The rail network compares poorly with other European countries in terms of length and electrification. The proportion of the road network accounted for by motorways in Ireland is among the lowest in the OECD. Despite the inadequacies of our transport infrastructure, investment has been low until relatively recently. In the period from 1990 to 1996 — the most recent time for which comparative data are available — investment per head in Ireland was the third lowest in the European Union, a ranking that would almost certainly apply equally to the period prior to 1990.

4.38 Since the mid-1990s, there has been a major increase in expenditure on roads and transport. In recognition of the need to tackle long-running inadequacies in the road and transport networks and to relieve the growing burden of congestion, the National Development Plan 2000-2006 made provision for unprecedented levels of investment in transport infrastructure: €8bn. on roads, of which almost €6bn.was allocated to the primary road network; €2bn. on the rail network; and over €1.5bn. on bus transport. Delivery of this investment programme has been affected however by a number of factors. Planning delays have hit start and completion dates. High inflation in the construction sector — around 40 per cent in the three years from 1999 to 2001 — have led to major cost overruns and substantially eroded the return on expenditures. More recently, the less favourable position of the public finances has placed a question mark over the funding of the full range of projects provided for under the Plan. The mid-term evaluation and review of the National Development Plan is to be undertaken in 2003. This will provide a vital opportunity to assess the progress made and problems encountered to date in implementing investments in roads and transport, to take a close look at the causes of the time delays and cost overruns that have affected their implementation in the first half of the Plan period, and to determine priorities and procedures for the second half of the Plan. An inter-departmental group chaired by the Department of Transport which has been appointed to explore more radical and innovative ways for the funding and delivery of the Roads Programme, including in particular the scope for greater private sector investment, is also due to report shortly to the Cabinet Committee on Infrastructure. In March 2003, the National Roads Authority signed the first Public Private Partnership Scheme [PPP] Contract for a major inter-urban road project. The Authority has identified a further ten PPP projects as part of an overall strategy to deliver the national roads element of the National Development Plan. There should be no doubt about the imperative of effective delivery of the infrastructural aims of the Plan for the enterprise sector's competitiveness in the short term and growth potential in the longer term.

Ports

4.39 As a highly open island economy, Ireland is heavily dependent on an efficient, competitive port network. In 2003, the Government will complete a high-level review

of the State port companies which will examine their governance, structures, regulation, financing of investment needs, and private sector involvement. The aim is to ensure that, in line with available resources, there is adequate infrastructure at ports to cope with growth in throughput and to facilitate competitive shipping services and the effective integration of maritime transport with the broader transport chain. In order to assist action on the high-level review and to ensure effective feedback on service provision, a National Port Users' Forum is also to be established in 2003.

Energy

4.40 The supply and cost of energy are critical for enterprise development at national, regional and sectoral level. The record growth of the past decade has put considerable strains on the electricity network in particular. Peak demand for electricity rose from under 2,500 MW in 1990 to over 3,800 MW in 2001, an increase of over 50 per cent. This rise in demand occurred in a period in which electricity and gas markets have been in a process of transformation arising from market liberalisation and new forms of regulatory oversight. Both markets are set to be fully liberalised by 2005.

4.41 The margin between electricity supply and demand is currently finely balanced and does not offer a satisfactory degree of security of supply. Eirgrid estimates suggest that 300MW of new generating capacity will be needed by 2005, 250MW more by 2007, and a further 150MW by 2009.[15] Because of liberalisation, the ESB is no longer mandated to provide additional generating capacity. The provision of this capacity will depend on new private sector investment and to date there has been limited success in attracting additional generating capacity from this source. As it takes several years to plan and build new generating plants, action needs to be taken now to ensure that future electricity needs can be met. In October 2002, the Commission for Energy Regulation published a consultation paper on the options available for securing additional capacity in 2005. Following the consultation process, the Commission decided to hold a competition for a contract for the supply of up to 400MW to ESB Public Electricity Supplier. In May 2003, it announced that it had received expressions of interest from seven generators interested in bidding in the competition, the outcome of which is expected to be announced in October 2003. As well as addressing short-term capacity, there is a need to ensure long-term security of supply. Following detailed consultations, the Commission for Energy Regulation has recently undertaken a major review of market trading arrangements in the sector, and set out new wholesale market arrangements which are intended to replace the existing transitional arrangements with effect from 2005. During 2003, the Government will bring forward electricity transmission legislation to overcome planning problems in the delivery of transmission projects. The

[15] Goodbody Economic Consultants. 2002. **Assessment of the Key Competitiveness Issues and Policy Requirements Facing the Irish Energy Market.**

Electricity Bill 2003 will deal with remaining regulatory and restructuring issues in relation to the electricity industry, and will include a universal service obligation so that all customers enjoy the right to be supplied with electricity of a specified quality at reasonable prices. In addition, a licensed Public Electricity Supplier, part of ESB, will continue to act as supplier of last resort, and its tariffs will be subject to regulatory control by the Commission for Energy Regulation.

4.42 If the adequacy of generating capacity is the over-riding issue for national energy policy, the electricity transmission and distribution networks are the main issue for regional policy. As things stand, a number of the towns prioritised for development by the National Spatial Strategy and by the enterprise development agencies are not in a position to support significant additional demand for electricity in the medium-term. An analysis by Forfás of future electricity needs and current network capacities in sixteen towns identified a number of necessary investments in regional transmission networks.

4.43 Cost is the other dimension of the energy policy of greatest concern to business. Box 7 summarises the available data on gas and electricity prices for small, medium and large industrial consumers in mid-2002. While gas prices for Irish industrial consumers are among the lowest in the European Union, the reverse is true of electricity prices. As electricity is a more important energy source than gas, electricity prices have a greater impact on business competitiveness. For small industrial consumers, Irish electricity prices were around 36 per cent higher than the average for the 14 EU member states surveyed, while for large and medium-sized consumers, they were around 28 per cent higher. This analysis was undertaken, moreover, before the most recent round of electricity price rises in January 2003 which saw tariffs for small and medium-sized enterprises rise by around 8.4 per cent and those for large consumers increase by around 4.2 per cent. The need for additional investment in the electricity industry is likely to exert continued upward pressure on Irish electricity prices in the period ahead. In most of our competitor economies, by contrast, there is a surplus of generating capacity and, possible short term shocks from rising oil prices aside, the outlook is for stable or falling prices. Close attention will be have to be paid in the period ahead therefore to the effect of trends in electricity costs on Irish competitiveness.

Box 7: Energy Costs in Ireland in Comparative Perspective*

	Number of Countries Ranked	Ireland's Rank	Ireland's Ranking by Quartile	Top Three Countries
Gas prices — industrial use excl. VAT (4186 GJ/200 days) July 2002	13	2	1	Spain Ireland United Kingdom
Gas prices — industrial use excl. VAT (41860GJ/250 days/ 400 hours) July 2002	13	3	1	Spain Belgium Ireland
Electricity prices — industrial use excl. VAT 1.25GWh per annum July 2002	14	14	4	Sweden Finland Norway
Electricity prices — industrial use excl. VAT 10GWh per annum July 2002	13	12	4	Sweden Norway Finland
Electricity prices — industrial use excl. VAT 24GWh per annum July 2002	13	11	4	Sweden Norway Finland

*The country with the lowest prices is ranked 1, while that with the highest prices is ranked 13/14. Prices for Germany and, in some cases, Italy and France are an average of prices in different cities/regions.

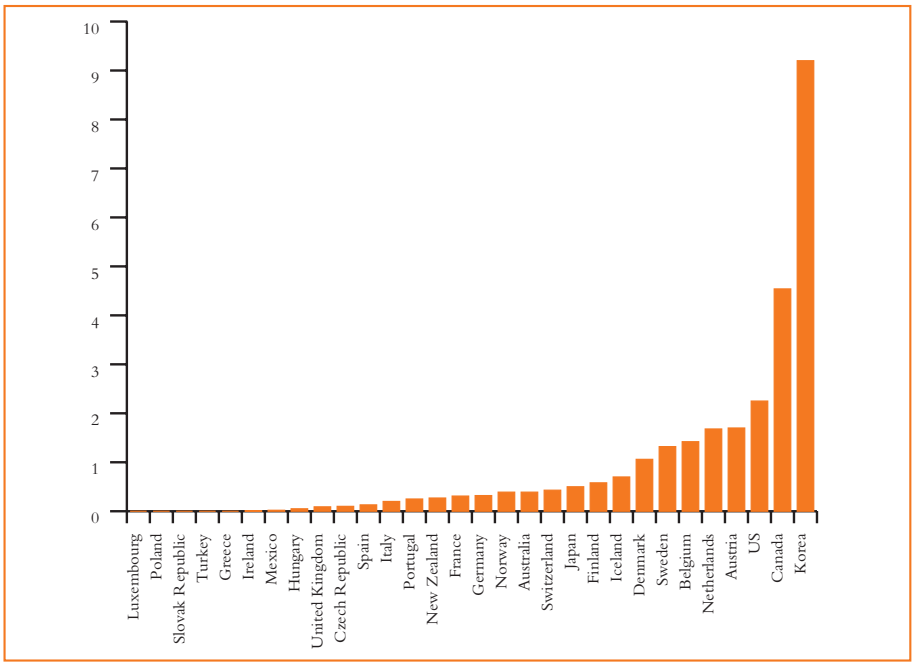
Source : Eurostat. **Electricity Prices for EU Industry on 1 July 2002.** Statistics in Focus: Environment and Energy. Theme 8 — 15/2002. **Gas Prices for EU Industry on 1 July 2002.** Statistics in Focus: Environment and Energy: Theme 8 — 17/2002.

Infrastructure for the Information Economy and Society

4.44 The growth of the Internet has the potential to transform many areas of social and economic activity. Though electronic commerce is still in its infancy, it has already had a transforming effect in some sectors of the economy and, particularly in business to business transactions, is set for continued growth over the next decade. The Internet is similarly having a growing impact and influence in a wide range of areas from health to public administration, education to entertainment. Like previous technological revolutions, the Internet, and the information economy and society of which it is a prime mover, needs a dedicated infrastructure for its full development. The key such infrastructural requirement is broadband connectivity. Broadband has come to be the accepted term for high-speed 'always on' Internet access, the main vehicles for which are DSL (digital subscriber line) and, to a lesser extent, cable modem lines. Its importance stems

from the fact that it is the mechanism for the simultaneous, high-speed transmission of data, voice and image communications, and is hence the foundation of eBusiness, digital media, and other significant areas of modern knowledge-based enterprise. Though ISDN (integrated services digital network) is not normally considered a broadband technology, it can be used as a substitute for DSL where this service is not available. In recent years, there has been a steady growth in the number of 2Mbit/s ISDN lines in service in Ireland. For households and many small businesses, however, the principal form of Internet access in Ireland remains that of dial-up via a standard telephone line. Wireless Internet access through 3G networks will almost certainly grow in importance in the not too distant future, but is unlikely to have a major impact in the short term.

Figure 33: Broadband Penetration Rates in OECD Countries July 2001: No. of DSL Cable Modem Lines per 1000 Inhabitants



Source: OECD Telecommunications Database.

4.45 As an economy with a strong presence in the ICT sector and which is seeking to make the progression to higher-value activities, Ireland needs to compare favourably with other advanced economies in the provision of the telecommunications infrastructure and services required for the development of electronic commerce and the information society. Our performance to date in this area, however, has been disappointing. Compared with most other OECD economies, the rollout of broadband in Ireland has been slow, and its cost high. The cost of Internet access via a standard telephone line is also high in Ireland, with charges determined on a metered basis. Figure 33 sets out

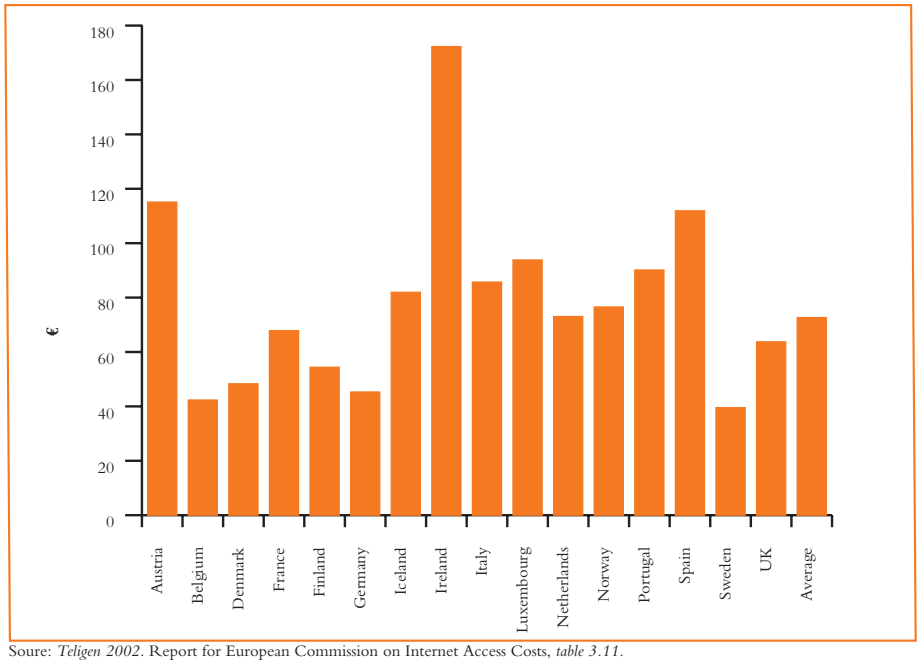
broadband penetration rates as measured by DSL and cable modem lines per 100 inhabitants in OECD member states countries in mid-2001. As can be seen, broadband provision in this country was negligible, and we ranked 25th of the 30 countries surveyed.

4.46 The almost complete absence of broadband availability revealed by the 2001 data for Ireland at figure 33 was attributable to two related factors. Though Ireland had broadband connectivity to the rest of the world and the main broadband backbone was in place around the country, the final requirement of high speed lines in and around towns and into businesses and homes has been lacking. The provision of DSL services by telecoms operators was also subject to lengthy delay. Since 2002 significant progress has been made in these areas. In March 2002, the Government announced a major investment programme to be undertaken in partnership with the private sector to make broadband available on a phased basis to all towns in the State with a population of over 1,500. Phase 1 of the project which involves an investment of €65m. to extend broadband coverage to 19 new towns is currently underway and is set to be completed by around mid-2004. In May 2002 Eircom and ESAT launched DSL services. It is estimated that DSL coverage in the final quarter of 2002 applied to around 30 per cent of telephone lines, with this figure projected to rise to around 50 per cent by the end of 2003. As coverage in the best-performing countries such as Korea, Denmark and Belgium is now over 90 per cent, this underlines how much ground remains to be made up.

4.47 Broadband coverage may have improved in Ireland, but its take-up has remained low. The high cost of the service until very recently in Ireland would appear to be a major reason for the relatively small number of subscribers. Figure 34 shows DSL prices in sixteen European countries in May 2002 based on the average minimum monthly rental per 1Mbit/s of bandwidth. Irish broadband prices were more than twice the European average and 50 per cent more costly than the next most expensive country. As these figures are based on average price charges for DSL, they understate if anything the price differential between this and other countries. In the majority of countries, though not in Ireland, there is a significant degree of competition and price variation in broadband provision and the lowest price is significantly below the average.

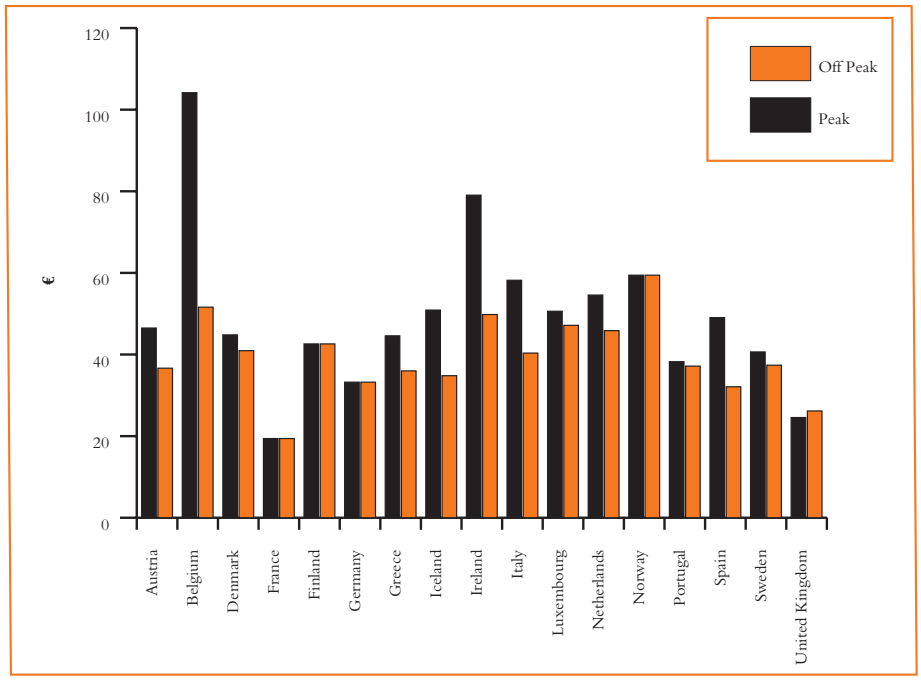
4.48 The cost of narrowband Internet access through the telephone network has also been high in Ireland. The absence of flat-rate Internet packages in particular has put Ireland at a competitive disadvantage with other countries. Figure 35 sets out the lowest available prices for 40 hours' peak and off-peak internet access via a standard telephone line in seventeen European countries in May 2002. Costs in Ireland for peak time usage were the second highest of the seventeen countries surveyed, while those for off peak usage were the third highest. The price differential for peak usage was particularly marked with costs in Ireland being from 60 to 300 per cent higher than in most of the countries surveyed.

Figure 34: DSL Prices in Europe May 2002
Average Minimum Monthly Rental per 1 Mbit/s



Soure: *Teligen 2002*. Report for European Commission on Internet Access Costs, *table 3.11*.

Figure 35: Total Cost per Month of 40 Hours' Internet Access via Standard Telephone Line* May 2002



Source: as for figure 34, tables 3.4 and 3.5.

4.49 The high price of broadband in Ireland has played a significant part in keeping take-up low, while low take-up has in turn contributed to keeping prices high. There now appears to be an acceptance that this cycle must be broken. The Minister for Communications, the Marine and Natural Resources observed in January 2003[16]:

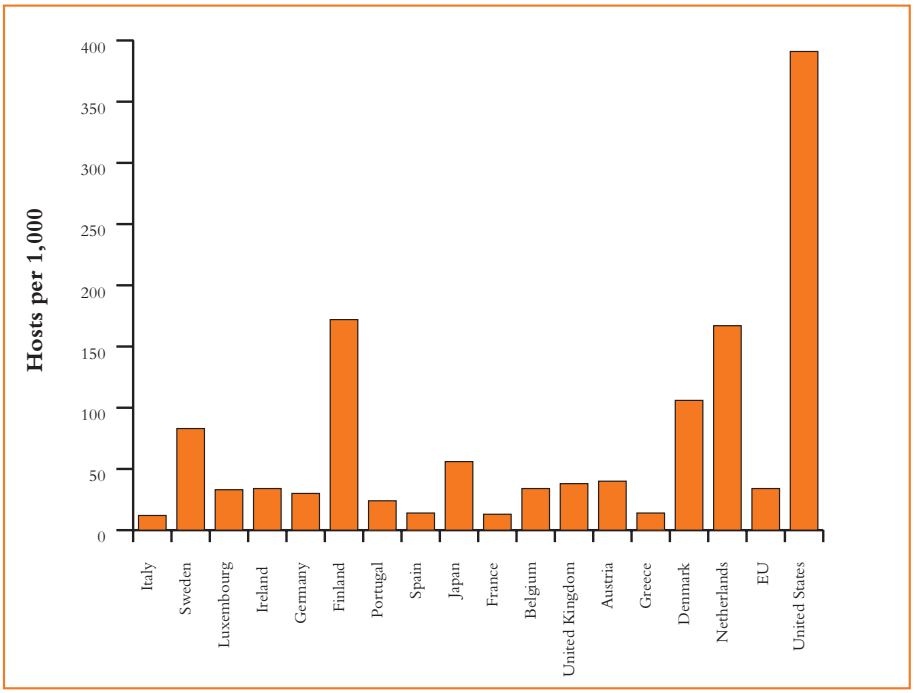
> The New Economy is not immune from old-style economics. The only thing that will drive broadband is price. We have to cut prices, attract volume, drive demand.

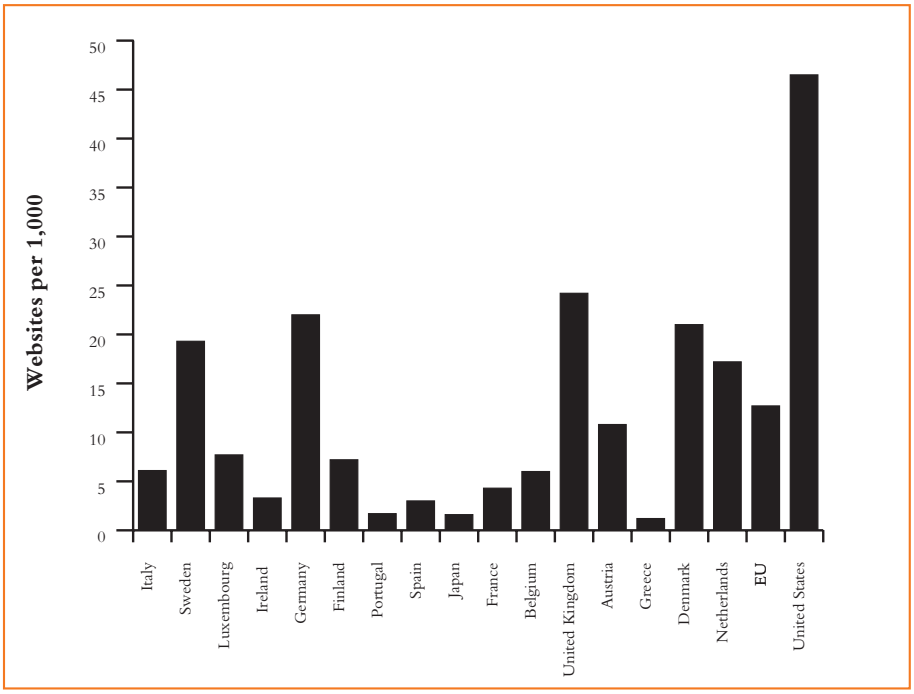
The Government's Broadband Strategy has set a target for Ireland to be in the top ten per cent of OECD economies for broadband accessibility and cost. In December 2002, the Minister for the Communications, the Marine and Natural Resources issued a direction to the Commission for Communications Regulation that provision for flat-rate Internet access should be introduced. In February 2003, a Telecoms Strategy Group comprising representatives of the main telecoms operators and relevant Government departments was established with the aim of moving Ireland up the European broadband table. In April 2003, the main telecoms providers in Ireland announced the introduction of broadband packages that will cut the cost of broadband access for consumers by around one-half. This represents a much-needed step forward. Flat-rate dial-up Internet packages are also expected to be introduced shortly.

4.50 Delays in the provision of accessible and affordable broadband and narrowband Internet access have affected aspects of our ranking as an information economy and society. Figure 36 shows the number of Internet hosts and websites per 1,000 inhabitants in European Union member states, the US and Japan in December 2001. The number of hosts provides an indication of the relative development of Internet infrastructure in various countries, while the number of active websites is a guide to the relative development of Internet content in different countries. Ireland ranked joint 9th of 17 countries for the number of Internet hosts and was at the EU average, while it ranked 13th of 17 countries for the number of websites and was below the EU average. Our performance is somewhat better however on some other indices of Internet and information society development. Figure 37 shows the proportion of households in EU member states with Internet access in 2002. Despite the high cost, the proportion of Irish households with such access was above the European Union average — 48 per cent compared to 40 per across the EU as a whole. Ireland ranked 7th of the fifteen member states but, at slightly under half of all households, access levels here were significantly behind the rates of almost two-thirds achieved in Denmark, Sweden, and the Netherlands.

[16] Address by Mr Dermot Ahern T.D., Minister for Communications, Marine and Natural Resources at Launch of Southern Ring Broadband Loop, 31 January 2003.

Figure 36: Internet Hosts per 1,000 Inhabitants December 2001 and Websites per 1,000 Inhabitants July 2001



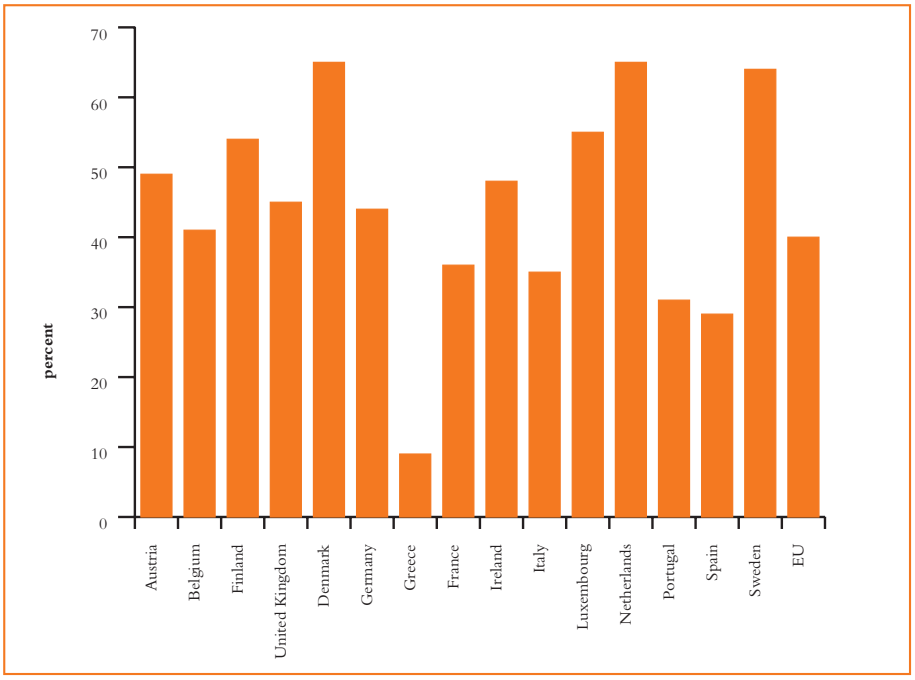


Source: OECD Communications Outlook 2001 and 2002, and David, C. 'Information Society Statistics'. Eurostat 2003: Statistics in Focus, Theme 4-15/2003.

eBusiness

4.51 Though the end of the dotcom boom has done away with some of the hype that formerly surrounded it, eBusiness has continued to progress steadily, if more quietly. Individuals, firms, and governments are conducting an increasingly broad range of commercial and other activities over the Internet. According to one estimate, worldwide eBusiness revenues are projected to rise from €319bn. in 2000 to €3.5 trillion in 2004.[17] Business to business (B2B) which was always the core of eCommerce has continued to grow in importance and impact. Over the period from 2000 to 2004, its share of total eBusiness revenues is projected to rise from 69 to 77 per cent in Europe and from 70 to 88 per cent in the United States.

Figure 37: Percentage of Households with Internet Access 2002



Soure: Eurobarometer No. 125.

4.52 The development of eBusiness capabilities and awareness is vital for Ireland for two main reasons. First, eBusiness is at the heart of a number of high-value sectors and activities in which we are already well-established and/or have growth potential, including software, financial services, digital media, and biotechnology. The future business of these sectors will to a large extent be eBusiness. Second, for the enterprise sector more generally, effective eBusiness strategies and practices can deliver increases in sales and reductions in costs as well as having considerable potential as a creative force for adding

[17] Forfás. 2002. **eBusiness: Where Are We and Where Do We Go From Here:** pp. 4-5.

and maximising business value. With Irish firms facing an increasingly competitive trading environment, the opportunities offered by eBusiness to increase productivity and efficiency and to stimulate innovation should be availed of to the fullest possible extent.

Table 33: eBusiness Development in European Union Enterprises 2001

% of companies employing >10 with

	Internet Connection	Website	Website Used for Making Orders*	Products/ Services Sold through Electronic Marketplace	Average % share of total sales made on internet**
Belgium	92.9	60.5	23.5	7.3	8.7
Denmark	96.4	74.6	35.8	12.0	4.6
Germany	96.1	80.0	47.9	18.0	7.9
Greece	82.6	57.5	38.8	6.9	6.0
Spain	92.2	57.2	31.8	3.4	5.4
Finland	99.4	77.2	36.5	17.6	9.9
France	73.2	59.1	25.7	6.8	5.6
Ireland	95.3	64.8	39.7	15.8	12.8
Italy	91.4	62.8	29.5	8.1	5.3
Luxembourg	84.7	64.2	32.6	15.8	5.2
Netherlands	91.3	76.9	26.8	12.7	6.1
Austria	98.9	73.7	44.8	16.2	12.9
Portugal	65.7	54.2	37.3	3.9	7.4
Sweden	98.8	75.7	37.7	16.3	8.0
United Kingdom	84.3	77.1	36.5	20.0	6.2
EU	89.0	70.2	37.9	12.8	7.3

*As percentage of companies with website
**Among companies selling electronically.

Source: Eurobarometer No. 116.

4.53 Table 33 is based on a survey undertaken for the European Commission in December 2001 and gives details of the level of development of a range of aspects of eBusiness capabilities among enterprises with more than ten employees in European Union member states. The findings of the survey suggest that the performance of Irish business compares reasonably well on the whole with that in other EU countries. The proportion of firms with an Internet connection in Ireland was 6th highest of the 15 member states and above the EU average. While the proportion of Irish companies with

a website was below the European average, the gap between this country and the best performing economies was not very large. Irish companies with websites, moreover, used them more intensively and for a wider range of purposes than those in most other member states. The proportion of company websites that could be used to make orders in Ireland was the third highest of the 15 EU members, while the proportion of Irish companies selling goods or services through electronic marketplaces was the fifth highest in the EU. Among companies making sales through the Internet, the average share of total sales made on the Internet in Ireland was the 2nd highest of the 15 member states. A survey of over 500 chief executives or managing directors undertaken on behalf of the Information Society Commission in October/November 2002, however, found that the proportion of businesses with websites had fallen from 77 per cent in 2000 to 65 per cent in 2002, suggesting a possible loss of momentum in the eBusiness area.[18] Given the obstacles posed by inadequate broadband provision and high internet access charges, these figures are reasonably encouraging on the whole. Though there is considerable scope for further progress, Irish firms appear to show an awareness of the benefits of eBusiness and a readiness to exploit the potential it presents. As broadband provision improves and the cost of both broadband and narrowband access come down, this offers a solid platform for further expansion.

eGovernment

4.54 The technologies of the Information Society present Governments with new opportunities to reshape the delivery of government services around user needs and on a '24-7' basis. They can also provide a potential competitive advantage through reduced costs and charges, higher efficiencies, better services, and opportunities for enterprises to develop new applications and content around eGovernment services. The development of eGovernment is also central in shaping how we evolve as an Information Society. Apart from the goals of improved service delivery and enhanced efficiencies, Government business processes clearly serve as a key stimulus to wider engagements with ICT — both within the business community and among the general public. Internationally, progress in eGovernment is increasingly seen as a key indicator of wider Information Society development and as a significant factor in national competitiveness.

4.55 Irish Government policy on the Information Society includes a commitment to promote a progression to integrated electronic service provision across the civil and public service in a customer-focused manner. A public service eBroker facility is currently being developed to provide for the integrated delivery of Government and public services. This will form the basic platform upon which the public will interact with Government and will involve the use of Personal Public Service numbers as identifiers. Important steps taken to date include:

[18] Information Society Commission. April 2003. **Business Survey.**

- The establishment of the OASIS and BASIS websites to provide information to citizens and business respectively;

- The establishment of the Reach agency to provide online services for the Department of Social, Community and Family Affairs;

- The establishment of the Revenue Commissioner's online system and of an online facility for folio search in the Land Registry.

4.56 A survey undertaken for the European Commission in April 2002 found that Ireland rated first among EU member states for the online availability of public services.[19] A more broadly based survey undertaken by Accenture in 2003 ranked Ireland eleventh of twenty two states in respect of the scope and maturity of public services available online.[20] Despite a slowdown in the implementation of some eGovernment initiatives in Ireland, the Accenture report concluded that steady progress continued to be made. It is important that the momentum achieved to date in this area is maintained. In particular, the introduction of the eBroker facility and implementation of initiatives such as eProcurement in the public service and the second phase of BASIS would help to drive the development of eBusiness in the economy generally.

Waste Infrastructure and Management

4.57 Rising waste levels have been one of the less welcome effects of the record growth of the past decade. In 2000, 2.3 million tonnes of household and commercial waste were generated in Ireland, an increase of 60 per cent in the five years from 1996.[21] In the second half of the 1990s, Ireland ranked 22nd of 28 OECD economies for volume of municipal waste generated per head, and 10th of 15 countries for industrial waste generated per unit of GDP.[22] Though we produced above-average levels of waste, we recycled less of that waste than most other modern economies; around 88 per cent of household and commercial waste went to landfill in 2000 with just 12 per cent being recycled. According to figures from the late 1990s, Ireland ranked 24th of 25 countries surveyed for the proportion of paper and board waste recycled and 16th of 24 countries for the proportion of glass recycled. While new arrangements for recycling waste have been introduced in some areas since these surveys were undertaken, we still have a long way to go in order to emulate the countries with the best re-use and recycling records.

[19] European Commission, Directorate General Information Society. **eGovernment: Online Availability of Public Services 2001-02.** www.europa.eu.int/informationsociety/europe/benchmarking/list/2002/e government.
[20] Accenture. April 2003. **eGovernment Leadership.**
[21] Environmental Protection Agency. 2002. **Environment in Focus,** p. 8.
[22] National Competiveness Council. **Annual Competitiveness Report 2001,** p. 73 & table 11; **Annual Competitiveness Report 2002,** pp. 37-38 and 93-94.

4.58 Rising waste volumes and relatively low levels of recycling have put Ireland's waste infrastructure under considerable strain. These strains have coincided with a growing recognition of the limitations of landfill — traditionally the main means for dealing with waste in Ireland — as a method of waste management. The inadequacy of the present waste infrastructure is now such that, in Forfás's view, it is an impediment to national industrial competitiveness. As there is no statutory obligation on local authorities to collect commercial, as distinct from domestic, waste, there is an ongoing concern among enterprises that their operations could be affected by the lack of adequate waste services. A related concern for businesses in certain sectors is the difficulty experienced in setting up commercial incineration and other specialised waste treatment facilities. Reliance on overseas treatment facilities for certain wastes, particularly hazardous wastes, leaves Ireland highly exposed in the event of these outlets being closed to us in the future.

4.59 The development of Regional Waste Management Plans to facilitate the proper provision of waste services, including a waste service for industry, has been underway for several years by local authorities. With progress proving slow and difficult, the Department of Environment and Local Government had to introduce amending legislation in 2001 to ensure the adoption of these Plans in the face of the failure of local councillors to implement them. The provision of necessary waste infrastructure has also been subject to extensive delays arising from resource and other problems in the planning and licensing process. Concern over the inadequacy of our waste infrastructure and the lack of progress in improving it led the Department of Enterprise, Trade and Employment to approach Forfás to set up a Waste Management Task Force with representatives of government departments, state agencies, and other interests to develop an effective strategy for the future. Its report published in December 2001 contained a wide range of recommendations, including the establishment of a National Waste Management Agency and regional Waste Management Boards, and the acceleration of planning processes for waste infrastructure.

V Competition, Regulation and Corporate Governance

4.60 The Culliton Review Group emphasised the cost burden to the enterprise sector that resulted from uncompetitive markets for key inputs such as telecommunications, energy, and transport. Over the past decade, important steps have been taken to open these and other sectors to greater competition. Arising from decisions at European Union level, air transport and telecommunications have been fully liberalised, while the electricity market is set to follow by 2005. Domestically, market restrictions in the Dublin taxi industry and in retail pharmacies have been abolished. It is generally accepted that liberalisation has brought benefits to consumers in transport and telecommunications

in particular. The OECD estimates that the average price of a basket of telecoms services fell by around one-third between 1990 and 2000, mainly as a result of liberalisation and increased competition. Increased competition played a major part in the reduction in the cost of air travel in and out of Ireland and contributed significantly to the expansion of the tourism sector during the 1990s.

4.61 Despite the changes of the past decade, there remain a number of areas in which the Irish economy is not as competitive as it could or should be. As outlined in chapter 2, prices in Ireland, particularly for services provided domestically, have been rising at two to three times the rate in other European Union member states in recent years. The price level for goods and services in Ireland is now significantly ahead of the EU average, and a recent survey undertaken for Forfás concluded that Ireland is set to become the most expensive economy in the Eurozone for consumer goods and services. While there are a number of reasons why this has occurred, lack of competition in certain sectors has played a part. As well as their direct effects on enterprise costs, curbs on competition damage competitiveness in other ways. High domestic costs for goods and services make us less attractive to inward investment and to highly mobile scientific, technical and professional personnel. In the short term, employees paying inflated prices for domestically provided goods and services are liable to seek higher wage compensation. In the longer term, Irish-owned firms will only attain the levels of productivity and product quality needed to compete internationally if the home market is properly competitive.

4.62 The rise in the domestic cost base in recent years has made the achievement of greater efficiency an imperative for the enterprise sector. Competition policy is now widely seen as a key instrument for promoting economic efficiency. It has taken on added importance in the context of the transfer of national control over monetary and exchange rate policy effected by European Monetary Union. The recent enactment of the Competition Act 2002 was a major step forward in strengthening the legal framework for competition policy in Ireland. Among the main provisions of the Act are:

- the establishment of the Competition Authority as an independent agency;
- a wider remit for the Authority in the assessment and approval of non-media mergers;
- significantly increased penalties for breaches of competition law and enhanced powers of enforcement for the Competition Authority.

The personnel resources of the Authority have also been enhanced. Since 2000, its staff complement has been increased by around fifty per cent. The revised framework of

competition law, together with the greater autonomy and resources given to the Competition Authority, will assist in tackling anti-competitive practices in the Irish economy in the period ahead. The Authority is currently engaged in studies of competition in the professions, banking, and insurance. In March 2003, it published a consultancy report on competition in the medical, legal and construction sectors. The Authority will publish consultative papers on competition in these professions prior to producing a final report on each profession in 2004. The banking and insurance studies got underway in September and October 2002 respectively. In view of the importance of the services provided by these sectors for the Irish economy and enterprise sector, any recommendations arising from these studies should be considered and implemented as a matter of priority.

4.63 While the process of liberalisation is set to continue in sectors such as electricity, it is now recognised that it needs to be complemented by regulatory reform. At European Union and international level, consequently, there is now an emphasis on better regulation as well as on deregulation. In Ireland, a number of steps have been taken, or are in train, to enhance the effectiveness of regulatory codes and to strengthen enforcement powers and resources. A review of regulatory reform in Ireland published by the OECD in 2001 concluded that, while real progress had been made in recent years, the reform agenda was still substantial. There was a need in particular to strengthen domestic competition in a number of areas. In response to the OECD review, the Government has issued a consultation paper, ***Building Better Regulation***, which is intended to form a prelude to a National Policy Statement on the subject, probably in the form of a White Paper. It has also appointed a High-Level Group on Regulation to consider the findings of the OECD report and to contribute to the formulation of the Policy Statement. The Government has also approved the introduction of a system of regulatory impact analysis in order to provide a structured method for evaluating policy proposals involving legislation or regulation. These initiatives will help to drive the process of regulatory reform and give Ireland a regulatory framework in keeping with best international practice.

4.64 The plans for the reform of the insurance market now in the process of implementation illustrate how improvements in the environment for enterprise may require both regulatory reform and the promotion of greater competition. As noted in part I, insurance costs for businesses have escalated in recent years to the point where they represent a threat to employment and even to the very survival of some businesses. The Report of the Motor Insurance Advisory Board [MIAB] published in April 2002 provided a thorough and wide-ranging analysis of costs and competition in the industry; though its specific focus was on motor insurance, the analysis and conclusions were relevant to other forms of insurance, particularly employers' and public liability

insurance. The MIAB report found that the market for private motor insurance was not competitive and that this situation was compounded by the compulsory character of the product. Mergers had reduced the number of motor insurers from seventeen in 1993 to just five in 2001. Litigation costs (legal and expert fees) added 40 per cent to every €1 paid in compensation for injury sustained in motor accidents. In tandem, vested interests and inefficiencies might account for as much as half of the premium charges paid by motorists. The Report put forward a total of sixty seven recommendations spanning a wide spectrum of issues affecting the insurance market.

4.65 In October 2002, the Tánaiste and Minister for Enterprise, Trade and Employment announced a package of reform measures, including:

- The immediate establishment of a Personal Injuries Assessment Board on an interim basis pending the enactment of legislation to put it on a statutory footing.
- An Action Plan for the implementation of the recommendations of the Motor Insurance Advisory Board outlining the specific steps required to give effect to those recommendations, a time frame for their implementation, and an estimate of the anticipated impact on premium costs.
- A study of the insurance sector by the Competition Authority and the Department of Enterprise, Trade and Employment to identify anti-competitive practices and other constraints on competition in the non-life insurance market, and to make recommendations aimed at ensuring that competition operated in the interest of Irish consumers.

The Tánaiste has stated that the ultimate test of the reform package will be the extent to which it has a positive impact on premium charges and on the availability of insurance.

4.66 The regulatory structures for the insurance and financial services have undergone extensive reform with the establishment of the Irish Financial Services Regulatory Authority [IFSRA]. IFSRA which was launched in May 2003 will act as a single regulator for the financial services sector and have responsibility for both prudential supervision and consumer protection. The Authority as a whole — its board, statutory officers, senior management and staff — is required to have regard to consumer issues, while a new statutory post of Consumer Director has been established to act as an advocate for the consumer. The establishment of IFSRA will, in these ways, help to strengthen the consumer focus of financial services regulation.

Regulation of Intellectual Property and E-Commerce

4.67 As noted earlier, the development of knowledge-based enterprise and electronic commerce are a key part of our enterprise development strategy. Effective regulatory

codes are essential for both intellectual property and eBusiness. The Copyright and Related Rights Act 2000 modernised Irish copyright law and has put in place a well-structured framework for intellectual property suited to modern needs and conditions. In July 2001, Ireland ratified the Madrid Protocol, an international agreement under the auspices of the World Intellectual Property Organisation, which allows individuals and enterprises, through their own national patent offices, to submit a single application for a trademark with a view to designating any or all of the more than fifty signatory countries to the agreement.

4.68 In the eBusiness sphere, the role of Government is to provide a clear, consistent, and predictable legal framework, and to promote a pro-competitive environment in which electronic commerce can flourish. There is also a need to provide adequate safeguards for public interest objectives such as privacy, prevention of fraud, consumer protection, and public safety. Consumers must feel confident that electronic transactions provide the same legal protections as traditional ones. Business must be confident that it is operating in an environment that protects its legitimate interests. Concerns about illegal and harmful uses of the Internet present an additional set of issues requiring a balanced policy response. The effective management of such issues will be critical to progress towards Ireland's aim to be a world-leader in eBusiness and knowledge-based enterprise. The Electronic Commerce Act 2000 was an innovative step in providing a clear, flexible and user-friendly framework for e-business. The Act created equivalence of treatment between electronic documents, contracts, writing, signature, seals and their paper counterparts under Irish law. It allows for the introduction and maintenance of a voluntary accreditation scheme and a supervision scheme for the issue of electronic signatures. Draft regulations to give effect to the outstanding provisions of the Electronic Commerce Directive [2000/31/EC] are currently being finalised with a view to being signed into law in 2003.

Corporate Governance

4.69 Recent revelations of accounting and other irregularities in major corporations such as Enron and Worldcom have led to a renewed appreciation of the importance of corporate governance and of the effective regulation of the audit and accounting profession. These disclosures have highlighted the extent to which enterprises and their employees, clients and investors depend on trust and confidence in the integrity of corporate managements and auditors and in the effectiveness of regulatory codes and authorities. In this country, a major reform of the framework of company law in Ireland was underway before the emergence of this evidence of corporate wrongdoing. The Company Law Enforcement Act 2001 established a new independent statutory office, the Office of the Director of Corporate Enforcement, with responsibility for the enforcement of company law in Ireland. The Director of Corporate Enforcement is

responsible for investigating suspected offences under the Companies Acts and has assumed powers previously exercised by the Minister for Enterprise, Trade and Employment in relation to company investigations. The establishment of the new Office represents a clear statement of intent that failure to comply with basic principles of good corporate governance will not be tolerated.

4.70 The Company Law Enforcement Act 2001 also established a statutory advisory body, the Company Law Review Group. As part of its initial work programme, the Review Group conducted a wide-ranging examination of company law in Ireland. Its report published in 2002 sets out a comprehensive strategy to give Ireland a world-class code of company law, and contains almost 200 recommendations for the reform and restructuring of the Companies Acts. The Report sought in particular to simplify company law and to make corporate responsibilities under the Acts clear, effective, and readily intelligible to directors and shareholders. Among its recommendations are that:

- the private company limited by shares, rather than the PLC, should be the standard company type defined in the Companies Act;
- companies should be able to transact some functions electronically;
- private companies should be able to become incorporated with just one member.

The Department of Enterprise, Trade and Employment is currently drawing up proposals to give legislative effect to the recommendations in the Review Group's report.

4.71 The regulation of the audit and accountancy profession has also come under renewed scrutiny in recent years. Arising from the findings of the Public Accounts Committee Report on Deposit Interest Retention Tax, a Review Group on Auditing was established in February 2000. Following submission of the Review Group's report, a draft scheme of a Bill entitled the Companies (Audit and Accounting) (Amendment) Bill was published in February 2002. This was followed by publication of the Bill proper in February 2003. This provides for the following:

- The establishment of an independent regulatory body, the Irish Auditing and Accounting Supervisory Authority, to enforce proper accounting standards and to supervise the regulation by professional accounting bodies of their members;
- A requirement on large firms to establish audit committees comprising a majority of non-executive directors;
- Disclosure requirements on companies in regard to fees paid to audit firms for non-audit services.

4.72 Pending the establishment of the Supervisory Authority on a statutory basis, an interim Board set up in April 2001 will continue in existence. Taken together, the establishment of the Office of the Director of Corporate Enforcement and the proposed legislation to modernise company law and regulate the audit and accounting profession

represent major steps towards giving Ireland a modern, progressive legal and regulatory framework for corporate governance.

Public Service Reform

4.73 The public service is directly responsible for the planning and provision of many of the key elements of the environment for enterprise such as education, infrastructure, and regulation. It also plays a central role in the overall management of the economy and in the maintenance of macroeconomic stability. An efficient, effective public service is accordingly a vital cornerstone of a strong enterprise sector and a competitive, prosperous economy. In 1994, the Strategic Management Initiative (SMI) was launched in order to implement a range of reforms designed to enhance the public service's contribution to national economic and social development. The Delivering Better Government [DBG] programme initiated in 1996 sought to build on the SMI framework, and set out a vision of a civil service committed to greater openness and accountability, the delivery of quality customer service, and the fair and efficient operation of streamlined regulations. It outlined a range of improvements in human resource, financial, and information systems management necessary to drive progress towards these objectives.

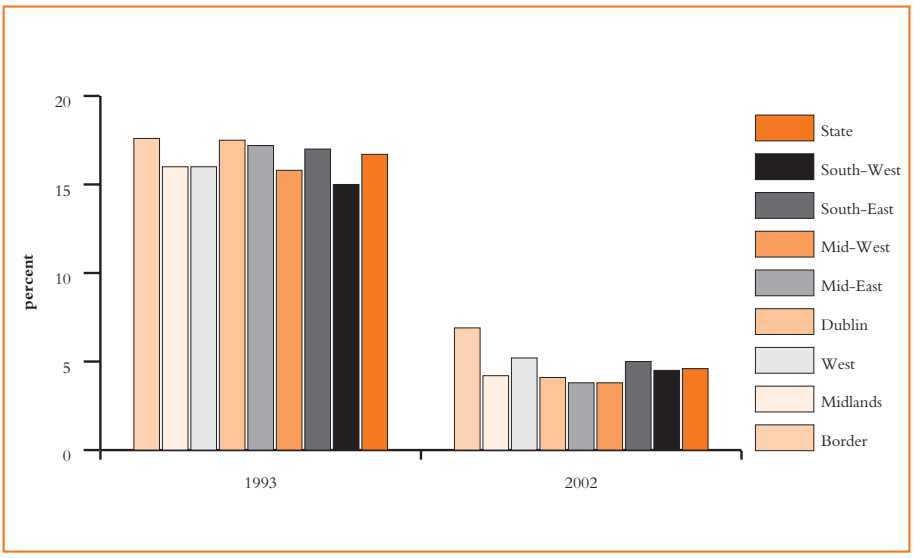
4.74 In mid-2001, the PA Consulting Group was commissioned to review progress under the Strategic Management Initiative and the Delivering Better Government programme. The Group concluded that the civil service was a more effective organisation than a decade ago and that much of this improvement was due to the SMI and DBG programmes. It found, however, that modernisation of the civil service still had a significant way to go. In particular, further progress needed to be made in strengthening capabilities in the key management areas of human resources, finance, and information systems. In response to the Consulting Group's report, the Government has requested the Implementation Group of Secretaries General to develop a new vision, strategy, and action programme for reform in the next phase of the modernisation process that is to cover the period to 2007. The process of continuing public sector modernisation forms a significant part of the new Social Partnership agreement, *Sustaining Progress*.

VI Balanced Regional Development

4.75 Periods of rapid growth tend to be marked by regional disparities in economic performance, and the Irish growth experience of the 1990s was no exception. All parts of the country benefited from the strong economic expansion from 1994 to 2000, but the main engines of that expansion were more narrowly concentrated. Spatial differences in the nature and pace of development in recent years have, to varying degrees, exacerbated existing disparities in population, income, and enterprise base. An analysis undertaken as part of the preparation of the National Spatial Strategy indicates a number of distinct regional growth paths since the late 1980s:

Box 8: Regional Classification Border, Midlands & Western Region	
Border	Cavan Donegal Leitrim Louth Monaghan Sligo
Midland	Laois Longford Offaly Westmeath
West	Galway County Borough Galway County Mayo Roscommon
Southern & Eastern Region	
Dublin	Dublin County Borough Dún Laoghaire/Rathdown Fingal South Dublin
Mid-East	Kildare Meath Wicklow
Mid-West	Clare Limerick County Borough Tipperary North Riding
South-East	Carlow Kilkenny Tipperary South Riding Waterford County Borough Waterford County Wexford
South-West	Cork County Borough Cork County Kerry

Figure 38: Unemployment by Region 1993 and 2002⋆



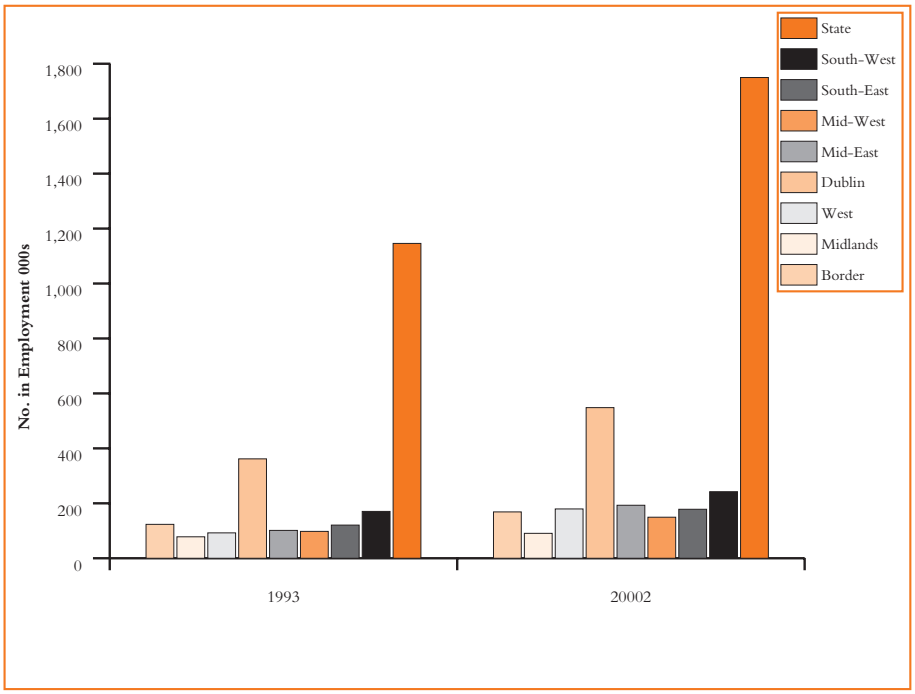
⋆ March-May.
Soure: CSO. 1993 Labour Force Survey. 2002 Quarterly National Household Survey.

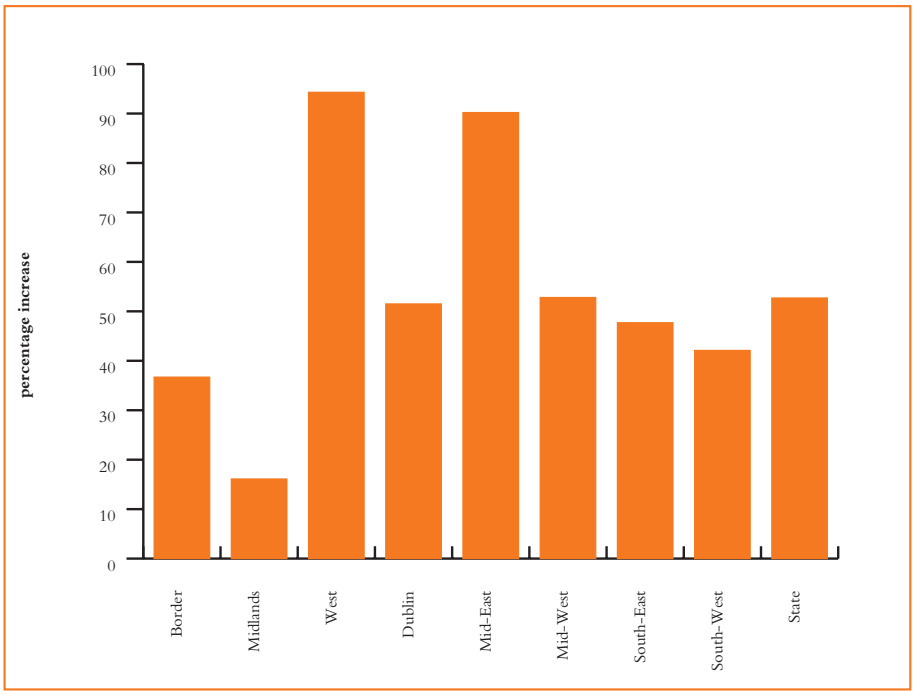
- The Greater Dublin area has developed and expanded rapidly. Though this has delivered vital benefits nationally, it has also led to further economic centralisation, congestion, urban sprawl, and to socially and environmentally undesirable effects such as the growth of long-range commuting.
- The other four main urban centres — Cork, Galway, Limerick, and Waterford — have, to differing extents, enjoyed a lesser but still buoyant level of economic growth and development.
- A number of areas in the West, South-East and Midlands have shown evidence of economic strength and potential, driven generally by the presence of strong towns.
- Many areas, particularly in the North-West, Midlands, South-East, and South-West, face economic challenges deriving from the decline in agricultural and related employment, the presence of mainly small-sized towns without critical mass, and under-utilised potential generally.

4.76 The framework for regional analysis in Ireland derives from the eight regional authorities established in 1994: Border; Midlands; West; Dublin; Mid-East; Mid-West; South-East; and South-West. These regions were subsequently grouped into two larger regions in 1999: the Border, Midlands and Western region, and the Southern and Eastern Region. Box 8 outlines the composition of the eight regions by county and county borough. While regional analysis of economic performance is now relatively well-developed, two points should be kept in mind. First, some measures of performance, such as gross value-added per person by region, are subject to measurement difficulties due to the impact of factors such as persons living in one region and working in another. Second, statistics on regional performance conceal sizeable variations within regions in many cases.

4.77 Figures 38-40 outline regional trends in unemployment, employment and population over the past decade. As can be seen from figure 38, all regions experienced a large fall in unemployment from 1993 to 2002 and, with the exception to some extent of the Border region, current regional variations in unemployment rates are relatively small. Employment trends have shown greater regional variation in recent years. In the economy as a whole, the number of persons at work rose by a little over 50 per cent between 1993 and 2002, but the increase varied from a low of 16 per cent in the Midlands region and 37 per cent in the Border region to a high of 90 cent or more in the Mid-East and West regions. The population growth figures at figure 40 also show an exceptional rise in the Mid-East region and a weaker performance in the Border region; population in the Mid-East increased by 27 per cent, over twice the national average, while that in the Border region rose by 7.3 per cent, around two-thirds the national average.

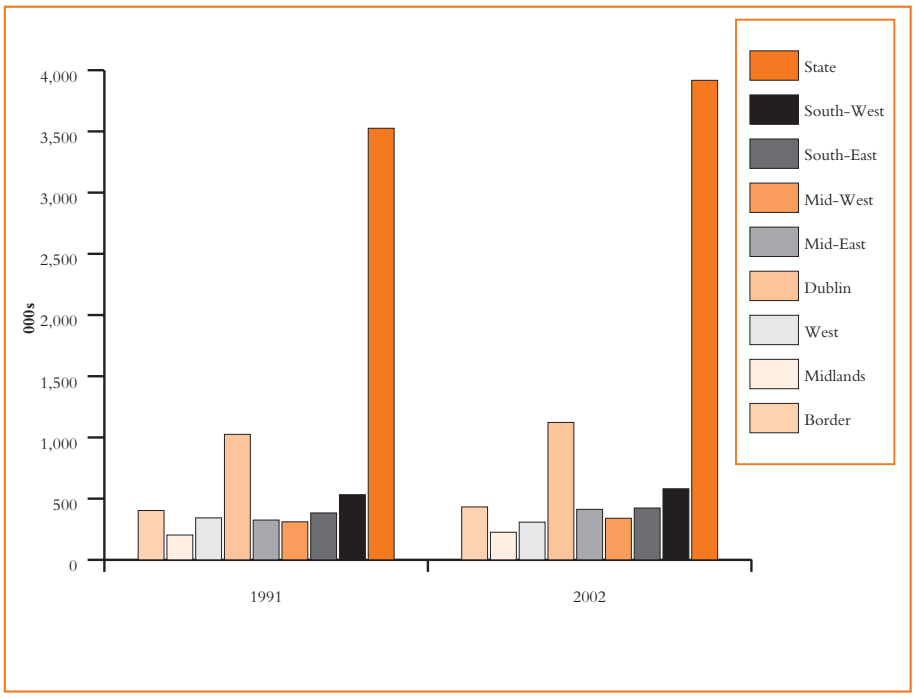
Figure 39: Employment by Region 1993 and 2002*

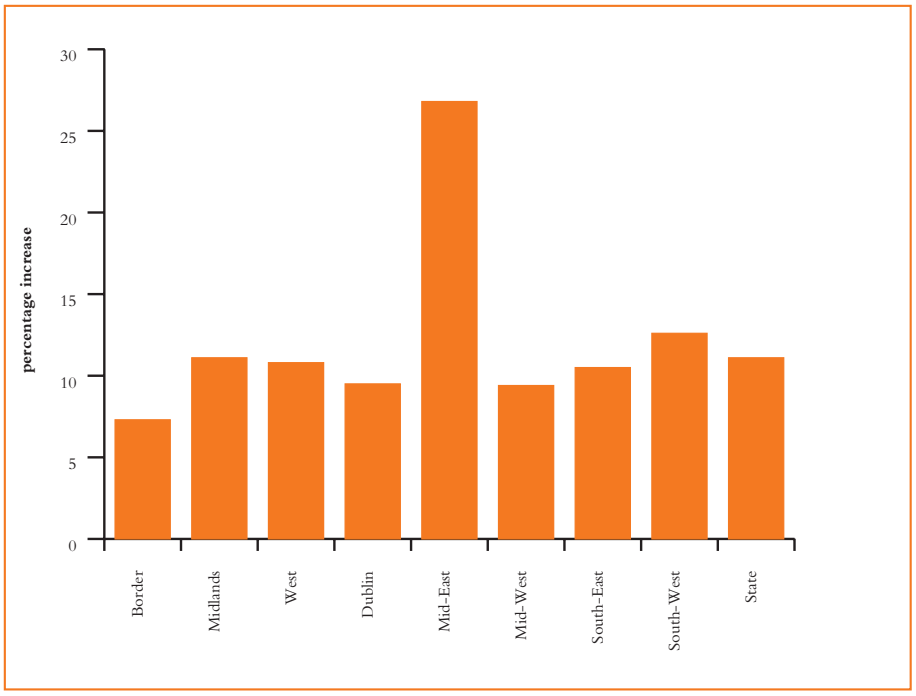




* March-May.
Source: CSO. 1993 Labour Force Survey. 2002 Quarterly National Household Survey.

Figure 40: Population by Region 1991 and 2002⋆





⋆ preliminary Census estimate.
Soure: CSO.

4.78 There are also significant differences in income and output levels among regions. Table 34 gives details of disposable income per person in the regions in 1995, 1999 and 2000. As can be seen, disposable income in Dublin was almost seventeen per cent higher than the national average in 2000. In all other regions except the Mid-East, disposable income was below the national average, with the lowest income levels being recorded in the Midlands, South-East, and Border regions. Though absolute incomes rose significantly in all regions between 1995 and 1999, the gap in regional income levels widened over the period. Disposable income in the Midlands, Border, South-East and South-West regions lagged further behind the national average in 1999 than in 1995; the relative decline was most marked in the Midlands where per capita income fell from 89.3 per cent of the mean in 1995 to 83.1 per cent in 1999. Between 1999 and 2000, however, this trend was reversed as disposal income in the Border, Midlands, West, South East and South West rose relative to the national average.

Table 34: Indices of Disposable Income per Person by Region 1995, 1999 and 2000

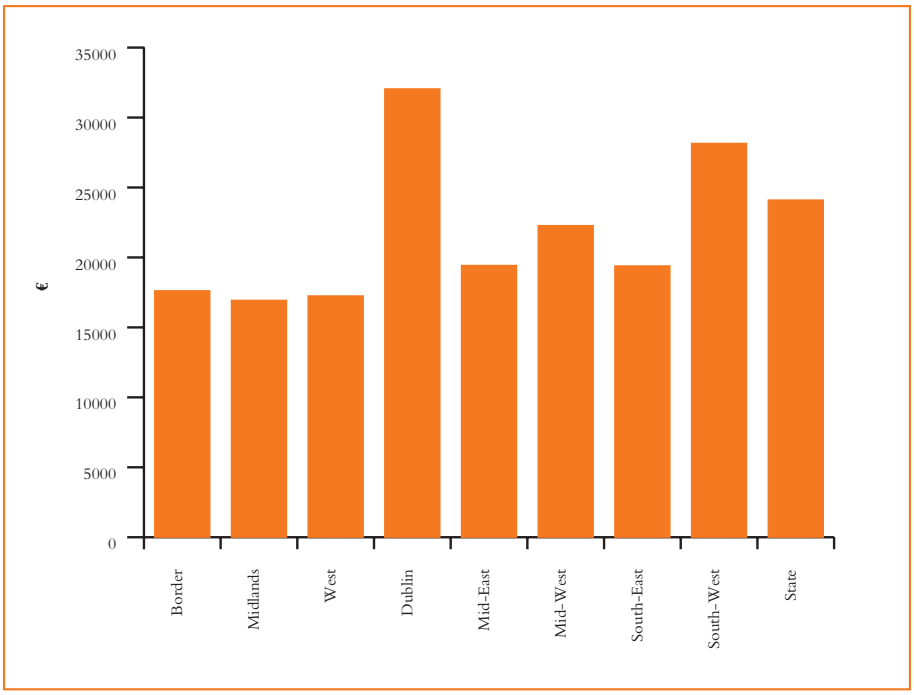
(State = 100)

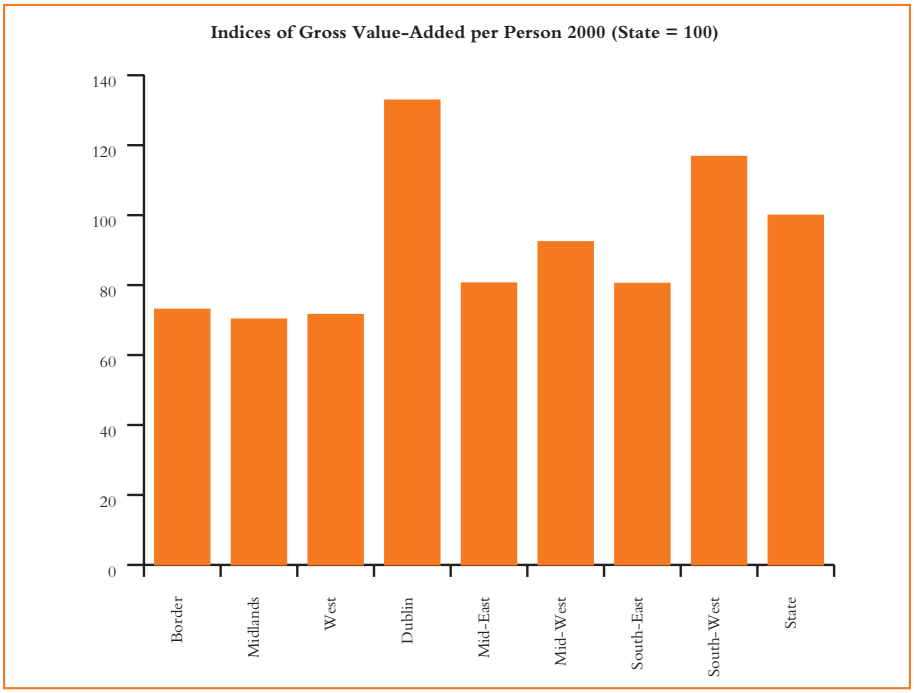
	Border	Midland	West	Dublin	Mid-East	Mid-West	South-East	South-West	State
1995	91.7	89.3	91.3	115.0	97.3	97.5	91.3	96.3	100
1999	89.0	83.1	91.1	118.1	100.1	98.7	87.9	94.2	100
2000	89.2	85.8	92.9	116.8	98.5	98.4	89.4	94.3	100

Source: CSO.

4.79 The main measure of regional output is gross value-added [GVA] per person; this is similar to GDP in that it measures the value of goods and services produced in a region or country, but differs in that it excludes product taxes and includes product subsidies. Figure 41 sets out gross value-added per person by region in 2000. As is evident, there was a considerable gap in per capita output between Dublin and to a lesser extent the South-West and all other regions of the country. Gross value-added per person in Dublin was one-third higher than the national average, and close to twice the level in the Midlands. Apart from Dublin and the South-West, per capita GVA in all other regions was at or below 90 per cent of the average for the state, and was below 80 per cent of the national average in the Midlands, West, and Border regions.

Figure 41: Gross Value-Added per Person by Region 2000





Source: CSO.

4.80 These differences in output and income levels are associated with significant differences in sectoral and industrial structure. Table 35 outlines the share of agriculture, industry and services in regional gross value-added in 2000. Dublin stands out for the low share of agriculture, and high share of services, in its output, while the Mid-East and South West are notable for their high share of industry. In regions with below-average income and output levels such as the Border, Midlands, and West, agriculture's share of value-added was relatively high. Table 36 outlines the share of total employment in manufacturing and international services that is located in 'modern sectors' (chemicals, electronic and optical equipment, and international services) and throws further light on the factors underlying regional disparities in income and output. The share of employment in these sectors varied from 25 per cent or less in the Border and Midlands to around 60 per cent in Dublin. Though the share of employment in modern sectors rose in most regions between 1995 and 1999, the increase was most pronounced in Dublin, the Mid-West and the West, while it fell in the Midlands and grew only modestly in the Border region.

Table 35: Sectoral Share of Gross Value-Added by Region 2000

	Border	Midland	West	Dublin	Mid-East	Mid-West	South-East	South-West	State
Agriculture	8.3	7.6	7.4	0.3	3.9	5.4	7.3	4.5	3.8
Industry	39.7	42.2	35.5	33.4	55.6	47.6	45.5	56.6	42.4
Services	52.0	50.1	57.1	66.3	40.4	47.0	47.2	38.9	53.8

Source: CSO.

Table 36: Share of Manufacturing and International Services Employment in Modern Sectors* 1995 & 1999

%

	Border	Midland	West	Dublin	Mid-East	Mid-West	South-East	South-West	State
1995	20.8	28.9	36.1	41.9	39.7	40.9	17.4	37.6	34.2
1999	23.7	25.2	46.4	59.2	45.4	52.0	23.9	44.2	44.9

*Pharmaceuticals, electrical and optical equipment as a percentage of total employment in manufacturing and international services supported by IDA, EI, Shannon Development and Údarás na Gaeltachta.

Source: National Spatial Strategy. 2001. **Irish Spatial Perspectives — Paper 6 'Enterprise, Employment and Productivity Trends'**, table 4.7.

4.81 The promotion of more balanced regional development and the reduction of regional disparities in output and income is one of the core objectives of the National Development Plan 2000-2006. The National Spatial Strategy launched in November 2002 after an extensive analysis of trends and needs sets out a long-term framework for strategic planning and development at regional level. Among the main conclusions reached in the course of its analysis were that:

- Strong urban structures were an essential element of successful regions.
- Linkages between those urban centres and their surrounding hinterlands represented the most effective way of spreading benefits to the wider region.
- The regions needed to build on established strengths as far as possible and to manage and develop these so as to ensure that they complemented each other.

The Strategy identifies a national framework of 'gateways' and 'hubs' designed to provide the necessary scale of infrastructure and services to enhance the economic and social potential of the regions and to drive their future development. In addition to the existing major urban centres of Dublin, Cork, Galway, Limerick and Waterford, four further gateways were designated for the Border, Midland and West regions: Sligo, Letterkenny (in tandem with Derry), Dundalk, and a linked gateway of Athlone, Tullamore, and Mullingar in the Midlands. The Strategy also designates nine hubs to support and extend the effect of the gateways and to lead the development of their own catchment areas: Castlebar/Ballina; Tuam; Ennis; Tralee/Killarney; Mallow; Kilkenny; Wexford; Monaghan; and Cavan.

4.82 The clear focus of the National Spatial Strategy is on the potential of different areas to create and sustain economic strength through developing critical mass in population, infrastructure, education and skills, and enterprise. As discussed in chapter 5, the enterprise development agencies now give a high priority to the promotion of greater regional balance in enterprise development. Past experience suggests that this regional balance will not be achieved on a sustained basis unless enterprises are rooted in real regional capabilities and strengths. In the 1960s and 1970s, there was a significant regional dispersal of industrial enterprise and employment as new foreign-owned enterprises were set up throughout the country, sometimes in relatively isolated rural areas. Between 1961 and 1981, for example, Dublin's share of industrial employment declined from 46.5 per cent of the national total to 33.1 per cent. In many cases, however, the enterprises established in rural areas were heavily dependent on low labour costs and were not rooted in any more lasting sources of comparative advantage. While they gave a boost to their local economies during their time here, this did not offer a viable basis for long-term development.

4.83 It must be recognised that the high-value, high-innovation enterprises that we now need to foster will locate only in areas in which the right human resources, infrastructure and services are available.[23] If such enterprises require significant numbers of graduates and researchers, for example, they will typically want to locate close to higher education institutions with well-developed capabilities in their particular field. In other cases, enterprises may need to be close to specialist suppliers or key business services, or may require high-quality energy or telecommunications infrastructure. Enterprises of this kind will typically also want to locate in an area with good housing, amenities and leisure facilities that can offer managers and staff an attractive lifestyle. In many cases, sites relatively close to the main urban centres are the only locations in Ireland that enterprises of this kind will consider. By developing new gateways and hubs, the National Spatial Strategy aims over time to broaden the number of areas in Ireland that can offer a viable and attractive location for advanced high-technology enterprise. It should be kept in mind in this context that the main rival locations for such enterprises are not generally smaller towns or rural areas in Ireland but larger cities and urban centres in other parts of Europe, the United States, or Asia. While this is obviously true of foreign-owned enterprise, the large increase in outward direct investment by Irish-owned firms suggests that it is also applicable to some indigenous firms with a strong growth record.

4.84 It is widely recognised that the concentration of enterprises, a skilled labour pool, and suppliers of goods and services in a particular geographical areas boosts efficiency, encourages downstream activity and sub-supply opportunities, and stimulates innovation and enterprise formation. As noted in chapter 3, while there is little sign of fully integrated clusters, there is evidence of spatial concentration of particular industries in, for example, financial services and software in Dublin, electronics in West Dublin/Kildare, pharmaceuticals in Cork, and medical devices in Galway. The corollary of the advantages associated with cluster development, however, is that the scope for the geographical dispersal of enterprises is necessarily reduced. There are lessons to be drawn here from the past. In the 1930s when the focus of enterprise policy was on fostering indigenous industry by means of protectionist measures, the development of concentrations of similar and related enterprises in particular areas was frustrated by administrative decisions that new businesses should be dispersed around the country rather than locate in centres with an established presence in their particular sector.[24] While well-intentioned, this went against all the tenets of cluster formation and did not contribute in the long run to either national or regional development.

4.85 The proposed new gateways and hubs in the Border, Midlands and West are intended to serve as drivers of development and sources of dynamism in their regions.

[23] 'Inward Investment: Regional Strategy', address by Seán Dorgan, Chief Executive IDA Ireland, to Waterford Institute of Technology Conference, 17 September 2002.
[24] Ó Gráda, C. **Ireland: A New Economic History 1780-1939** (Oxford: Clarendon Press), p. 398.

While these centres, and the concentrations of high value enterprise that it is hoped will emerge in them over time, have a vital role to play, the vibrancy of many smaller towns, villages and rural areas will depend critically on small and micro-enterprises in agriculture, tourism, local services, and land and marine-based natural resources. As noted in chapter 3, the initial impetus behind the expansion of the past decade may have come from export-oriented, high-tech enterprise, but its momentum was sustained in significant part by record enterprise and employment growth in small businesses in a wide range of locally traded services. These enterprises will continue to have a critical role to play in local and regional development. The support services provided for them by the City and County Enterprise Boards, Leader and other programmes are outlined in chapter 5.

VII Sustainable Development

4.86 Economy, society and environment are inter-dependent, and the supply of natural resources (water, energy, raw materials) and human resources (labour, skills, creativity) underpins all economic activity. Economy and society draw on natural resources, but also in turn have an impact on the environment. Over the past century, that impact has increased to the point where it represents a threat not just to the natural environment and other species, but also to the quality, and ultimately even perhaps the survival, of human life. In response to the growing evidence of environmental damage, there is now a recognition of the need to put the concept of sustainable development at the heart of economic and social policy. By sustainable development is meant development that strives to balance economic, social and environmental dimensions with a view to ensuring that the needs of the present generation are met in a way that will not damage the needs of future generations. The concept was first brought into the mainstream of international policy-making at the 1992 UN Earth Summit in Rio at which principles and actions for achieving sustainable development were agreed by heads of state. At European Union level, the Gothenburg Council of June 2001 witnessed the formulation of the first EU sustainable development strategy, presented by the European Commission.

4.87 Late industrialisation helped for a considerable time to spare Ireland from some of the environmental blights experienced in other industrial societies. While the relative lack of heavy industry still contributes to a comparatively good standard of environmental performance in some areas, the rapid growth of the past decade has contributed to a worsening situation in others, particularly greenhouse gas emissions and waste generation. In its *Environment in Focus 2002*, the Environmental Protection Agency noted that 'while Ireland's environment is still generally of a high standard, many pressures on it are increasing at significantly faster rates than in most other European countries. These

pressures have resulted from the rapid economic growth experienced by Ireland in recent years, and in particular from growth in the transport and energy sectors.'[25]

4.88 After consultations with other departments and agencies, the social partners and other interested organisations, and the public, the Department of Enterprise, Trade and Employment launched its first Sustainable Development Strategy in January 2003. The aim of the Strategy is to chart a course for both the enterprise sector and the Department itself to find more environmentally and socially responsible and sustainable ways of doing business. Four priority strategic areas have been selected for the Strategy over the three-year period from 2003 to 2005:

- Climate Change
- Competitive Sustainability
- Corporate Social Responsibility
- Departmental Sustainability

4.89 The Strategy will be implemented by the incorporation of relevant objectives and actions into the strategy statements and business plans of the Department and its agencies. Its implementation will be reviewed in the Department's annual report, while an overall evaluation will be undertaken as the term of the Strategy comes to a close at the end of 2005. Before considering the other three pillars of the Strategy, we will look first at the issue of climate change.

Climate Change

4.90 It is now widely agreed that emissions of greenhouse gases (GHG) such as carbon dioxide from human activity are contributing to changes in our climate that threaten the future sustainability of human society. According to the Intergovernmental Panel on Climate Change, globally averaged mean surface temperature is projected to increase by 1.4 to 5.8 degrees Celsius over the period from 1990 to 2100. If this occurs, particularly at the higher end at the range of projections, it will have grave consequences for many aspects of the natural environment and human life, including the habitability of low-lying areas, human health and disease, agriculture, and the survival of other species. In response to the growing global concern about climate change, the Kyoto Protocol of 1997 set a target for a 5 per cent reduction in greenhouse gas emissions over the 1990 levels in the industrialised countries to be achieved by 2008-2012. The Protocol and the related agreement on implementation procedures make provision for a number

[25] Environmental Protection Agency. 2002. **Environment in Focus,** p.12

of 'flexible mechanisms' to enable the achievement of emissions' reduction obligations at least cost:

- Emissions trading — this provides a mechanism whereby emissions' reduction targets can be met at least cost by the buying and selling of allowances on the market. Emissions trading is due to start in the EU from 2005 and internationally from 2008.
- Joint Implementation — this provides for project investments to reduce emissions' reductions in other developed countries in return for credits to be used to meet Kyoto targets.
- Clean Development Mechanisms — this is broadly similar to Joint Implementation but provides for project investment in developing countries.

4.91 In order for the Protocol to come into effect, it must be ratified by 55 countries and the ratifying countries have to include developed economies representing at least 55 per cent of total carbon dioxide emissions in this bloc of countries in 1990. As of June 2003, the Protocol had been ratified by over 100 countries, including the European Union and its members states and Japan, while the second requirement for ratification is expected to be met in the not too distant future. The United States and Australia have indicated that they will not ratify the Protocol.

4.92 Under the Kyoto Protocol, the European Union agreed to an aggregate 8 per cent reduction in greenhouse gas emissions below their 1990 levels. Following agreement on a system of burden-sharing among EU member states, Ireland was set a target, by virtue of its status as a cohesion country, of having emission levels in 2008-2012 no more than 13 per cent above the 1990 baseline. Because of the scale of economic growth in recent years, however, our emissions in 2001 were 31.1 per cent above their 1990 level.[26] Significant reductions in emission levels are now necessary therefore in order to meet our binding obligations under the Protocol. The National Climate Change Strategy adopted in October 2000 sets out a range of measures for achieving reductions in GHG emissions in all sectors to enable us to meet our Kyoto target. Key cross-sectoral measures include taxation, negotiated agreements, and the flexible mechanisms of emissions trading, Joint Implementation and Clean Development.

4.93 The enterprise sector is not the main source of greenhouse gas emissions in Ireland; in 1998, industrial emissions (including manufacturing, construction, and commercial/institutional sector emissions) accounted for 16.3 per cent of all GHG emissions. This share was projected to rise to 20.4 per cent (15 million tonnes carbon dioxide equivalent) by 2010 if no abatement measures were taken, though such projections are sensitive to changes in the rate of economic growth and in the composition of the industrial sector. Under the National Climate Change Strategy, the enterprise sector has

[26] European Environment Agency. 6 May 2003. 'EU Greenhouse Gas Emissions Rise for Second Year Running', www.eea.eu.int/documents/newsreleases/ghg-2003-en.

been set an emissions reduction target of 2.175 million tonnes carbon dioxide equivalent per annum from 2008 to 2012. Since the publication of the Climate Change Strategy, the Department of Enterprise, Trade and Employment and Forfás have given detailed consideration to the issue of how this target can be met without impairing the competitiveness of Irish enterprise. Under the Department's Sustainable Development Strategy outlined at box 9, it is proposed that Ireland should pursue a policy of optimum participation in the emissions trading, joint implementation and clean development mechanisms provided for under the Kyoto Protocol, while also developing appropriate taxation measures along with methods for assessing the impact of inward and indigenous investment projects on greenhouse gas emissions.

4.94 While climate change and national and sectoral obligations under the Kyoto Protocol are pressing issues, the other elements of the Department's Sustainable Strategy are concerned with the broader questions of how awareness of sustainable development can be enhanced and conditions created in which the needs of sustainability and competitiveness can be balanced and integrated. The goals and objectives of the Strategy for the enterprise sector and the Department itself in these areas are outlined at box 9. Achieving these goals will present a number of new challenges for enterprise policy and the enterprise sector. There is a need, first, to encourage and promote the development and adoption of environmentally friendly, resource-efficient products, processes and services. There is a related need, second, to develop and strengthen capabilities for R&D and innovation in areas such as clean technologies and energy-efficient design. Third, greater priority will have to be given to waste prevention, minimisation, recovery, and recycling by firms, organisations, consumers, and households. It is now time for enterprises and other organisations to take a proactive approach to environmentally sustainable production and resource consumption and, in so doing, to begin the break the link between economic growth and pollution. While this may entail some costs, there is also considerable potential for new business and niche market opportunities, enhanced corporate image, and improved work organisation and productivity.

Box 9: Department of Enterprise, Trade and Employment Sustainable Development Strategy 2003-2005

GOAL 1 CLIMATE CHANGE

Pursue the establishment of appropriate mechanisms to ensure that the enterprise sector can meet its obligations to reduce greenhouse gas emissions under the National Climate Change Strategy as cost-effectively as possible.

Objectives

- Facilitate optimum participation for enterprises in the EU emissions trading scheme.
- Pursue the establishment of structures and mechanisms to ensure that enterprises can engage in negotiated agreements where possible.
- Facilitate optimum participation for enterprises in Joint Implementation and Clean Development Mechanism projects abroad and consider the implications of Joint Implementation projects to be based in Ireland.
- Ensure that mechanisms are in place to assess the impact of inward and indigenous investment projects on greenhouse gas emissions.
- Contribute to the development of appropriate taxation measures as part of the policy mix for achieving greenhouse gas emission reduction targets.
- Improve the availability and take-up of information for enterprises on actions that can be taken to address greenhouse gas emissions and climate change issues.

GOAL 2 COMPETITIVE SUSTAINABILITY

Integrate sustainability and competitiveness by supporting the move to more sustainable forms of production through promoting knowledge, research and development in areas such as clean technologies, green business opportunities, and design of sustainable products and processes.

Objectives

- Enable companies to reduce their environmental impact and improve productivity through the development, diffusion and use of eco-efficient technologies and practices.
- Maximise the potential for innovation to contribute to both competitiveness and sustainability goals.
- Support and develop policy instruments for sustainable development that also contribute to enhanced competitiveness, innovation and economic efficiency.

GOAL 3 CORPORATE SOCIAL RESPONSIBILITY

Encourage and support the adoption of socially and environmentally responsible attitudes and practices by enterprises.

Objectives

- Actively promote the adoption of good corporate practices by enterprises.
- Continue to promote the implementation of sustainable trade policies and practices at national, EU and international level.
- Enhance the capacity of enterprises to move towards sustainable management principles and practices.
- Support sustainable consumer choice through ensuring the provision of accurate and credible social and environmental information on products and services.

GOAL 4 DEPARTMENTAL SUSTAINABILITY

Integrate sustainable development principles and practices into departmental and agency policy-making and operations management.

Objectives

- Build up internal expertise on how to integrate sustainable development into departmental decision-making and policy development
- Incorporate best environmental practice into the Department's operations.

Conclusion

> The challenge ... is to move to an Innovation-Driven economy and develop deep clusters. This is a slow process, however, as companies need to move to new types of strategies, investment priorities must change, and new institutions must be developed ... Such inflection points require a wholesale transformation of many interdependent dimensions of competitiveness.
>
> Professor Michael Porter[27]

4.95 The data presented in the foregoing analysis present a mixed picture. On the one hand, Ireland lags behind other advanced economies on a number of the key foundations of a knowledge-intensive economy. This is in large part a legacy of successive decades of under-development and the consequent lack of investment in science and technology, education and training, and infrastructure. On the other hand, significant progress has been made in a number of areas over the past decade in strengthening capabilities and narrowing the gap with other economies. Investment programmes and other measures are currently being implemented in a range of fields such as science and technology, lifelong learning, competition policy, broadband provision, eGovernment, and corporate governance with the aim of bringing performance and practice in Ireland up to the best international standards.

4.96 Making the transition to a more advanced state of enterprise and economic development is not automatic or assured. Success in the past decade is no guarantee of success in the next. Achieving the desired progression will take time and will encounter obstacles. GNP per capita in Ireland may now be slightly above the EU average, but the economies with which we are now on a par have enjoyed the benefit of higher income levels over a period of decades. In that time, they have been able to build up infrastructure and develop human capital and science and technology capabilities. We also face the prospect of making the transition to a more knowledge-based economy at a time of continuing uncertainty and volatility in the world economy. The closures and job losses that have resulted from the global downturn in the ICT sector attest to the problems that can result from unfavourable external developments. The required investment in research and development, and infrastructure must be made, furthermore, in a period of constraint in the public finances. This will necessitate taking a long-term view of the needs of the economy and the enterprise sector, determining our priorities accordingly, making difficult choices in the allocation of scarce resources, and recognising that commitments in one area will require restraint in others.

[27] Porter, Michael. E. 2002. 'Building the Microeconomic Foundations of Prosperity' in World Economic Forum, **Global Competitiveness Report 2002-2003,** p. 29.

Chapter 5 — The Enterprise Development Agencies

I Overview

5.1 Enterprise development agencies have been a feature of enterprise policy in the half-century since the establishment of the Industrial Development Authority in 1950. In the succeeding decades, the formation of new agencies and the restructuring of established bodies has led to the existence of a well-developed network of agencies to support the main constituents of the enterprise sector. Among the agencies under the aegis of the Department of Enterprise, Trade and Employment are **Forfás**, the advisory body for enterprise and science and technology policy, which is charged also with co-ordinating the activities of IDA Ireland and Enterprise Ireland. A number of advisory bodies operate under its auspices: **the National Competitiveness Council; the Irish Council for Science, Technology and Innovation; and the Expert Group on Future Skills Needs. IDA Ireland [IDA]** is responsible for foreign-owned enterprise in manufacturing and internationally traded services, and **Enterprise Ireland [EI]** is responsible for Irish-owned enterprise in manufacturing and internationally traded services. The **City and County Enterprise Boards [CEBs]** cater for micro, or very small, enterprises.

5.2 There are also agencies devoted to enterprise development in a particular region or geographical area. **Shannon Development** has a broad developmental mandate for the Shannon area and Mid-West region with particular emphasis on enterprise and tourism development. **Údarás na Gaeltachta**, which is under the remit of the Department of Arts, Heritage, Gaeltacht and the Islands and is not covered in this Review, combines an enterprise development role with community, cultural, and language development activities in Gaeltacht areas of the country.

5.3 Agencies have also been established to promote key activities integral to enterprise. **Science Foundation Ireland [SFI]** was set up by Government in 2000 to establish Ireland as a centre of research excellence in strategic areas relevant to economic development, particularly information and communication technology [ICT] and biotechnology. A Bill to establish SFI on a statutory basis and as an agency of Forfás was published in February 2003. **InterTrade Ireland** was set up under the agreement on North-South Implementation Bodies between the Government of Ireland and the Government of Great Britain and Northern Ireland to exchange information and co-ordinate work on supporting trade, business and related matters in a cross-border context. The **National Standards Authority of Ireland** provides services in the areas of standards development, certification, and legal metrology.

5.4 While **FÁS** has not traditionally been seen as one of the core enterprise development agencies, its ***Statement of Strategy 2002-2005*** sets out its intention to place significantly greater emphasis in the future on services to employers and persons in employment. As outlined in chapter 4, enhancing the skills and human capital of the workforce in all sectors of the economy is a prerequisite for sustaining high levels of income and employment in the long-term. Along with other bodies in the education and training field, FÁS has an important contribution to make to this objective.

The Changing Role of the Enterprise Development Agencies

5.5 The enterprise development agencies have played an important part in the transformation of the Irish economy and enterprise sector in recent decades. IDA Ireland has earned a worldwide reputation for its success in attracting foreign direct investment to Ireland. The efforts of Enterprise Ireland, its predecessors Forbairt and ABT, and Shannon Development to develop the capabilities of indigenous firms and to build up a domestic base in sectors such as software have contributed to the resurgence of Irish-owned enterprise over the past decade. The City and County Enterprise Boards have pioneered new approaches to the development of micro-enterprise. The role of the development agencies in creating and sustaining a strong enterprise sector, however, should not be overstated. The most important determinant of the strength of a country's enterprise sector is the quality of its environment for enterprise — education and skills, research and development, infrastructure, telecommunications, taxation, finance, competition, regulation, and public administration. If these are characterised by fundamental weaknesses, the resultant obstacles to enterprise development will not be remediable by the activities of enterprise agencies. In the past, as the Culliton Review Group suggested, agency grants and programmes may have been seen at times as a way of compensating for deficiencies in the enterprise environment. This proved neither a solid foundation for enterprise development nor a sound strategy for the enterprise agencies.

5.6 In the past, the chief goal of the enterprise agencies, whether dealing with foreign or Irish-owned enterprise, was job creation and the main focus of their activity lay in the provision of grants and other incentives to firms in order to stimulate employment-generating investment. From the 1980s, this was accompanied by an increased emphasis on the development of strategic competences, particularly among indigenous firms. Ireland's transition in the 1990s from a low-growth, high unemployment economy to a high-growth, full employment economy led, in tandem with other developments, to a further re-evaluation of the role and strategy of the enterprise agencies. With many firms experiencing labour shortages, the priority accorded to employment creation and job numbers required re-assessment. Enterprise strategy could no longer assume the availability of plentiful supplies of relatively low cost labour, but had instead to focus on the development of new capabilities that would enable the Irish economy and enterprise

sector to make the transition to higher-value, more knowledge-intensive activities. With some parts of the country experiencing a growing problem of congestion while others remained less developed, particularly in modern high-technology activities, the need for balanced regional development took on greater importance.

5.7 The operations of the agencies have also been affected by more stringent European Union state aid rules on grant assistance to enterprises, traditionally the main instrument of enterprise support in Ireland. In the past, the financial assistance to firms provided by IDA Ireland, Enterprise Ireland, and other agencies was primarily sanctioned under the EU's regional aid guidelines. Prior to 2000, Ireland was regarded by the European Commission as a single under-developed region for the purposes of the regional aid regime. Up to this time the levels of grant assistance considered necessary or desirable by enterprise agencies here were within the limits imposed by the then regional aid guidelines. The sustained Irish growth of the 1990s, however, rapidly bridged the previous gap in output and income between Ireland and other European Union member states. The revised EU regional aid guidelines drawn up for the period 2000-06 on the basis of a detailed analysis of national and regional economic performance imposed, for the first time, significant restrictions on the level of assistance that could be provided to enterprises in some parts of Ireland. Table 37 outlines the maximum aid levels that can be granted for projects in different regions of the country over the course of this period.

Table 37: Revised Regional Aid Intensities for Investment Projects

Maximum Aid Intensity: % of Eligible Costs that Can be Grant-Aided

	2000	2001	2002	2003-06	Additions
Border, Midlands, West	40	40	40	40	Plus 15% for SMEs
South-East, Mid-West, & South-West	37	31	26	20	Plus 10% for SMEs
Mid-East	35	29	23	18	Plus 10% for SMEs
Dublin	17.5	17.5	17.5	17.5	Plus 10% for SMEs

5.8 As can be seen, the operation of the state aid rules significantly limit the level of aid that can be provided to enterprises in Dublin over the entire period from 2000 to 2006 and, as the aid intensity ceilings gradually decline over the period, will increasingly restrict the levels of assistance that can be provided to enterprises in other regions outside the Border, Midlands, and West. It is not possible at this point to predict the revised state aid guidelines that will obtain after 2006. Since the guidelines for the 2000-06 period were drawn up, however, this country has continued to outperform other EU member states. Unless there is some dramatic reversal of our comparative economic

performance in the period immediately ahead, it would seem prudent to anticipate further restrictions on the level of aid permissible in all regions of the country from 2007. There has been an ongoing shift in the state aid rules away from sectoral supports and ad hoc measures for individual projects towards assistance for wider projects designed to help advance broad economic and social objectives of the European Union. These horizontal aid frameworks permit supports to be provided under carefully defined conditions for activities with a public good dimension such as training and research and development. As restrictions on other forms of aid to enterprise increase, these horizontal frameworks are set to grow in importance.

The Challenge for the Enterprise Development Agencies

5.9 The enterprise development bodies have been alert to the wide-ranging changes in the national and international environments for enterprise and to their implications for agency strategies and activities. In ***Shaping our Future*** (1996) and **Enterprise 2010** (2000) Forfás set out a vision of an enterprise sector refocused on innovation and higher value-added activity, and outlined the changes in policy and performance needed to achieve it. In 1999, at the direction of the Tánaiste and Minister for Enterprise, Trade and Employment, IDA Ireland began a wide-ranging review of corporate thinking, policies, and programmes that led to the adoption of a new strategy ***IDA 2000+***. The new strategy placed a central emphasis on job quality, regional development, and contributing to the development of a world-class environment for enterprise. Enterprise Ireland, which was established in 1998, formulated a three-year Business Plan in 1999 that took account of the changed conditions facing indigenous industry and the objectives of the National Development Plan 2000-06. The agency's strategic direction was guided by a policy statement issued by the Tánaiste and Minister for Enterprise, Trade and Employment on its establishment. This stressed the importance of fostering sustainable sources of competitive advantage among indigenous enterprises and the need for a flexible approach focused on the developmental problems faced by growth-oriented firms. 2000 saw a major initiative in enterprise policy with the establishment of Science Foundation Ireland. Its aim is to help develop the advanced research capabilities that will underpin Ireland's development as a knowledge-based economy and create the basis for continued economic advances in the decades ahead.

5.10 In the second half of the 1990s, enterprise strategy and the enterprise agencies were operating in a context of record growth rates and a favourable domestic and international environment. Since 2000, however, the downturn in the global economy and in the ICT sector have brought about a different and more difficult environment for the agencies and their client base in manufacturing and internationally traded services. Job losses in 2001 and 2002 among firms supported by IDA Ireland, Enterprise Ireland and Shannon Development have been at levels not witnessed for a decade or more,

while the rate of new job creation has also declined. Though unemployment remains relatively low, maintaining and creating jobs has assumed greater importance, particularly in regions and localities in which unemployment is significantly above the national norm.

5.11 As set out in chapter 4, the twin challenge now for enterprise policy and the enterprise sector is to raise the value of the goods and services we produce and to produce goods and services more efficiently. In a difficult global economic environment, a very open, relatively high-cost economy such as ours must do both these things if it is to maintain enterprise and employment in the short-to-medium term while laying the long-term foundations for an enterprise base focused on value and innovation. This will require the complementary strengthening of business enterprises and the business environment. Advancing the enterprise sector up the value chain cannot be achieved without advancing the enterprise environment — education, research and development, infrastructure, regulation, public administration — up the value chain and *vice versa*.

5.12 The enterprise development agencies can make an important contribution to this strategic challenge at a number of levels:

(i) at enterprise level, by promoting new high-value businesses, while helping to raise value and efficiency levels among existing firms;

(ii) at niche and sector level, by assisting in the development of factors associated with strong clusters such as effective partnerships between third-level institutions and enterprises;

(iii) regionally, by promoting enterprise development at regional level and by providing an enterprise-focused perspective on the development of regional capabilities and infrastructure;

(iv) at the level of the overall environment for enterprise, by identifying priority areas and actions needed to ensure a high-quality business environment and infrastructure, and working with central and local government, state agencies and other bodies to address these needs.

Later sections of the chapter outline the ways in which the enterprise agencies are currently working to advance these aims.

Organisational Framework of the Enterprise Agencies

5.13 In the early 1990s, concern about the performance of the enterprise sector and the persistence of high unemployment prompted an intensive period of re-organisation

among the enterprise development agencies. In 1993, the responsibilities for overseas industry, indigenous industry, and policy development which had been undertaken until then by the former Industrial Development Authority were divided among three agencies: Forfás for advisory and co-ordination functions; IDA Ireland for foreign-owned industry; and Forbairt for Irish-owned industry. Around the same time, a number of new initiatives were also taken to assist micro-enterprise, local development, and areas of economic and social disadvantage. This led to the establishment of City and County Enterprise Boards to foster the development of very small enterprise, of Leader Groups to assist rural development, of Business Innovation Centres to provide support services for innovative new enterprise, and of Area Based Partnerships to promote the regeneration of designated areas of economic and social deprivation.

5.14 A further major organisational change occurred in 1998 with the establishment of Enterprise Ireland as a new agency for indigenous industry incorporating Forbairt, an Bord Tráchtála — the Irish Trade Board, and some of the activities of FÁS. Its formation reflected a concern that supports for Irish-owned industry were spread among too many different bodies and could be delivered with greater effectiveness by a single agency. This was followed in 2000 by the establishment of two new bodies, Science Foundation Ireland and Inter-Trade Ireland. By any standards, therefore, the organisational framework of the enterprise development agencies has undergone unprecedented change over the past decade. The restructuring of the period has absorbed a considerable amount of time and effort at agency and departmental level. The priority now is to maximise the agencies' contribution to enterprise development and employment maintenance and creation, and consideration of changes to their organisational structures has not formed part of the present Review.

Expenditure on Enterprise Support and Development

5.15 Enterprise support and development involves a major commitment of resources by the Exchequer. Table 38 outlines the budgets in 2002 of the main enterprise agencies and enterprise programmes for which the Department of Enterprise, Trade and Employment has responsibility — IDA Ireland; Enterprise Ireland; Forfás; SFADCO; Science Foundation Ireland, Inter-Trade Ireland; the National Standards Authority of Ireland; the City and County Enterprise Boards; and the science and technology development programmes for enterprise administered by the Department's Office of Science and Technology. The figures include in some cases resources generated by the agencies themselves as well as the Exchequer contribution to their budgets. In the case of Shannon Development, the figure includes expenditure on tourism and other areas outside the direct scope of enterprise development. In 2002, the aggregate budget for enterprise agencies and programmes was approximately €640m. Over the period from 1990 to 2000, combined expenditure under these headings was in the region of €7bn.

Table 38: Enterprise Development Budget 2002	
	Budget €m.
IDA Ireland	219.4
Enterprise Ireland	205.2
Shannon Development	51.2
Forfás	21.0
Science Foundation Ireland	35.0
Inter*Trade*Ireland	10.7
City and County Enterprise Boards	36.8
National Standards Authority of Ireland	4.0
Science and Technology Development	57.0
Total	640.3
Source: Department of Enterprise, Trade and Employment.	

5.16 Though agency expenditure rose significantly over the past decade, there has been a downward trend in the cost of jobs created and sustained by IDA Ireland and Enterprise Ireland. Figure 42 outlines trends in cost-per-job in both agencies from the late 1980s to 2001. Cost-per-job is calculated by dividing all agency grants to all firms in a seven-year period by the number of jobs created during, and sustained to the end of, that period. The figures are calculated on a seven-year rolling basis in order to reduce the distorting effect of agency-supported jobs that survive only for a relatively short time. Over the seven years from 1986 to 1992, jobs created and sustained by IDA Ireland cost, in constant prices, €20,743 on average. From 1995 to 2001, the most recent period for which data are available, the figure was €13,375 per job, a fall of around 35 per cent. For employment in indigenous enterprise supported by Enterprise Ireland and its precursors, the cost-per-job created and sustained remained relatively unchanged until the latter half of the 1990s, but then declined significantly. In the period from 1995 to 2001, the figure was €8,977 compared with €14,324 over the period from 1987 to 1993, a decline of around 37 per cent.

Figure 42: Cost per Job Sustained IDA and Enterprise Ireland⋆

⋆ constant 2001 prices.
Source: Forfás.

5.17 As noted above, the level of financial assistance that can be provided to individual enterprises in much of the country in the years to 2006 has been significantly curtailed under European Union state aid rules. This will contribute to further downward pressure on cost-per-job levels in the period ahead, though the higher rate of job losses since 2001 will tend to exert a countervailing upward pressure. It is the aim of policy that the progressive reduction in the cost of interventions in individual firms will be sustained in the coming years. The revised funding guidelines for Enterprise Ireland outlined later in the chapter provide for a higher level of repayability for financial support to indigenous enterprise. Greater administrative efficiencies will continue to be pursued by the development agencies. IDA Ireland is engaged in a process of reducing staff numbers by six per cent. Enterprise Ireland have reduced personnel levels by around ten per cent from those obtaining in the organisations that preceded it — Forbairt, an Bord Tráchtála, and part of FÁS.

5.18 Other factors have also contributed to a greater emphasis on forms of enterprise support other than direct grant aid to individual enterprises. As enterprise policy puts greater priority on promoting knowledge-based enterprise, forms of enterprise support other than grants to individual firms have assumed greater significance. The establishment of the Technology Foresight Fund and of Science Foundation Ireland reflect a view that investments in research capabilities and infrastructure have a vital role to play

in attracting future large-scale biopharmaceutical and ICT investments. A number of proposals for major investments in knowledge and physical infrastructures by the enterprise agencies have been put forward for consideration or are likely to arise in the future.

II Forfás, Science Foundation Ireland, and Intertrade Ireland

Forfás

5.19 Forfás is the national policy and advisory board for enterprise, trade, science, technology and innovation. It is also the body in which the state's legal powers for industrial promotion are vested, and through which these powers are delegated to IDA Ireland and Enterprise Ireland. A Bill to establish Science Foundation Ireland as an agency of Forfás and to include it within Forfás's co-ordination function was published in February 2003. In its policy role, Forfás monitors trends nationally and internationally, conducts surveys and other research, and works with enterprise agencies and Government departments in the development of policies to support enterprise and innovation. A sizeable part of this work is done by the advisory bodies that operate under Forfás's auspices and for which it provides secretariats — the National Competitiveness Council; the Irish Council for Science, Technology and Innovation; and the Expert Group on Future Skills Needs. It is the responsibility of Forfás, aided by these advisory groups, to develop and promote the national competitiveness agenda.

5.20 The research and analysis undertaken by Forfás has strengthened considerably the knowledge base available for the formulation and evaluation of enterprise policy. The work of Forfás and the bodies under its auspices have also had a significant direct impact on policy in a number of areas. The report of the Technology Foresight Task Force set up under the auspices of the Irish Council for Science, Technology and Innovation, for example, led to the establishment of the Technology Foresight Fund and Science Foundation Ireland. The analyses of the Expert Group on Future Skills Needs have contributed to important initiatives in education and training. Forfás's assessments of infrastructural requirements in areas such as broadband and electricity supply have focussed attention on shortcomings and needs of critical importance to the economy and the enterprise sector.

5.21 Forfás is also charged with co-ordinating the activities of the enterprise agencies that come within its remit. In practical terms, this co-ordinating role is exercised through the presence on the Forfás board of the chief executives of IDA Ireland and Enterprise Ireland and the secretary general of the Department of Enterprise, Trade and Employment. An Inter-Agency Planning Managers Group chaired by Forfás, together with a number of other cross-agency working groups, also work to ensure that agency activities

are effectively co-ordinated. As subsequent sections of the chapter will show, IDA Ireland, Enterprise Ireland, and Shannon Development are all now increasingly engaged in activities such as developing partnerships between third-level institutions and enterprises, fostering niches and networks, and influencing national and regional business infrastructures. Forfás's co-ordination role has assumed greater importance as a result of these developments and is set to become more significant in the future.

Science Foundation Ireland

5.22 Science Foundation Ireland [SFI] has been established to administer the Technology Foresight Fund of €646m. set up to support world-class research in technological niches, initially in ICT and biotechnology, capable of driving long-term economic growth and competitiveness. The aim is to help attract new overseas high-technology firms to Ireland, foster new indigenous high-tech start-ups, and strengthen the capabilities of existing foreign and Irish-owned firms. The Foundation's programmes are guided by a number of core principles. Funding support is based solely on performance and merit. Researchers supported by SFI enjoy the freedom and autonomy essential to scientific activity. The Foundation is committed to the development of strong networks linking Irish researchers to leading scientists and research teams in other countries.

5.23 Grant awards from Science Foundation Ireland are made on the basis of competitive calls for funding. Research funded by SFI is subject to regular international peer review. Under its new funding system announced in early 2002, the following are the main activities and programmes supported by the Foundation:

- Fellow awards of up to €1m per year to support competitive research programmes by Irish and international scientists;
- Investigator Programme Grants of €100-250k per annum to attract and retain talented researchers to work in Ireland;
- Visitor awards to attract eminent researchers to Ireland for one-year periods;
- Research Centre awards to support scientists building collaborative clusters allied to industry, together with possible matching funds for new laboratory or other facilities.

At the end of 2002, the Foundation was funding research projects with a financial commitment of over €155m. over five years. In May 2003, SFI announced awards of €42m. to establish three new research Centres in Science, Engineering and Technology [CSET]. The new Centres will involve partnerships between Irish universities and world-leading research corporations and some of Ireland's most promising ICT and

biotechnology companies. They will link faculty at NUI Galway, the Royal College Surgeons and University College Cork with their counterparts from Hewlett-Packard, Procter and Gamble, and Servier and a number of Irish companies.

5.24 There is every cause for confidence that Science Foundation Ireland can be successful in its primary objective of fostering world-class research. Ensuring that this research base provides a springboard for sustained economic development is a more complex and less certain process. It will require the co-operation of the universities and colleges, development agencies, funding bodies, individual enterprises, and other parties. It is vital therefore that SFI, Forfás, IDA Ireland, Enterprise Ireland, Shannon Development, the higher educational sector and other interests develop the kind of strong, constructive partnerships and relationships needed to reap the maximum dividend from the enhanced research activity now underway.

InterTrade Ireland

5.25 The progress of the Irish economy in recent decades has been achieved in large part by virtue of our closer economic ties with the European Union on the one hand and the United States on the other. Economic and trading links between the two parts of the island of Ireland have, by contrast, undergone relatively less growth and development over this period. Established in 2000, InterTrade Ireland [ITI], one of six cross-border bodies set up under the Belfast agreement, is charged with exchanging information and co-ordinating work on trade, business development, and related matters in areas in which the two administrations agree that it would be in their mutual interest. Though trade between the two parts of the island has increased in recent years, surveys undertaken by ITI show that valuable business opportunities are not being availed of because of lack of market awareness and other barriers.

5.26 InterTrade Ireland supports a number of programmes and networks designed to help businesses North and South to build strategic relationships and exchange market information so as to optimise the potential for all-island trade expansion and business co-operation. ITI's knowledge transfer initiative, Fusion, was set up to improve the transfer of skills and knowledge from universities and colleges to SMEs on an all-island basis. Under the programme, companies are partnered on a one-to-one basis with a knowledge centre — a third-level institution, research centre or other body — with specialist expertise in their area of operation. A recent graduate with relevant expertise is also based in the company to spearhead the project and to act as a link between the company and its designated knowledge centre. Focus, a sales and marketing programme provides SMEs with a support package to enable them to hire a sales and marketing graduate to help develop new cross-border sales. ITI has also established an Equity Network Programme to fund new business start-ups and expansions across the island.

Other areas it has focussed on to date include all-island competences in the ICT sector and North-South trade patterns and supply chains.

National Standards Authority of Ireland

5.27 The National Standards Authority of Ireland [NSAI] is involved in three main activities:

- **Standards Development** — the process of identifying what exactly needs to be done in either a manufacturing or service process in order to ensure that the end product or service meets an agreed standard of performance in respect of quality, design, safety, environmental impact or other attributes. Standards development — whether it involves originating indigenous standards or representing Irish interests in the development of European and international standards — is at the heart of the NSAI's public policy role.

- **Certification** — the process by which a standards body such as NSAI certifies that an activity or process meets the standards laid down for the markets in which such a process takes place or into which products may be sold. NSAI certification is recognised worldwide through a network of mutual recognition agreements with other major certification bodies. A related activity is agrément — certification designed specifically for new building products and processes that do not have a long history of use and for which formal national standards have yet to be developed.

- **Metrology** — the Legal Metrology service is a statutory body within the NSAI. It exercises regulatory and control functions with regard to measurements made for the purpose of trade. Its main functions are, first, maintaining a uniform system and standard of units of measurement and, second, ensuring the accuracy and integrity of measuring equipment used in trade through regular in-service inspection of measuring instruments and other means.

5.28 Standards development at national, European and international level is the core policy function of the Authority. Its role in this and the metrology area are of vital importance, particularly for a highly open economy like Ireland's. The use of accredited standards and quality marks enhances enterprise competitiveness and consumer confidence, while the harmonisation of standards across economies helps to remove barriers to trade. The NSAI receives an annual grant approved by the Oireachtas in respect of these public policy functions; this covered a little over one-fifth of its expenditure in 2000. The Authority's certification role provides its main source of revenue. In 2000, income from certification fees came to approximately €10.2., almost two-thirds of NSAI's expenditure. The Legal Metrology service also imposes charges in accordance with a statutory schedule of fees for its work in checking measuring instruments.

III Foreign-Owned Enterprise and the Role of IDA Ireland

Outlook for FDI and Foreign-Owned Enterprise

5.29 Foreign direct investment has been a key influence on Ireland's economic transformation over the past half-century and its economic regeneration over the past decade. As outlined in chapter 3, foreign-owned firms now account for half of total employment in manufacturing and international services, for three-quarters of manufacturing output, and for nine-tenths of manufacturing and services exports. Ireland now hosts a large number of leading global companies in high-technology sectors such as ICT and pharmaceuticals. While this has contributed to a general upgrading of the FDI base, strategic functions such as research and development remain relatively under-developed among the Irish subsidiaries of overseas firms. Foreign-owned enterprise will continue for the foreseeable future to be pivotal to our prosperity and progress. A small country such as Ireland is unlikely to generate the volume of large-scale, technologically advanced, globally competitive enterprise required to maintain high levels of income and employment. We must sustain and build on the success we have had in attracting in attracting major overseas companies to Ireland and in expanding their Irish operations. The challenge now in particular is to strengthen and deepen new and existing overseas enterprises in Ireland through enhancing skill levels, value-added, and adding strategic corporate functions.

5.30 Success in obtaining and maintaining foreign investment is a function of the global climate for such investment and of our attractiveness as a destination for it. For most of the 1990s, we benefited from both a buoyant global environment for overseas investment and our ability to offer prospective investors an attractive and competitive base for overseas operations. That favourable conjunction began to wane under the impact of the slowdown in the US ICT sector from 2000, and in the US and global economies from 2001. This slowdown coincided with the emergence of increased cost pressures domestically and the intensification of competition for foreign investment, particularly from Central and Eastern Europe and, further afield, China and India.

5.31 The effects of the changed economic and investment climate were felt, first, in a fall in new overseas investments projects to this country. They resulted, second, in retrenchment of varying degrees of severity by overseas firms operating here. Both factors have contributed to the fall in employment in overseas firms since 2000. Table 39 gives details of IDA client companies and job numbers, gains and losses in these companies from 1998 to 2002.

Table 39: Full-Time Employment in IDA Client Companies 1998-2002					
	1998	**1999**	**2000**	**2001**	**2002**
No. of Companies	1,165	1,276	1,262	1,158	1,098
Job Gains	15,959	17,634	22,801	13,226	11,713
Job Losses	7,282	9,269	8,084	17,840	14,754
Job Losses as % of total jobs	6.2	7.4	5.7	13.1	11.1
Net change in employment	8,677	8,365	14,717	–4,614	–3,041
% change in net employment	+8.0	+7.1	+11.7	–3.3	–2.2
Total employment	117,657	126,022	140,739	136,125	133,084
Source: Forfás.					

5.32 After rising steadily during the 1990s, the number of IDA-supported companies declined from 1,276 in 1999 to 1,098 in 2002, a fall of 14 per cent. Job losses of 17,840 in 2001 were more than double the 8,084 recorded in 2000, while job gains totalled 13,226 compared with 22,081 in 2000. Aggregate employment fell by 4,600, over 3 per cent, in 2001, the first such decline in fifteen years and a graphic contrast with the record gain of 14,700 in net employment in 2000. This trend continued in 2002, though the number of job losses and the rate of job loss were somewhat lower than in 2001. Job gains were also lower, however, than in 2001 and net employment fell for the second successive year; the decline in total employment in IDA-backed companies was around two-thirds of that in 2001. Reflecting the impact of the global downturn in the ICT sector, the bulk of job losses have occurred in the electronics and engineering sector, total employment in which fell by almost 10,000, or around 14 per cent, between 2000 and 2002. The sector continues, however, to be a significant source of new employment, with over 8,000 new jobs generated in 2001-2002. Though output in pharmaceuticals and healthcare grew strongly over this period, the rise in employment has been more modest with around 3,000 new jobs recorded in 2001-02. The number of new jobs generated in international and financial services fell from 9,418 in 2000 to 5,527 in 2002, while total employment in the sector declined slightly in 2002. Though conditions remain difficult, IDA Ireland have recently expressed cautious optimism about the outlook for 2003. The number of new projects secured in 2002 was two-thirds up on 2001, fifty-five compared with thirty-three. The final quarter of 2002 saw a rise in the number of new projects secured together with a strengthening of the pipeline of new investments for 2003.

Enhancing the Quality of Foreign-Owned Enterprise

5.33 The shift in Ireland's cost profile, the virtual elimination of the large labour surplus of the 1980s and early 1990s, and the increased competition for FDI from Central

and Eastern Europe and Asia mean that the kind of inward investment projects Ireland is able to attract in the future will differ in significant respects from those secured in earlier decades. This is part of the process by which, as economies develop, they must progressively move into higher-value activities. In response to this shift, enterprise policy now accords a higher priority to the quality of inward investment projects. Taking salary level as a proxy for job quality, 38 per cent of new jobs negotiated in foreign-owned firms in 2000 were in salary ranges above €31,743 (£25,000) per annum compared with 25 per cent in 1999. In 2001, 38 per cent of new job approvals had salaries of over €34,000. A number of strategic new projects have been secured since 2000, notably Wyeth's €1.2bn investment in a biotechnology facility in West Dublin; Genzyme's €150m. investment in a biotechnology plant in Waterford; and the recent decisions of Google and Overture to establish operations centres in Ireland.

5.34 There are currently around 1,100 foreign-owned companies in manufacturing and international services, and these include the great majority of major global corporations in targeted sectors such as ICT, pharmaceuticals, and healthcare. The prevalence of corporate mergers and alliances notwithstanding, the chemicals/pharmaceuticals sector has long been relatively stable, with the majority of major companies having occupied a leading position in the sector for a half-century or more. Many believe that a similar process of maturation may be underway in the ICT sector and that, particularly in the industry's current difficulties, there are likely to be fewer major new players emerging in the period ahead.

5.35 Expansions of existing operations, or the establishment of new operations by overseas firms based here have, for some time, accounted for a sizeable part of the annual increment in investment and employment from FDI. Maintaining the existing base of overseas firms, encouraging companies with operations here to expand and to make new investments, and move into higher value activities are, consequently, key priorities for IDA Ireland. The recommencement of work on Intel's FAB 24 facility and Xilinx's expansion of its semi-conductor design operation at City West in Dublin represent significant recent successes towards this end. As well as a move to higher value goods or services, considerable emphasis is placed on the addition of strategic functions to the Irish operations of foreign-owned companies — research and development, logistics and supply chain management, materials sourcing, marketing, customer service, IT, and treasury management among others. In 2002, 31 companies undertook to invest nearly €120m. in R&D activities in their Irish operations. Given the historically low levels of research and development in foreign-owned enterprise in Ireland, this is an encouraging development. Important gains in the areas of eBusiness and digital media, for example, include Microsoft's decision to base its Internet strategy operations for Europe, the

Middle East and Africa in Ireland, and IBM's decision to locate a global procurement portal and a strategic eBusiness applications centre here.

5.36 More generally, there is no shortage of examples of foreign-owned enterprises which, over time, have enhanced and deepened the quality and strategic value of their operations in Ireland.

- Microsoft Ireland began as a manufacturing operation in 1985, added a European Product Development Centre for product localisation in 1988 which now localises over one hundred different software products into 27 languages, established its European Operations Centre in Ireland in 1993 with responsibility for distribution and revenue transactions for all of the company's European subsidiaries, and has since expanded this Centre's remit to include functions such as logistics, supply chain management, and customer operations. As noted above, the company's Internet Strategy Operations for Europe, the Middle East, and Africa are also based in Ireland.

- Boston Scientific, a leading US healthcare company, established a manufacturing facility in Galway in 1994, and went on to establish three other facilities at Cork, Tullamore, and Letterkenny, and now employs around 3,000 people in Ireland. In 2002, it announced a substantial expansion of the research and development facility in its International Product Development Centre in Galway which will establish it as a key resource within the company globally. Announcing the decision, its Chief Executive Officer noted: 'We originally came to Ireland expecting to find a good manufacturing environment, but over the years we have found much more. One of the highlights of our experience has been finding a wealth of innovative, responsive people, including an impressive number of technologically and scientific competent professionals. These have proved their ability to work at many levels of R&D'.

- PepsiCo Inc., a major world producer of branded beverages and snack foods established a plant in Cork in 1974 to manufacture and supply concentrate to Pepsi's European franchise bottlers. In 2001, Pepsi Cork won corporate approval to undertake a range of shared service and technical activities for the Pepsi group, including data warehousing, eBusiness and treasury functions, and is now a key global site for the company.

- Novell Software Ireland Ltd was established in Dublin in 1994 to manage the company's software outsourcing and localisation for Europe. It has since become the worldwide centre for software outsourcing and localisation operations and has also added a new eBusiness division.

5.37 It is vitally important that other foreign-owned enterprises with operations here follow a similar process of evolution. The methodology used until recently by IDA Ireland to guide this process was known as SIMS — Strategic Initiative for Multi-National Subsidiaries. This ranked the subsidiaries of multi-national companies along eight stages of strategic development ranging from undertaking a basic mandate with little or no autonomy to being the strategic apex, or main corporate centre, for the entire multi-national enterprise. IDA Ireland's objective is to advance as many companies as far up this developmental scale as possible. Operational experience with the SIMS model identified potential improvements, and an enhanced version called the Strategic Competitiveness Programme has now replaced it.

Contributing to Sectoral Development

5.38 Ireland is a small country which came late to industrialisation. It is a significant distance from, and has no direct land access to, its main markets. These and other factors inevitably exert an influence and constraint on the kind of activities in which enterprise in Ireland can realistically hope to prosper. This is not a matter either of picking winners or of decreeing that certain activities cannot succeed, but rather of seeking a flexible and pragmatic fit between the capabilities that exist or can realistically be developed in an economy and the types of activity and enterprise to which they are best suited. It is based also on a recognition that the concentration of companies in particular sectors or niches within a given geographical area can improve the efficiency and sophistication of existing businesses and stimulate the growth of new enterprises.

5.39 The strategic decisions taken from the 1970s to place particular emphasis on attracting inward investment in electronics, pharmaceuticals and healthcare, and financial and international services have paid undoubted dividends. This strategy has been progressively refined over time to take account of developments such as emergence of eBusiness and the increased importance of biotechnology. As noted in chapter 3, Ireland has become a significant global force in a number of niches within the sectors targeted by enterprise policy. Despite the ongoing difficulties in the global information technology industry, the strategic focus on ICT, pharmaceuticals and healthcare, and international and financial services remains the correct policy for this country and will be maintained. ICT will remain pivotal to enterprise development and economic growth in the decades ahead. In the view of informed commentators, biotechnology is set to be a key science and technology in the early decades of the twenty-first century. This strategic focus on ICT, biotechnology, and international services will not preclude Ireland from competing strongly for quality investment projects in other sectors. The only types of project that will be eschewed as a point of policy are those in sectors or activities that do not have a longer-term competitive future in Ireland.

5.40 The pace of technological and market change in advanced economies is such that opportunities in newly-emerging fields and niches have to be kept under continual scrutiny. IDA Ireland has set up a new division to identify and develop new potential growth areas for inward investment at the higher value end of the enterprise spectrum. One of the agency's key long-term objectives is to help create a number of niches in which Ireland will have a world-ranking position. The aim is that, in these niches, major global companies would see Ireland as an essential place in which to have strategic operations. These Irish operations, moreover, would be the first link in the creation of new value chains within the company rather than, as is largely the case at present, being a subsidiary part of a broader corporate value chain. As a first step towards this goal, IDA Ireland has formulated proposals for the development of Strategic Business Areas [SBAs]. These comprise innovation-based niches or clusters in which this country has already developed strengths and whose further development requires the involvement of foreign and indigenous companies, universities and other third-level institutions, research bodies, venture capital funds, regional bodies, local authorities, and others. Initial targets for the development of Strategic Business Areas are selected areas of software, biotechnology and digital media.

Balanced Regional Development

5.41 As the analysis in chapter 4 showed, there are sizeable variations in income and output levels between different regions in Ireland. Regions in which per capita income and value-added are below the national average are also those in which enterprises in sectors such as ICT, pharmaceuticals, and international services are under-represented. An analysis of the regional spread of enterprise and employment in foreign-owned companies undertaken by IDA Ireland at the end of the 1990s found that a number of regions, particularly the North East, Midlands, and South East, had a lower proportion of jobs in IDA-supported firms, and a higher level of unemployment, than the national average. These imbalances had grown over the course of the 1990s; in the period from 1991 to 1999, employment in IDA-supported companies in the Border, Midlands and West grew by 33 per cent compared with 184 per cent in Dublin and 77 per cent in other areas of the country.

5.42 In response to the clear need for greater regional balance in enterprise development, IDA Ireland drew up enterprise development plans for the different regions of the country. These started from an analysis of factors such as the presence of higher education institutions, the level and adequacy of infrastructural provision, the skills base, and the composition and competitiveness of the existing enterprise base. The development plans then sought to identify the sectors that best matched the capabilities of different regions, the towns on which future enterprise development should be centred, and the infrastructural and other constraints on development that needed to be addressed.

In order to drive the commitment to regional development, a target was set that 50 per cent of all new jobs approved in greenfield projects by overseas firms in the period to end-2003 should be sited in the Border, Midlands and Western [BMW] region. This compared with a prior out-turn of around 25 per cent. Actions taken in furtherance of this target included ensuring that a high proportion of site visits by prospective investors occurred in the BMW region. 45 per cent of all jobs negotiated in greenfield projects in 2000, and 42 per cent in 2001, were secured for the BMW region. In 2002, employment in IDA-supported companies rose in some regions such as the North West and South East, but declined more sharply than the national average in the West and Mid-West. The agency has expressed a concern that inward investors are again focusing on city areas as their preferred locations and that this may make it difficult to sustain progress on the target for 50 per cent of greenfield jobs in the BMW region. In IDA Ireland's view, this underlines the importance of the focused implementation of the National Spatial Strategy.

5.43 In keeping with the approach of the National Spatial Strategy, IDA Ireland and the other enterprise agencies are committed to the development of strong magnets of attraction in key centres in all regions of the country. Much of the work needed to develop regional strengths and capabilities lies outside the direct scope of the enterprise agencies. IDA Ireland is actively working with local authorities, third-level institutions, and other parties to identify and support the delivery of the required interventions and improvements. As well as co-operating with other bodies to improve regional business environments, the agency has upgraded its own portfolio of sites in the regions. A range of properties in key gateway and hub locations are being developed to international standards as Regional Flagship Business and Technology Parks suited to both office and factory use, while industrial estates in other locations have been upgraded to Regional Business Parks. IDA Ireland has also devolved a range of functions and a sizeable number of staff to its offices in Waterford and the gateway towns of Sligo and Athlone.

IV Indigenous Enterprise and the Role of Enterprise Ireland and Shannon Development

Importance of Indigenous Enterprise

5.44 Indigenous enterprise remains vital for economic development for a range of reasons:

- It is the main channel through which the entrepreneurial drive and talent of Irish people can be harnessed and developed.
- Irish-owned enterprises are generally more embedded in the Irish economy and, in the majority of sectors, source proportionately more materials and services from

domestic suppliers than their overseas counterparts. They thus play a crucial role in creating and sustaining income and employment, as well as in helping to maintain a balanced enterprise base.

- Indigenous enterprise is more geographically dispersed and regionally balanced than foreign-owned enterprise and is essential to the achievement of more balanced local and regional development.

Indigenous Enterprise in the 1990s

5.45 The latter half of the 1990s was a positive time for Irish-owned enterprise. Output and employment showed steady growth, while profitability also rose. A sizeable number of new indigenous businesses emerged in high technology sectors such as software, some of which grew to become significant players in European and global niche markets. The emergence of these firms was in many ways the most encouraging development of the past decade. For the first time in our economic history, we had a core of high-value, knowledge-based enterprises with the ability to compete internationally and the potential for sustained development. Despite the progress made in this period, however, significant weaknesses remained evident in the structure and capabilities of indigenous enterprise. As outlined in chapter 3, these include:

- ***Scale:*** over 90 per cent of Irish-owned firms in manufacturing and international services employ fewer than 50 people.
- ***Productivity:*** much of indigenous enterprise is dominated by small and medium-sized firms with levels of productivity that are generally lower than in competing economies.
- ***Technology:*** there is a comparatively low level of technological capability and investment in a substantial part of Irish-owned enterprise.
- ***Exports:*** a majority of indigenous SMEs do not export, while many engaged in exporting continue to focus heavily on the British market.

5.46 The deterioration in market conditions since 2000 has had a significant impact on the indigenous enterprise sector. A total of 488 Irish-owned manufacturing and international services establishments supported by the enterprise agencies ceased operations in 2002. Job losses rose from 11,277 in 2000 to 14,335 in 2001 and 17,244 in 2002, while job gains fell from 20,111 in 2000 to 15,913 in 2001 and 13,605 in 2002. The net loss of 3,639 jobs in Irish-owned client companies of the enterprise agencies in 2002 represented the first decline in aggregate employment levels since 1993. Amidst the difficulties of the past two years, however, there have been some encouraging developments. Both 2001 and 2002 saw a significant number of start-ups and expansions among Irish-owned firms in manufacturing and international services.

Strategy for Indigenous Enterprise

5.47 In considering strategy for indigenous enterprise, it is important to keep in view a key difference between Irish and foreign-owned enterprise. The overseas enterprises supported by IDA Ireland have all reached the level of development needed in order to establish an overseas operation. Some are among the world's strongest and most advanced enterprises. The Irish-owned firms supported by Enterprise Ireland and Shannon Development, by contrast, cover a broader span in terms of scale, sophistication, capabilities, and potential. Only a relatively small proportion have shown the capacity to internationalise their operations demonstrated by IDA-backed companies. Strategy for indigenous enterprise puts a high priority consequently on developing the competences and capabilities required to enable Irish-owned firms to compete successfully on world markets and to increase output, value, exports and employment. This entails a range of approaches and actions on a number of levels: new and existing businesses; sectors and niches; and the enterprise environment and infrastructure regionally and nationally.

Fostering High-Potential Start-Up Businesses

5.48 Policy for indigenous enterprise attaches considerable importance to the development of high-potential start-up businesses, and the growth of new Irish-owned enterprises in high technology sectors such as software was a notable feature of the past decade. A survey of Irish-owned software companies conducted in 2001, for example, found that 70 per cent had been set up since 1996. The identification of high potential start-up businesses involves extensive agency contacts with, and promotional activity directed at, target groups such as managers in indigenous and foreign-owned firms, Irish executives working overseas, and academics with research that can be commercialised. Agency engagement with such start-up businesses occurs in two main stages:

- At the pre-start up stage through project evaluation, assistance in the preparation of a business plan, and introductions to potential business partners such as investors, personnel in third-level institutions, and financial and legal advisers.

- At the start-up and early growth phase through financial assistance and access to other supports such as technology development specialists and the overseas office network.

A total of 150 new high-potential start-ups were assisted by Enterprise Ireland over the course of its *Business Plan 1998-2001* compared with a plan target of 60 such businesses. In 2002, the agency supported the establishment of 51 new businesses with high growth potential.

5.49 A number of dedicated programmes have been set up to provide support for academic personnel who wish to commercialise their research. These include a Research

Innovation Fund to back research ideas with commercial potential and a Campus Companies Programme to support the establishment of new campus-based enterprises and the expansion of existing ones. Special business training courses are also provided for academic entrepreneurs. A Business Incubation Centre programme provides funds to develop and expand incubation facilities on college campuses. To date, twelve Centres have been approved for development, with funding of €27m. Around twenty significant transfers of technology from third-level institutions into business enterprises are anticipated by Enterprise Ireland in 2003, including the establishment of a number of new campus companies.

5.50 Because of the difficulties experienced by start-up companies in accessing finance, their funding needs require specific attention. Enterprise Ireland operates a dedicated funding package for high-potential start-ups that involves it taking a modest level of equity participation in new growth and export-oriented enterprises in return for financial support at the high-risk early stages of company development. Where grant aid of over €127,000 is provided to such a company, an equity stake of up to ten per cent is taken. In the buoyant financial climate of the late 1990s, this policy delivered impressive gains. The return from Enterprise Ireland's equity portfolio rose from €4.44m. in 1996 to €14.6m. in 1998 to €34.3m. in 1999 to €101.6m. in 2000 as the agency sold off holdings in a number of fast-growing high-technology firms. The market outlook for high-tech firms is now very different, and returns on this scale are unlikely to be seen again. In 2002, in a difficult equity market, Enterprise Ireland realised €12m.from its equity portfolio. Policy remains committed to the sharing of risk and reward with new high-potential, export-oriented enterprise.

5.51 Historically, Irish enterprise has suffered from the lack of a developed venture capital base, and this has hindered the emergence of high potential, high-risk, start-up businesses. Under the Operational Programme for Industrial Development 1994-1999, Enterprise Ireland participated with private interests in the establishment of a number of venture capital funds designed to provide early stage companies and growth-oriented SMEs with equity capital. Over the period from 1996 to 2000, there were some 214 investments in 101 companies totalling €84.7. Though the funds were successful in their aims, they were availed of mainly by businesses in the Greater Dublin area.

5.52 A new Seed and Venture Capital Fund Scheme was approved in mid-2001 as one of the measures to assist indigenous industry under the Productive Sector Operational Programme of the National Development Plan 2000-06. This Scheme was targeted at SMEs at early stages of development, smaller investment amounts, sectors which had experienced difficulty raising finance in the past, and investments with a strong regional emphasis. Fifteen funds have now been established under the National Development

Plan which have made €416m. available for investment, to which Enterprise Ireland has committed €99m. Investments by the funds to December 2002 totalled €40.4m., of which EI contributed €8.2m. The funds are aimed at start-up and early stage businesses, with over half of the available monies having a regional or sectoral focus. Those launched to date include:

- The Seroba BioVentures Fund, a €15m. life sciences fund of which €7.5m is to be provided by Enterprise Ireland.
- The Enterprise Equity Venture Capital Fund, a Galway-based fund of €7m., half of which is to be supplied by EI, and which is intended to support existing companies and early-stage start-ups in the West and Border counties.
- The Bank of Ireland Kernel Capital Partners Private Equity Fund, a Cork-based fund of €19m., of which €6.35m is to come from Enterprise Ireland, that will seek to provide investments in the range of €0.3 to €1.5m to early stage companies.
- The Growcorp European Bioscience Fund, a €25m. fund in which EI has invested along with Irelandia Investments and PriceWaterhouseCoopers and which is aimed at investments in the bioscience sector in Ireland, the rest of Europe, and at US scientists and entrepreneurs seeking to start a business in Ireland.

Strengthening Existing Indigenous Enterprises

5.53 The engagement of the enterprise agencies with established Irish-owned companies focuses on those with growth plans and potential. In its work with these companies, Enterprise Ireland and Shannon Development operate on the basis of a well-defined Business Development Model [BDM]. The Model provides an integrated approach for the assessment of the needs, development potential, and barriers to growth of client companies. Each company is allocated a Development Advisor who, in conjunction with management, works to draw up a development plan aimed at generating increases in sales, exports, and employment together, where appropriate, with an investment support package. The enterprise development plans focus on six key business functions which the Business Development Model sees as critical to enterprise competitiveness and growth:

- business planning;
- human resources;
- production and operations;
- research and development;
- marketing;
- finance.

5.54 Technology and its application are vital to enterprise competitiveness and development in all sectors of indigenous enterprise, and technology development needs

to be an integral part of enterprise support. At company level, the development of research and development capabilities is assisted through R&D grant aid and the competitive Research, Technology and Innovation [RTI] scheme. Enterprise Ireland has introduced a post of technology development advisor whose job is to work with companies to assist them to identify key technology-related needs and to find and source solutions to them.

5.55 Under Enterprise Ireland's *Business Plan 1998-2001,* the agency's primary goals were to increase sales, exports and employment. In its *Business Plan 2001-2004,* exports have replaced sales as the key measure of output, while productivity features for the first time among the agency's core aims. With the competitiveness of Irish-owned firms affected by rising domestic costs and under additional threat from currency movements, it is difficult to overstate the importance of increasing productivity for both the short-term health and the long-term development of the indigenous enterprise sector. Improving the export performance of indigenous enterprise is the most effective way of overcoming the scale limitations of the home market, as well as of improving enterprise performance through competition with efficient rivals in demanding markets. Increasing exports and productivity are thus intertwined objectives vital to the future development of Irish-owned enterprise.

Plan 1998-2001	**Plan 2001-04**
Sales	Exports
Exports	Productivity
Employment	Employment

5.56 For a substantial part of the indigenous enterprise sector, low productivity remains the single greatest barrier to long-term growth. The main mechanisms used by the enterprise agencies to assist companies to improve efficiency and productivity involve benchmarking and world class manufacturing. Benchmarking is a systematic process for evaluating company performance in respect of productivity and other measures such as quality and innovation by means of detailed comparison with the best-performing companies in the sector concerned. World class manufacturing is used to enable companies to improve productivity through the use of recognised process mechanisms and teamwork. A new competitive scheme has been launched by Enterprise Ireland to provide financial assistance to companies for measures to improve productivity. The scheme will be allocated a fixed amount of money, and decisions about the allocation of support to applicant companies will be determined competitively on the basis of their need and

potential to raise productivity. Support under the scheme will be conditional on companies setting agreed targets for raising productivity. The following funding limits are proposed for the scheme.

Table 40: Funding Limits under Enterprise Ireland Competitiveness Scheme

Region	Amount
Dublin and Mid-East	25% of eligible project costs to a maximum of €125k
Remainder of South & East	35% of eligible project costs to a maximum of €150k
Border, Midland, & West	45% of eligible project costs to a maximum of €200k

5.57 Though exports by companies supported by the enterprise agencies have increased in recent years, much of this growth has been in the British and US markets. Despite the major opportunities offered by the European Single Market, only 34 per cent of exports by indigenous companies in 2000 went to European Union countries other than the United Kingdom, compared with 40 per cent to the United Kingdom. In response to the need to exploit the potential of the European market and to create a more balanced export portfolio, Enterprise Ireland has undertaken an initiative, Eur-Opp 2003, to assist companies to enter, or expand activity in, Eurozone markets. The target for the initiative is to double the number of companies selling in excess of €6.35 (£5m) annually to these markets over a three-year period. In addition to its established marketing supports, the agency is opening incubator offices in seven European cities which will be available on short-term lease to companies wishing to build up a presence in these markets. These will complement its US incubator facilities in New York, Boston, and Silicon Valley.

5.58 Irish companies can also develop a presence in foreign markets through overseas acquisitions, developing strategic relationships with enterprises in other countries, and outsourcing. As outlined in chapter 3, overseas direct investment by Irish firms grew rapidly over the past decade. The evidence to date suggests that this trend has helped create new high-skilled jobs at head offices in Ireland and, over time, has the potential to generate additional benefits through the replacement of exports of finished goods by exports of high value-added intermediate goods. In the case of goods whose production can no longer be no carried out competitively in this country, outsourcing to lower-cost countries may be the only way of preserving the market position — and possibly ensuring the survival — of Irish firms. Among client companies of Enterprise Ireland, almost one-sixth have outsourced some operations in the past three years, while a further one-fifth are considering outsourcing in the future.

Framework for Support of Indigenous Enterprise

5.59 The Department of Enterprise, Trade and Employment and Enterprise Ireland have recently undertaken a review of the agency's programmes and grant support for individual enterprises. Following the review, revised guidelines governing the package of financial support payable to individual companies were drawn up, the main features of which are as follows.

- Future funding for expansions will, with limited exceptions, be directed at projects intended to increase exports or sub-supply to multi-national companies that export.
- The funding package will be linked to the projected level of export growth. Subject to compliance with EU state aid rules, more favourable terms may apply where companies are diversifying into new markets.
- The highest levels of eligibility for funding will apply to firms in the Border, Midlands and Western region, intermediate levels to firms in the rest of the South and East, and the lowest levels to firms in Dublin and the Mid-East.
- All funding will be in the form of preference shares and, subject to specified exemptions for research and development and human resource development, will be fully repayable. Where an agreed level of R&D and training is undertaken and validated, the level of repayment will be reduced by the expenditure on R&D and training up to specified thresholds. These thresholds will be highest in the BMW region and lowest in Dublin and the Mid-East.

As is apparent, the revised guidelines provide for more favourable treatment of projects that fit with the strategic goals of increasing exports, raising skill and value levels, and promoting more balanced regional development. In keeping with European Union state aid guidelines, they make more favourable provision for spending on R&D and training because of the policy priority attached to these goods and their public good character. The revised guidelines also provide for an overall increase in the level of repayability of financial aid to firms based on the principle of sharing risk and reward between state and enterprise.

Sectoral Development

5.60 The policy commitment to growth-oriented indigenous enterprise involves a focus on sectors, as well as companies, with growth potential. In the light of the rapid expansion of the indigenous software industry over the past decade, Enterprise Ireland adopted a strategy in 2000 for the development of indigenous international services companies. This identified four sectors that offered significant opportunities for Ireland — Informatics (including ICT and software), Digital Media, eBusiness, and Health

Sciences — and set targets for increases in their sales, exports, and employment in the period to 2007. In February 2002, the agency launched a strategy aimed at developing a strong core of entrepreneur-led biotechnology and life sciences enterprises. Its objective is to increase the number of indigenous biotechnology companies from twenty-one to sixty and to increase employment from 400 to 1,800 over a four-year period. Optoelectronics has been identified as a further sector in which this country has well-established strengths and resources, and which offers good growth prospects for the future. Enterprise Ireland also sees potential in the stimulation of a photonics cluster and plans to bring forward proposals to advance this process, including the formation of an industry association and of networks linking researchers and companies. The Digital Hub in Dublin is intended to support the development of the digital media industry in Ireland by generating strong clusters of companies and support services.

5.61 Efforts to build up strong niches in high-tech sectors require close links and co-operation between the enterprise and higher education sectors. A key policy intervention to encourage technology transfer and strengthen relations between the enterprise sector and the research community involves the Programmes in Advanced Technology [PATs]. The Programmes were first established in the late 1980s to meet the need for a strategic expertise base in a number of key technologies. They have recently been restructured in order to strengthen their performance and effectiveness. There are now six PATs engaged in areas of research relevant to indigenous enterprise: AMT Ireland; BioResearch Ireland; Materials Ireland; Optronics Ireland; Power Electronics Ireland Technologies; and the Informatics Research Initiatives. The Programmes are based in a large number of centres throughout third-level institutions and work to help businesses access new technology, improve the quality and competitiveness of products and processes, and move into new higher value activities. The Programme have also generated a significant amount of new business activity in the form both of joint ventures with industry and of spin-off campus companies.

Regional Development

5.62 Enterprise Ireland's Regional Development Strategy adopted in February 2001 sets four main objectives:

- Developing the competitiveness and export potential of existing regional businesses;
- Enhancing regional operating environments for business;
- Supporting an increased level of new high potential start-up enterprise in the regions;
- Facilitating the expansion of companies from Dublin and the Eastern region to regional locations.

The targets set by the Strategy for increases in the number of start-ups, new exporters, and investment projects outside Dublin in the period to 2004 are outlined at table 41 below.

Table 41: Targets of EI Regional Strategy 2001-04

The establishment of 50 new high potential start-up companies outside Dublin;
The expansion of 30 Dublin-based companies into the regions;
Assisting 150 companies from outside Dublin to become first-time exporters;
Making 360 major investment commitments outside the Dublin area;
Committing 30 per cent of EI's financial supports to projects in the BMW region, an area which accounts for 20 per cent of the total output of EI's clients.

5.63 The enterprise agencies are actively engaged in an enabling role at regional level with local authorities, higher educational bodies, and others aimed at strengthening regional environments for enterprise. This involves fostering stronger links between new and established industry in the regions and the universities and institutes of technology, adopting a pro-active approach to infrastructural development particularly in the area of telecommunications, and sourcing incubator space for new technology start-ups. In addition to the Business Incubation Centres being developed in universities and institutes of technology throughout the country, Enterprise Ireland has launched an initiative called *Webworks* aimed at stimulating start-ups in the regions in strategic sectors such as software and bioinformatics and at encouraging the formation of locally-rooted clusters in these fields. The Webworks comprise high-quality, regionally-based office facilities for technology-based companies which will be located close to third-level institutions and have broadband access or, pending its provision, ISDN. They will also have appropriate management and support structures and flexible leasing arrangements. It is envisaged that these facilities will provide accommodation for 20-30 large units and 10-15 smaller units, with scope for subsequent expansion. Phase one of the Webworks initiative involving the development of facilities in Cork, Galway, Waterford, and Sligo is at an advanced stage, with construction tenders set to issue before the end of 2003. Subject to a review of its first phase, phase two of the initiative would see the establishment of facilities in Athlone, Carlow, Dundalk, Letterkenny, and Tralee. Though these initiatives are still in their early stages, there are some encouraging signs. Fledgling IT clusters have emerged for the first time in the regions, particularly the South West and North West.

Shannon Development

5.64 Shannon Development was established in 1959 with a mandate to build on the presence of Shannon Airport in order to develop industry and tourism in the region.

The airport's duty-free status was extended to embrace manufacturing industry in an adjoining designated zone, the Shannon Free Zone [SFZ], thereby creating the world's first duty-free industrial zone. The special tax status of this industrial zone is set to expire in 2003 with the introduction of a general 12.5 per cent rate of corporation tax. In the decades since its establishment, the scope and geographical spread of Shannon Development's operations has grown steadily. At end-2000, there were around 22,000 people employed in enterprises supported by the agency; roughly one-third of these were employed in the SFZ, with the remaining two-thirds based in the wider Shannon region. In common with other agencies, 2001 and 2002 saw increased job losses and reduced job gains in companies backed by Shannon Development. Total employment declined from a peak of 21,972 in 2000 to 20,226 in 2002, a fall of around 8 per cent.

5.65 On the enterprise development side of its remit, the agency now has responsibility for foreign and indigenous manufacturing and internationally traded services in the Shannon Free Zone. Outside the Shannon Free Zone, it has responsibility for indigenous manufacturing and international services enterprises in the wider Shannon region comprising Clare, Limerick, North Tipperary, South Offaly, and North Kerry. Shannon Development also carries out a range of functions as part of its tourism and regional development brief, including the management of tourism development and visitor services for the Shannon Region and of a number of commercial tourism businesses and visitor attractions. The scope of this remit marks Shannon Development out from other enterprise development agencies.

5.66 An independent study of economic, enterprise, and tourism development in the Shannon region from 1989-1998 found that the enterprise sector had performed well during this period, particularly in comparison with other regions outside Dublin and the Mid-East region. Indigenous enterprise in particular had recorded strong growth compared with other parts of the country. Employment in Irish-owned firms had increased by almost twice the average rate outside the Dublin and the Mid-East, while the rate of sustained indigenous start-ups was twice that in other regions. The report concluded that, on the enterprise development side of its brief, Shannon Development had demonstrated its effectiveness and made a perceptible difference to the strength of the enterprise sector in the region.

5.67 The evolution of Shannon Development's strategy and programmes has followed a broadly similar course to that of Enterprise Ireland. The agency operates the Business Development Model used by EI and thus takes an identical approach to indigenous enterprise development. In recent years, Shannon Development has taken a number of important initiatives to strengthen the knowledge and skills base in the region and to improve business infrastructure. These initiatives include:

- The Shannon Development Knowledge Network which seeks to bring business, education and innovation together in a number of locations in the region — the National Technology Park Limerick; Kerry Technology Park; Tipperary Technology Park; and the Information Age Park Ennis. Each of these centres contains an Innovations Works incubator facility designed to support emerging knowledge-based enterprise.
- A partnership with local authorities in the region to improve broadband costs and access.
- An eBusiness cluster pilot programme aimed at assisting SMEs to develop eBusiness capabilities.
- A venture creation system comprising entrepreneurship programmes, business supports and business mentoring.

V Micro-Enterprise and the City and County Enterprise Boards

5.68 As noted in chapter 3, there are probably in the region of a quarter of a million businesses in Ireland at present, the great majority of which are not among the client base of the mainstream enterprise agencies. This gap in enterprise support structures was one of the main reasons for the establishment of the City and County Enterprise Boards [CEBs] in 1993. The aim of the CEBs is to stimulate micro-enterprise and economic activity at local level through the provision of financial aid and a range of non-financial supports — principally information, advice, and management training and development. Because of concerns about displacement and deadweight, restrictions were placed on the type of projects for which the Boards could provide financial support. Projects ineligible for financial assistance include retail outlets, mainstream professional services, and the construction of housing, hotels and guesthouses. In addition to general guidelines and criteria such as these, the individual Boards are guided in their work by Enterprise Plans drawn up in consultation with local interests.

5.69 Typically, the Boards of the CEBs have around fourteen members, including members of local authorities and representatives of state agencies, the social partners, and farming and community groups. Applications for financial assistance are assessed by an Evaluation Sub-Committee which generally has a strong business orientation and consists of representatives of local businesses, financial institutions, and the state enterprise agencies. In the initial years of the Boards, the main emphasis was on job creation and the principal type of support offered was grant aid. Over the course of the Operational Programme for Local Urban and Rural Development 1994-99, the Boards provided grant aid of €96.25m. (£75.8m.) to over 9,000 micro-enterprises in respect of 17,400 jobs. As in the case of the other enterprise development agencies, however, the

marked improvement in the economic and employment situation in the latter part of the 1990s led to a reconsideration of the Boards' activities and approaches. Evaluations of the Boards for the purposes of the Operational Programme for Local Urban and Rural Development 1994-99, while positive about many aspects of their work, also raised questions about the provision of grant aid, in particular the significant level of deadweight found to be associated with it. They also found a degree of overlap and duplication between the CEBs, the Leader Groups, and the Area Partnerships and suggested that this had led in some cases to competition among the agencies and 'grant shopping' by their clients.

5.70 The micro-enterprise sub-measure of the Local Enterprise Development Operational Programmes 2000-06 proposed a shift in the Boards' expenditure from, first, financial to non-financial ('soft') supports aimed at strengthening management capabilities in micro-enterprises and, second, from grant aid to repayable forms of financial assistance.

- In the period to 2006, the sub-measure will ensure that CEB expenditure on 'soft' supports in the South and East region will be similar to that devoted to financial supports, while in the Border, Midland and Western region it should comprise 75 per cent of it. In 1995, by contrast, CEB expenditure on grants was almost ten times that on non-financial supports.
- In the South and East region, not less than 35 per cent of financial assistance to micro-enterprise in the period to 2006 should be repayable, whether in the form of equity or refundable grants. In the Border, Midland, and Western region, the repayable element should total 25 per cent over the period. Whereas in 1999, just over 2 per cent of the monies approved by the Board for micro-enterprise projects were repayable, the corresponding figure in 2000 was over 17 per cent.

5.71 The increased emphasis on non-financial supports has broadened the scope of the CEBs' activities and led to a number of innovative new developments. The Empower initiative provides eCommerce support, training, and awareness to micro-enterprises, while the companion web site offers enterprises ready access to a sophisticated platform for eCommerce, including business-to-business and business-to-consumer sales. An eLearning initiative pioneered by the Boards delivers online, interactive training modules targeted at the skills and development needs of micro-enterprises. This forms a valuable supplement to the extensive range of training courses provided by the CEBs. In 2001, these included courses on subjects such as health and safety in the workplace, manual and computerised bookkeeping and accounts, basic taxation for the self-employed, sales and customer care, management development, and the euro changeover. The CEBs are

also active in a variety of programmes in schools designed to encourage and stimulate the longer-term development of an enterprise culture.

5.72 It is important to recognise that the work of the City and County Enterprise Boards is broader than simply providing financial and other supports to small-scale entrepreneurs. Under both Regional Operational Programmes, the Boards' activity is viewed as an influential factor in encouraging rural development. Whether through their work in running enterprise programmes in schools, promoting the use and benefits of information technology in micro-enterprises, or managing specific programmes to encourage more women to involve themselves in enterprise, the Boards have a distinctive role to play in building the sustainability of local communities and countering the effects of disadvantage.

The City and County Enterprise Boards in the Future

5.73 In the period since their formation, the City and County Enterprise Boards have filled an undoubted gap in the enterprise support framework. While the bulk of exchequer funding for enterprise development is rightly allocated to businesses with a strong growth and export orientation, the great body of small and very small enterprises throughout the country are an indispensable part of the enterprise sector and merit appropriate support. In the past, Ireland was not a society or economy noted for a spirit of enterprise. That now seems to have changed. The progress made by indigenous enterprises in manufacturing and international services during the 1990s was noted earlier. Most of the large gain in employment recorded over this period came from micro, small and medium-sized Irish-owned businesses in the services sector. As noted in chapter 4, the evidence suggests that, compared with the majority of other European Union member states, there has been a high level of new enterprise formation in Ireland in recent years. The record in fostering female entrepreneurs, however, is less noteworthy. The National Development Plan 2000-2006 indicated that this imbalance called for specific positive action initiatives designed to encourage women entrepreneurs. The City and Country Enterprise Boards now operate programmes designed to encourage women to form new enterprises and to support those already engaged in running business enterprises.

5.74 The micro-enterprises that form the CEBs' client base continue to suffer from the resource and management weaknesses and limitations that have traditionally affected small and very small enterprises. These difficulties have been aggravated by the emergence of less favourable economic and market conditions since 2000. The Boards have a vital role to play in catering for this segment of the enterprise sector. This applies particularly to the provision of advice, information, and skills and management development. While carefully targeted financial support will continue to be a function of the CEBs,

its provision must inevitably be constrained both by other demands on scarce resources and by the need to minimise the inefficient use of such resources through deadweight and displacement.

5.75 With their dual focus on enterprise and local development, the CEBs have a particularly important part to play in helping to bring about more balanced regional development. While, as we have seen, systematic efforts are underway to achieve a better distribution of very large, large, and medium-sized enterprise throughout the regions, the infrastructural and other needs of such projects mean that they will tend to cluster around the existing large urban areas or the proposed new gateway towns and their associated development hubs. Small and micro-enterprise will remain critically important consequently for small towns, villages, and rural areas in all parts of the country. Enterprises of all sizes and types have a key role to play in ensuring that less developed areas can offer the spread of business, consumer and personal services needed to sustain vibrant local economies and communities. In time, a minority of these businesses will grow if the enterprise environment is supportive, and this may in turn stimulate the formation of other enterprises. A number of high-potential start-up businesses now supported by Enterprise Ireland first received backing from County Enterprise Boards.

5.76 The Boards will continue to encourage and support the establishment of new micro-enterprises, and the expansion of existing ones, particularly in the less-developed areas within their boundaries. This involves the provision of information, advice, training, and in appropriate cases financial support, in order to help these businesses sustain themselves. As with its eLearning and eCommerce initiatives, the Boards will actively seek out innovative ways of providing targeted support to their client base. They will also give priority to identifying micro-enterprises that have the capability and potential for substantial and sustained growth. The CEBs will assist these businesses to identify and develop suitable market and product opportunities, and will help them develop the relations with larger companies, higher educational institutions, venture capital providers and others needed to provide a platform for expansion. They will liaise with Enterprise Ireland to ensure that, when such businesses reach the stage of development at which they are more appropriately dealt with by EI, the transition is smooth and straightforward for the enterprise. The Boards will also continue to place an emphasis on their work in schools and communities to encourage and promote a spirit of enterprise. While the fruits of this work may not be apparent in the short term, it is an important part of the broader developmental mandate of the Boards.

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