2005

Annual Competitiveness Report 2005

Forfás

National Competitiveness Council

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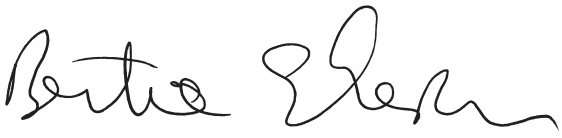
Foreword by An Taoiseach

The continued strong performance of the Irish economy over the past year has been outstanding. Sustained economic growth has brought many benefits to our society, including improvements in real living standards, the continued availability of good quality jobs, and sustained improvements in real take home pay. Ireland's international competitiveness has played a crucial role in building this success. Therefore, in order to build on the success and to ensure that living standards continue to rise, it is vital that we maintain and develop the competitiveness of the economy. Competitiveness will be enhanced by well-designed social policies and services, making Ireland an attractive place to live in and supporting higher participation in employment. Economic and social progress are inherently interlinked, and associated policies should complement and reinforce each other.

At present Ireland faces challenges to our competitiveness on several fronts. Increased competition both in Europe and globally makes it difficult to compete on the same basis as in the past. We need to protect our current strengths and develop new bases for competitive advantage. Ireland is no longer a low cost economy. In order to maintain and enhance competitiveness in the context of a higher cost economy, a greater focus on productivity across all sectors of the economy is essential. Important policy issues in the medium term include developing our innovation potential, the human capital of our country and our economic and technological infrastructure. The Government is currently investing almost 5% of GNP in public capital projects, twice the EU rate.

Competitiveness is a key focus of Government policy. The Government is determined that the conditions for enterprises operating in Ireland should be as favourable as possible. This encompasses policies on the skills needs of the population, the knowledge capital in the economy, the physical infrastructure, the costs that businesses face, the utilities and other services that businesses need, the regulatory environment and other factors. Many aspects of these issues are benchmarked in this report.

The National Competitiveness Council provides a valuable input to the formation of Government policies through its work on competitiveness benchmarking. I would like on my behalf and that of my colleagues in Government to thank the Council for its important work and I am pleased to introduce the Annual Competitiveness Report 2005.



Bertie Ahern
An Taoiseach

August 2005

Chairman's Preface

This is the eighth Annual Competitiveness Report (ACR), published by the National Competitiveness Council. The 2005 report analyses Ireland's competitiveness, relative to our main trading partners and competitors, using a wide range of indicators, published by a number of international sources. The Competitiveness Challenge 2005, which will be published later in the year, will draw on the ACR's analysis, highlighting the main challenges facing the business sector in Ireland and policy responses required to meet them.

The Irish economy continued to perform very well in 2004. The number of people in employment in Ireland grew strongly, living standards increased, consumer inflation stabilised, and government finances remained healthy. The level of employment in Ireland is now at a record level of almost 1.9 million people. GDP is expected to grow by a 5.3 per cent in 2005 compared with an OECD average of 2.6 per cent

The rate of economic growth is an important signal of competitiveness. Using this criterion, Ireland is one of the most competitive economies in the developed world. Our economic performance has been strong, but not surprisingly, we also face challenges.

Recent estimates from the CSO indicate that the rate of economic growth slowed down in late 2004 and early 2005. Projected Irish growth in 2005/06 is expected to be largely driven by increases in expenditure from households and government, as growing household debt rates support construction activity and consumption, rather than through success in export markets. While Ireland continues to increase its share of the world's services trade, merchandise exports are declining.

We are falling behind our peers in continental Europe and North America in terms of prices and costs competitiveness. While Irish prices and costs are no longer increasing at a rate faster than elsewhere in the EU, they have stabilised at a much higher level. The ACR highlights particularly high relative costs in the energy and waste management sectors, and also notes the moderation of insurance costs. The moderation of insurance costs shows the benefits of sustained implementation of well thought out policies. Higher costs and the current weakness of the US dollar are making Ireland an expensive production location relative to our trading partners. National policies in areas such as energy, waste and other externally imposed costs can have significant impacts on competitive performance at firm level. This is particularly true of small countries, like Ireland, that are highly open to international trade.

Enhanced productivity can enable both domestically and internationally trading firms to sustain their competitiveness in a relatively high cost environment by using inputs more efficiently. Productivity is the effective use of innovation and resources to increase the value-added content of products and services. In the long term, it is the key source of competitiveness. High and increasing levels of productivity support long term economic growth and a higher standard of living for all. While Ireland's economy-wide productivity performance is strong, the ACR indicates significant divergences in performance across sectors. A range of Irish sectors, including agriculture, retail and wholesale trade, utilities, construction and general services, have recorded a much weaker performance than their EU and US peers.

In the long run, in a small regional economy like Ireland, economic prosperity ultimately depends on our ability to sell goods and services abroad and therefore on the productivity of our economy. The NCC believes that the crucial challenge for Ireland is to put the policies in place now that will develop the conditions necessary to drive productivity growth in the coming decades. It is in many of these policy areas – such as the level of investment in R&D, competition policy, and the usage of ICT, where Ireland's performance is relatively weak, and where the NCC believes the focus of government policy should now be put. We also need to sustain investment and policy attention at all levels of education and training.

This report seeks to compare various aspects of Ireland's competitiveness relative to other countries. I hope it will, as a reference document, stimulate further debate and discussion. The Competitiveness Challenge will examine these issues in more detail, and will highlight the key policy directions that are needed to ensure that Ireland can continue to be successful over the next decade.

Finally, I would like to thank all of the Council members and the advisors from the relevant government departments for their work on this document. The structure of the analysis in this report reflects the evolving thought process of past and current members of the Council since 1998. As such, I would like to acknowledge the work of past Council members, in particular the contribution of the two previous chairmen, Brian Patterson and William Burgess. Finally, I would like to acknowledge the Forfás Executive for the outstanding work they have done in preparing material for consideration by the Council.

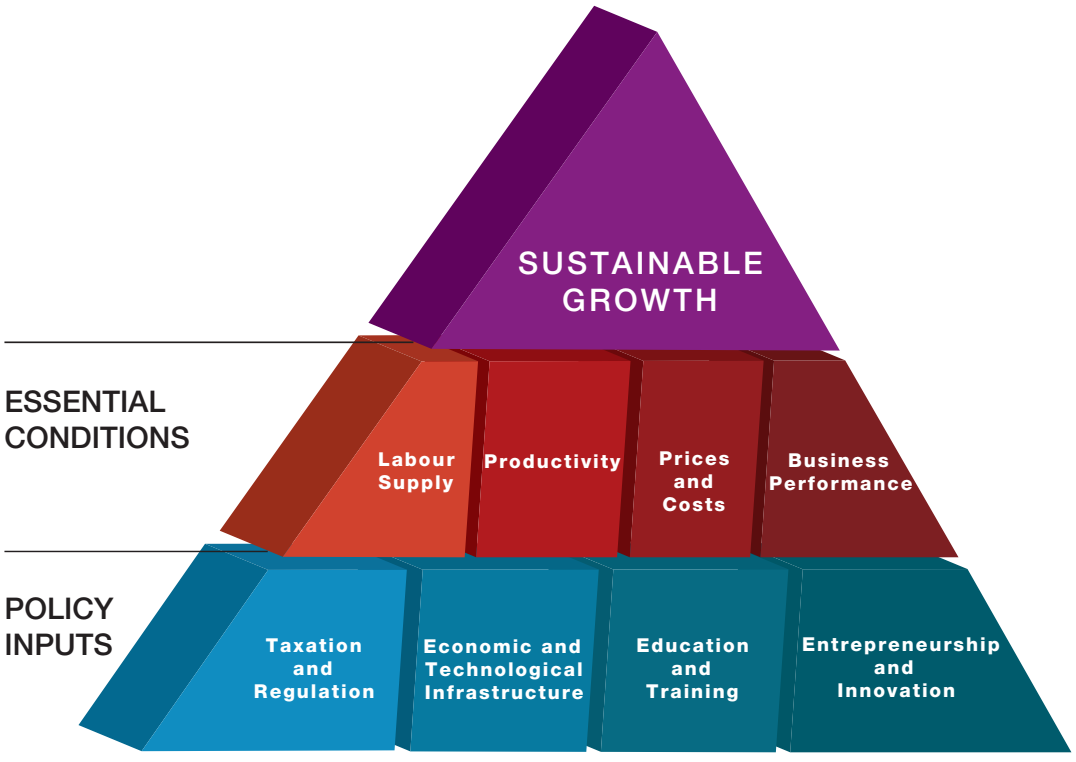
Don Thornhill
Chairman, National Competitiveness Council

August 2005

Contents

Council Members			ii
Foreword by An Taoiseach			iii
Chairman's Preface			iv
1	Introduction and Overview		2
1.1	Introduction		2
1.2	Overview		3
	1.2.1	Sustainable Growth	3
	1.2.2	Essential Conditions for Competitiveness	4
	1.2.3	Policy Inputs	7
1.3	Conclusions		8
2	Sustainable Growth		10
2.1	Income		11
2.2	Quality of Life		15
2.3	Environmental Sustainability		16
3	Essential Conditions		20
3.1	Labour Supply		22
3.2	Productivity		30
3.3	Prices and Costs		36
	3.3.1	Prices	36
	3.3.2	Pay Costs	39
	3.3.3	Non-Pay Costs	44
3.4	Business Performance		49
4	Policy Inputs		56
4.1	Taxation and Regulation		56
	4.1.1	Taxation	58
	4.1.2	Regulation and Competition	63
	4.1.3	Labour Market Regulations	65
4.2	Economic and Technological Infrastructure		67
	4.2.1	Total Investment in Infrastructure	69
	4.2.2	Transport and Energy Infrastructure	71
	4.2.3	Information and Communications Technology (ICT) Infrastructure	73
	4.2.4	Housing	76
4.3	Education and Training		79
	4.3.1	Total Investment in Education	81
	4.3.2	Pre-Primary Education	82
	4.3.3	Primary Education	83
	4.3.4	Secondary Education	84
	4.3.5	Tertiary Education	88
	4.3.6	Life Long Learning	90
4.4	Entrepreneurship and Innovation		92
	4.4.1	Business Formation and Management	94
	4.4.2	Investment in Research and Development (R&D)	99
	4.4.3	Innovation	105
	4.4.4	Clusters and Networks	109
5	Appendices		113
	Appendix 1	ACR Data Sources	114
	Appendix 2	Key Data Bases	116
	Appendix 3	Glossary of Terms	117
	Appendix 4	NCC Publications	122

1 Introduction and Overview

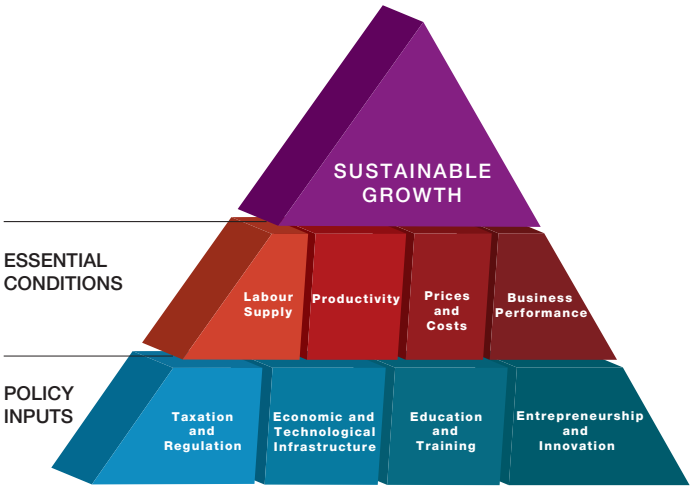


1 Introduction and Overview

1.1 Introduction

For the National Competitiveness Council (NCC), national competitiveness is a broad concept that encompasses a diverse range of factors that support the ability of firms in Ireland to achieve success in international markets, in a way that provides Ireland's people with the opportunity to improve their living standards and quality of life.

Figure 1: The NCC Competitiveness Pyramid



Drawing from this definition, the Annual Competitiveness Report (ACR) 2005 benchmarks Ireland's performance against other advanced countries across a range of competitiveness factors, using a total of 170 indicators, organised around the competitiveness framework above.[1] **Sustained economic growth** is the ultimate outcome of competitiveness. The **essential conditions** supporting competitiveness are represented in the middle layer of the pyramid. The key **policy input** areas are shown at the bottom layer.

The NCC believes that international benchmarking is a useful exercise that stimulates debate on Ireland's progress across a range of economic indicators, and on the challenges that the economy faces in sustaining this success into the future. At the same time, it is important to draw attention to some limitations of competitiveness benchmarking. Firstly, aside from the challenges of securing timely and internationally comparable data for those dimensions of competitiveness which are quantifiable (e.g. output growth, taxation rates etc.), there is the added challenge that certain competitiveness issues can be difficult to quantify (e.g. the quality of education and national levels of creativity and innovation).[2] Secondly, given the different historical contexts and economic, political and social goals of various countries, and their differing physical geographies and resource endowments, it is not realistic or even desirable for any country to seek to outperform other countries on all measures. Finally, it is important to note that trade and investment between countries is not a zero-sum game; economic advances by other countries can, in aggregate terms, lead to improvements in living standards for the Irish population.

1 *Ireland's performance is generally ranked against 15 other countries, in order to reflect Ireland's current trading partners and competitors for mobile investment flows. These include seven eurozone countries, two non-eurozone European Union countries, two new EU members, one non-EU European country and four non-European countries chosen for either their global importance (e.g. the USA) or for their similarity to Ireland in terms of size and / or stage of economic development (e.g. New Zealand).*

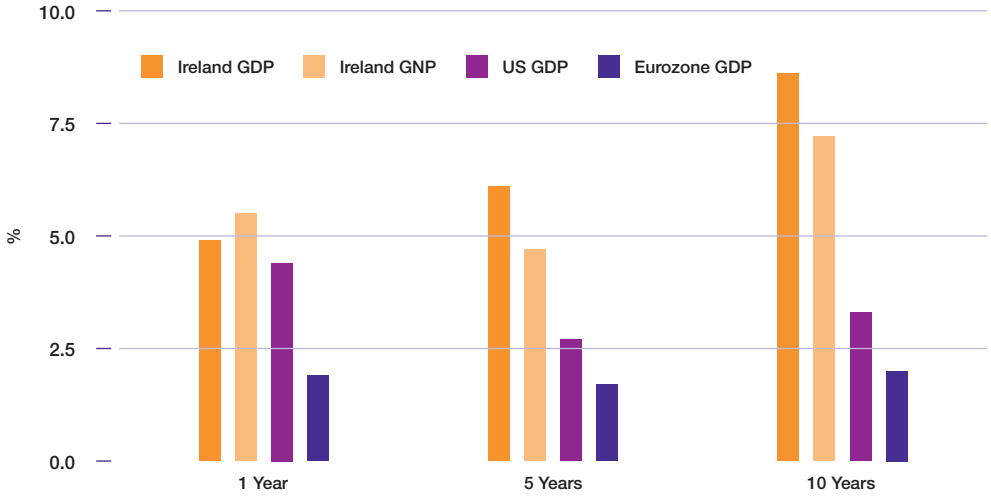
2 *The Council does not collect primary data, but presents and interprets data collected by other agencies. A description of the organisations that collect this data is included in an appendix.*

1.2 Overview

1.2.1 Sustainable Growth

The ultimate objective of national competitiveness, represented by the top layer of the competitiveness pyramid (figure 1), is to achieve sustainable improvements in living standards and quality of life. By this measure, Ireland's competitiveness performance remains very impressive. In 2004, Gross National Product (GNP) grew by 5.5 per cent in real terms – the highest rate of growth in the OECD. GDP is expected to grow by a 5.3 per cent this year compared with an OECD average of 2.6 percent.[3] In the ten years to 2004, the growth of Irish national income averaged over seven per cent, more than double that of the USA and close to triple the average growth rate in the eurozone. From just over €37 billion in 1980, by 2004 Ireland's national income had grown to €122 billion.

Figure 2: GDP / GNP Growth to 2004



Ireland's rapid economic growth has lifted income per capita in this country to among the highest in the world. In 2004, GDP per capita measured €30,691, second only to the USA among the 15 countries benchmarked. GNP per capita in 2004 was lower, at €25,704, putting Ireland in sixth place among the 15 countries.[4]

Measures assessing broader concepts of quality of life and environmental sustainability show a more mixed performance. We score well under the UN's Human Development Index, reflecting a strong performance in terms of life expectancy and income per capita. Measures of environmental sustainability for Ireland are, however, weaker.

3 *OECD Economic Outlook, December 2004.*

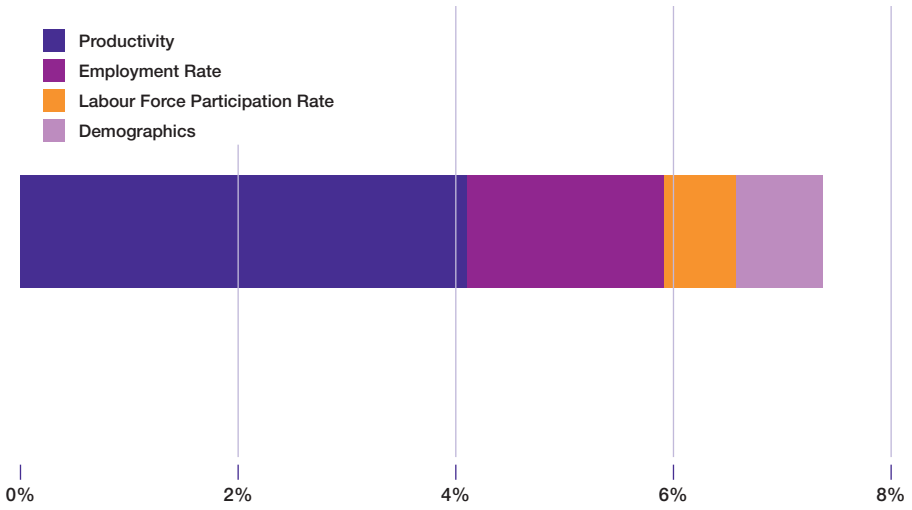
4 *GDP (national output) is significantly greater than GNP (national income) due to the repatriation of profits and royalty payments by multi-national firms based here. Generally, the GNP figure is the more appropriate metric for Ireland, though both sets of figures are reported in the indicators presented.*

1.2.2 Essential Conditions for Competitiveness

Ireland has experienced a substantial increase in employment over the past decade that is unparalleled in other advanced countries. Between 1994 and 2004, employment increased by over 600,000, amounting to a 50 per cent increase on 1994 levels. The rapid growth in ***labour supply*** that facilitated such high rates of employment growth over this period reflected a number of factors: strong growth in the working age population (boosted by immigration, including returning Irish emigrants), a large rise in the number of Irish women (particularly in the 18-35 age cohort) in the labour force and a rise in the employment rate, as the unemployment rate dropped from 14 per cent of the labour force in 1994 to around 4 per cent since 2000. Figure 3 outlines the contribution of various elements of labour supply growth and productivity growth to the annual average per capita economic growth rate of 7.2 percent over the period 1994 to 2004.

Projected labour force growth is expected to remain strong relative to other countries, reflecting our young demographic profile and the potential to increase immigration and female participation rates further. This will not, however, be enough to sustain the employment growth rates of the past decade.

Figure 3: Contribution to per Capita GNP Growth, 1994-2004



Central Statistics Office

Income per Person	=	Productivity	x	Employment Rate	x	Labour Force Participation	x	Demographics
GNP / N	=	GNP / E	x	E / LF	x	LF / N 15-64	x	N 15-64 / N

Where:

GNP	=	Total Income
N	=	Total Population
E	=	Total Employment
LF	=	Numbers of the Labour Force
N 15-64	=	Population of Working Age (those aged 15-64 years)

In addition to high rates of employment growth, over half of the gains in GNP per capita in the decade to 2004 were accounted for by increased labour productivity – or output per worker. ***Productivity*** is a measure of the efficiency with which goods and services are produced, and is a key long-term determinant of a nation's competitiveness and living standards. The ACR notes that in the decades between 1940 and 1990, labour productivity in Ireland increased at a very steady rate, never deviating substantially from an average of 3.4 per cent per annum. In the decade to 2004, labour productivity growth accelerated to around 5 per cent, a remarkable performance given the fast growth in employment over the same period.

Analysis shows, however, that productivity growth has been concentrated in a small number of capital-intensive industries dominated by multinational companies, such as chemicals, pharmaceuticals and electronics. There is evidence of weaker productivity growth and levels in more traditional manufacturing sectors, and in those sectors of the Irish economy less exposed to international competition, such as utilities, construction, retailing and agriculture. In 2003, people employed in Ireland produced on average, 16 per cent less for each hour worked than their U.S. counterparts. This 'productivity differential' accounted for almost 60 per cent of the difference between Irish and U.S. living standards in that year, equivalent to €5,329 per person.

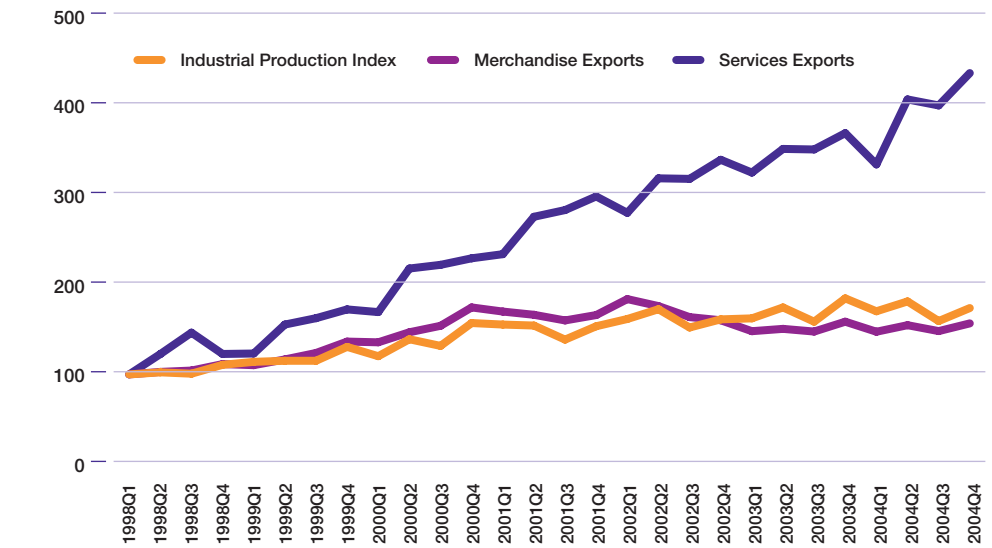
Irish consumer price inflation dropped close to the EU and eurozone average over the course of 2004. However, Ireland remains the most expensive country in the eurozone for consumer goods and services, and the second most expensive country in the EU, behind Denmark. ***Prices and Costs*** have increased by 18 per cent relative to our major trading partners over the period 1999-2004. The rise in the external value of the euro over this period, particularly against the U.S. dollar, was the biggest cause of the deterioration in Ireland's cost competitiveness, although faster growth in domestic prices relative to other countries also played a significant role.

Irish pay costs have also been rising faster than in other EU countries. In the period 1999-2004, average employment costs per employee in Ireland (including taxes) grew by 35.8 per cent. By 2004, this was estimated at €38,140. While lower than the U.K. (€38,900), this was higher than that of the EU15 average (€35,158).

The impact of rising pay costs on business competitiveness has been offset by rising worker productivity only in a small number of capital-intensive sectors dominated by multinational companies (e.g. chemicals, pharmaceuticals and electronics). While these sectors account for the bulk of manufacturing value added, they represent a much smaller share of employment. In contrast, the more employment intensive manufacturing sectors (e.g. transport equipment, leather, and textiles) have generally faced a significant rise in unit labour costs between 1995 and 2004. There is also evidence from this section of the report that a range of non-pay costs in industry, including electricity, waste, and office accommodation are higher in Ireland than in other countries. Other cost categories such as insurance appear to be moderating.

Our ***business performance*** is mixed. Ireland continues to be one of the most successful of the benchmark countries in terms of attracting foreign direct investment. Services exports continue to grow significantly. Ireland's total share of world services trade has grown from 0.5 per cent to 2 per cent since 1998. The performance of the manufacturing sector is much weaker. While Ireland's total share of world goods trade increased sharply from the mid-1990s, it peaked in 2002. Industrial production declined by over 3% in the year to March 2005. (See figure 4).

Figure 4: Industrial Production, and Merchandise and Services Exports, 1998=100

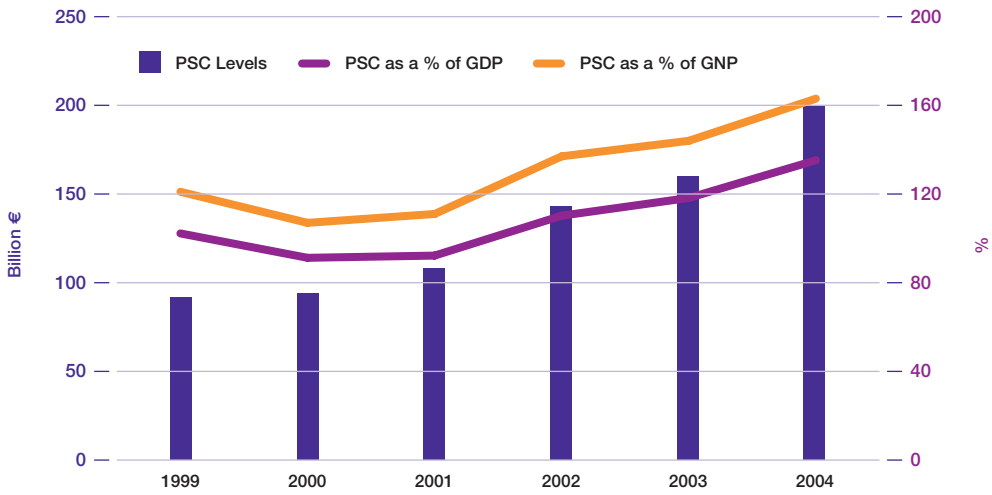


Central Statistics Office

The weaker performance of the export-driven manufacturing sector is to some extent being cushioned by strong growth in demand for domestic goods and services. Irish economic growth in 2005 / 06 is projected to be driven by increases in expenditure from households and government in areas such as construction (e.g. house building and infrastructure), rather than through success in export markets.

Household spending is being supported by growing debt levels. Irish private-sector indebtedness, measured as the value of private sector credit to gross national product (GNP), has increased substantially since the mid-1990s and is now at historically high levels. It increased from 78 per cent of GNP in 1995 to 163 per cent in 2004 (136% of GDP), significantly higher than that of the euro area (112 per cent of GDP in 2003). Credit levels continue to grow strongly. In the year ending May 2005, private sector credit grew by an additional 27 per cent. Private sector credit is estimated to grow by approximately €45 billion or 33 per cent of GNP in 2005, thus providing a strong stimulus to current economic growth.

Figure 5: Private Sector Credit (PSC) Levels as a % of GDP / GNP, 1999-2004



Central Bank of Ireland

Ireland's economic growth rates may fall significantly when borrowing slows. Our economic prosperity will in the long run depend on our export performance, and therefore on our competitiveness. Ireland's strong current economic performance, driven by primarily domestic factors, may divert attention from the factors that determine Ireland's underlying competitiveness. It is vital that the sectors of the economy that trade internationally maintain and grow their competitiveness.

1.2.3 Policy Inputs

Ireland's competitiveness performance today in terms of factors such as incomes, employment, productivity etc. is heavily influenced by decisions made in the past in the areas of ***Taxation and Regulation***, ***Infrastructure***, ***Education and Training*** and ***Entrepreneurship and Innovation***, as represented by the bottom layer of the competitiveness pyramid. Equally, our competitiveness performance in the years to come will depend heavily on the decisions being made today in these key policy areas.

The ***Taxation and Regulation*** environment remains one of Ireland's key competitive strengths. Ireland's corporation tax rate and personal tax rates are lower than all other comparator countries benchmarked in this report. In terms of regulatory policy, the ACR notes that labour market regulations in Ireland are not believed to have a significant impact on business activities relative to other countries. However, the intensity of local competition and the efficiency of competition legislation are perceived as being low.

Government investment on ***Infrastructure*** is significantly higher in Ireland than in most developed economies. Despite investments to date in Ireland, survey evidence shows that the perceived quality of Ireland's infrastructure in transport, energy and ICT (including broadband usage) remains weak relative to leading countries.

In terms of ***Education and Training***, this section of the report notes that Irish investment rates in education at third level matches other OECD countries, but that Ireland invests less in primary and secondary level than the OECD average. It also notes that participation rates in secondary education have grown significantly, but remain below those in leading countries. In terms of performance, 15 year-olds in Ireland perform strongly in terms of reading skills, although less well in terms of scientific and mathematical literacy relative to the benchmarked countries. A relatively high proportion of the Irish population in the 25-34 age group has a third level education, and Ireland continues to perform well in terms of science and engineering graduates per thousand population. Participation in life long learning in Ireland has increased significantly in recent years, although there is still a significant gap between Ireland and the leading countries on this measure.

Ireland's comparative performance with regards to ***Entrepreneurship and Innovation*** development is also mixed. Ireland leads Europe in the rate of business start-ups. However, we lag the leading entrepreneurial nations, particularly the USA, South Korea, and New Zealand, which may reflect continued difficulties reported by Irish entrepreneurs in accessing risk finance. While both public and business sector investment in R&D have increased substantially in recent years, they are below the levels pertaining in other advanced economies. Despite progress, patent applications and approval rates remain below those in other countries.

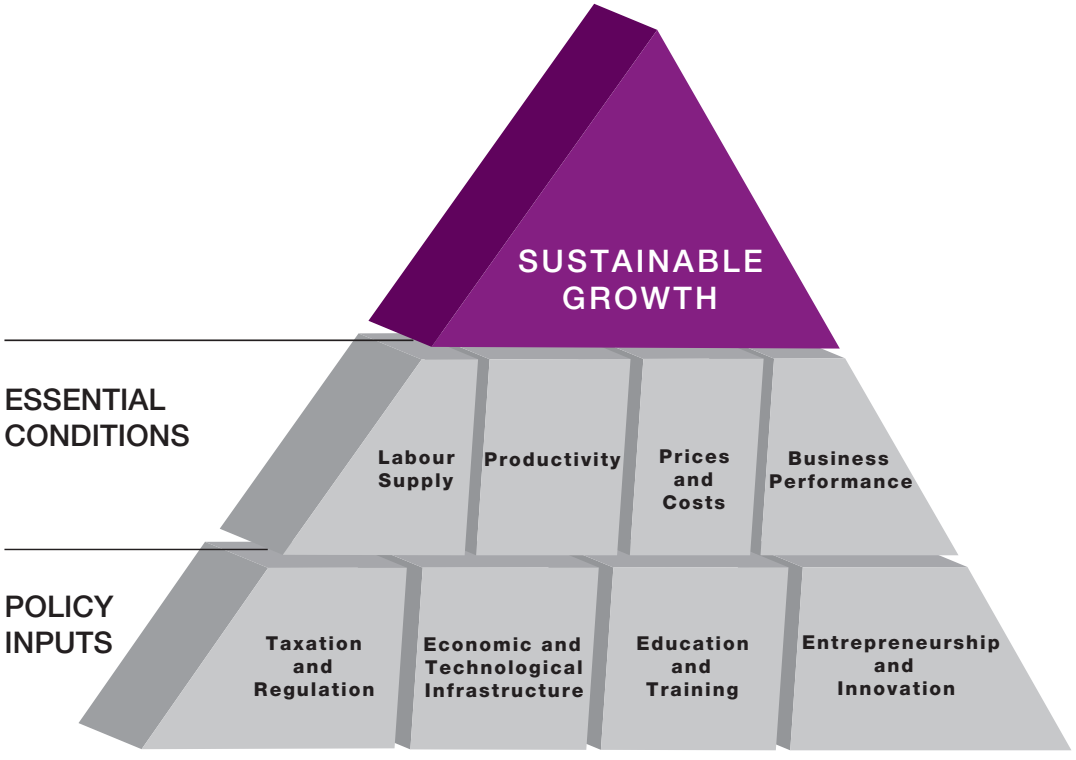
1.3 Conclusions

As documented by the Enterprise Strategy Group, Ireland's rapid economic growth from the early 1990s was set in motion by high levels of investment in Ireland by multinational companies, attracted to Ireland by our membership of the European Union and pro-enterprise Government policies in areas such as taxation, education, international trade and industrial relations through social partnership.[5] Fast export growth from multinational companies and a growing cohort of successful indigenous exporters, combined with rising national confidence and low interest rates, have had a knock-on effect on household and government spending that has driven economic growth. Irish living standards have converged with those in the wealthiest countries in the world. While there is much to be proud of, we must not become complacent. To remain at the forefront of international trade and competitiveness, we must display a singular commitment to promoting a favourable environment for business.

The Competitiveness Challenge 2005, which will be published later in the year, will examine these issues in greater detail, and will highlight the key policy directions that are needed today to ensure that Ireland can be as successful over the next decade.

5 *"Ahead of the Curve: Ireland's Place in the Global Economy", Enterprise Strategy Group, Forfás (2004).*

2 Sustainable Growth



2 Sustainable Growth

Competitiveness is not an end in itself, but is a means of achieving improvements in living standards and quality of life. This section of the report benchmarks Ireland's performance regarding the desired outputs of national competitiveness. These are covered under three headings: income, quality of life and environmental sustainability.

2.1 Income

High and rising material living standards are a key measure of national competitiveness. The indicators in this section cover the level of, and recent changes in, Ireland's national income levels, as well as the distribution of income. Living standards in Ireland as measured by GNP per capita (6th/15) have converged with the countries benchmarked in the report. However, living standards in Ireland remain lower than in many US states and regions of Europe. In a US context, Ireland would still rank as the 15th poorest state. There is not a significant gap in average income between the Border, Midland and West region and the rest of Ireland compared with regional disparities in other countries. National income across the population is distributed unevenly in Ireland relative to many other countries (11th/16).

2.2 Quality of Life

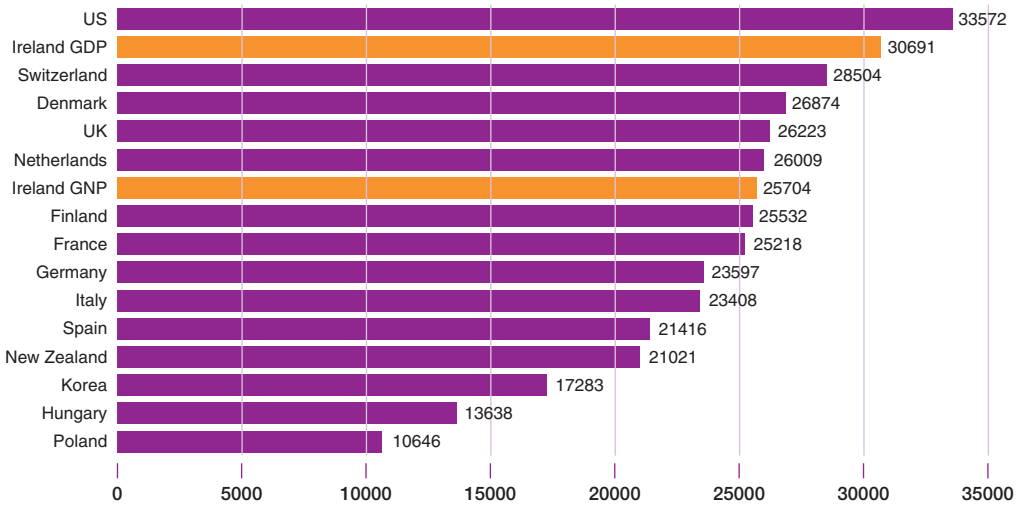
A key objective of competitiveness is to ensure an acceptable quality of life, which is a broader concept than material living standards. For the purposes of measuring quality of life, we use the UN's Human Development Index, which is a composite indicator based on life expectancy, school enrolment rates, literacy levels and incomes. Continued improvements in life expectancy and income per capita supports Ireland's strong performance in the UN's Human Development Index (5th/16).

2.3 Environmental Sustainability

The essence of environmental sustainability is a stable relationship between human activities and the natural world, which does not diminish the prospects for future generations to enjoy a quality of life at least as good as our own. Measures of environmental sustainability in Ireland are weaker relative to other countries benchmarked, particularly with respect to the generation of waste.

2.1 Income

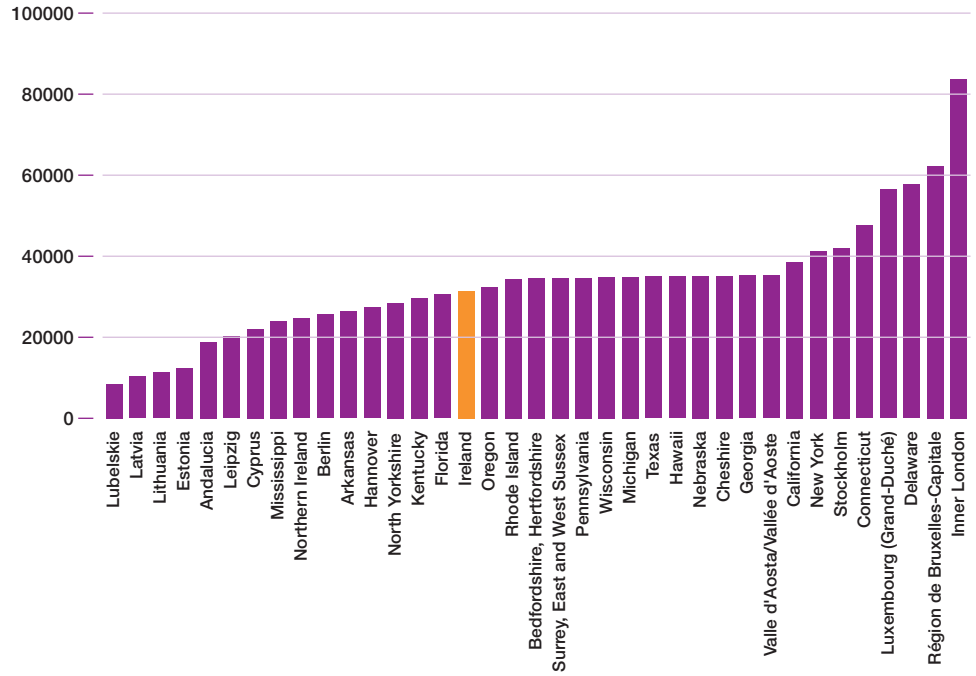
Figure 6: GDP per Capita (PPP, Euro), 2004



Groningen Total Economy Database / OECD

Ireland's rapid economic growth in recent years has lifted GDP per capita (a measure of output) to among the highest in the world. In 2004, GNP per capita (a measure of income) measured €25,704 ranking Ireland 6th out of 15 countries benchmarked. (See Appendix 3 for a discussion on GDP and GNP definitions).

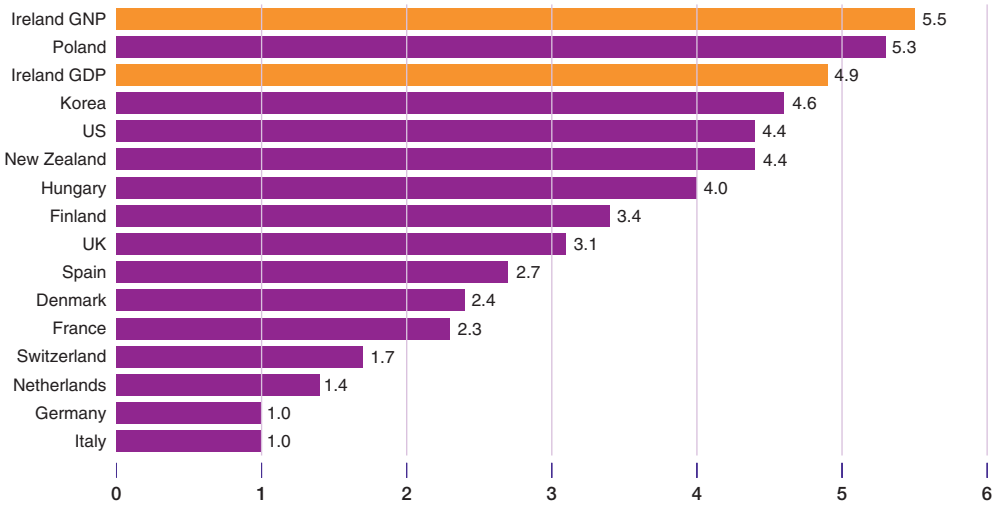
Figure 7: GDP per Capita: Ireland vs Selected US States and EU Regions (US$), 2002



US Bureau of Economic Analysis / US Bureau of the Census

If Ireland was a state of the USA, it would have ranked as the 35th richest state in 2002. There are also significant numbers of EU regions which are ahead of Ireland.

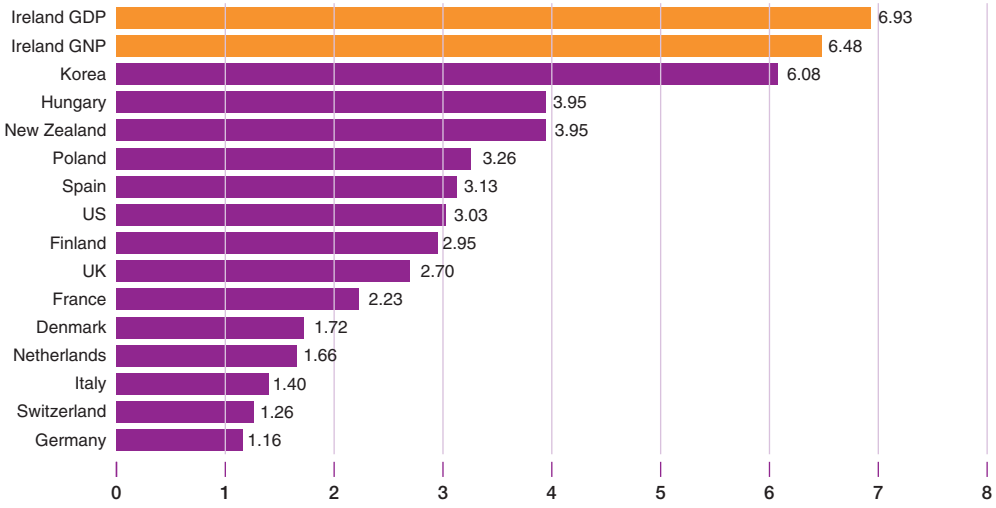
Figure 8: Real GDP Growth, 2004



OECD Economic Outlook / Ecowin

Ireland's GNP grew by 5.5 per cent in 2004, the second highest rate among the OECD countries. The average GDP growth in the eurozone and the OECD area in 2004 were 1.8 and 3.4 per cent, respectively.

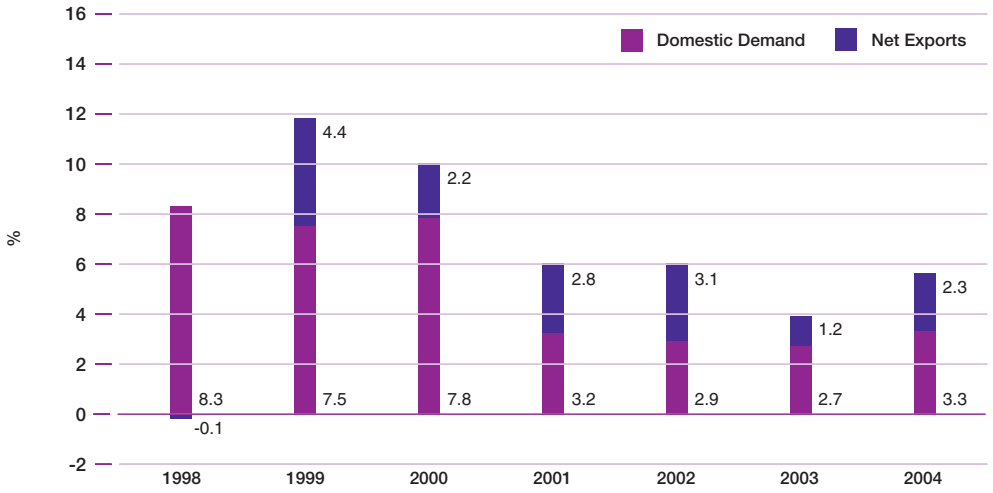
Figure 9: Annual Average Real GDP Growth Rates, 1999-2004



OECD Economic Outlook / CSO

The high GDP and GNP growth rates observed in Ireland during 2004 are a continuation of the trend since 1999. Between 1999 and 2004 Ireland grew faster than any of the OECD countries.

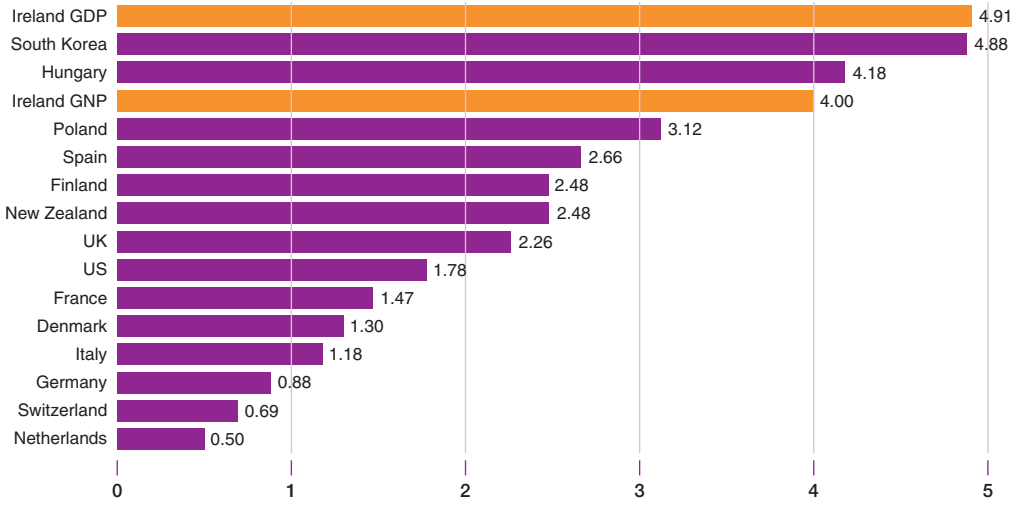
Figure 10: Contribution of Net Export Demand to GDP Growth



Central Statistics Office

This chart breaks down the drivers of Irish economic growth between net export demand and domestic demand which consists of private consumption, government expenditure and gross investment.

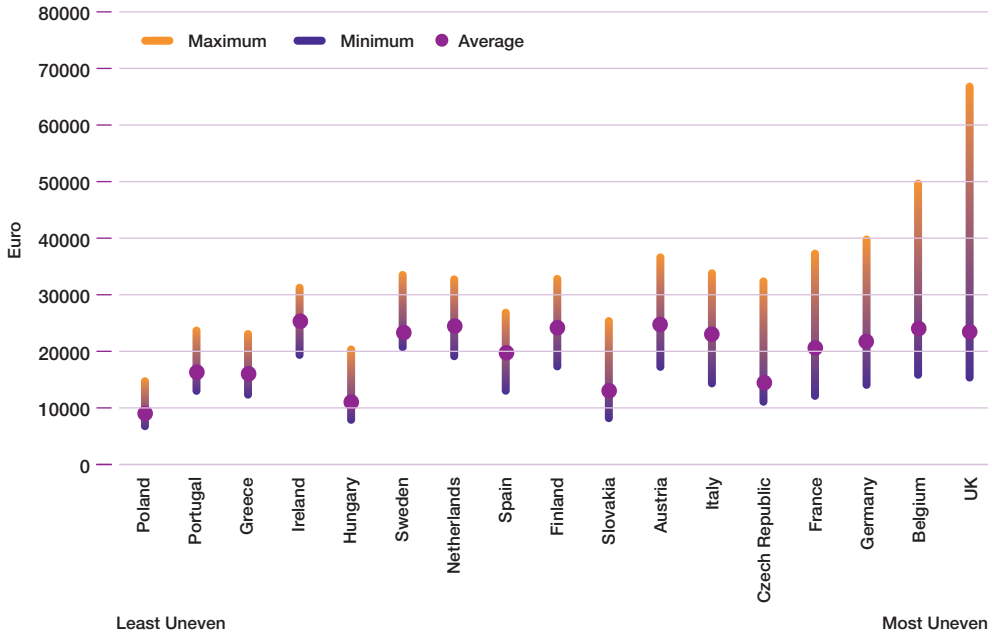
Figure 11: Average Annual Growth in GDP per Capita, 1999-2004



OECD Economic Outlook / CSO

Irish GNP per capita has increased by over 4 per cent per annum on average between 1999 and 2004. The growth of Irish GNP per capita has been less than the rise in total GNP, as the increased national income has been spread amongst a larger population.

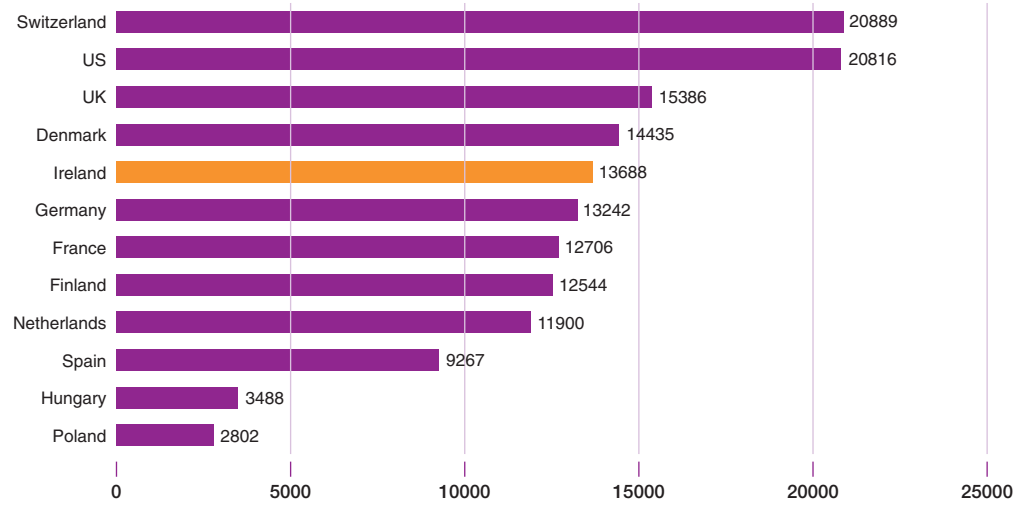
Figure 12: Regional Income Distribution



Eurostat

This graph shows the disparities in average incomes in euros between regions in EU countries. For each country, the region with the maximum income, minimum income and the average income is shown. The disparity between Ireland's two regions, namely Border, Midland and West (BMW) and the rest of the country is not very large by this measure.

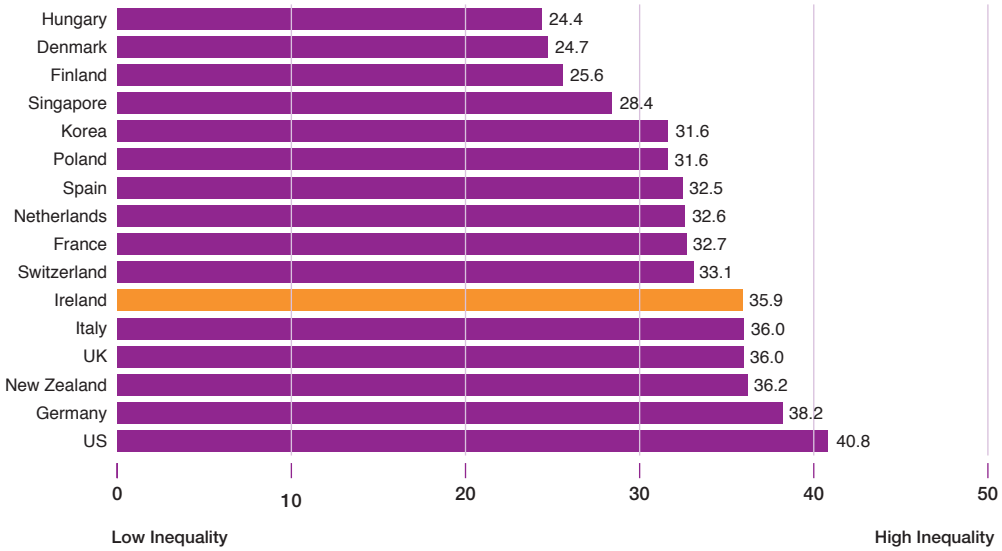
Figure 13: Consumption per Capita (PPP, Euro), 2002



OECD Economic Outlook

Consumption expenditure by households is another measure used for assessing a country's living standards. On this measure, Ireland was ranked 5th out of 12 in 2002, 65 per cent of the Swiss level, the leading country on this measure.

Figure 14: Income Inequality (Gini Co-Efficient)

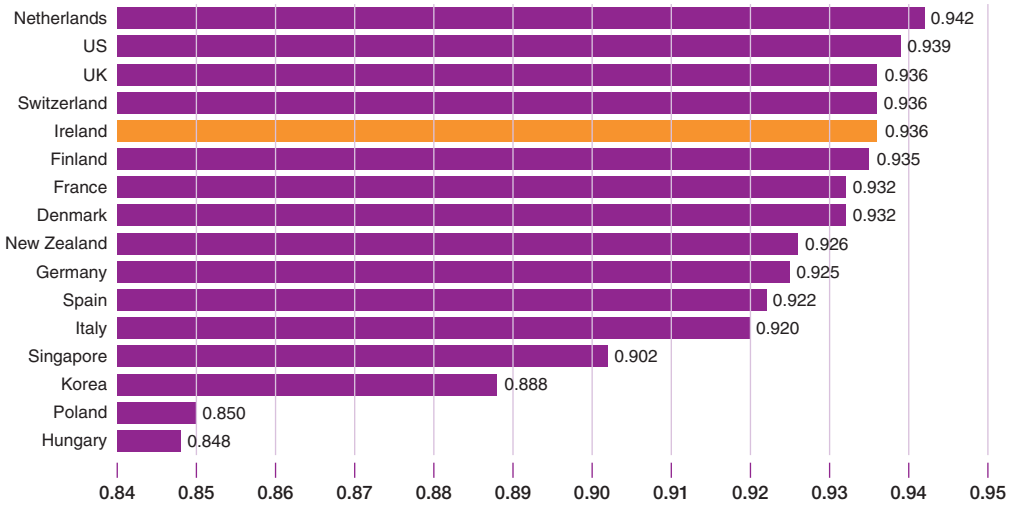


UN Human Development Report, 2004

The Gini Coefficient is a measure of income distribution. A score of zero indicates perfect equality, and 100 indicate that all national income is enjoyed by one person. The Gini coefficient showed a decrease in inequality in Ireland between 1973 and 1987, and an increase thereafter.[6]

2.2 Quality of Life

Figure 15: Human Development Index, 2002

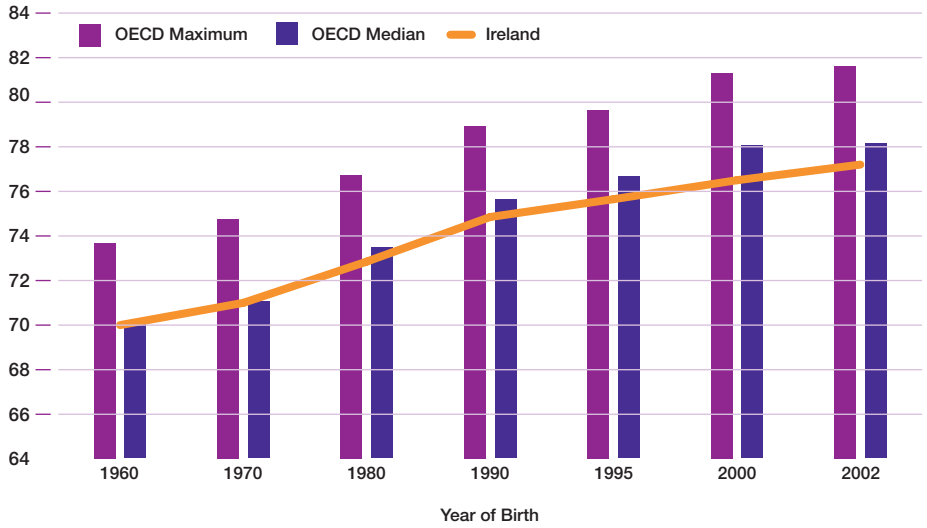


UN Human Development Report, 2004

The Human Development Index is a composite index which combines measures of life expectancy, school enrolment, literacy and income. A high score is an indicator of enhanced quality of life. The results of the UN Human Development Index are closely correlated with GDP per capita measure.

6 *"Equality in Economic and Other Dimensions", Sara Cantillon, chapter in* The Economy of Ireland, *National and Sectoral Policy Issues. O'Hagan and Newman eds. (2005)*

Figure 16: Life Expectancy in OECD Countries

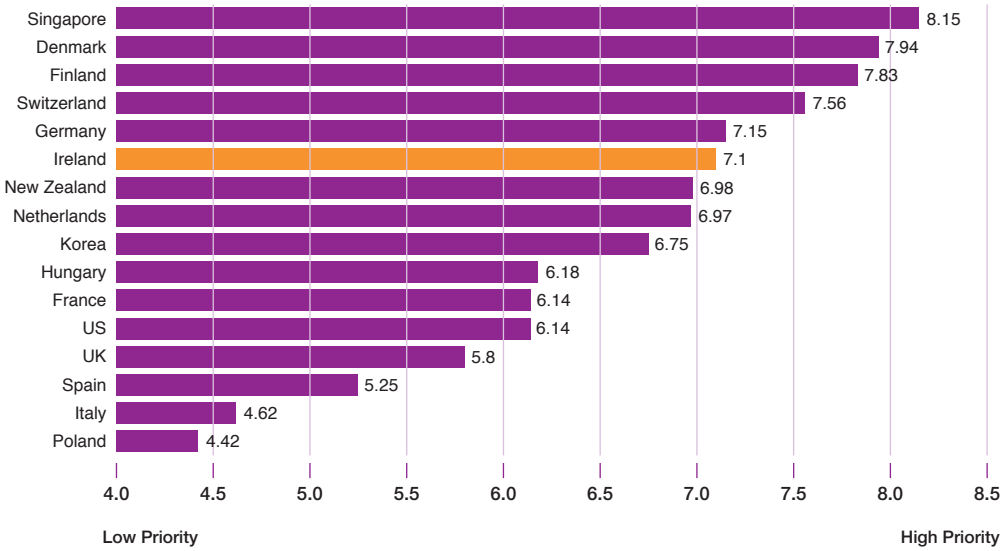


OECD Factbook, 2005

An important indicator of a nation's health is average life expectancy. Life expectancy in Ireland has been increasing steadily, from 70 years in 1960 to 77.8 in 2002, yet it remained below the OECD median as of 2002.

2.3 Environmental Sustainability

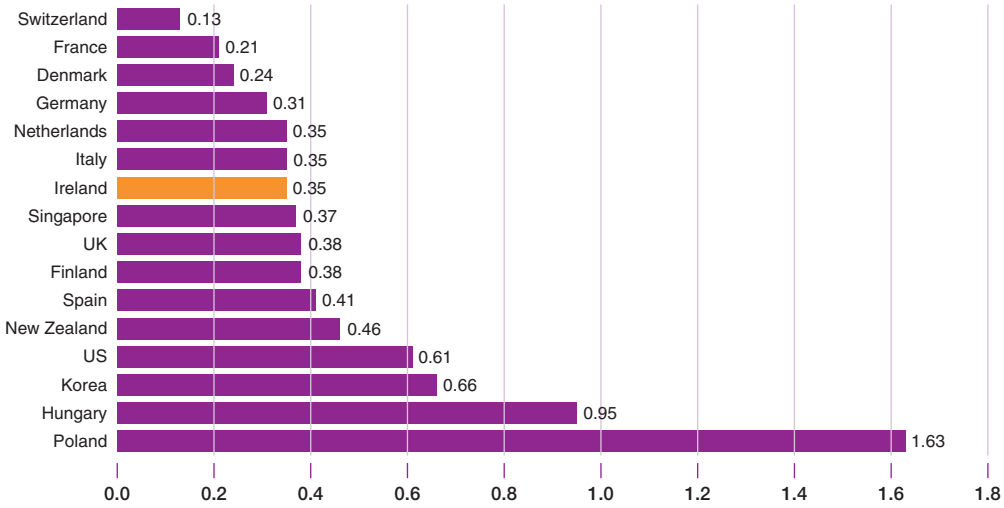
Figure 17: Sustainable Development, 2004 (Scale 1-10)



IMD World Competitiveness Yearbook, 2005

The UN defines sustainable development as development that meets the needs of the present population without compromising the ability of future generations to meet their own needs. Survey data among business people suggest that sustainable development is becoming a higher priority in Ireland.

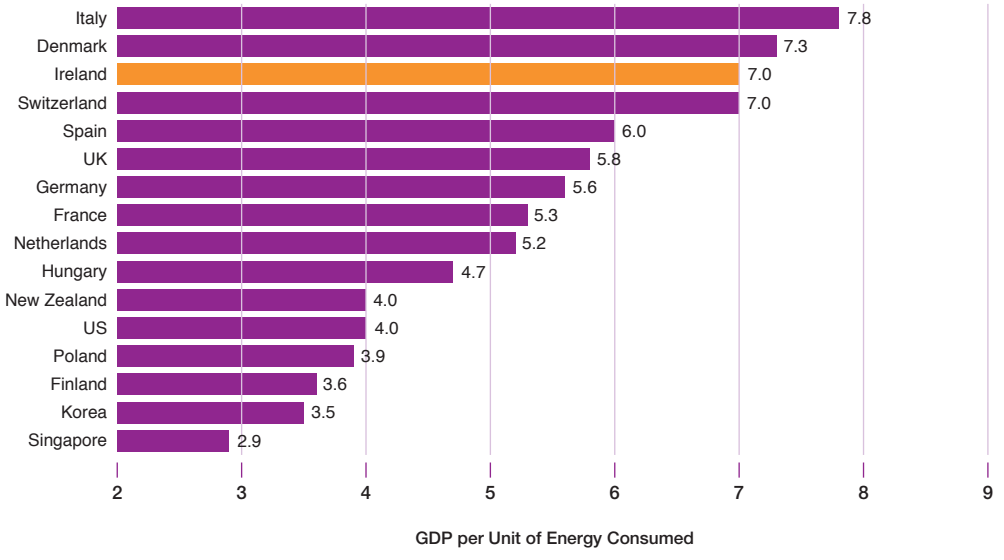
Figure 18: CO_2 Emissions per Unit of GDP, 2002



International Energy Association

Ireland ranks 5th among 16 countries in terms of CO_2 emissions, with 0.35 kg of CO_2 emitted per unit of GDP. In Ireland, the energy generation sector accounts for 36 per cent of total CO_2 emissions, the transportation sector accounts for 23 per cent while manufacturing and construction accounts for 12 per cent.

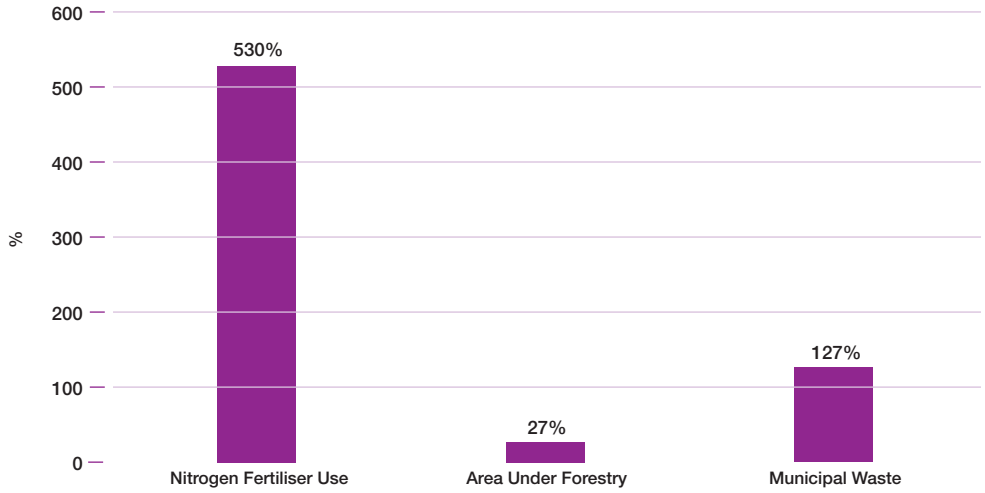
Figure 19: Energy Efficiency (1995 PPP US$ per kg of Oil Equivalent), 2001



UN Human Development Report, 2004

Ireland's energy efficiency improved throughout the 1990s, reflecting changes in Ireland's industrial structure and the growing importance of services, which are less energy intensive than manufacturing.

Figure 20: Sustainable Development Indicators – Ireland vs OECD Average (OECD=100)

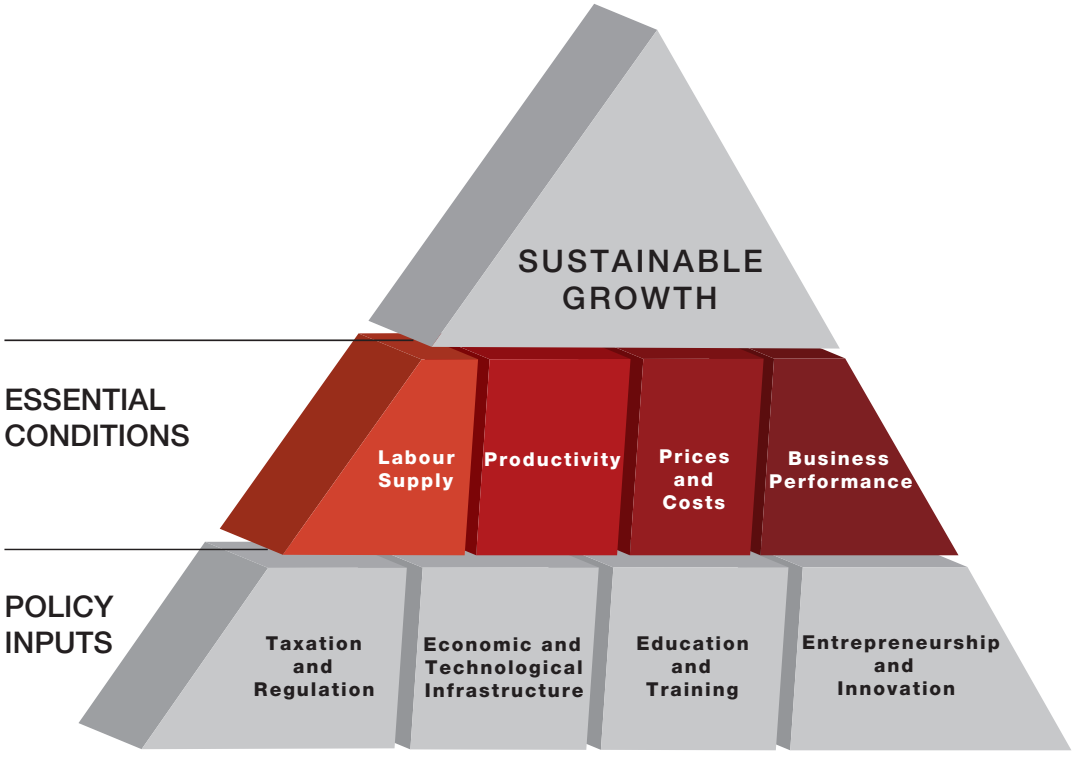


Note: Municipal waste as kg per capita.

OECD Environmental Data Compendium, 2004

This chart sets out a number of Irish environmental indicators, relative to the OECD average. Nitrogen fertiliser use measured as tonne per km^2 of arable land in Irish agriculture is more than five times the OECD average. Ireland has a relatively small amount of land under forestry as a percentage of land area.

3 Essential Conditions



3 Essential Conditions

The previous chapter benchmarked Ireland's current performance in terms of sustainable growth. This section reviews Ireland's comparative rankings under the headings of labour supply, productivity, prices and costs, and business performance, all of which are essential conditions for future economic growth.

3.1 Labour Supply

Growth in labour supply has played a key role in Ireland's economic development over the past decade. Economic growth was facilitated by a significant increase in employment, in turn supported by a growing population of working age, increasing female participation rates, and net immigration. Ireland recorded a strong performance in 2004 with employment growth of 1.7 per cent (5th/16) despite initial low unemployment (4th/15). Projected labour force growth is expected to remain strong relative to other countries in 2005 (3rd/15). Significant potential still exists to grow participation rates relative to other countries, particularly female participation rates (11th/15) and to build further on the contribution of migrants to labour force growth.

3.2 Productivity

A country's living standards depends not just on the number of people in employment, but on productivity. Productivity, defined as the value of output per hour worked, is a measure of the efficiency with which goods and services are produced. At a national level, Irish productivity levels have increased at relatively steady rates in recent decades. Ireland currently ranks 8th out of the 15 countries benchmarked in terms of hourly productivity. A sectoral level analysis indicates significant divergence between various sectors of the economy. While FDI dominated sectors such as chemicals and computers services have reported high levels of productivity, a broad range of other sectors including agriculture, retail and wholesale trade, utilities, construction and general services have recorded a much weaker performance relative to the EU and US average.

3.3 Prices and Costs

National developments in prices and costs can have significant impacts on the competitive performance of a nation's firms. This is particularly true of small countries, like Ireland, that are highly open to international trade. Over the past 12 months, Irish consumer inflation rates have dipped below the EU average (8th/15). However, Ireland remains the most expensive country in the eurozone for consumer goods and services, and the second most expensive country in the EU, behind Denmark. With regards to pay costs, compensation per employee increased by over 5 per cent between 2003 and 2004 placing Ireland 4th highest among the 14 benchmark countries. With regard to non-pay costs, energy (9th/10) and waste costs (8th/10) appear to be growing substantially, while the growth of insurance costs appears to be slowing.

3.4 Business Performance

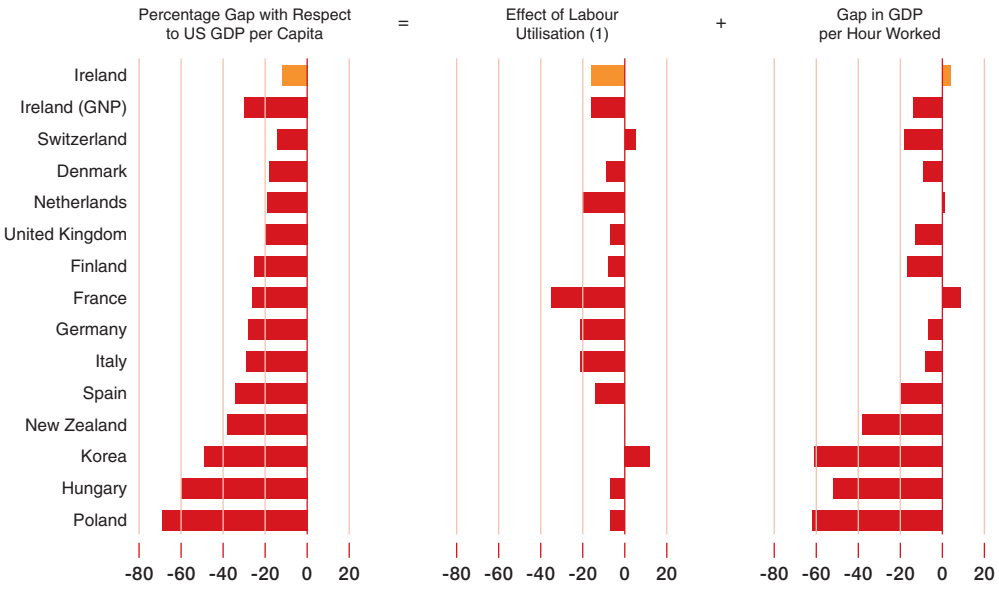
OECD research shows a positive correlation between a country's openness to international trade and investment and its performance regarding productivity and economic growth.[7] Ireland is one of the most open economies in the world in terms of trade in goods and services (2nd/16). Within the EU, Ireland has the greatest exposure to trade with non-EU countries. Ireland's total share of world services trade has grown from 0.5 per cent to 2 percent since 1998, overtaking Ireland's share of world merchandise trade, which has fluctuated at around 1.2 per cent. The stock of inward foreign direct investment in Ireland in 2003 was equivalent to 130 per cent of GDP (or 156 per cent of GNP), higher than any other country benchmarked on this measure and some distance ahead of second-placed Netherlands. US companies earn the highest rate of return on their investments in Ireland as compared with other investment locations. Outward direct investment has also grown substantially in the last few years, albeit from a low base (7th/14).

7 *'The Sources of Economic Growth in OECD Countries: A Review Article', M. Baily (Fall 2003).*

3.1 Labour Supply

Figure 21: Differentials in GDP per capita and Their Decomposition, 2003

Percentage point differences in PPP-based GDP per capita with respect to the United States

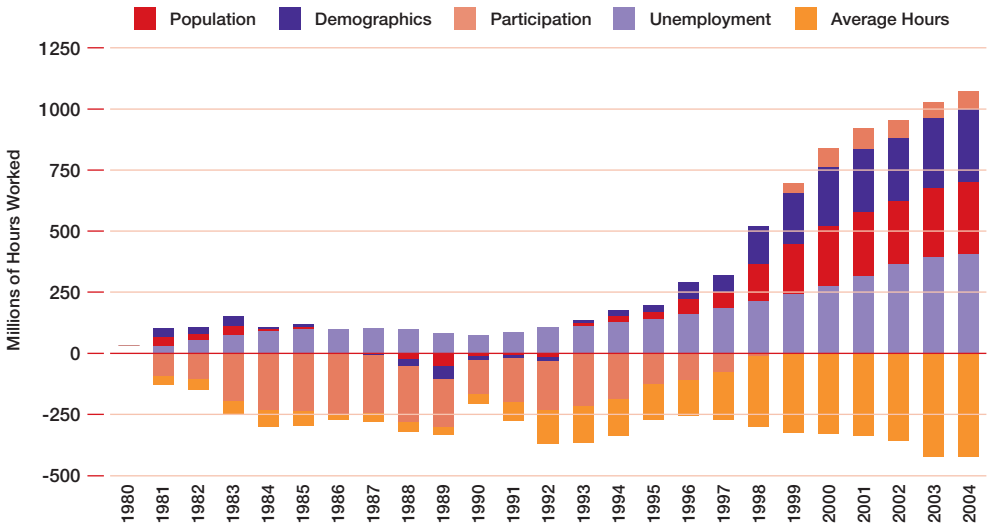


1) Based on total hours worked per capita

OECD Productivity Database

In 2003 GNP per capita in Ireland was 30 per cent below of the GDP per capita in the USA. One reason for this is the low level of labour utilisation mainly due to fewer people employed in Ireland than in the USA as a proportion of total population. In addition those who are in employment in Ireland work fewer hours than those employed in the USA. Lower level of labour utilisation accounted for around 53 per cent of the difference between Irish and US living standards in 2003.

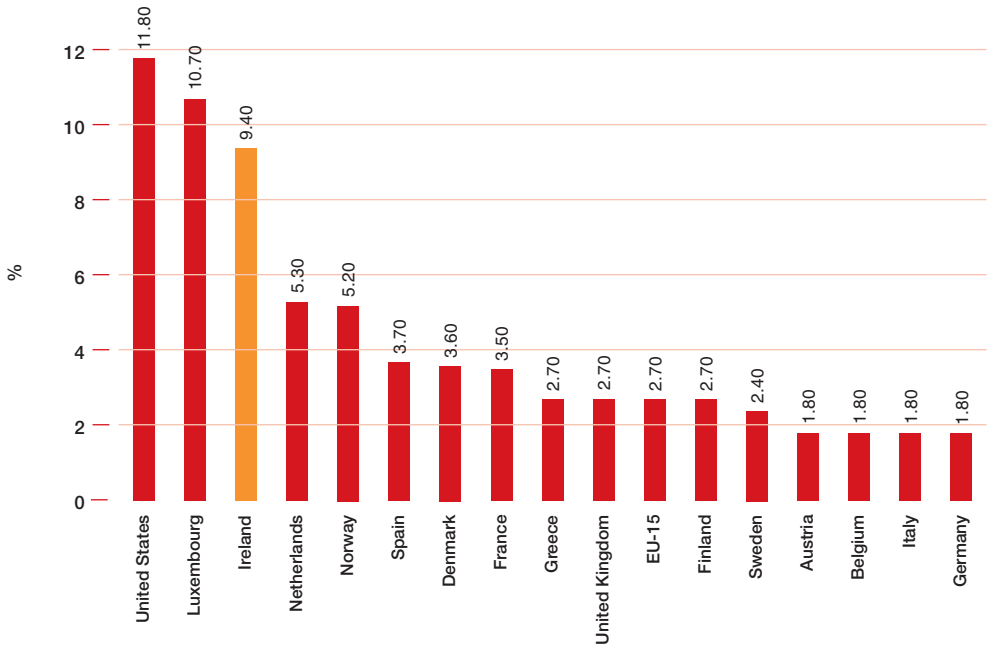
Figure 22: Decomposition of Changes in Total Hours Worked (Base Year=1980)



OECD / Forfás calculations

This chart breaks down the increase in the total hours worked in Ireland. While average hours worked per person has fallen, this has been offset as more people are now working. This has been driven by lower unemployment rates, higher participation rates, more people of working age (demographics), and strong population growth.

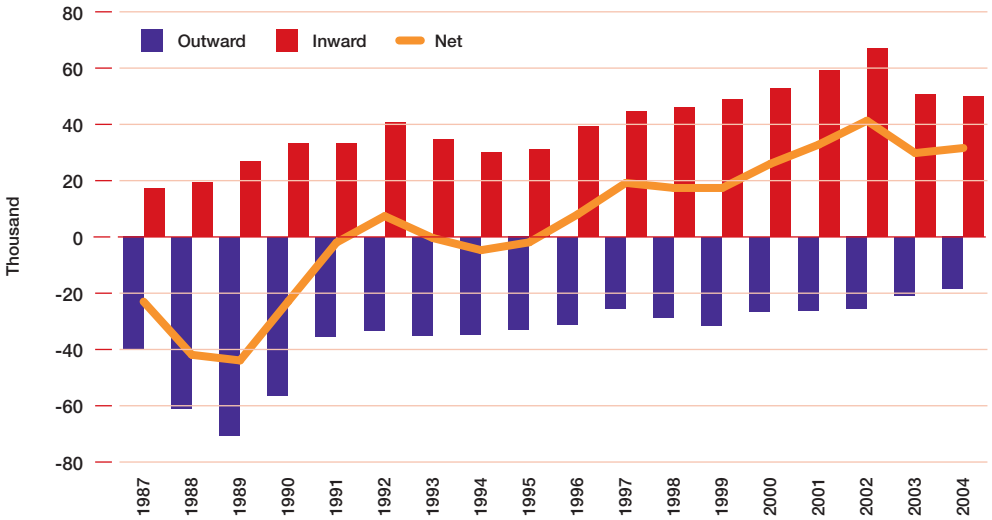
Figure 23: Percentage Change in Population, 1993-2002



CSO, Population Statistics

In 2002, the population of Ireland was 3.917 million – an increase of 9.4 per cent since 1993.

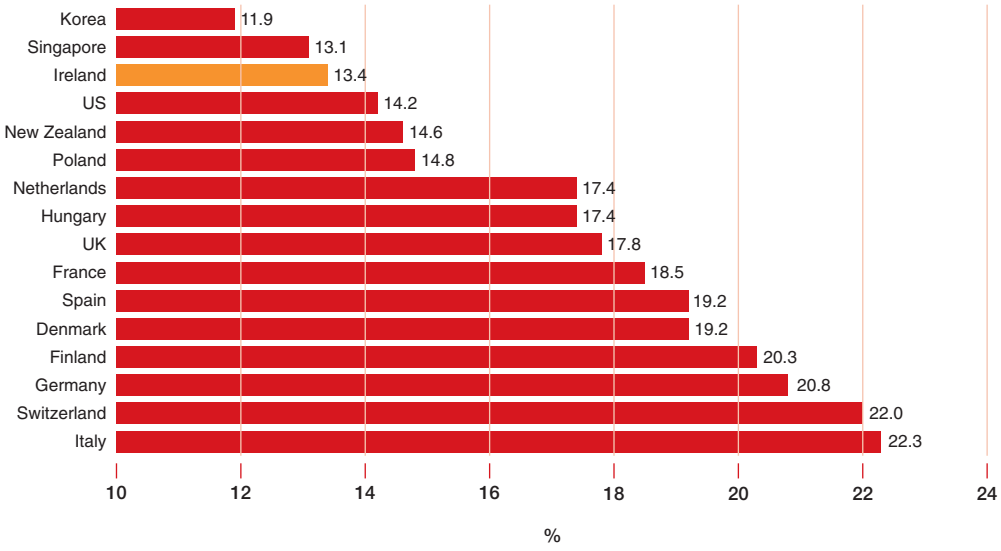
Figure 24: Irish Net Migration, 1987-2004



CSO, Population and Labour Force Projections

For a small regional economy such as Ireland, net migration has the potential to be very large relative to the size of the existing labour force. The switch from net outwards to net inwards migration happened in the early 1990s. Net immigration accounted for 53 per cent of the increase in population in Ireland between 1993 and 2002.

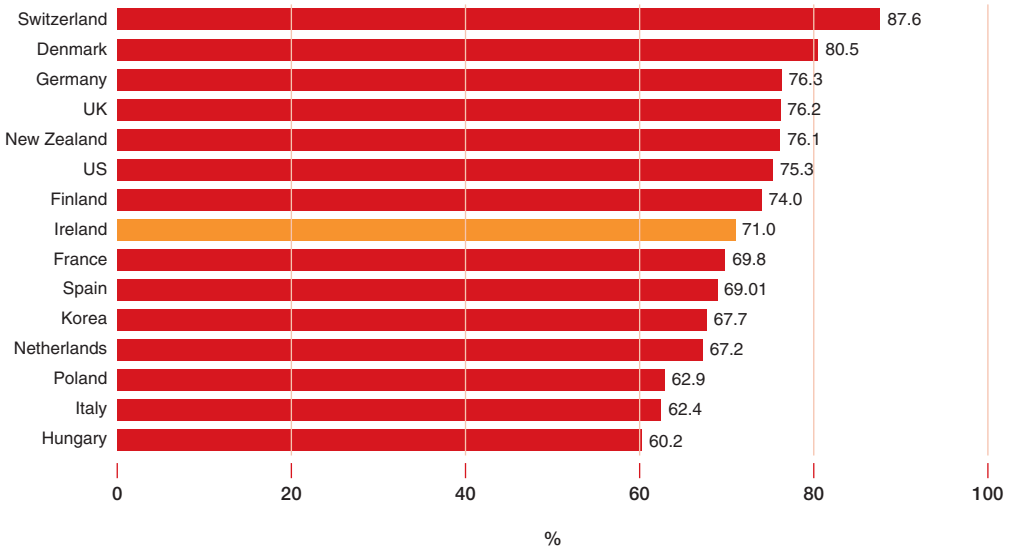
Figure 25: Measure of Ageing Population: Population Over the Age of 65 as a % of Total in 2015



UN Human Development Report, 2004

In 2002, 11.1 per cent of the population was over the age of 65 in Ireland. This is estimated to rise to 13.4 per cent by 2015, but will remain well below that of other countries benchmarked.

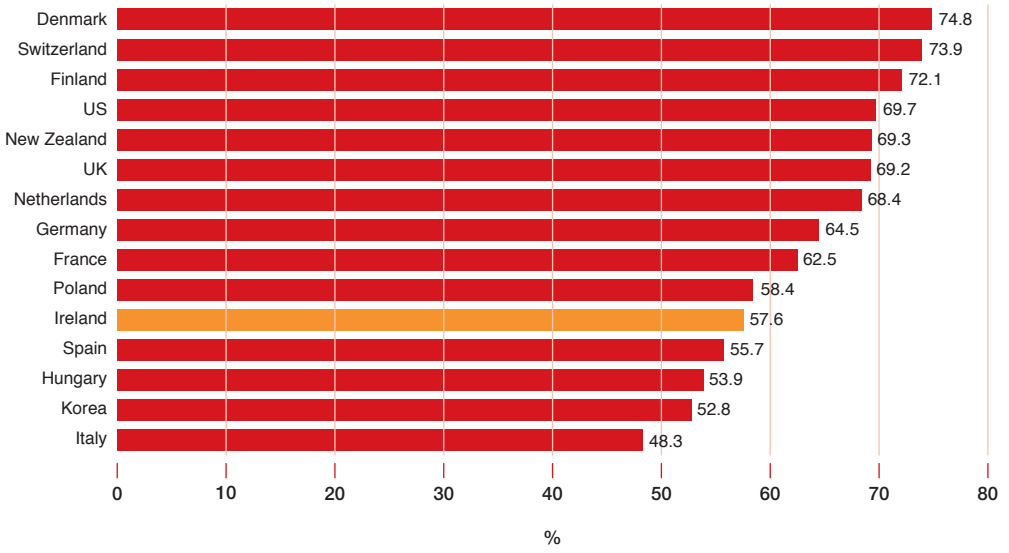
Figure 26: Labour Force Participation Rates, 2004



OECD Economic Outlook / Ecowin

The labour force participation rate is defined as the proportion of the population aged 15 to 64 either in employment or actively looking for employment. Irish labour force participation rates are in the middle of our peer group, despite a substantial increase over the period 1990 to 2004.

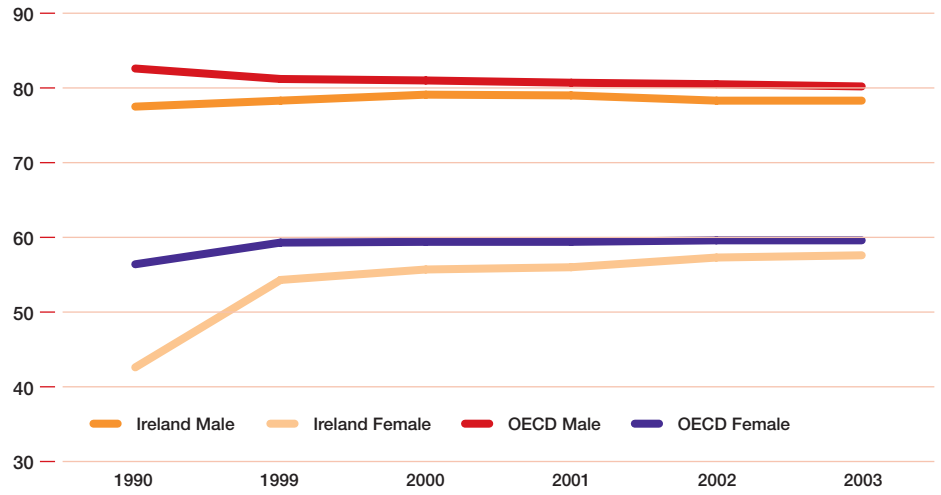
Figure 27: Female Participation Rates, 2003



OECD Employment Outlook, 2004

Ireland's participation rate falls behind many comparator countries primarily due to differences in female participation. In 2003, 58 per cent of women aged 15-64 in Ireland were employed, substantially less than Denmark, Switzerland and Finland. This is primarily due to lower female participation rates in Ireland in the 40-60 age cohort than in other countries.

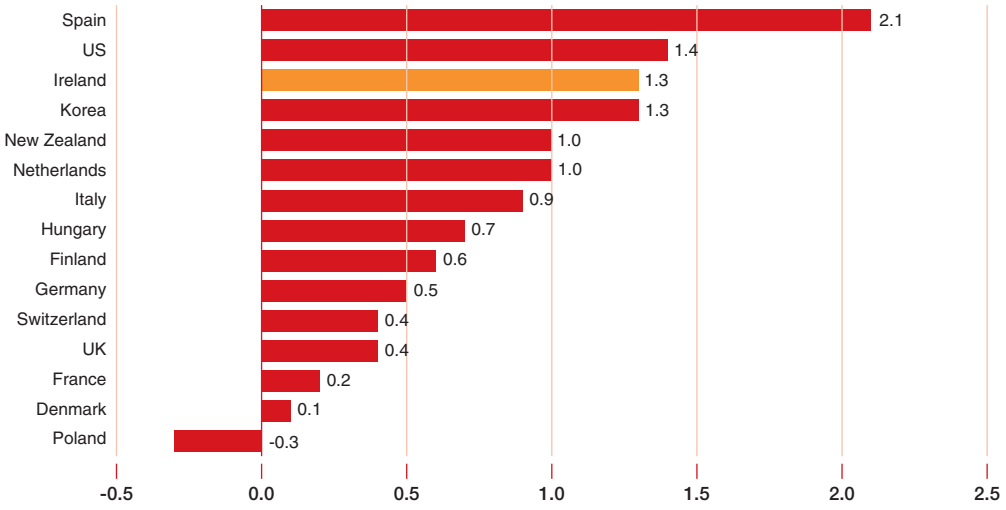
Figure 28: Labour Force Participation Rates, 1990-2003



OECD Employment Outlook, 2004

Since 1990 there has been little change in male participation rates in Ireland. However, female participation rates increased from 42 per cent in 1990 to almost 58 per cent in 2003.

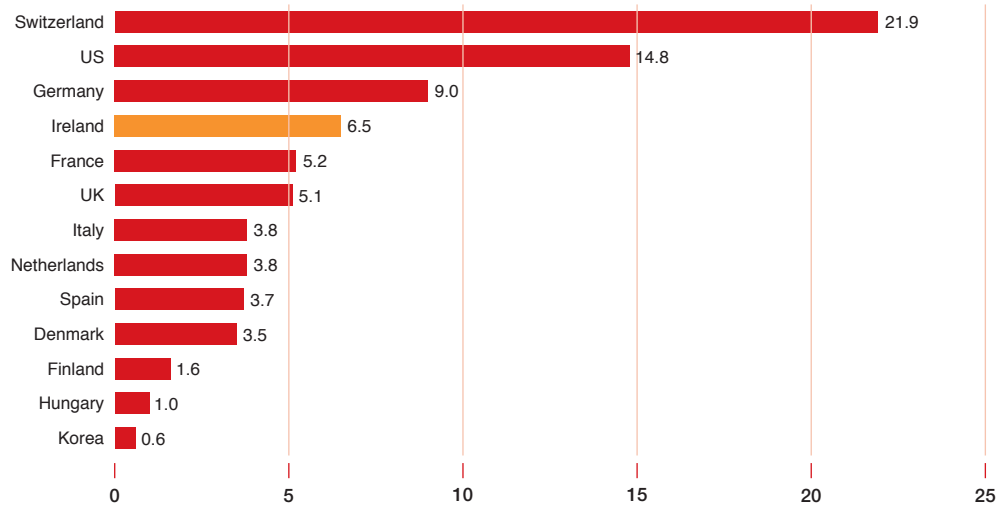
Figure 29: Projected Labour Force Growth, 2005



OECD Economic Outlook / Ecowin

The OECD estimates that the Irish labour force will grow by around 1.3 per cent in 2005, the highest rate projected after Spain and the US among benchmarked countries.

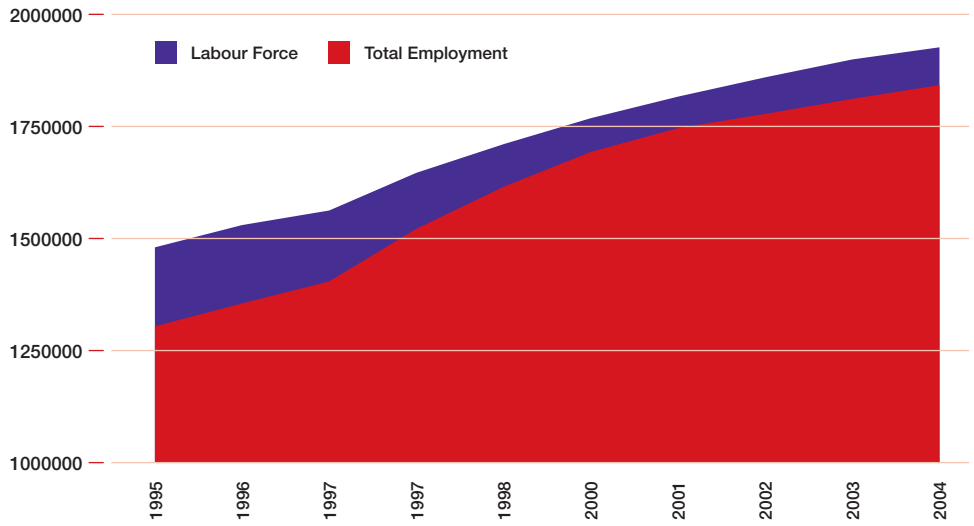
Figure 30: Stock of Foreign Labour Force as a % of Total Labour Force, 2003



OECD Trends in International Migration, 2004

As of 2003, the percentage of foreign workers in the labour force was higher in Ireland than in France, the UK and the Netherlands. This figure is heavily influenced by recent rather than historic migration patterns.

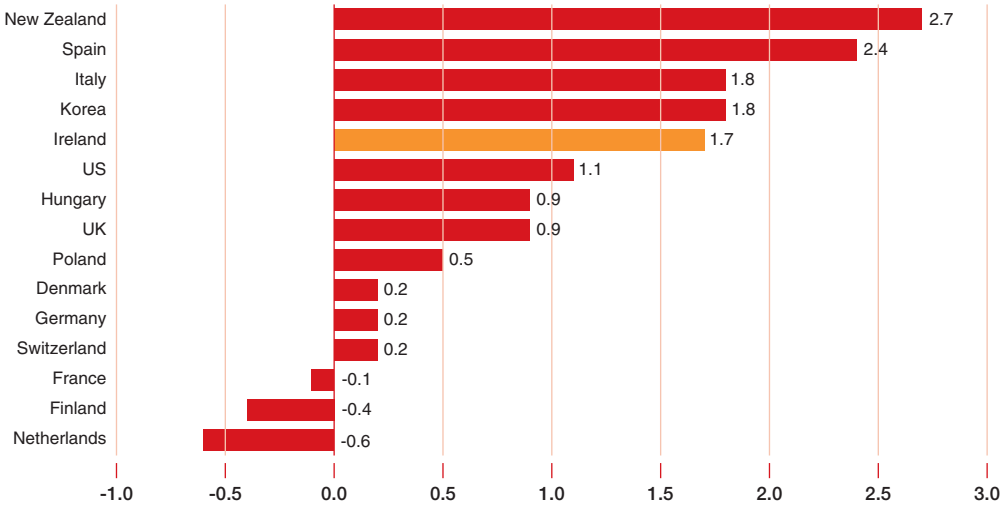
Figure 31: Total Employment and Labour Force in Ireland, 1995-2004



Central Statistics Office

There has been a substantial increase in employment in Ireland over the last decade. The number of persons employed in Ireland increased from 1.3 million in 1995 to 1.9 million in February 2005.

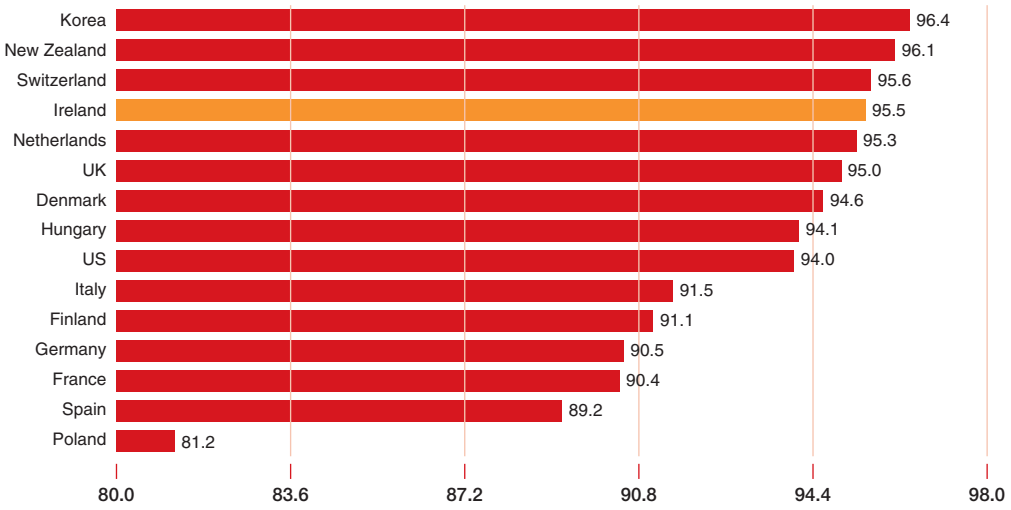
Figure 32: Employment Growth, 2004



OECD Economic Outlook / Ecowin

Employment growth in the Irish economy rose sharply in 2004. New Zealand, Korea and Ireland stand out as countries that experienced high employment growth despite low initial unemployment levels.

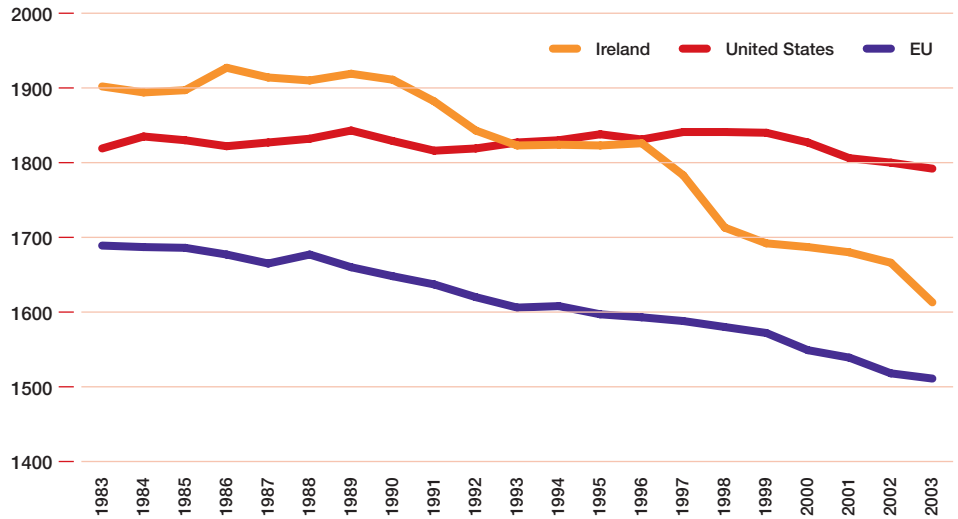
Figure 33: Employment Rates, 2004



OECD Main Economic Indicators, March 2005

As of March 2005, Irish unemployment stood at 4.5 per cent, which is around half the rate in many other European countries.

Figure 34: Average Hours Worked per Person per Year in Employment



OECD Economic Outlook / Ecowin

The average hours worked in Ireland have fallen rapidly over the last decade which to a certain extent could be due to the fall in the number of farmers, who report very high average hours worked.

3.2 Productivity

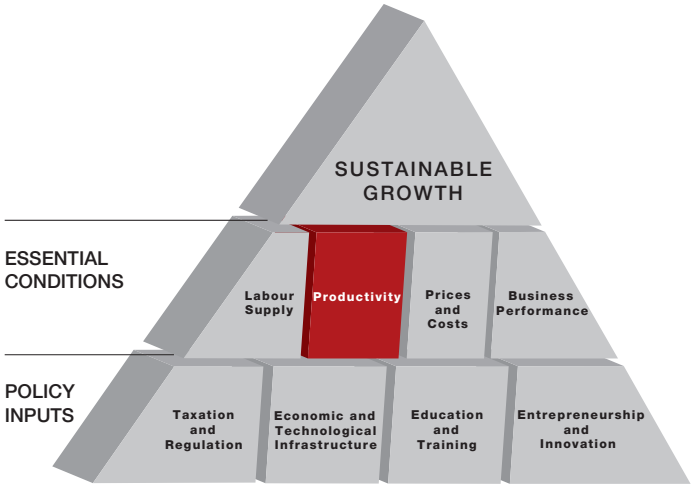
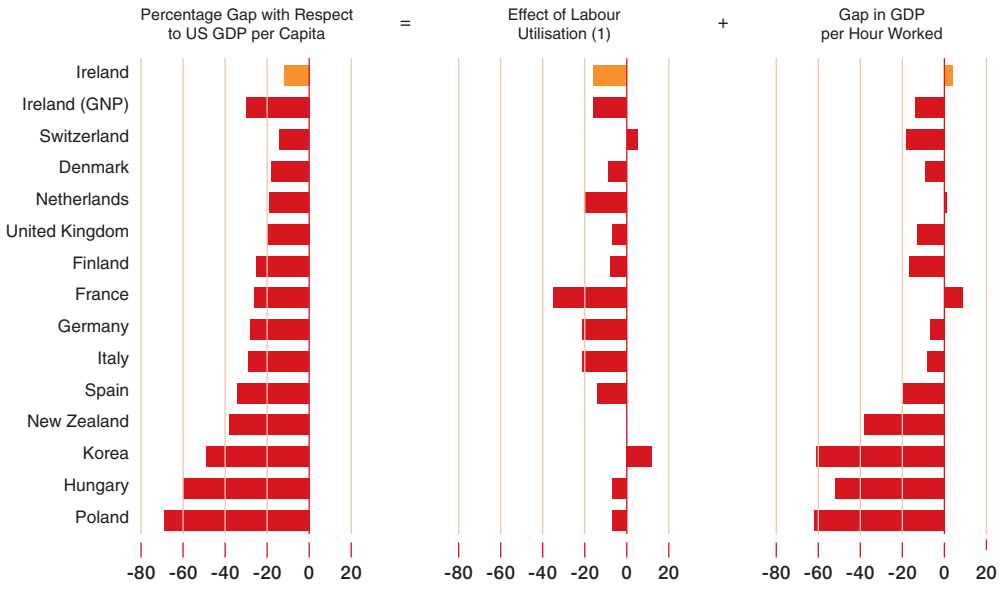


Figure 35: Differentials in GDP per capita and Their Decomposition, 2003

Percentage point differences in PPP-based GDP per capita with respect to the United States

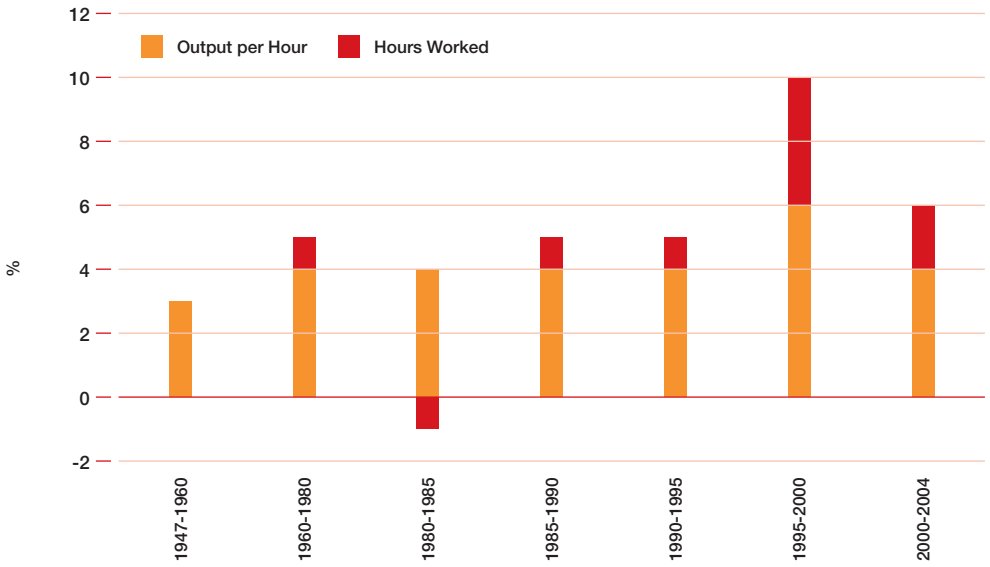


1) Based on total hours worked per capita

OECD Productivity Database

In 2003 people employed in Ireland produced 14 per cent less for each hour worked compared with those employed in the USA. This productivity differential accounted for around 46 per cent of the difference between Irish GNP per capita and the US GDP per capita.

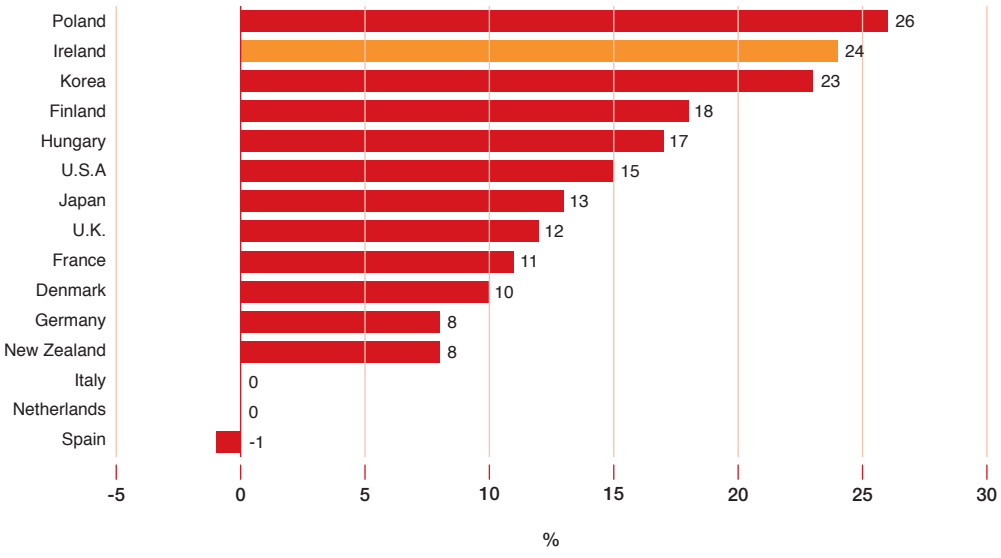
Figure 36: Decomposition of Average Annual Changes in Irish GDP, 1947-2004



OECD / Forfás calculations

Output per hour in Ireland has increased at a very steady rate of around 3.4% per annum since the end of the Second World War. There was a higher level of growth in the 1995-2000 period, which was partially due to the high reported productivity of foreign firms in key sectors of the Irish manufacturing industry.

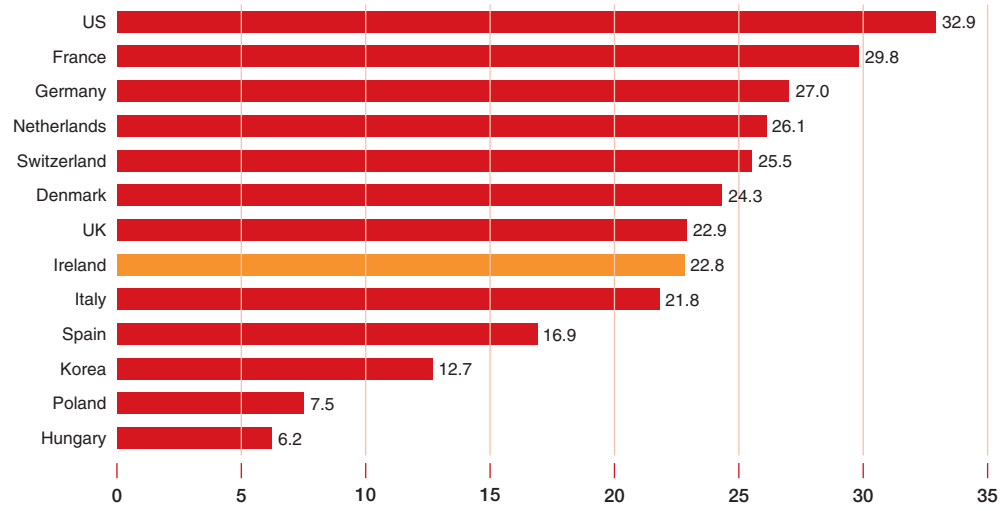
Figure 37: Productivity Growth Rate, 1999-2004



European Commission / Forfás calculations

This graph shows the growth in GDP per hour worked (productivity). The highest growth was observed in Poland, albeit from a lower base, with Ireland in second place. Most continental European countries lag significantly behind in productivity growth.

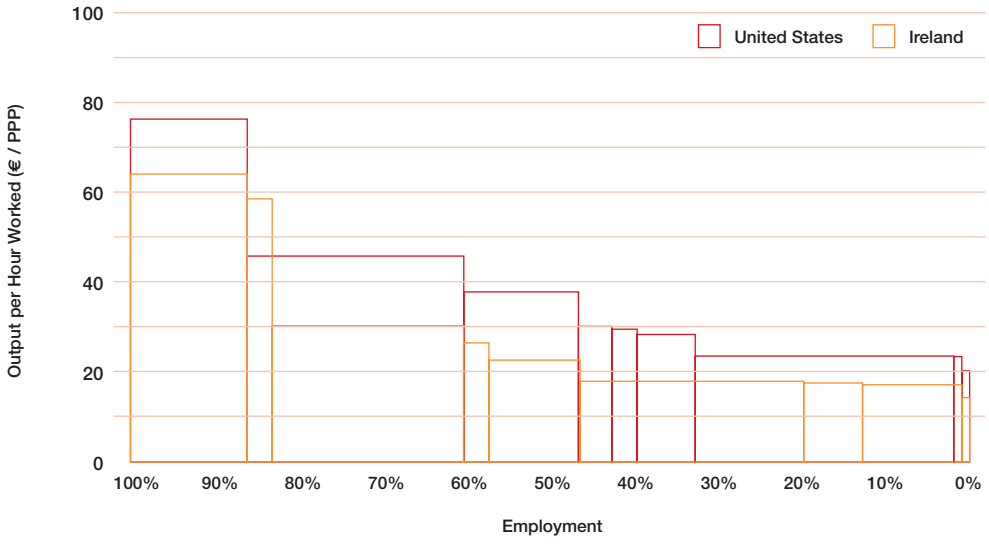
Figure 38: Hourly Productivity based on GNP (€), 2003



National Accounts / Forfás derived

Notwithstanding Ireland's strong productivity growth in recent years, hourly productivity figures based on GNP (which remove repatriated profits) show that Ireland's productivity performance remains significantly lower than the USA.

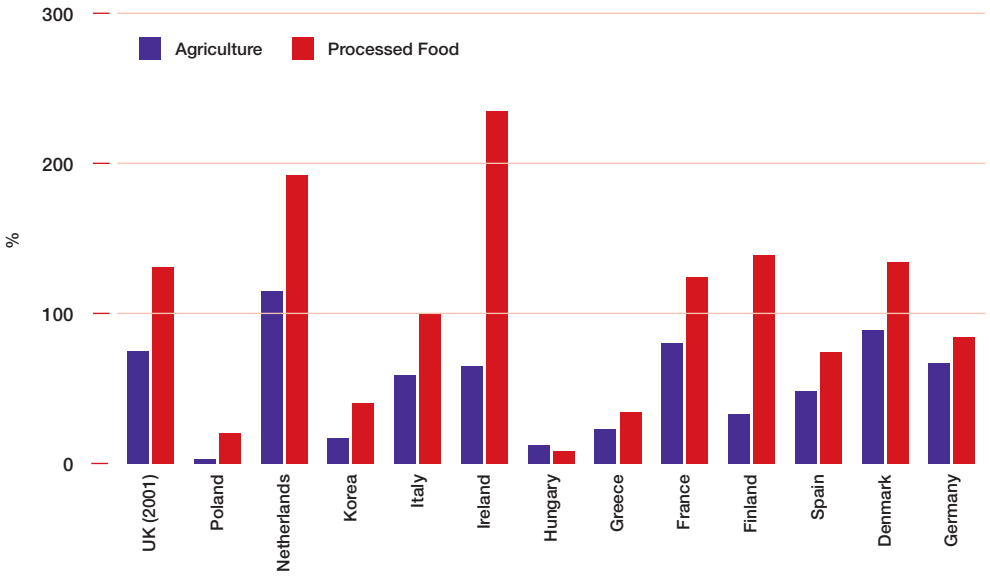
Figure 39: Productivity Step Diagram, Ireland and the US (Based on 2002 Data)



European Commission / Forfás derived

This graph shows the output per hour worked (productivity) across the Irish and US economies. For each industry, the height of the box shows that industry's hourly productivity in Euro, which can be read off the vertical axis. The length of each box shows the employment in that industry, and can be read off the horizontal axis. What is clear from the graph above is that the US productivity slope is both higher and a lot flatter than that of Ireland. This indicates that the USA has higher productivity than Ireland as a result of consistently high productivity across a spectrum of industries which account for a large proportion of aggregate employment. Ireland's high productivity in manufacturing is in contrast to the relatively low productivity in many services, particularly non-tradable services.

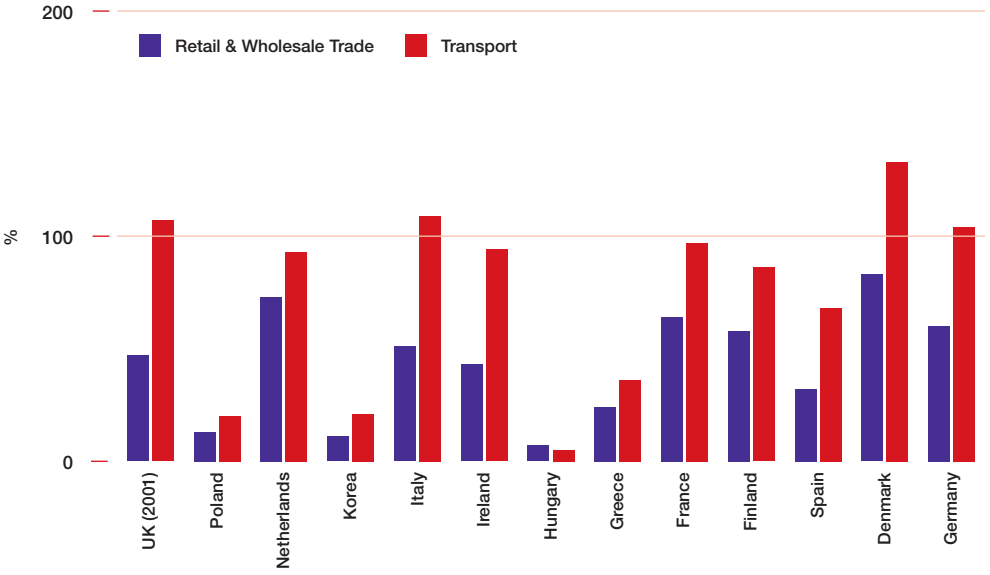
Figure 40: Food Industry Productivity, 2002 (US=100%)



European Commission / Forfás calculations

This graph shows the hourly output per worker for thirteen countries compared with the U.S. level for two sectors – primary agriculture and processed food. Ireland's performance in processed food may relate to the inclusion of the drinks industry where foreign firms report very high levels of productivity.

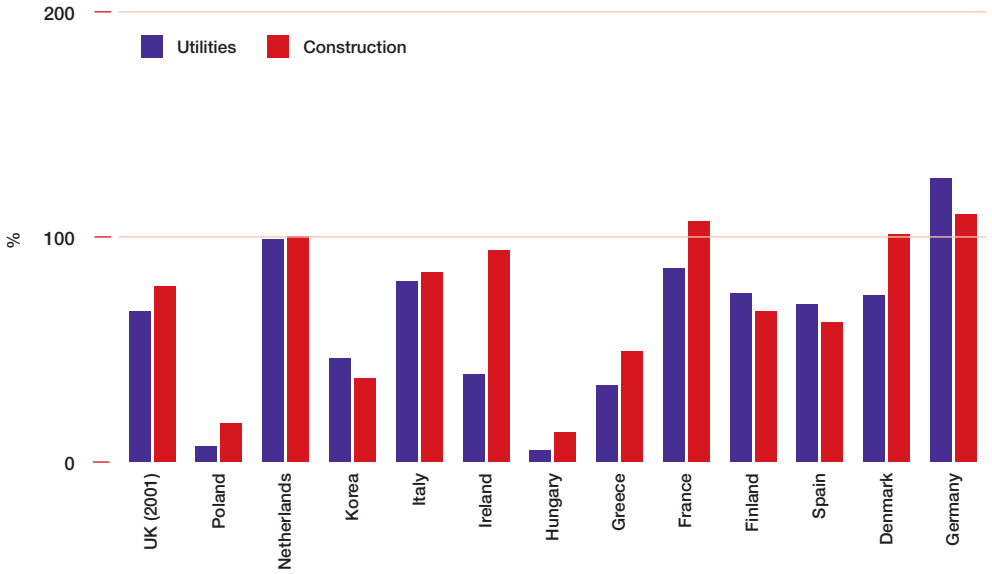
Figure 41: Transport, Retail and Wholesale Productivity (US=100%)



European Commission / Forfás calculations

This graph shows the hourly output per worker for thirteen countries compared with the U.S. level for two sectors – the retail and wholesale sector, and transport (which incorporates freight and people, etc). The productivity of Irish retail and wholesale trade sector is less than half of that of the US.

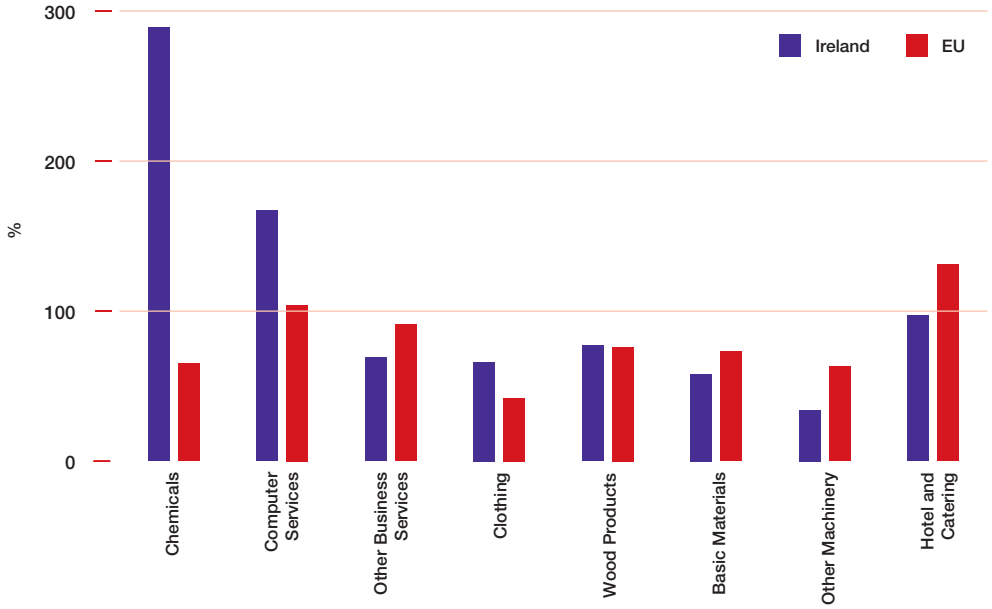
Figure 42: Fixed Infrastructure Productivity, 2002 (US=100%)



European Commission / Forfás calculations

This graph shows the hourly output per worker for thirteen countries compared with the U.S. level for two sectors – the utilities sector (e.g. electricity, gas, water and communications) and construction. Irish productivity in the provision of utilities is substantially below that of the US and our European peers, while construction productivity also falls short of average international levels, though only marginally.

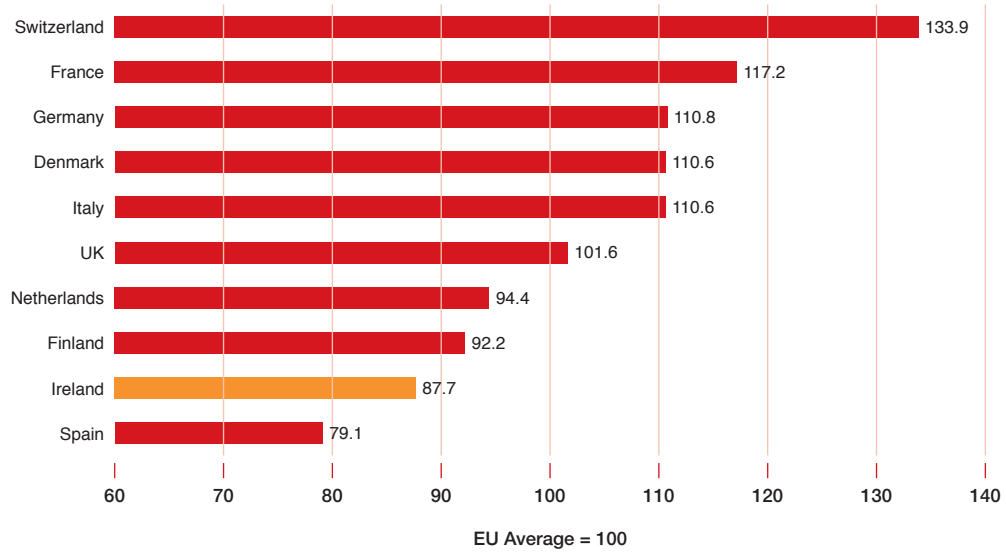
Figure 43: General Manufacturing Productivity, 2002 (US=100%)



European Commission / Forfás calculations

This graph shows the hourly output per worker across a range of manufacturing sectors. The first two industries listed; chemicals and computer services are heavily dominated by multi-national enterprises in Ireland, with the result that recorded productivity is a large multiple of both the U.S. and particularly the EU level.

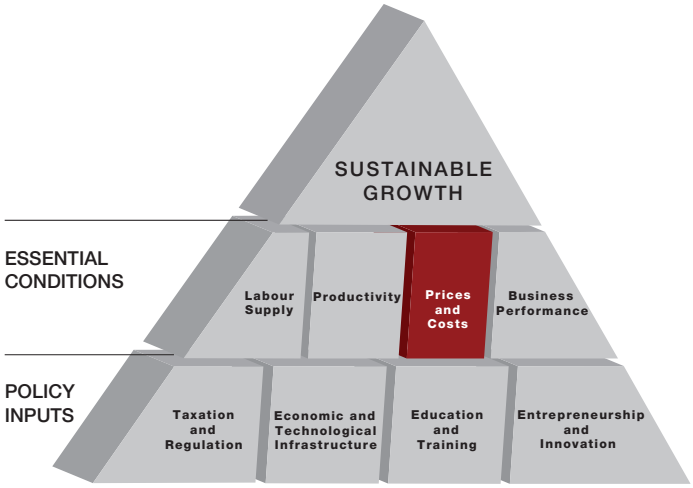
Figure 44: Index of Private Service Sector Productivity, 2003



European Competitiveness Index, 2004

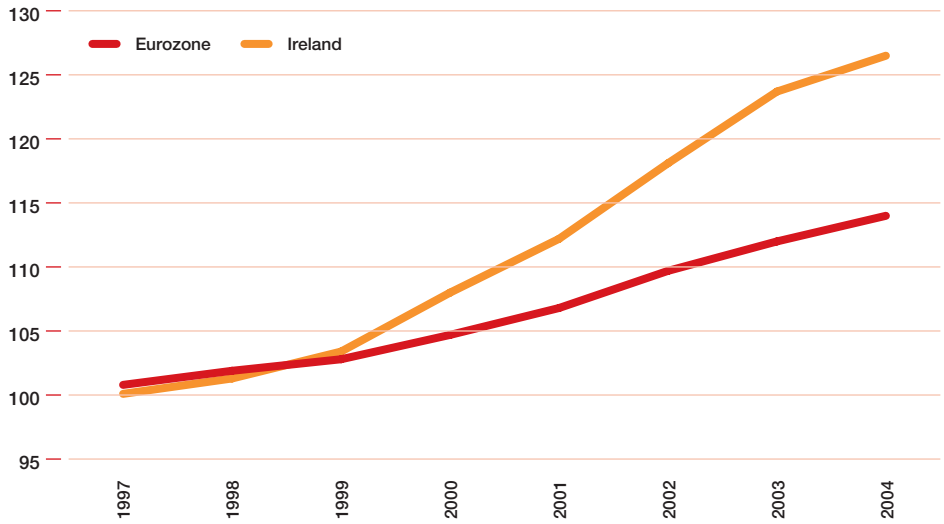
According to the European Competitiveness Index, Irish private sector services productivity ranks second last out of ten European countries. Evidence from the European Central Bank suggests that Irish public sector productivity also performs relatively poorly (based on the productivity performance in administration, education, health and infrastructure).

3.3 Prices and Costs



3.3.1 Prices

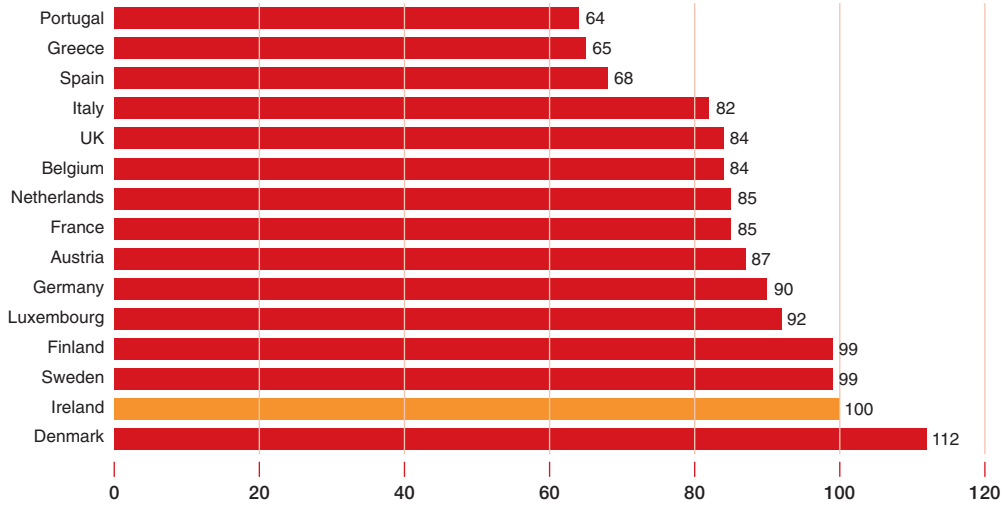
Figure 45: Harmonised Index of Consumer Prices, 1997-2004 (1996=100)



Eurostat

Following a sustained period of low inflation for most of the 1990s, Ireland's inflation rate accelerated and has exceeded the eurozone average for the past seven years, mainly driven by prices increases in the non-traded services sector. The rate of inflation had converged with the eurozone average by early 2005.

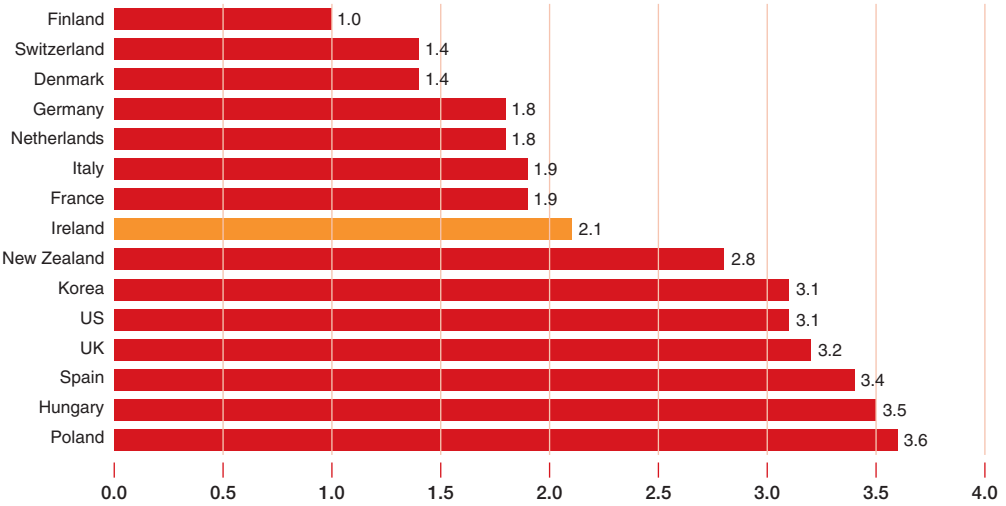
Figure 46: Comparative Private Consumption Price Levels – EU 15, 2003 (Ireland=100)



Eurostat

The latest internationally comparable data shows that as of 2003, Ireland was the most expensive country in the eurozone and the 2nd most expensive behind Denmark in the EU 15.

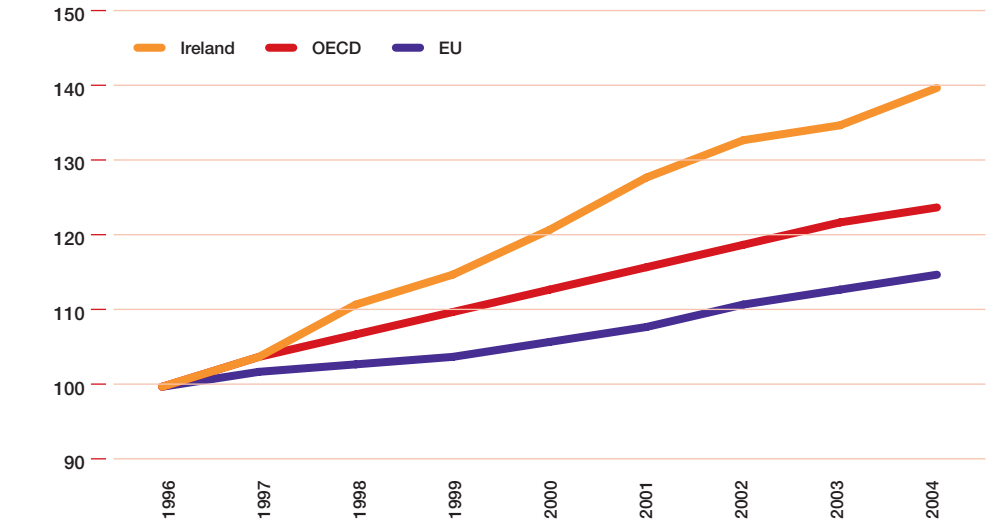
Figure 47: Growth in Consumer Prices (12 Month Rate of Change to March 2005)



OECD Main Economic Indicators, 2005

Over the last 12 months to March 2005, inflation rate converged towards the EU average of 2 per cent. This can be partially explained by the depreciation of the dollar which has resulted in lower imported inflation.

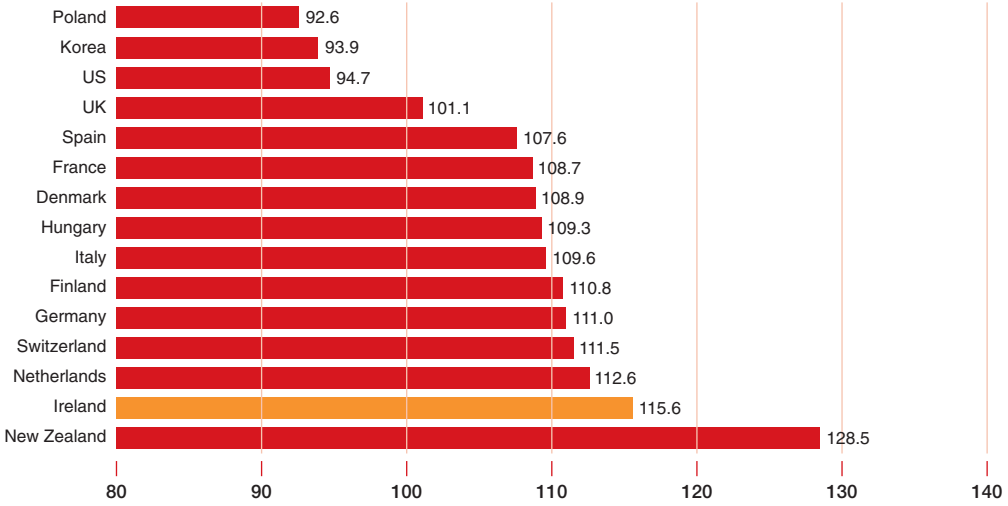
Figure 48: GDP Deflator (1996=100)



OECD Economic Outlook / Ecowin

The GDP deflator measures changes in the average price of an economy's output. This is a broader measure than the consumer price index and covers goods and services sold to businesses as well as households. Economy-wide price levels have increased at a higher rate in Ireland than in both the EU and the OECD since 1997.

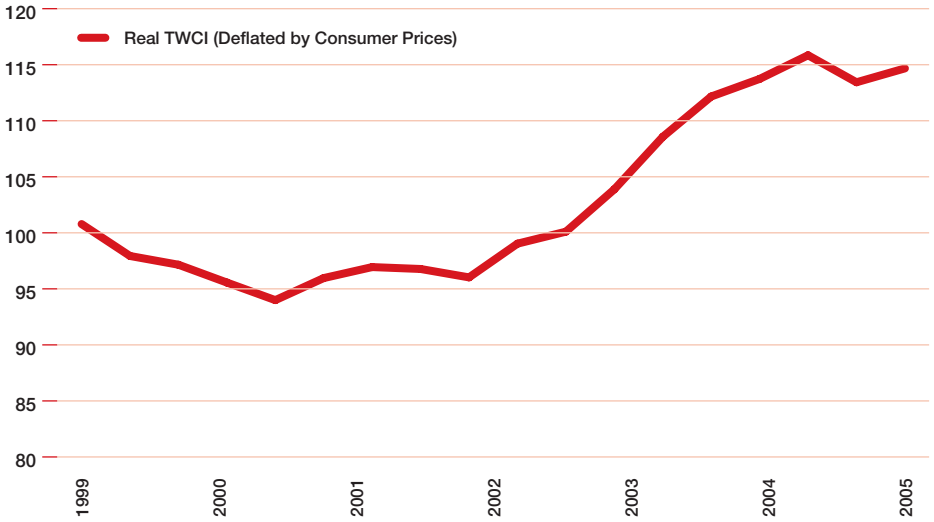
Figure 49: Trade Weighted Exchange Rate, 2004 (2000=100)



OECD Economic Outlook / Ecowin

Ireland's trade weighted exchange rate has appreciated by over 15 per cent since 2000, making Irish produce more expensive on international markets. Ireland is most exposed within the EU to trade with countries that have currencies linked with the US dollar.

Figure 50: Real Trade Weighted Competitiveness Index, 1999-2005 (1999 Q1=100)

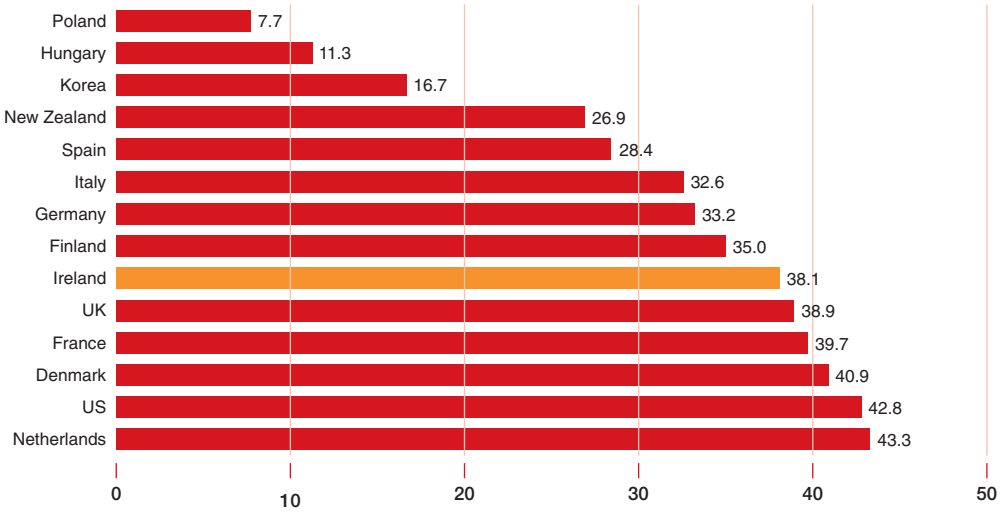


Central Bank of Ireland

The combination of changes in price differences and movements in effective exchange rates is reflected in the real trade weighted competitiveness index. The movement upward of this index indicates a loss of competitiveness for Irish firms.

3.3.2 Pay Costs

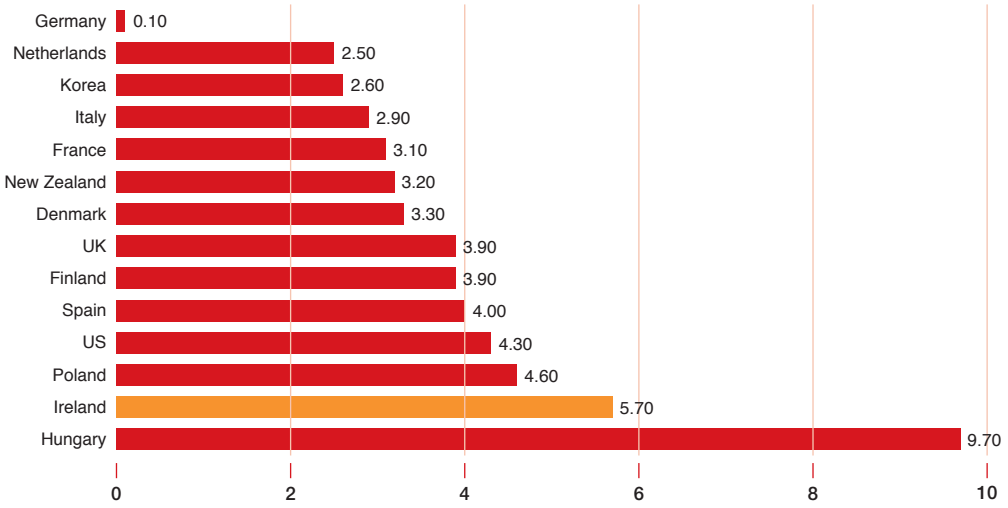
Figure 51: Total Cost Per Employee (€ '000 per annum), 2004



European Commission AMECO Database

Total cost per employee is defined as total remuneration in cash or in kind payable by the employer to an employee and includes taxes and social security contributions. Annual average employee costs in Ireland in 2004 was €38,100 per employee.

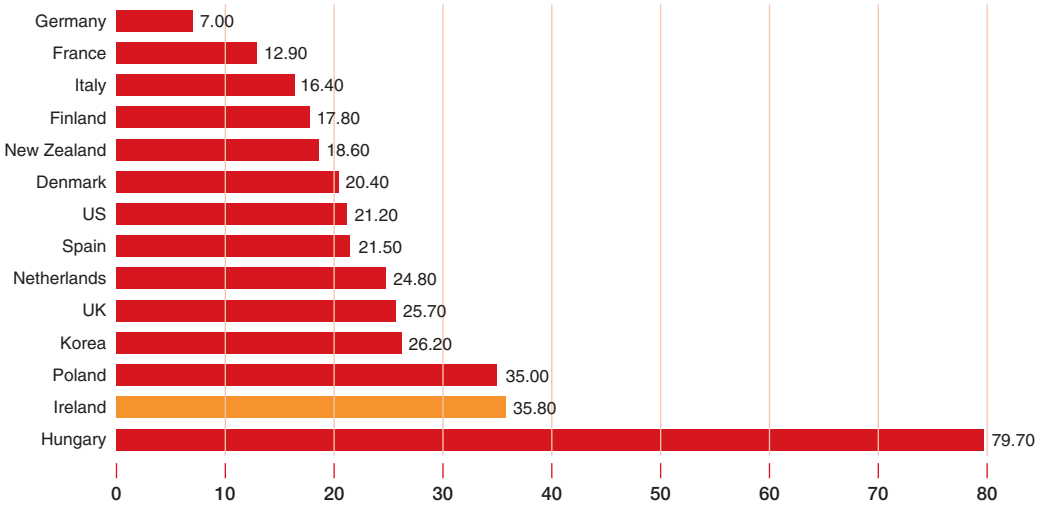
Figure 52: Growth in Total Cost per Employee (%), 2004



European Commission AMECO Database

In 2004, after Hungary, Ireland has experienced the highest increase in total cost per employee among the countries benchmarked.

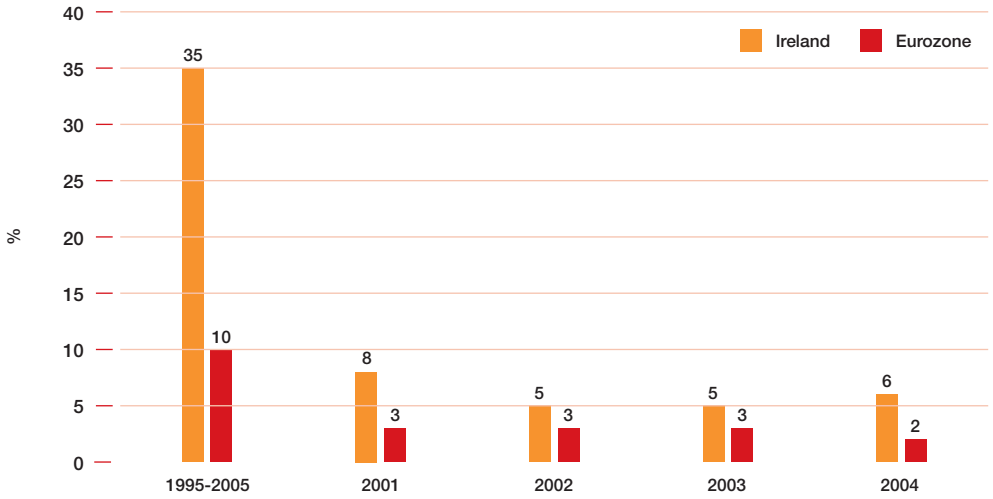
Figure 53: Growth in Total Cost per Employee (%), 1999-2004



European Commission AMECO Database

The increase in total cost per employee during 2004 reflects the trend that has been observed between 1999 and 2004.

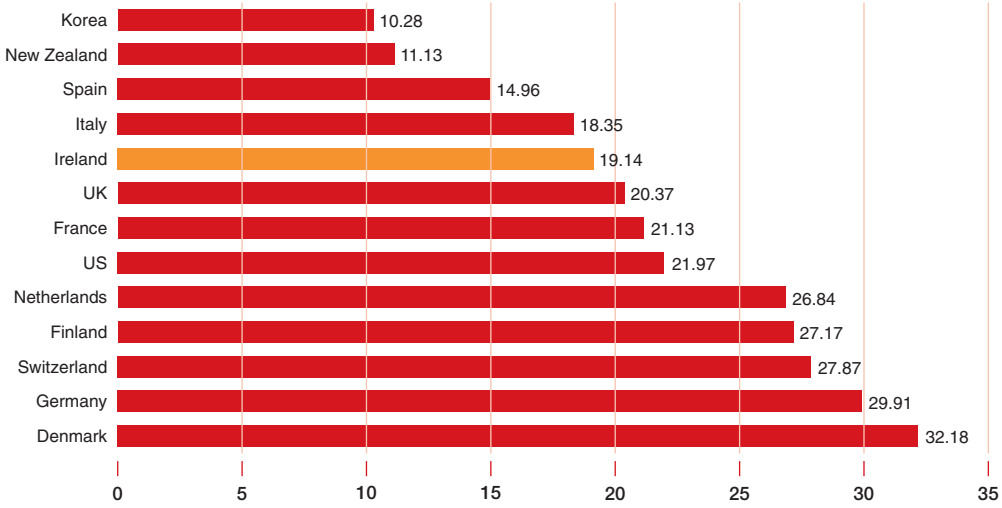
Figure 54: Change in Total Cost per Employee in Ireland and the Eurozone (%)



European Commission AMECO Database

A comparison of the percentage change in total cost per employee in Ireland and the eurozone shows that Ireland has experienced much higher growth in total cost per employee against the eurozone average since 1995, albeit from a lower base.

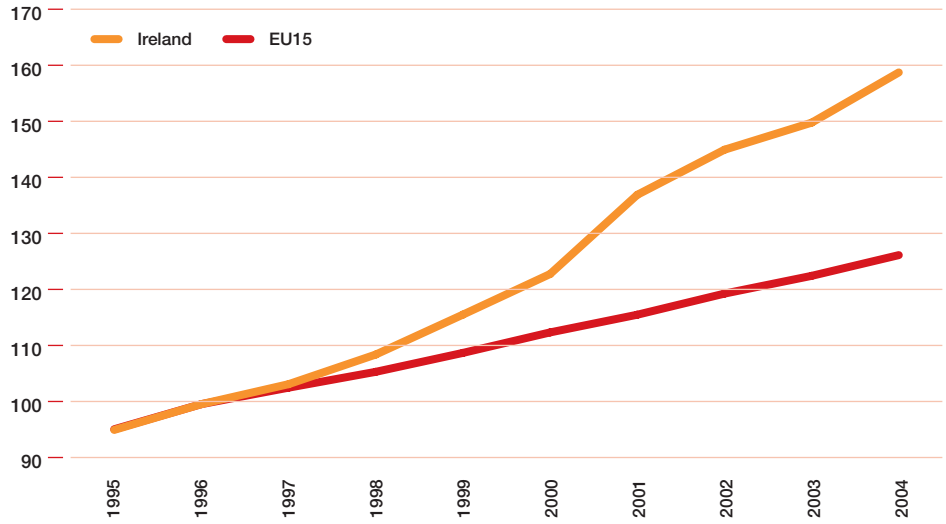
Figure 55: Hourly Compensation Costs for Production Workers in Manufacturing (US $), 2003



US Bureau of Labour Statistics

Hourly compensation costs include hourly direct pay and employer social insurance expenditures as well as other labour taxes.

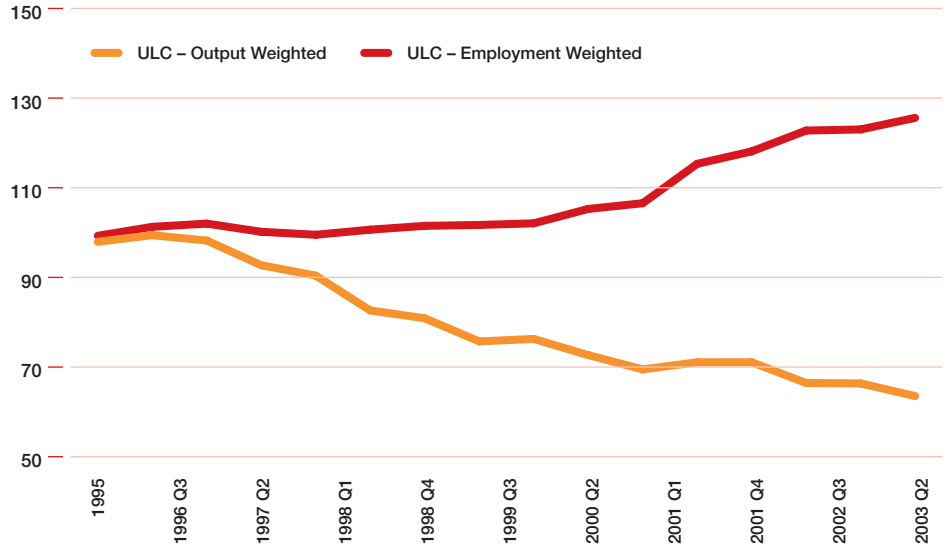
Figure 56: Irish and EU 15 Average Hourly Manufacturing Wage Indices, 1995 (Q3=100)



OECD Main Economic Indicators

Average hourly manufacturing wages have risen by around 25 per cent more in Ireland than in the EU 15 since 1995, albeit from a lower base.

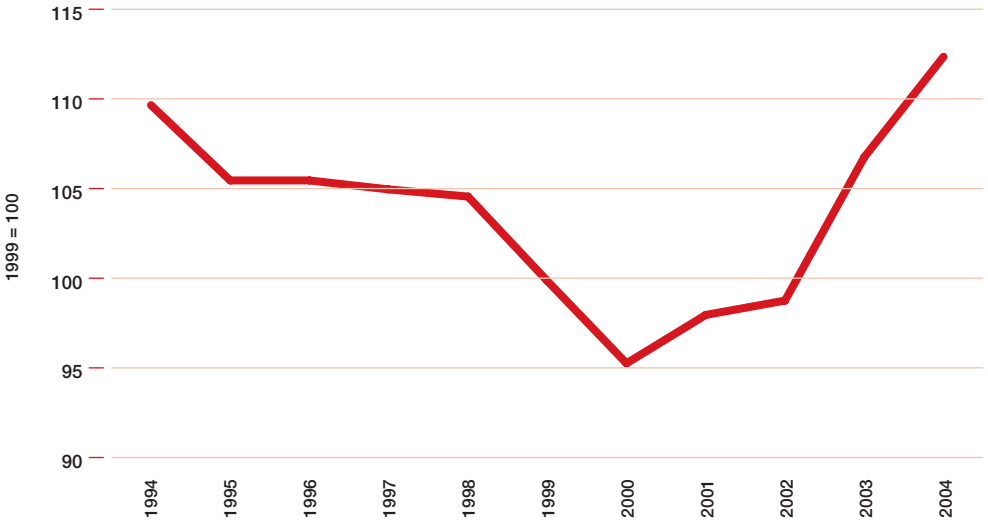
Figure 57: Unit Labour Costs in Ireland (1995=100)



CSO / Forfás Calculations

Unit labour costs (ULC) measure the cost of the labour input required to produce one unit of a good and combines developments in labour costs and productivity in a single measure. The economy wide unit labour cost index has decreased by around a third over the last decade, based on strong productivity growth in a limited number of sectors. Weighting ULCs by employment rather than output reduces the impact of high recorded productivity levels in FDI dominated sectors that are less employment intensive.

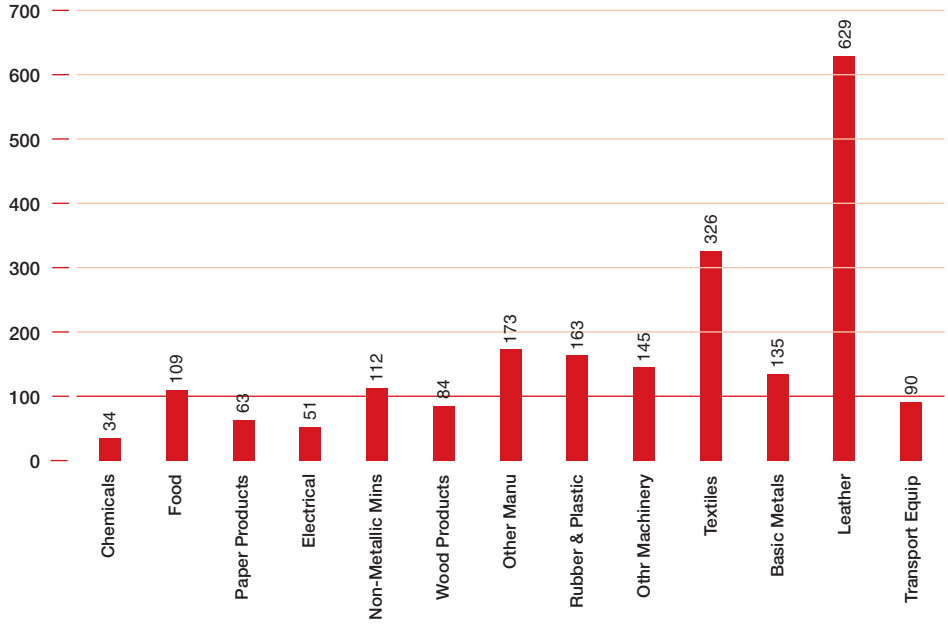
Figure 58: Real Effective Exchange Rates, Based on ULCs in Total Economy, 1994-2004



European Commission Ameco Database

This graph shows the evolution of Ireland's trade weighted competitiveness index and combines developments in ULCs and exchange rates. Based on this indicator, Ireland was at its most competitive in 2000.

Figure 59: Index of Unit Labour Costs by Manufacturing Sector, 2004 (1995=100)

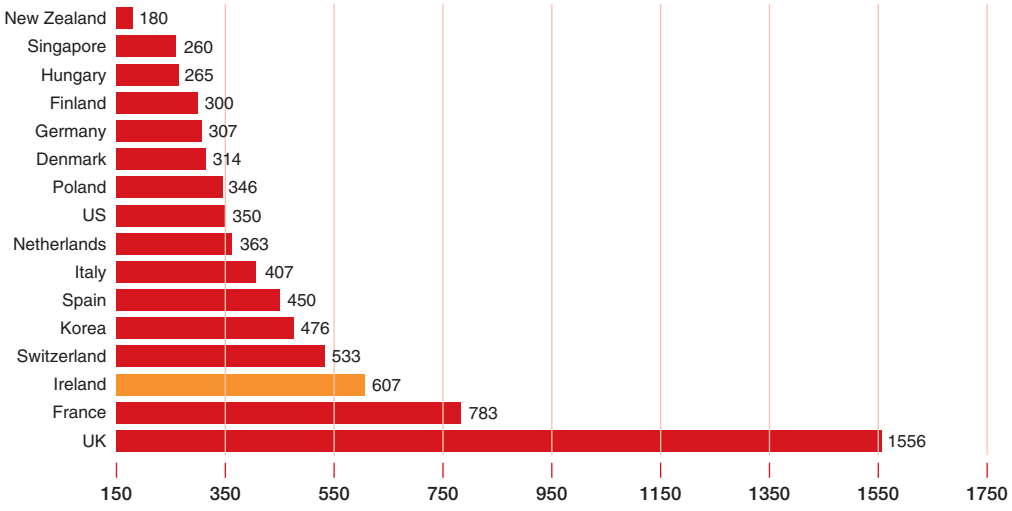


CSO / Forfás Calculations

This chart indicates that changes in ULCs between 1995 and 2004 differ significantly by sector. A range of 'traditional sectors' face much higher unit labour costs.

3.3.3 Non-Pay Costs

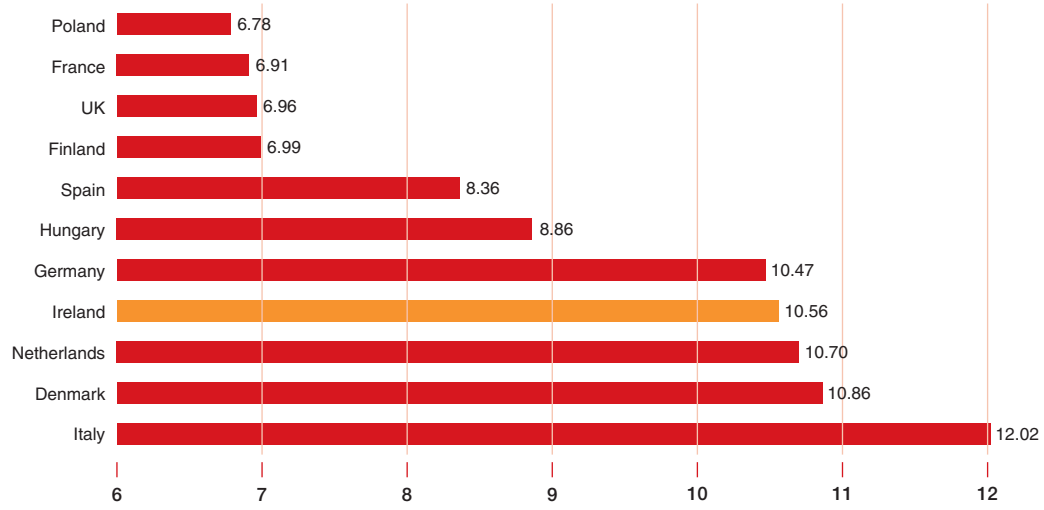
Figure 60: Office Rents: Total Occupation Costs in Capital Cities (€ per Sq Metre per Year), 2004



CBRE, Global Market Rents, 2005

This indicator measures the average rent of a 1,000 square metre unit in a building in a prime location in a capital city. Among the 16 cities included in this report, only two (London and Paris) were found to be more expensive than Dublin.

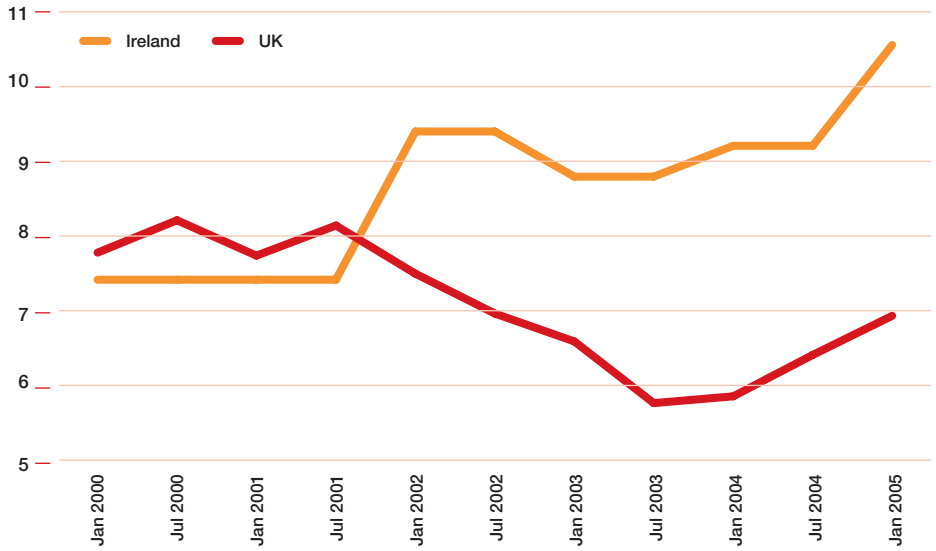
Figure 61: Industrial Electricity Prices, Jan 2005 (€ per 100 KWh – 10 GWh with Taxes and VAT)



Eurostat

Key sectors of the Irish economy such as pharmaceuticals and chemicals rely heavily on reliable, secure and competitively priced energy supply.

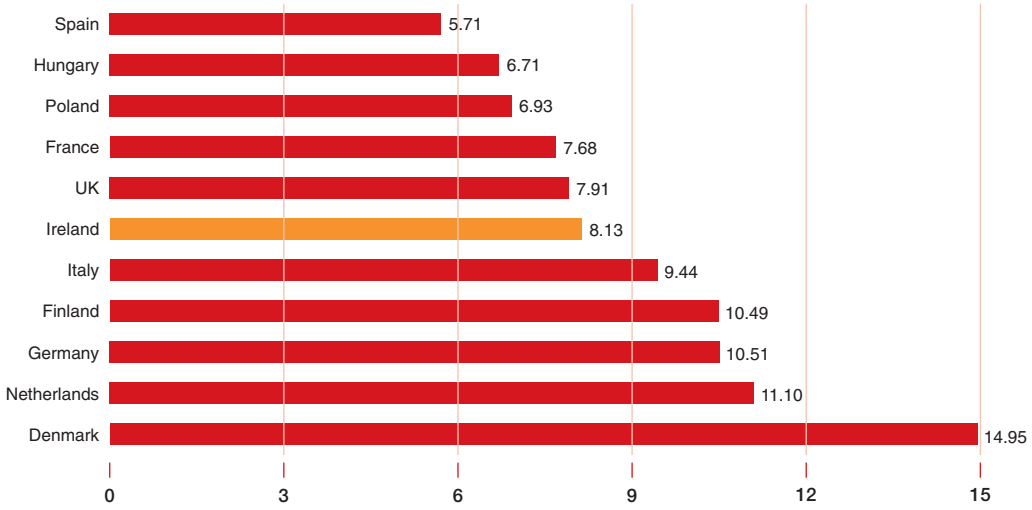
Figure 62: Electricity Prices (€ per 100 KWh) for Industrial Users in Ireland and the UK, 1995-2005



Eurostat

Electricity costs for Irish firms have escalated by almost 42 per cent between July 2000 and January 2005. The latest published tariff figures show that the price of electricity is around 51 per cent higher in Ireland than in the UK. The UK is among the lowest in the benchmarking group due to overcapacity in the market.

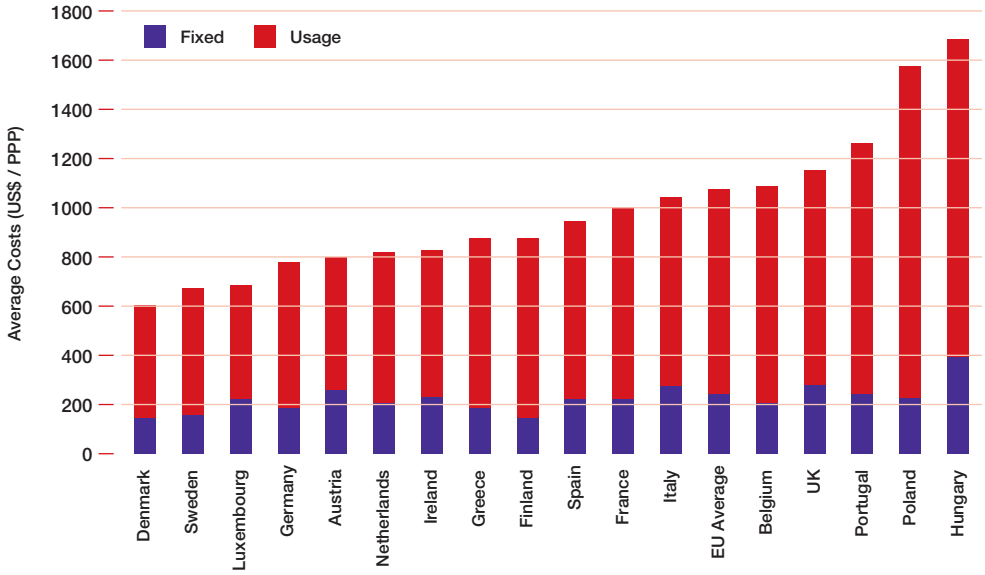
Figure 63: Industrial Gas Prices, Jan 2005 (€ per GJ – 4186 GJ per Annum with Taxes and VAT)



Eurostat

Gas prices for low volume industrial users (4,186 GJ) remained very stable until the second half of 2003. Between 2003 and 2005 prices for low volume users increased by over 25 per cent. For higher volume users (41,860 GJ) prices have nearly doubled since 1998.

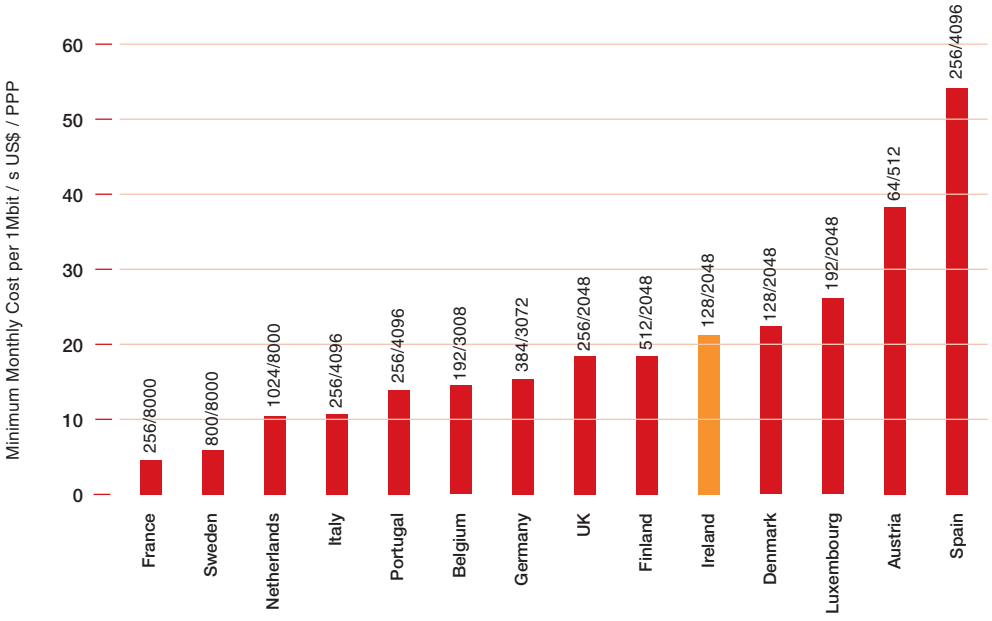
Figure 64: Telephone Costs, VAT Excluded – June 2005



ComReg, Key Data for Irish Communications Market, June 2005

Telephone costs are measured based on the cost of a basket of national calls (excluding calls to mobiles) using data from ComReg. The graph presents data for both fixed costs and usage costs. Ireland has traditionally ranked quite favourably in terms of telephone costs.

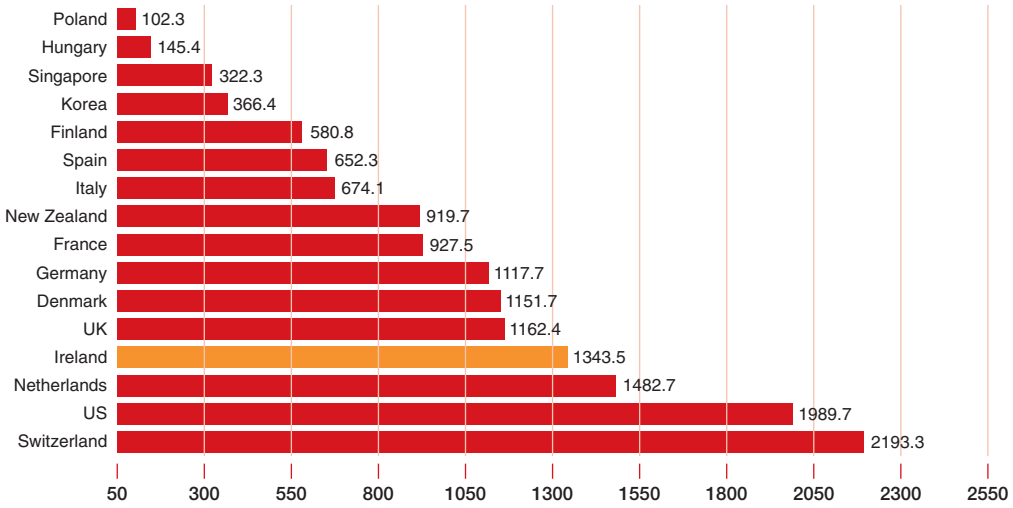
Figure 65: ASDL Lowest Monthly Rental, Normalised Results (VAT Incl.) – June 2005



ComReg, Key Data for Irish Communications Market, June 2005

ADSL is the dominant infrastructure for accessing broadband internet access in Ireland, and accounts for around 85% of all such connections. The graph shows the cheapest offering in each country with figures in boxes representing the upload/download speed, in kb per second, of the service offered.

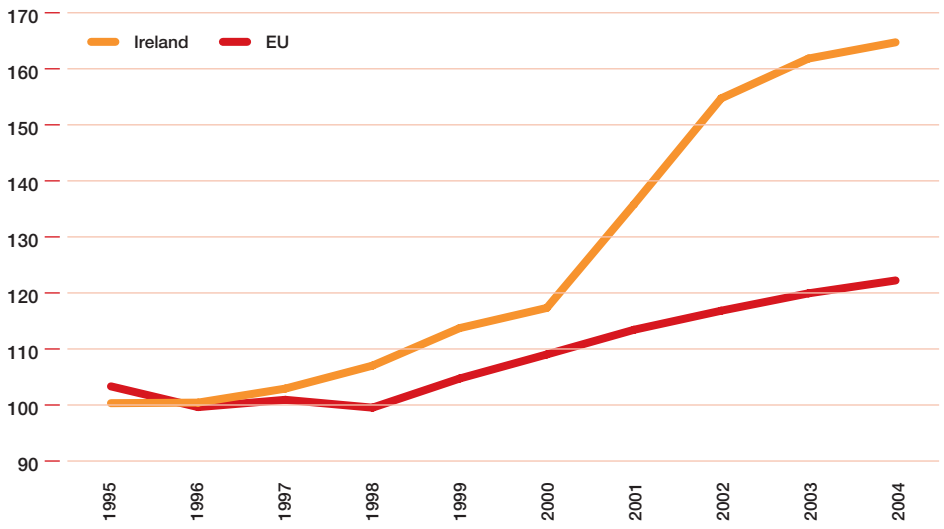
Figure 66: Non-Life Insurance Premiums (Total Business) per Capita US$, 2003



Swiss Re: Sigma No. 3 / 2004 World Insurance in 2003

Irish expenditure on non-life insurance was the 4th highest among the countries surveyed. Between 1998 and 2002 Ireland, after Poland, experienced the largest increases in premiums per capita.

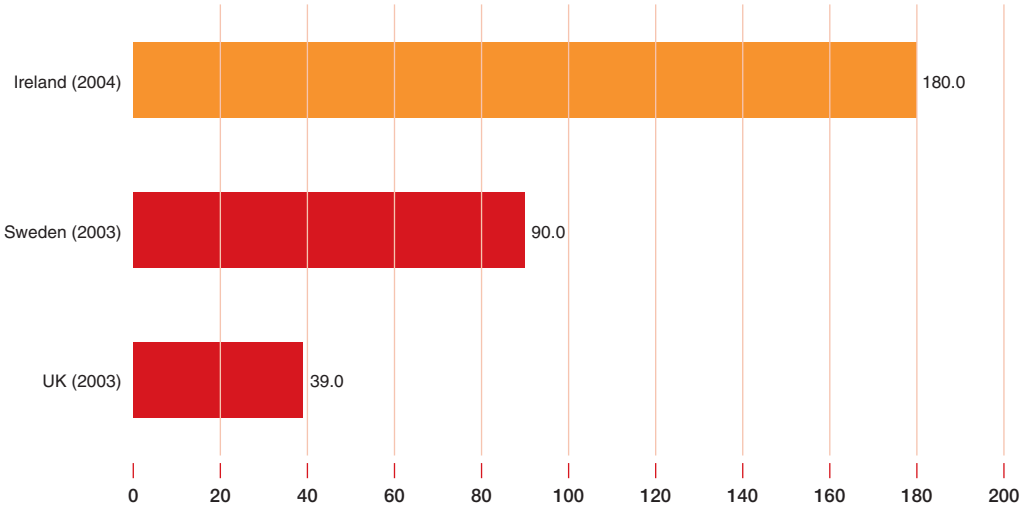
Figure 67: Insurance Price Index, 1995-2004



Economist Intelligence Unit

A comparison of the average insurance price index, which includes various types of insurance, in Ireland and the EU show that since 1995 insurance costs have risen by over 60 per cent in Ireland, whereas during the same period costs increased by just over 20 per cent in the EU. However, the Irish rate of growth has slowed down substantially in recent years.

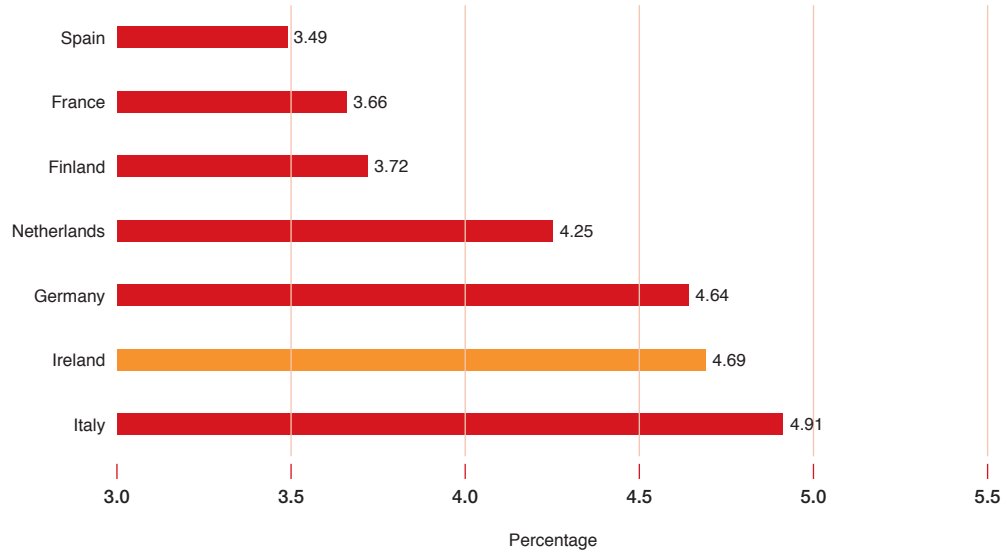
Figure 68: Land-fill Costs Including Tax (€/Tonne), Latest Data



IBEC

The average cost of landfill disposal has increased significantly in recent years. The total cost of waste disposal for business in Ireland has risen from €32 million in 1995 to over €800 million in 2004.

Figure 69: Lending Rates to Corporations, 2004



IMF, International Financial Statistics

In terms of lending rates to corporations, Ireland has one of the highest interest rates among the eurozone countries benchmarked.

3.4 Business Performance

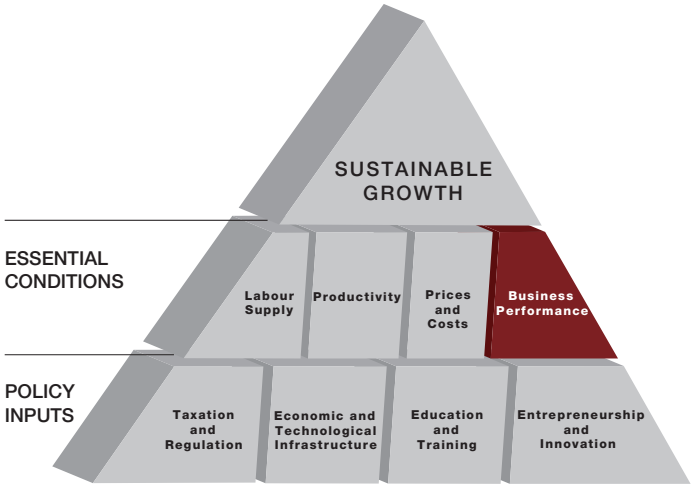
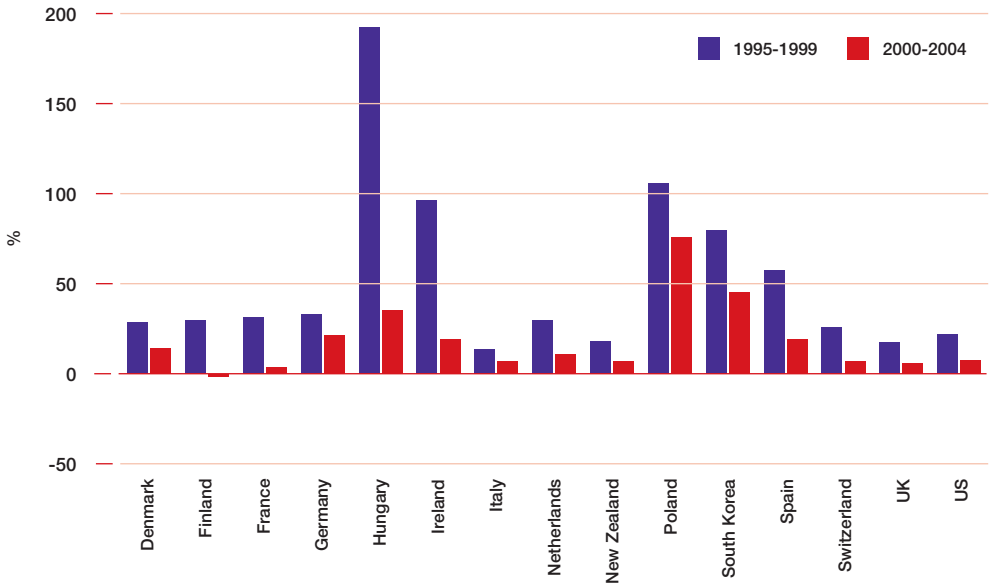


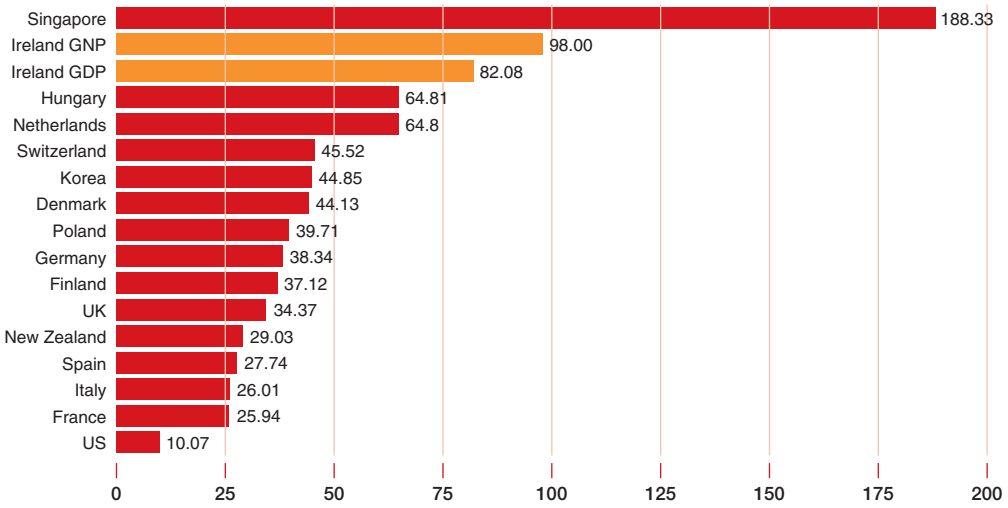
Figure 70: Percentage Growth in Exports of Goods and Services



OECD / Ecowin

The growth in the exports of goods and services was particularly high during the 1995 to 1999 period. However, growth was significantly lower for all countries during the latter period (2000-2004), following the global economic slowdown in 2001.

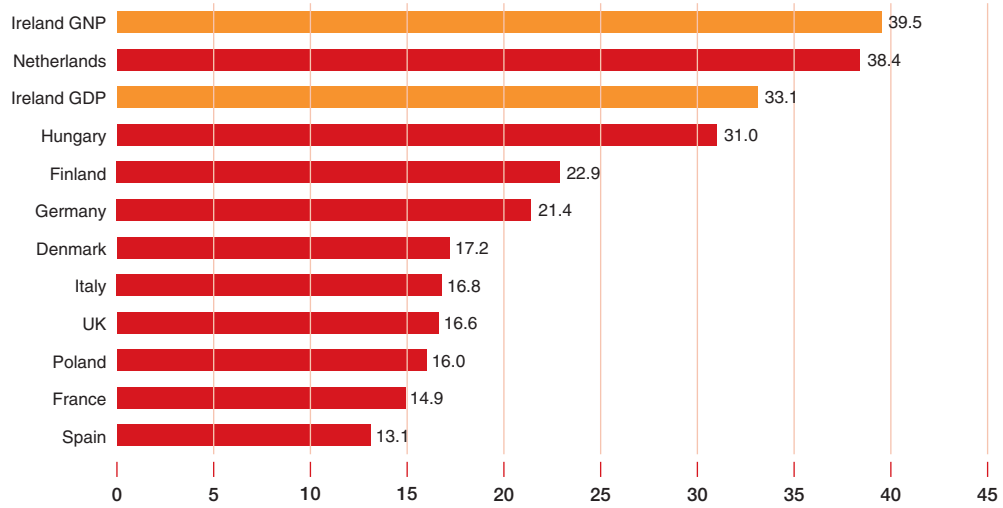
Figure 71: Exports of Goods and Services (% of GDP), 2004



OECD Economic Outlook / Ecowin / Forfás calculations

Ireland is one of the most open economies in the world in terms of trade in goods and services. This indicator is sensitive to country size, given that small countries tend to rely more on the export of goods and services.

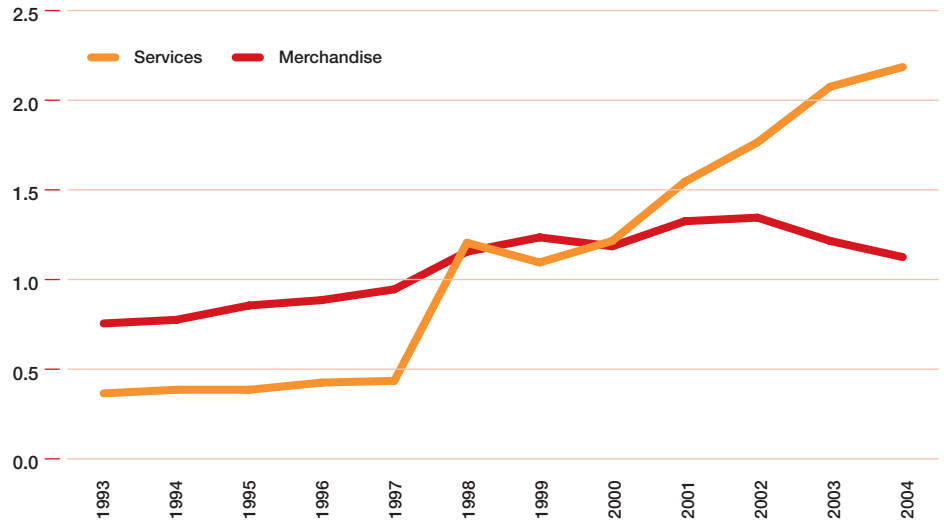
Figure 72: Extra EU Exports + Imports (% of GDP), 2004



Eurostat Structural Indicators

Trade within countries accounts for a greater proportion of trade in larger countries than in smaller economies, which can result in small country bias in aggregate trade statistics. Comparing extra-EU trade (as a proportion of GDP) helps to compensate this bias. When comparing extra-EU trade (as a % of GNP) Ireland has the highest ratio among the EU countries.

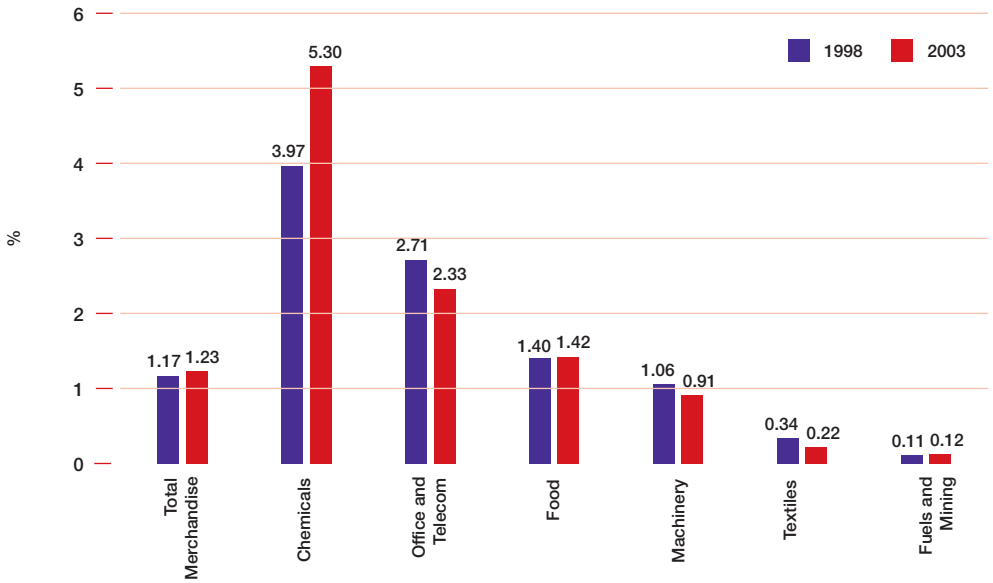
Figure 73: Ireland's Share in World Merchandise and Services Trade, 1993-2004



CSO / World Trade Organisation

Ireland's total share of world merchandise trade increased consistently from the early 1990s, reaching a peak during 2002. Our share of global commercial services exports has showed continuous strong growth.

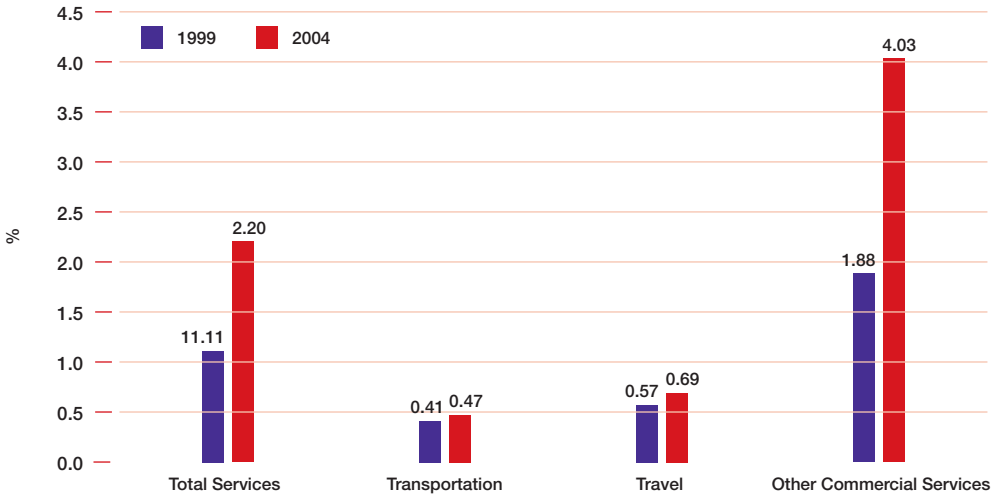
Figure 74: Ireland's World Market Share – Merchandise, 1998-2003



World Trade Organisation

The increase in Ireland's share in world merchandise trade was mainly driven by the chemicals sector.

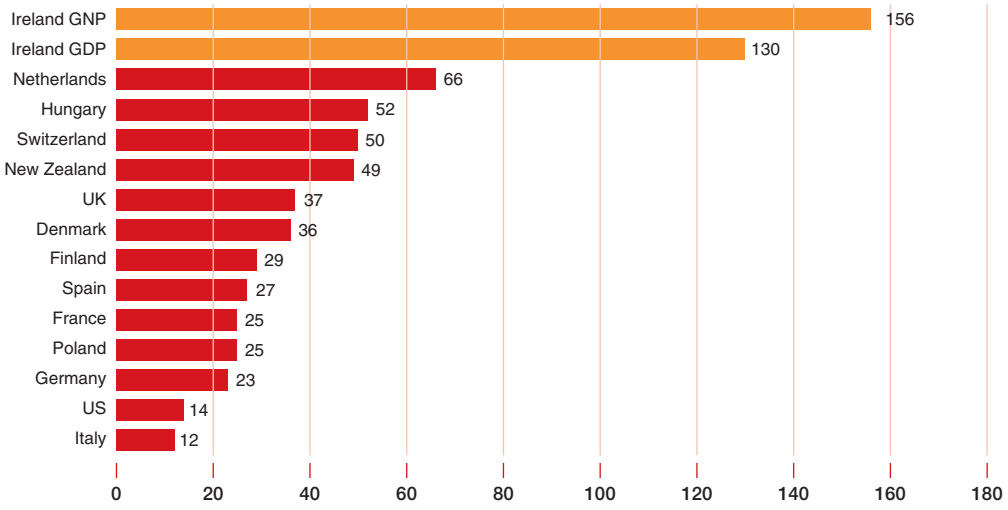
Figure 75: Ireland's World Market Share – Services, 1999 and 2004



World Trade Organisation

Ireland has increased its world market share in services. Most of this growth has come from the 'Other Commercial Services' category, communications, construction, financial (including insurance) and computer and information services.

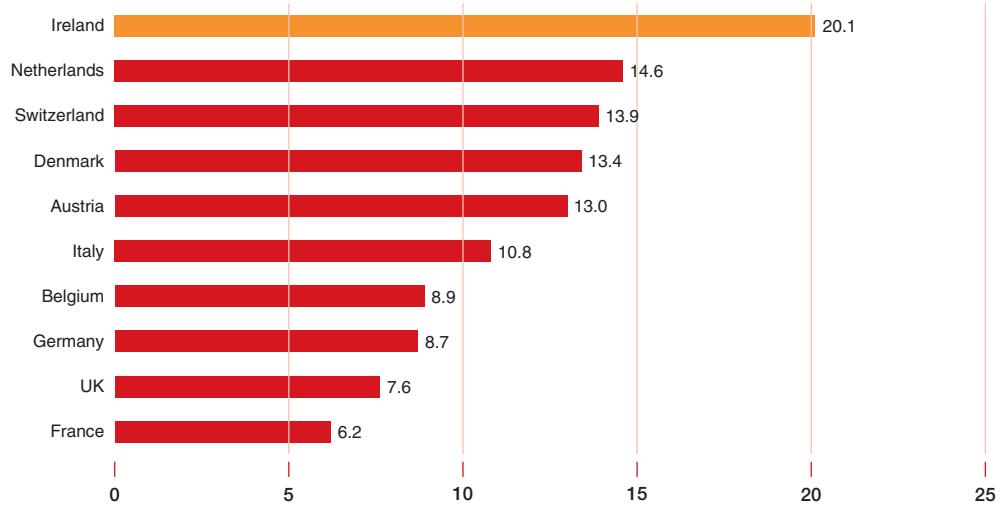
Figure 76: FDI Inward Stock (% of GDP), 2003



UNCTAD FDI Database

The stock of inward FDI as a percentage of GDP in Ireland in 2003 was higher than any other country benchmarked on this measure. The data for Ireland also includes financial flows into IFSC related companies.

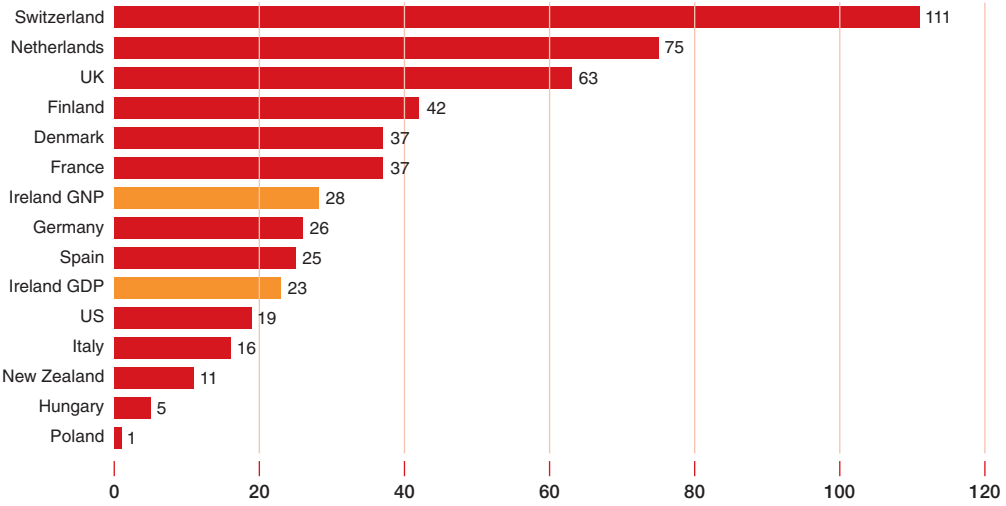
Figure 77: Percentage Rate of Return of US Owned Companies in Foreign Countries, 1995-2002



US Bureau of Economic Analysis, 2003

US companies earn the highest rate of return on their investments in Ireland as compared with other investment locations. In 2003, Ireland accounted for around 6 per cent of all US FDI coming into Europe, up from 4 per cent in 1999.

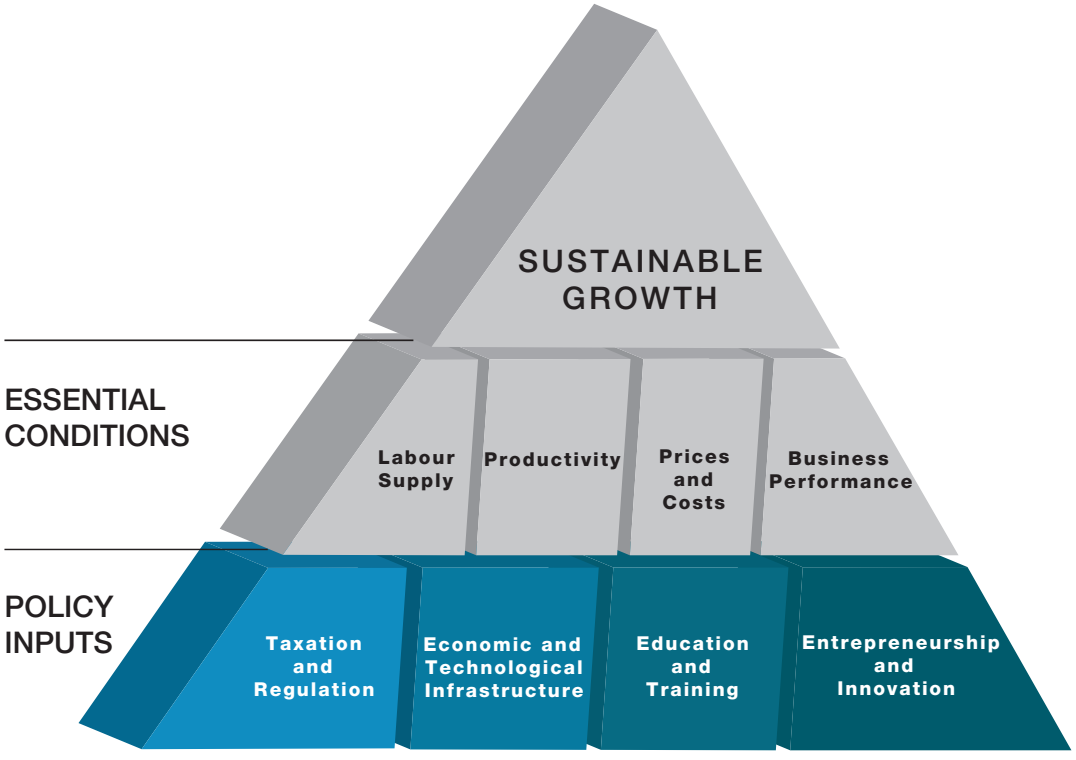
Figure 78: FDI Outward Stock (% of GDP), 2003



UNCTAD FDI Database

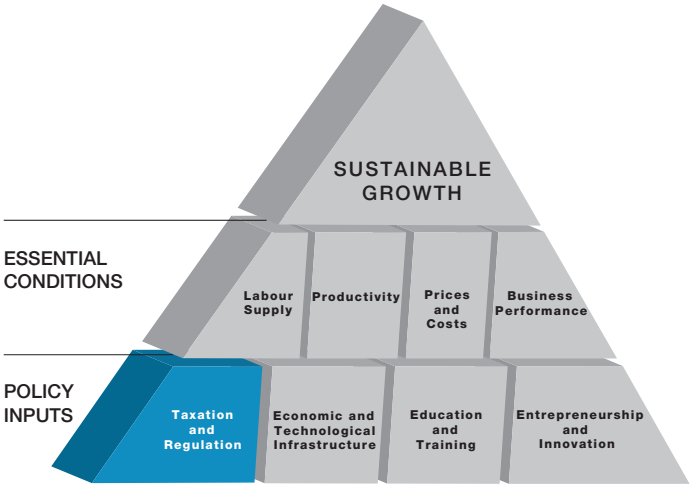
Ireland's success in attracting high levels of inward direct investment over the last decade has been well recognised, but the flow of direct investment has not been in one direction. Outward direct investment has grown substantially in the last few years, albeit from a low base.

4 Policy Inputs



4 Policy Inputs

4.1 Taxation and Regulation



Taxation and the regulation of labour and product markets can have significant impacts on a country's economic performance and competitiveness. In this section, indicators that illustrate Ireland's relative performance on these issues are grouped under the following headings:

4.1.1 Taxation

In addition to supporting broader social goals, taxation is required to finance government expenditure in areas such as infrastructure, education, and research, which are essential to competitiveness. Government spending and taxation above certain levels can adversely affect a country's competitiveness by creating disincentives to work and by reducing a country's attractiveness to mobile foreign direct investment.[8] For any given tax yield, the structure of a country's taxation system can also influence its economic performance. For example, higher direct taxes as opposed to indirect taxes may weaken economic growth, if they reduce the incentive to work.[9] Irish corporation tax rates (1st/16) and personal taxes (1st/15) are low relative to other countries benchmarked. Ireland collects a relatively high share of tax revenue from indirect sources (2nd/8) and a relatively low share from property (6th lowest from 15).

8 *"The Sources of Economic Growth in OECD Countries: A Review Article", M Baily, Internation Productivity Monitor (Fall 2003).*

9 *"The Sources of Economic Growth in OECD Countries", OECD (2003). The Council recognises that considerations other then economic efficiency are also important in designing a tax system.*

4.1.2 Regulation and Competition

The effectiveness and quality of regulation and the institutions that enforce it are a major determinant of a country's prosperity.[10] Well-designed business regulation, adapted to local market conditions (e.g. market size, etc), can improve the functioning of markets and can assist in achieving environmental and social policy goals. However, regulations can also have negative implications for a country's performance by adding to administrative costs, and in some cases, by restricting new competition.[11] Market entry by new firms and a high degree of competition between existing firms can improve industry-level productivity and competitiveness.[12] Intense domestic competition can also reduce price levels for consumers.[13] The level of regulation in Ireland is perceived as being low (4th/16), but increasing. The intensity of local competition (11th/16) and the efficiency of competition legislation (8th/16) are perceived as being relatively low.

4.1.3 Labour Market Regulations

Labour market regulation refers to the set of rules governing the hiring of new workers and the conditions of employment guaranteed thereafter by legislation. Labour market regulations in Ireland are not perceived to have a significant impact on business activity (7th/16).

10 *"Doing Business in 2004: Understanding Regulation", The World Bank (2004).*

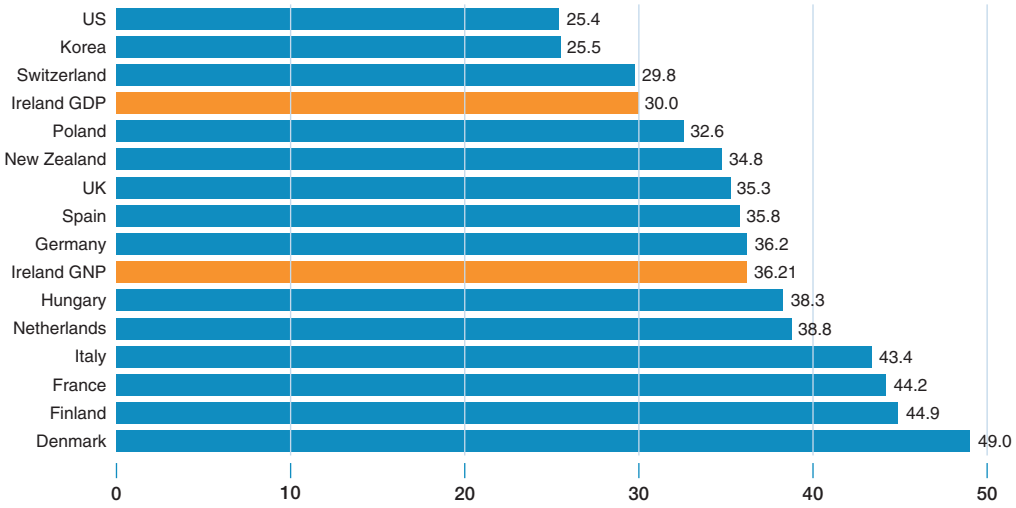
11 *"Make Consumers Count – A New Direction for Irish Consumers", Consumer Strategy Group, Forfás (2005).*

12 *"Microeconomic Evidence of Creative Destruction in Industrial and Developing Countries", Bartelsman et. al., Policy Research Working Paper Series 3464, The World Bank (2004).*

13 *"Assessing Ireland's Price and Wage Competitiveness", Philip R. Lane, Institute for International Integration Studies (IIIS) and Economics Department, Trinity College Dublin (July 2004).*

4.1.1 Taxation

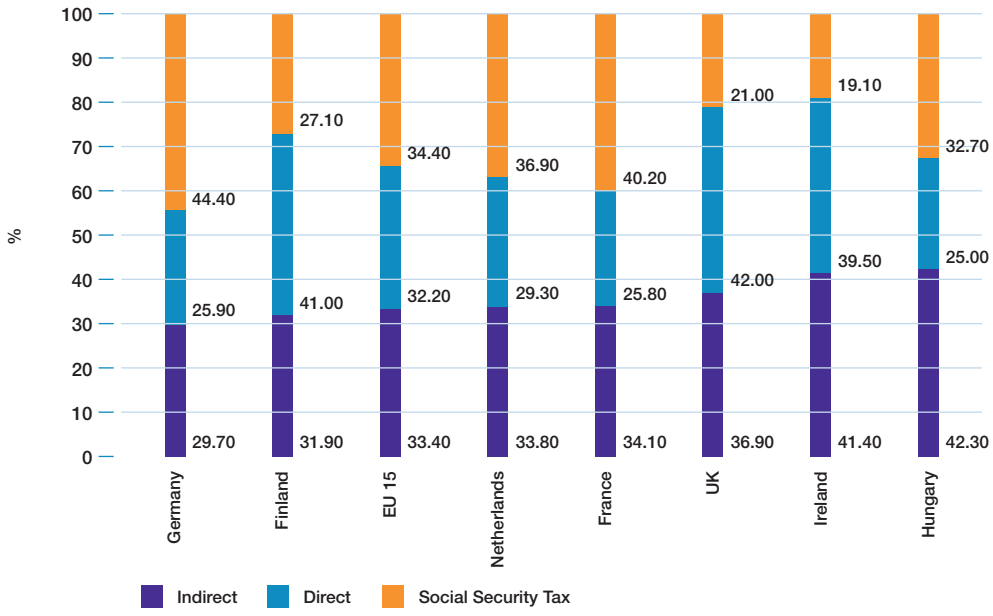
Figure 79: Total Tax Revenue (% of GDP), 2003



OECD Revenue Statistics

Total tax revenue as a percentage of GDP in Ireland has decreased by over 10 per cent between 1995 and 2003. This decrease can largely be explained by the significant increase in GDP during the same period.

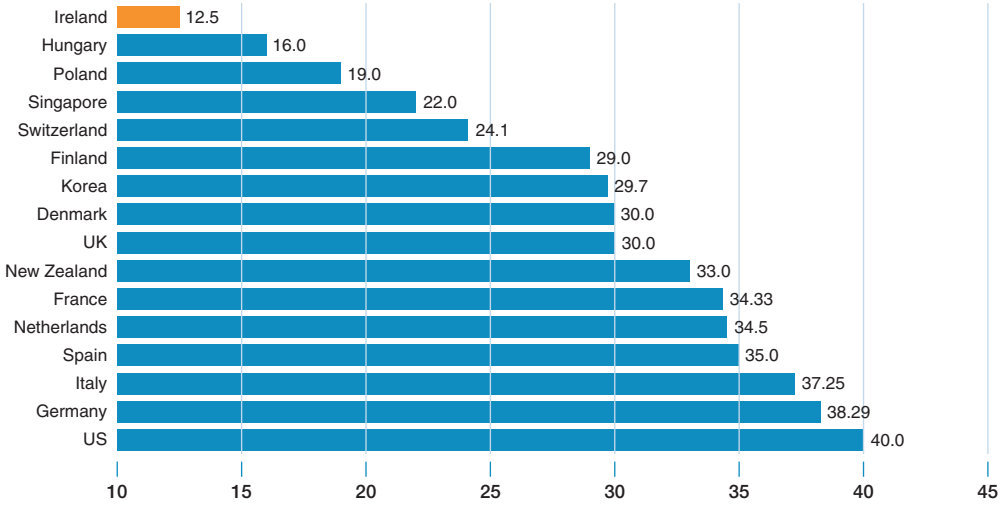
Figure 80: Breakdown of Tax Revenue, 2003



Eurostat, Statistics in Focus 3 / 2005

Breakdown of total tax revenue between direct, indirect and social security tax shows that Ireland has one of the highest shares of indirect tax as a percentage of total tax revenue. Low direct taxes and high indirect taxes favour export oriented manufacturing and services sectors over tourism.

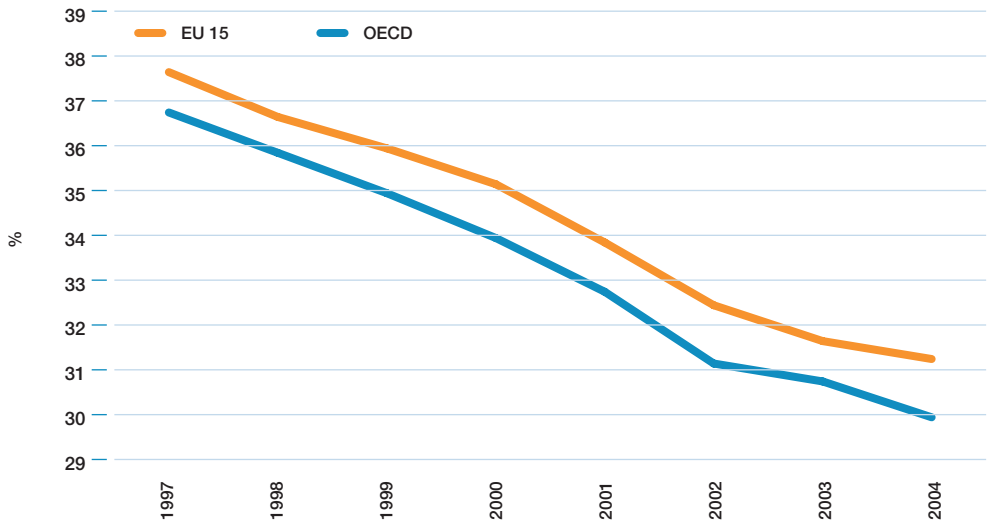
Figure 81: Standard Corporate Tax Rate (%), 2003



KPMG Corporate Tax Rates Survey, 2004

Ireland's low rate of corporation tax is frequently cited by foreign investors as the most important reason for locating in Ireland.

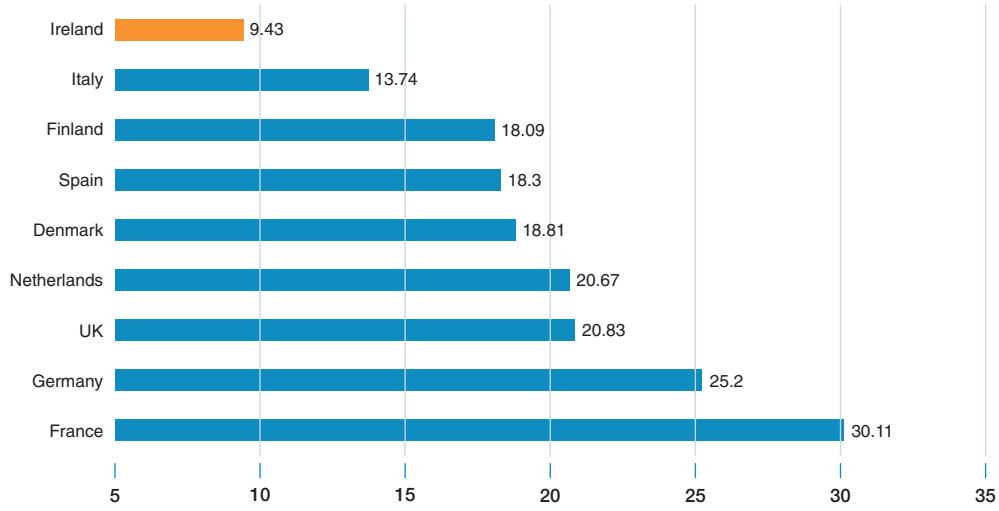
Figure 82: Average Corporation Tax Rate in EU 15 and OECD, 1997-2004



KPMG Corporate Tax Rates Survey, 2004

Average corporation tax rates have been falling in the EU and the OECD since 1997. Switzerland and 5 of the 10 new EU member states (Slovakia, Poland, Latvia, Hungary and the Czech Republic) have recently proposed or are passing tax-cutting legislation.

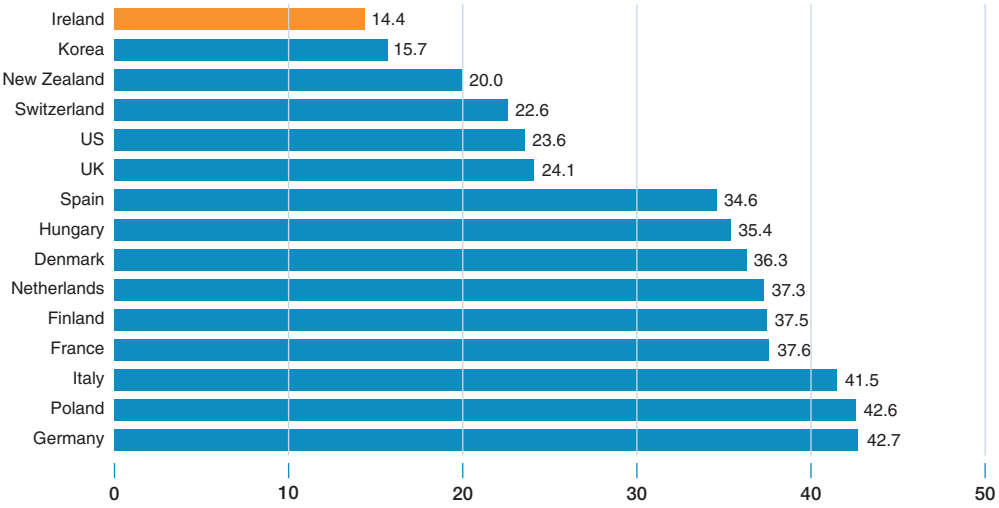
Figure 83: Effective Corporate Tax Rate, 2001



Effective Tax Burden of Companies in the Member States of the EU, Baker and McKenzie, 2001

In most countries, the effective rate of corporate taxation is substantially lower than the standard rate due to exemptions. In 2002, corporate income tax accounted for 13 per cent of total taxation in Ireland, compared to an EU-15 average of 5.9 per cent.[14] Ireland's total corporation tax yield equalled €5.2 billion in 2003, of which 47% was paid by foreign owned firms.

Figure 84: Effective Income Tax Rate (% of Gross Labour Costs), 2004



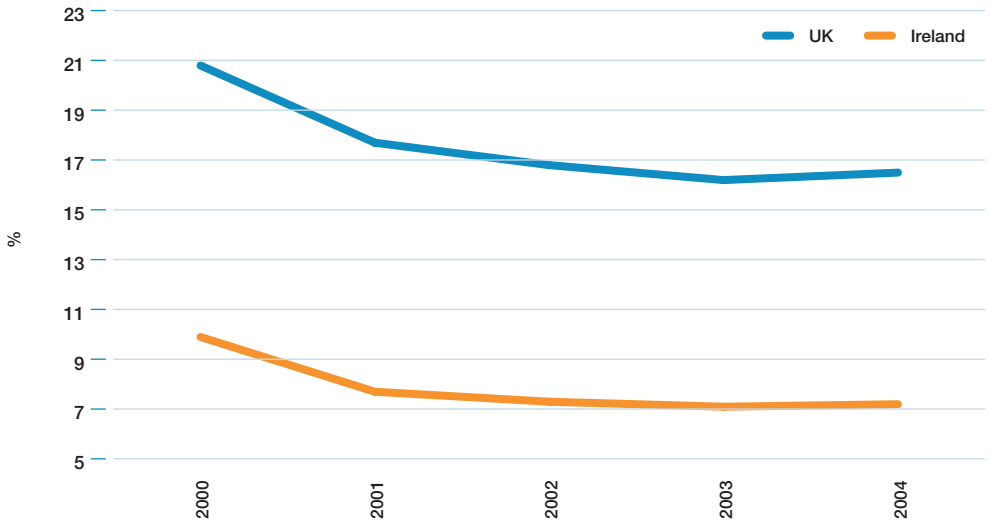
OECD Taxing Wages 2003 / 2004

Ireland has low effective tax rates on personal income.[15] In 2004, income tax after contributions and cash benefits accounted for 14.4 per cent of gross labour cost, whereas the same figure in 1999 was 24 per cent.

14 *"Structures of the Taxation Systems in the European Union", Eurostat (2004).*

15 *This rate is based on the earnings of a married couple with 2 children earning 1.67 times the average wage in 2004.*

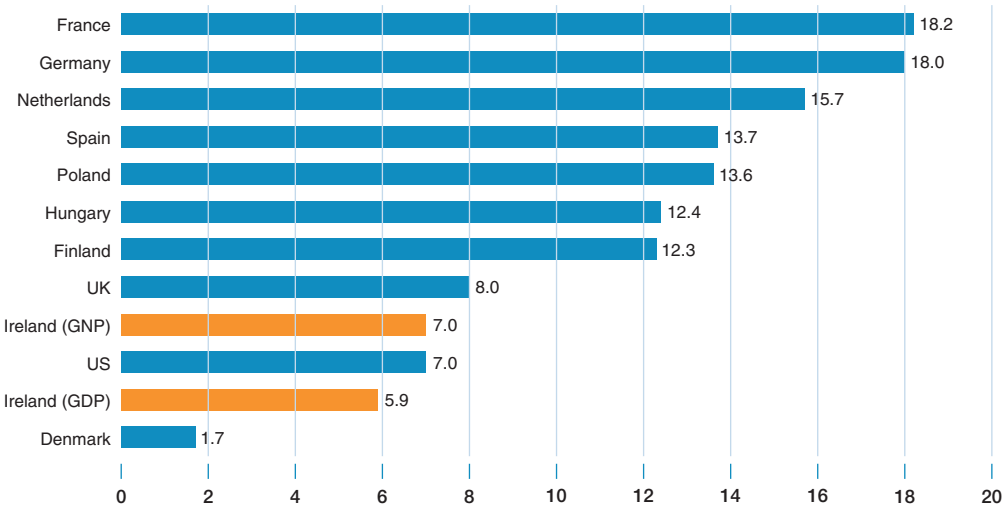
Figure 85: Average Personal Income Tax Rates, 2000-2004



OECD Tax Database

This graph shows the average personal income tax an average production worker pays as a percentage of income, after social security contributions. The indicator assumes the average worker is married with two children where there is a single earner.

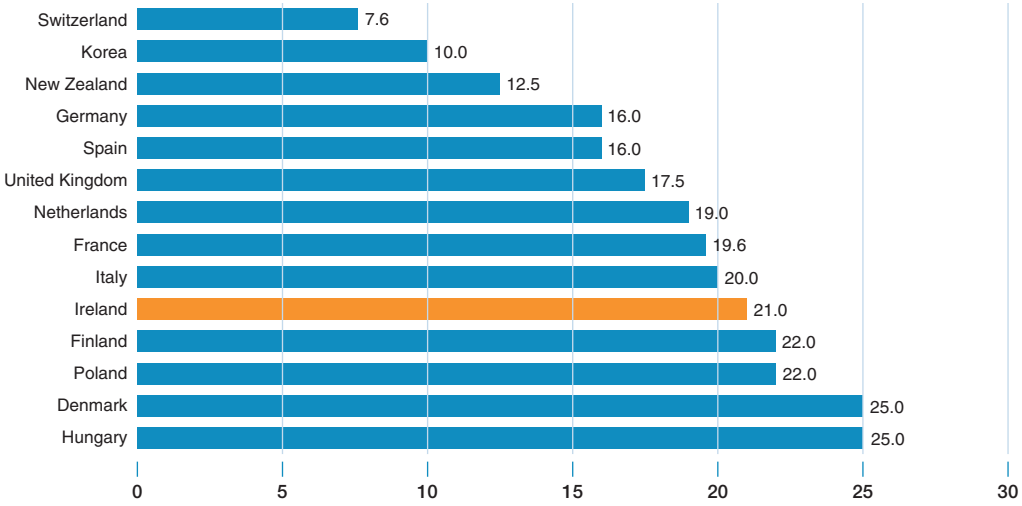
Figure 86: Social Contributions Received; General Government (% of GDP), 2004



European Commission

Social contributions are paid by residents or non-residents to social security funds, i.e. to the general government sector (but also to insurance enterprises as well as non-autonomous pension funds administering social insurance schemes) in order to secure the entitlement of social benefits. The level of social contributions received in Ireland as a percentage of GDP has fallen from 7.2 per cent in 1990 to 5.9 per cent in 2004.

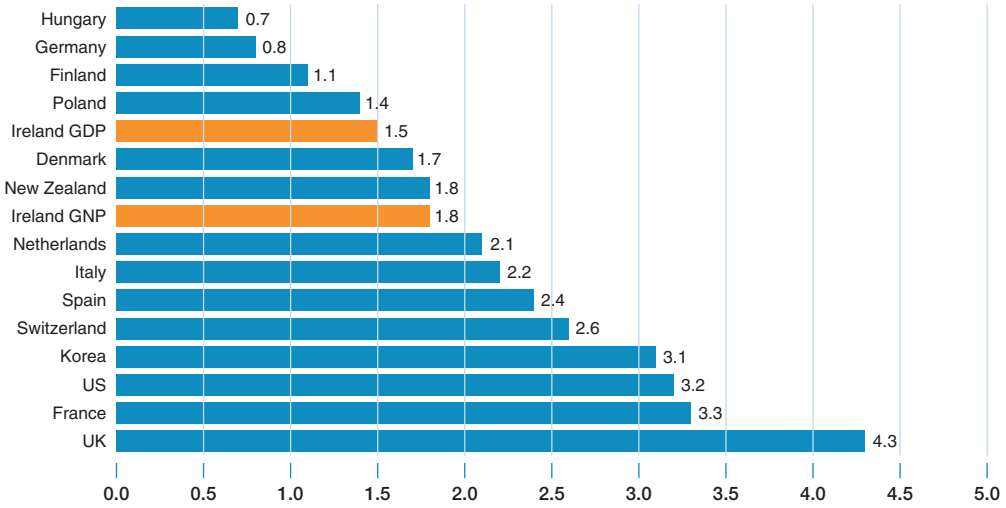
Figure 87: Value Added Tax Rate, 2003



OECD Tax Database

A high rate of VAT may have an impact on the competitiveness of the tourism industry in Ireland.

Figure 88: Taxes on Property (% of GDP), 2002

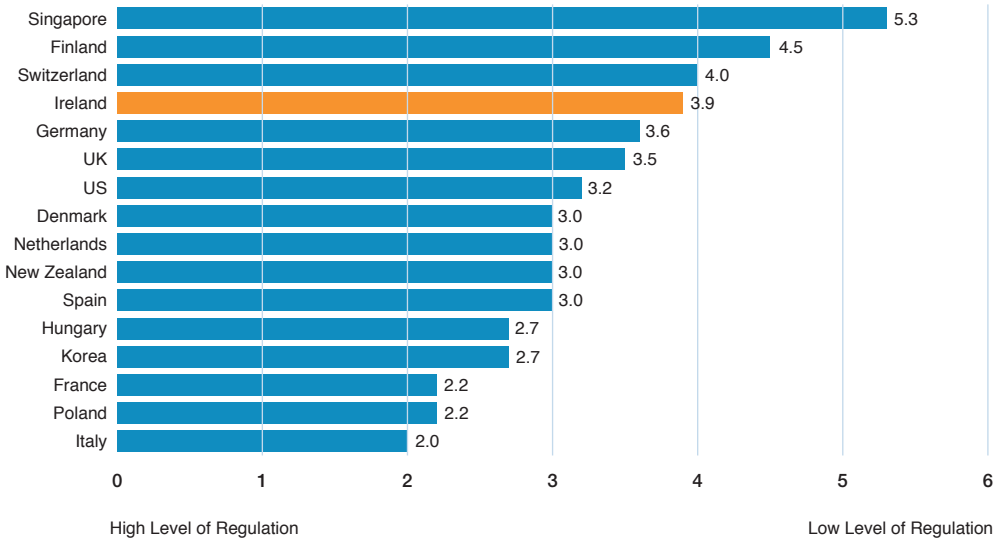


OECD Revenue Statistics

In 2002, revenue from property taxes accounted for 1.8 per cent of GNP, one of the lowest amongst the 15 countries included in this report. The main source of this tax revenue was through stamp duty in residential housing, accounting for over 60 per cent of overall property related tax revenue.

4.1.2 Regulation and Competition

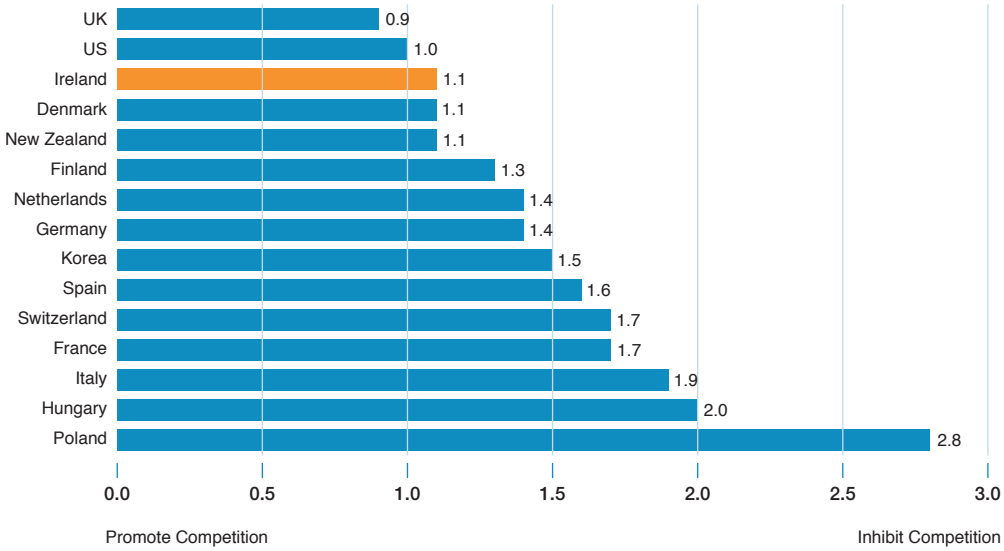
Figure 89: Level of Regulation, 2004 (Scale 1-7)



WEF Global Competitiveness Report 2004 / 05

The WEF survey data suggests that the level of regulation on Irish enterprises is low relative to many of the other countries benchmarked, though it has been rising during the past few years.

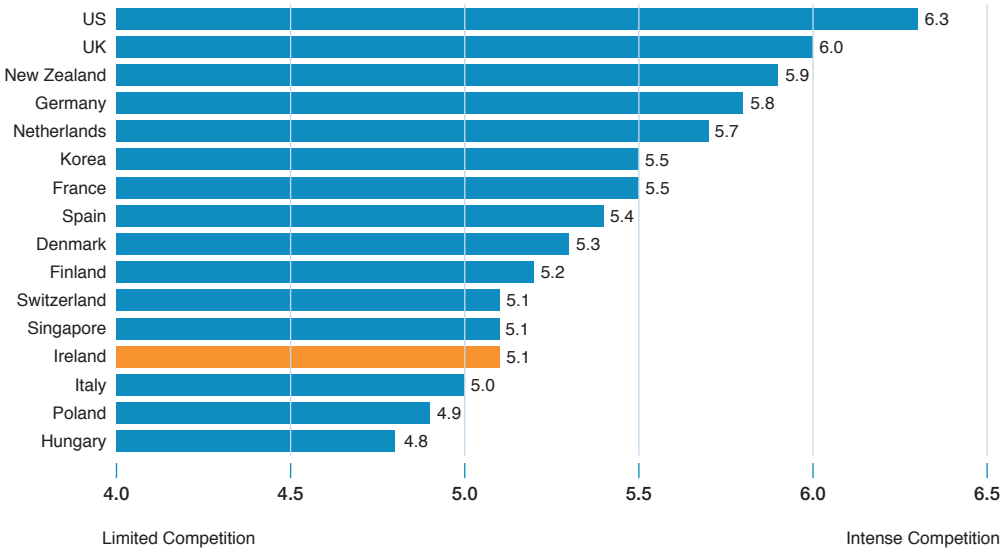
Figure 90: Product Market Regulation, 2003



OECD PMR Database

This is a composite indicator which measures the effect of regulations on competition in product markets. Product market regulations are not found to inhibit competition in Ireland significantly.

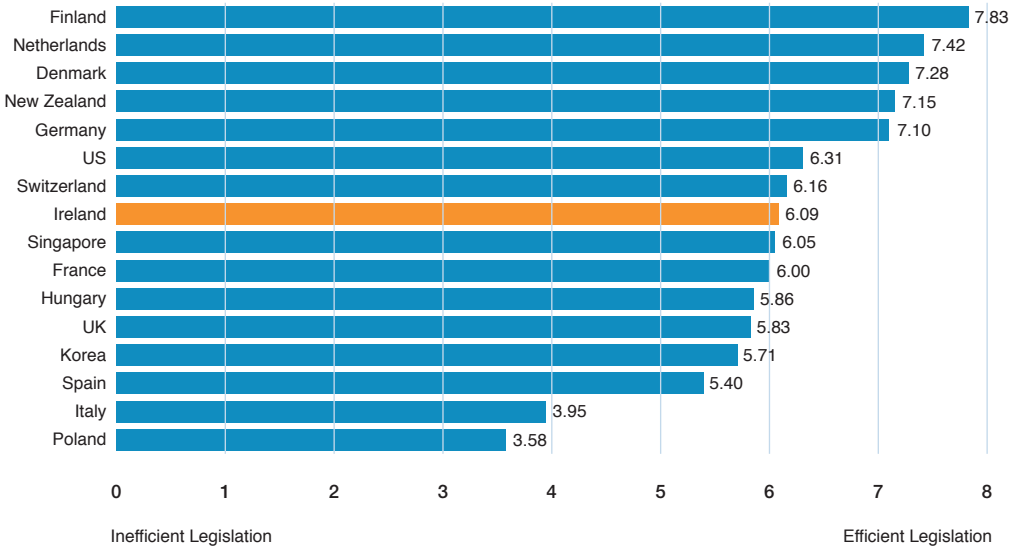
Figure 91: Intensity of Local Competition, 2004 (Scale 1-7)



WEF Global Competitiveness Report 2004 / 2005

Surveys of price competition places Ireland 11th out of 16 countries benchmarked. In 2002 Ireland was ranked 14th out of 16 countries.

Figure 92: Efficiency of Competition Legislation, 2004 (Scale 1-10)

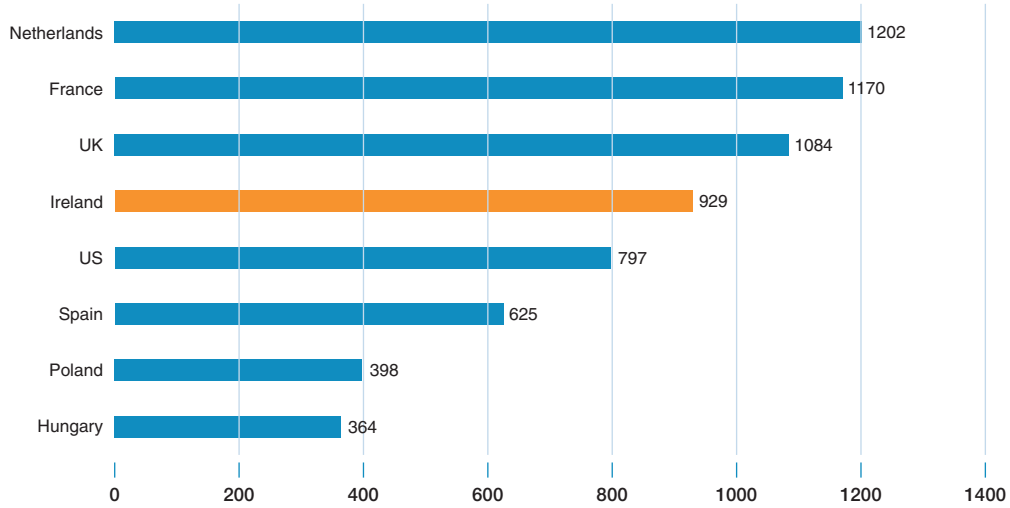


IMD World Competitiveness Yearbook 2004 / 2005

Survey evidence from IMD shows that industrialists perceive Ireland to have only moderately efficient legislation in preventing unfair competition.

4.1.3 Labour Market Regulations

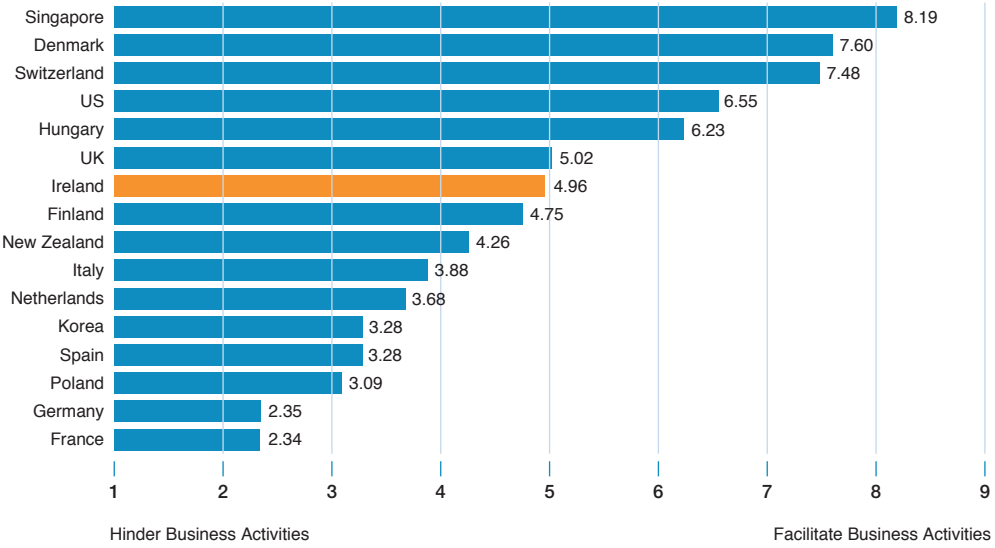
Figure 93: Monthly Minimum Wage, Euro (PPP), 2004



Eurostat, Statistics in Focus 10 / 2004

The minimum wage in Ireland increased from €7 per hour to €7.65 in April 2005. Recent research by ESRI suggests that the relatively high minimum wage in Ireland has had little or no impact on Ireland's competitiveness to date.

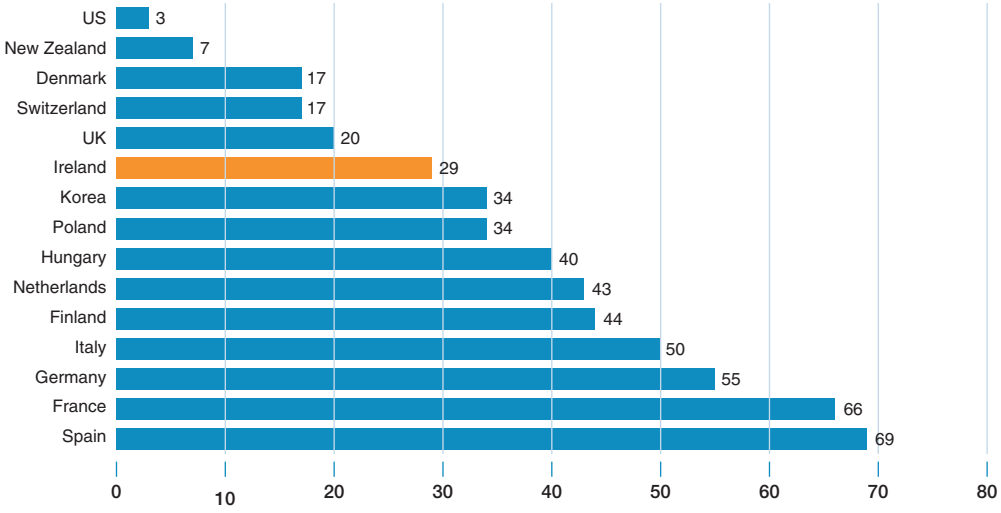
Figure 94: Labour Market Regulations, 2004



IMD World Competitiveness Yearbook 2003 / 2004

According to IMD survey data, labour market regulations in Ireland are not believed to have a significant impact on business activities.

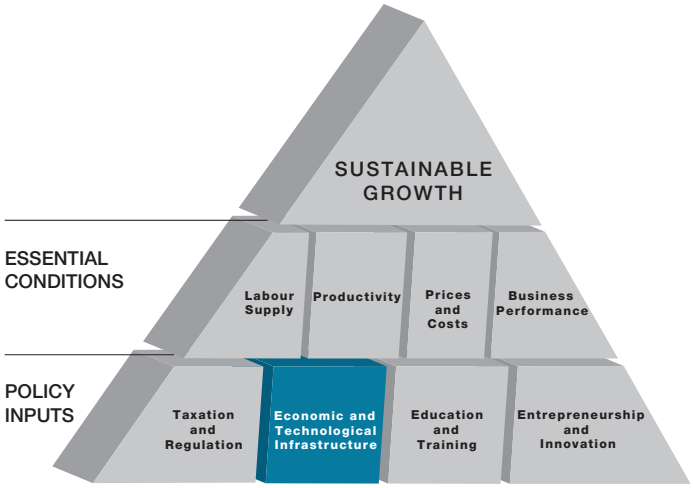
Figure 95: Rigidity of Employment Index, 2004 (Scale 0-100)



World Bank, Doing Business, 2005

The Rigidity of Employment Index is a composite indicator measuring the flexibility of labour laws governing the relationship between employers and employees.

4.2 Economic and Technological Infrastructure



The level of infrastructure in a country affects competitiveness and performance in a number of ways. Inadequate infrastructure can increase traffic congestion, reduce productivity, and increase costs. This not only affects existing firms, but also affects a country's attractiveness as an investment location and general quality of life. In this section, indicators that illustrate Ireland's relative performance are grouped under four headings; total investment in infrastructure, transport and energy infrastructure, information and communications technology infrastructure, and housing.

4.2.1 Total Investment in Infrastructure

Cuts in public investment due to the difficult economic circumstances of the 1980s coupled with high GDP growth rates in the 1990s placed significant pressures on Ireland's infrastructure. Ireland ranks 11th out of 12 countries in terms of the level of infrastructure stock relative to national income. However, general government investment is significantly higher in Ireland than in most developed economies (2nd/11). Despite investments to date, Ireland is ranked 13th from 16 countries in terms of perceived quality of infrastructure.

4.2.2 Transport and Energy Infrastructure

Ireland as an island economy, trading in the global marketplace, relies heavily on transport infrastructure and services. Inadequate transport infrastructure leads to increased delivery times and costs across the enterprise sector. Similarly, reliable and competitively priced energy is critical in terms of competitiveness. The indicators in this section are largely limited to surveys of industrialists' perceptions of the adequacy of infrastructure. Irish business people still rank Ireland poorly for transport (road, air, and sea) (14th/16), and energy (14th/16) infrastructure relative to leading countries. The costs of electricity and gas are analysed in section 3.3.

4.2.3 Information and Communications Technology (ICT)

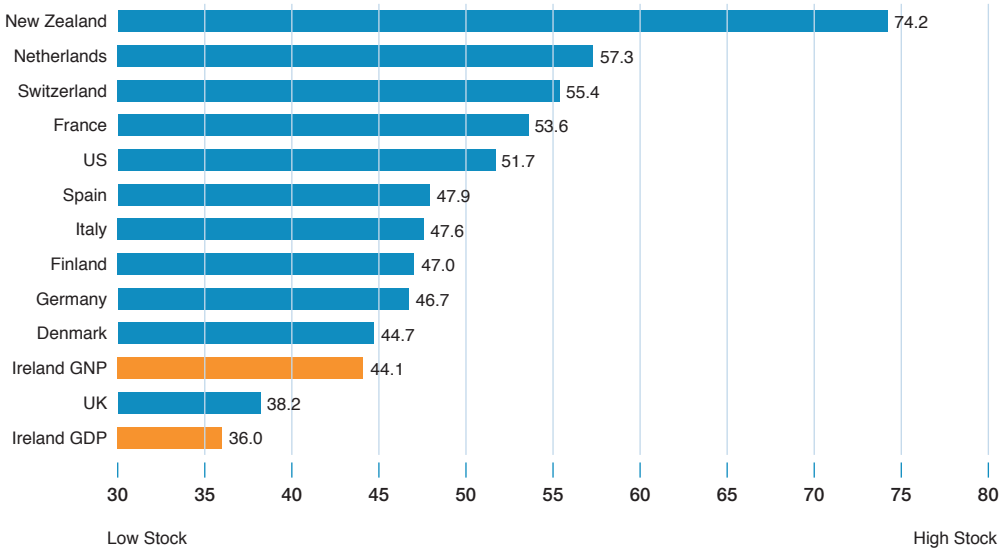
Improvements in ICT have transformed international commerce, social interaction, political relations and development issues. The indicators in this section assess overall investment in ICT, and more specifically our performance with regard to access to, and take-up of, broadband telecommunications (14th/15). Ireland's expenditure on ICT is close to the EU 15 average. Ireland continues to perform particularly poorly with respect to broadband usage (14th/15). The cost of broadband and other telecom services are analysed in section 3.3.

4.2.4 Housing

A stable and affordable housing market contributes positively to economic stability. Despite the high rate of housing completions (1st/9), the stock of housing in Ireland remains below the levels in comparator countries (9th/9). House prices increased by over 180% over the period 1998-2004, the highest rate among the benchmarked countries.

4.2.1 Total Investment in Infrastructure

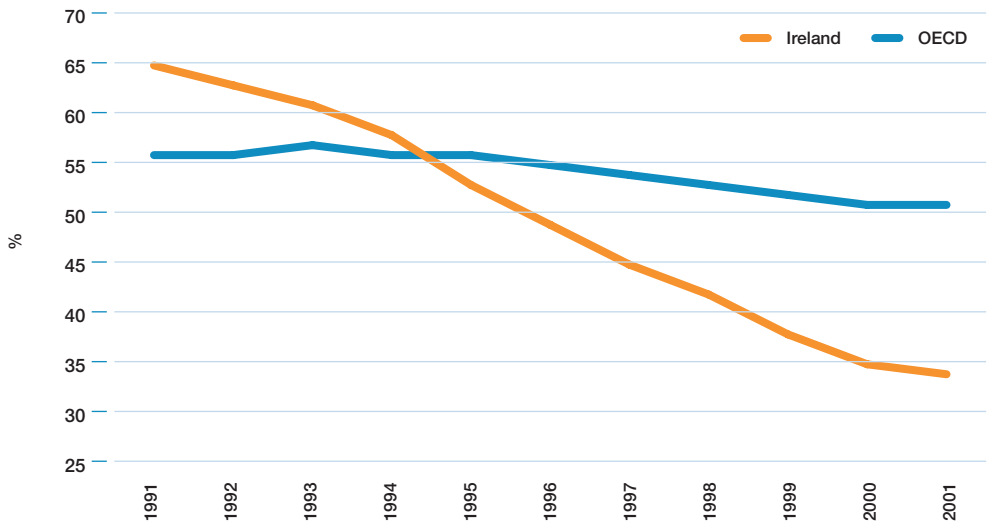
Figure 96: Infrastructural Levels (Public Capital Stock as a % of GDP), 2002



Kamps (2004) / OECD / Forfás

This indicator measures the level of infrastructural stock relative to national income. Examples of government capital stock include roads, railways, airports, schools and hospitals.

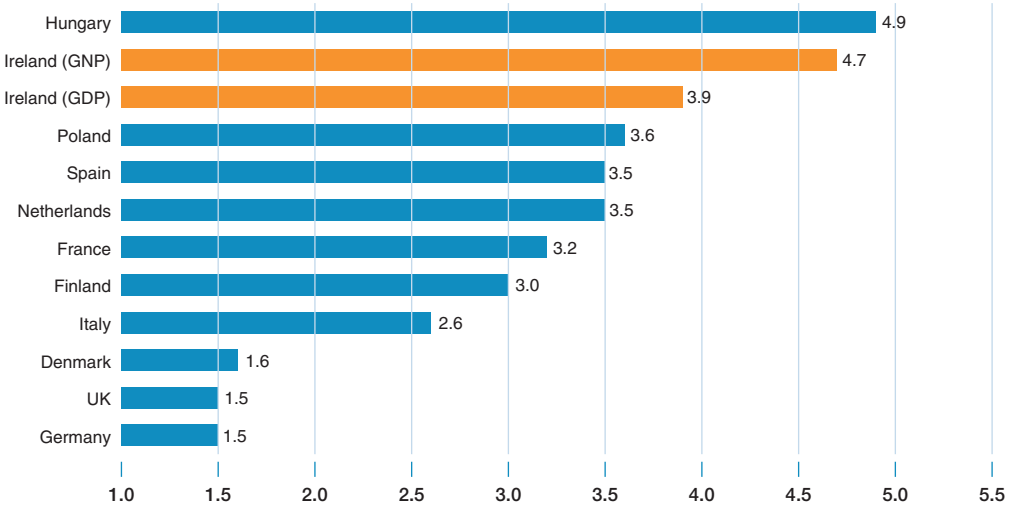
Figure 97: Infrastructural Stock (Public Capital Stock as a % of GDP), 1991-2001



Kamps (2004) / OECD / Forfás

Cuts in public investment during the late 1980s coupled with high GDP growth rates in the 1990s resulted in a steady fall in public capital stock as a percentage of GDP since the late 1980s. A high rate of infrastructural investment since 2001 is likely to have improved that trend.

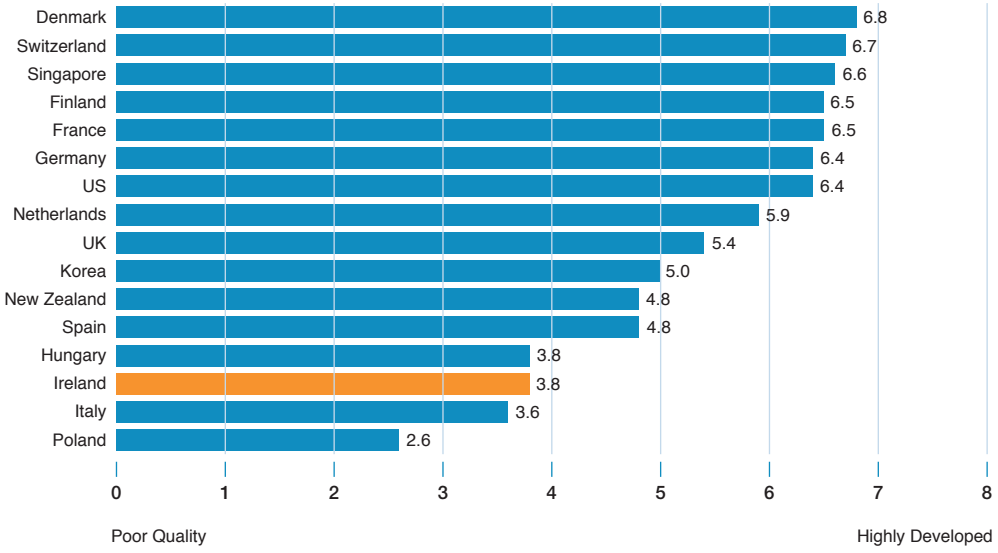
Figure 98: General Government Gross Fixed Capital Formation (% of GDP), 2003



Eurostat Structural Indicators

The 1999 National Development Plan (NDP) provided for an investment of €51.5 billion of public, EU and private funds in health services, social housing, roads, education, public transport, rural development, industry, water and waste services. This has resulted in higher levels of investment in gross fixed capital formation as a percentage of GDP in Ireland than in other countries.

Figure 99: Overall Infrastructure Quality, 2004 (Scale 1-7)

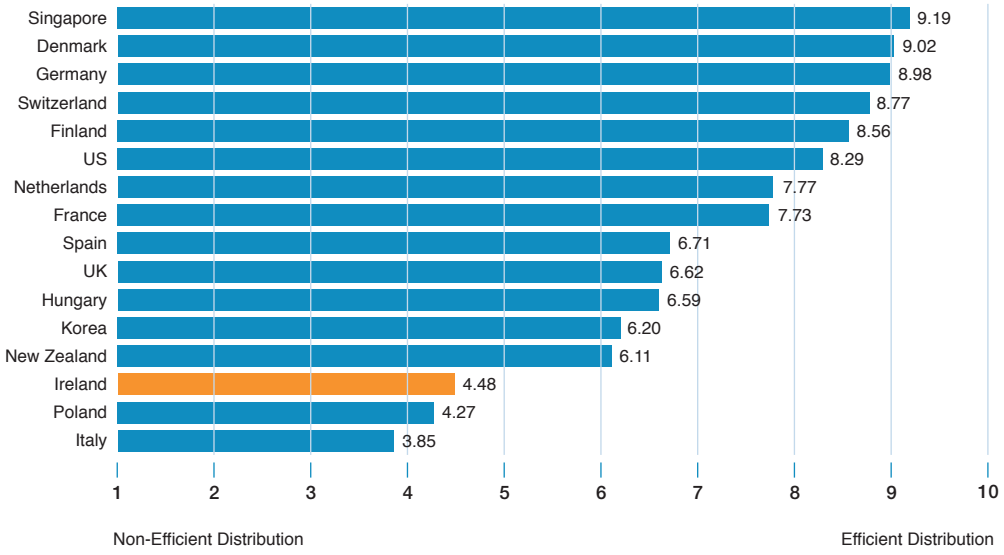


WEF Global Competitiveness Report, 2004 / 05

This chart measures industrialists' perceptions of overall infrastructure quality, encompassing transport, energy, ICT and housing infrastructure. Ireland has scored consistently low on this measure, showing little change over the past five years.

4.2.2 Transport and Energy Infrastructure

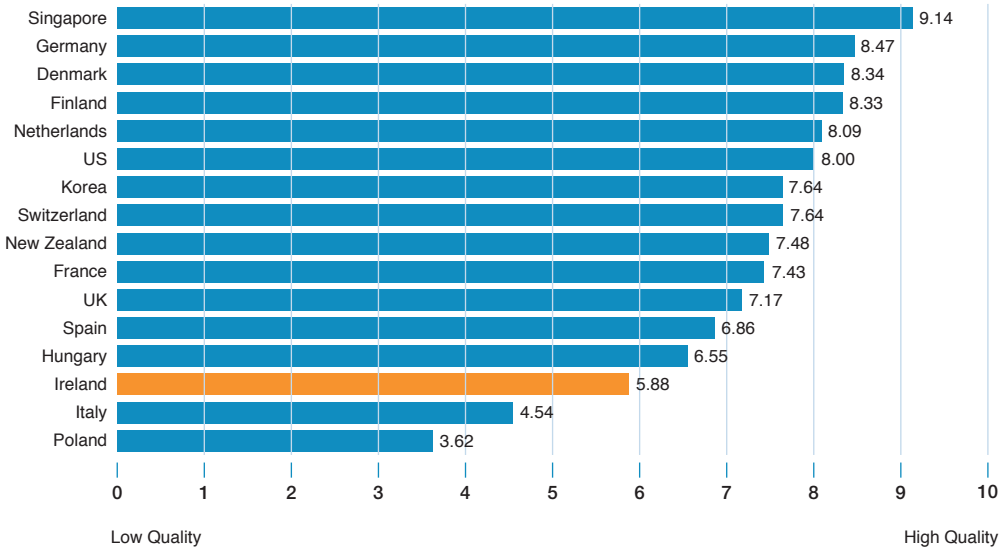
Figure 100: Efficiency of Distribution Infrastructure, 2004 (Scale 1-10)



IMD World Competitiveness Yearbook, 2005

This chart measures industrialists' perceptions of the efficiency of distribution infrastructure and includes road, rail, air and sea transport. Ireland's performance is reinforced by Eurostat data, which indicates that levels of motorway and rail density in Ireland are amongst the lowest in Europe. In 2003, motorway density (km of motorway per 1000 sq km area) in Ireland was 1.79 per cent. The EU 15 average was 16.35 per cent.

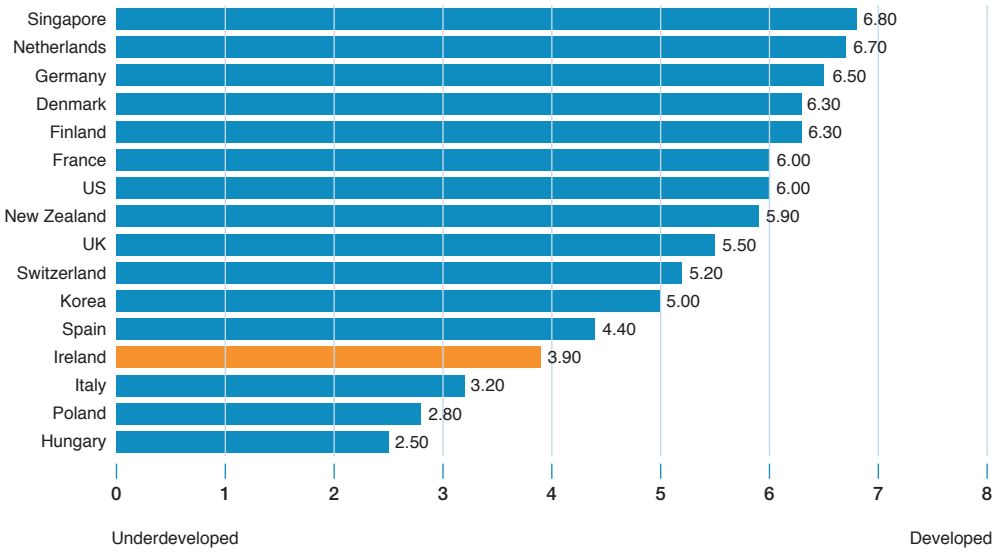
Figure 101: Quality of Air Transportation, 2004 (Scale 1-10)



IMD World Competitiveness Yearbook, 2005

This chart measures industrialists' perceptions of the quality of Ireland's air transportation infrastructure. The number of passengers flying out from Irish airports increased from 7.3 million to 9.9 million passengers between 1999 and 2004. Although just one per cent of Ireland's total export tonnage was transported via air in 2003, this accounted for 36 per cent of the total value of Ireland's exports.

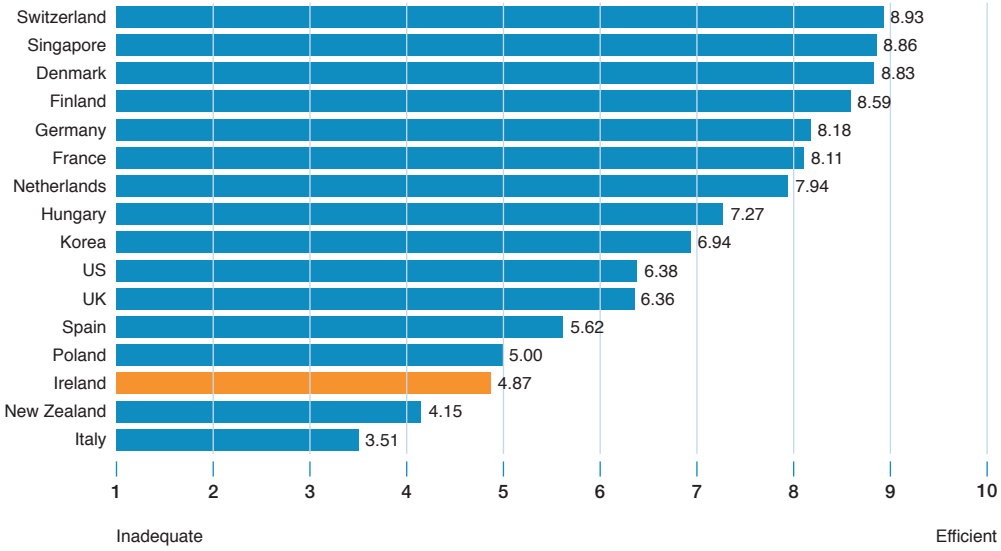
Figure 102: Port Infrastructure Quality, 2004 (Scale 1-7)



WEF Global Competitiveness Report, 2004 / 05

This chart examines industrialists' perceptions of the quality of Ireland's port infrastructure and inland waterways. The number of passengers travelling from Ireland by sea fell from 2.2 million to 1.9 million passengers between 1999 and 2004. In 2003, 51 per cent of the overall value of Irish exports was transported by sea. The EU 15 average was 28 per cent.

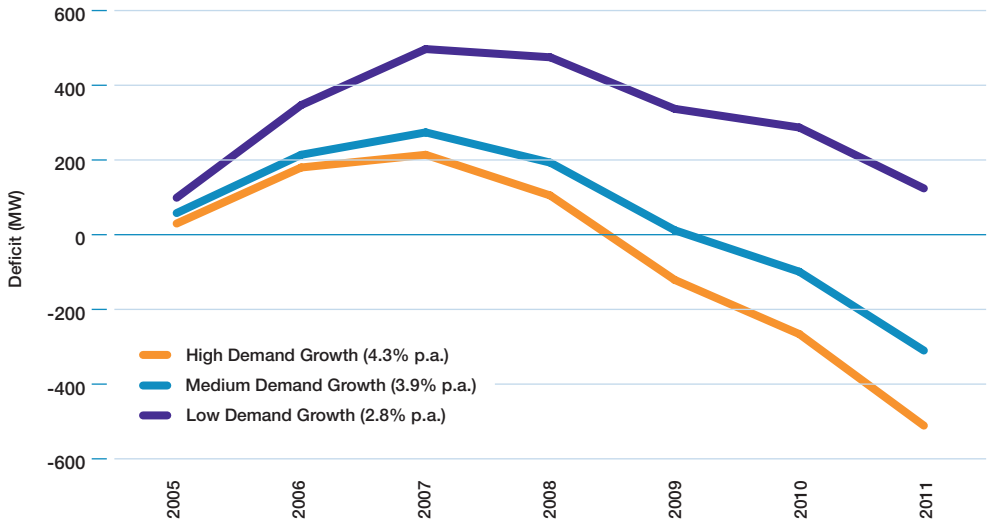
Figure 103: Energy Infrastructure, 2004 (Scale 1-10)



IMD World Competitiveness Yearbook, 2005

This chart measures industrialists' perceptions of Ireland's energy infrastructure. Ireland ranks 14th among the sixteen countries benchmarked.

Figure 104: Projections of Electricity Generation Adequacy, 2005-2011

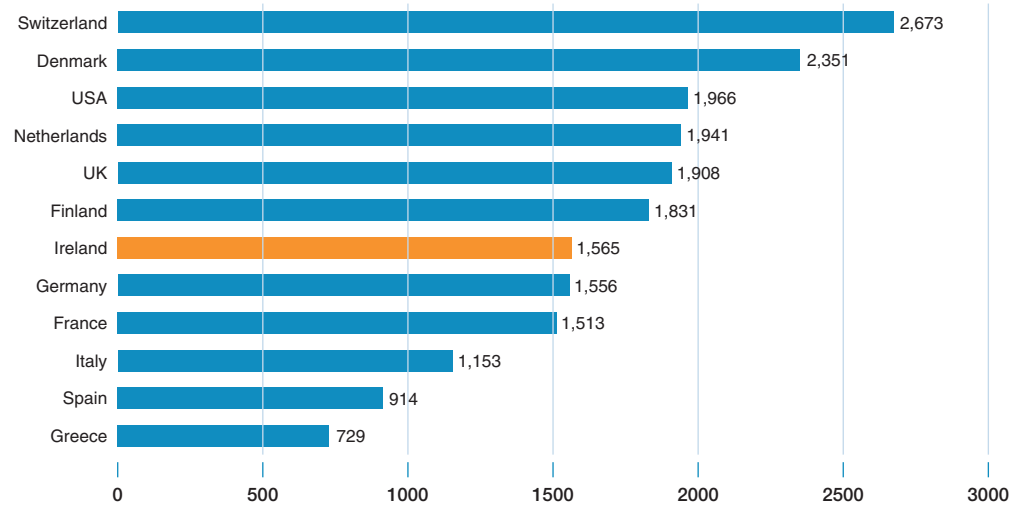


Eirgrid

Various electricity generation scenarios show that additional generation capacity will be required in the next few years.

4.2.3 Information and Communications Technology (ICT) Infrastructure

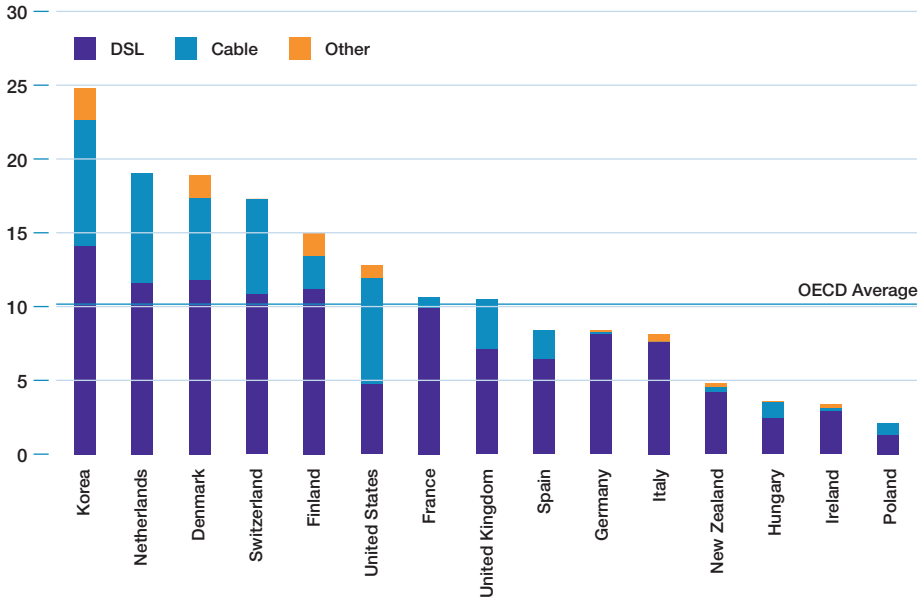
Figure 105: ICT Expenditure per Capita (€), 2004



European Information Technology Observatory (EITO), 2005

Ireland's expenditure per capita on ICT is slightly below the EU 15 average. Expenditure on ICT as a percentage of GDP in Ireland has fallen from 7.2 per cent to 5.4 per cent between 2000 and 2004.

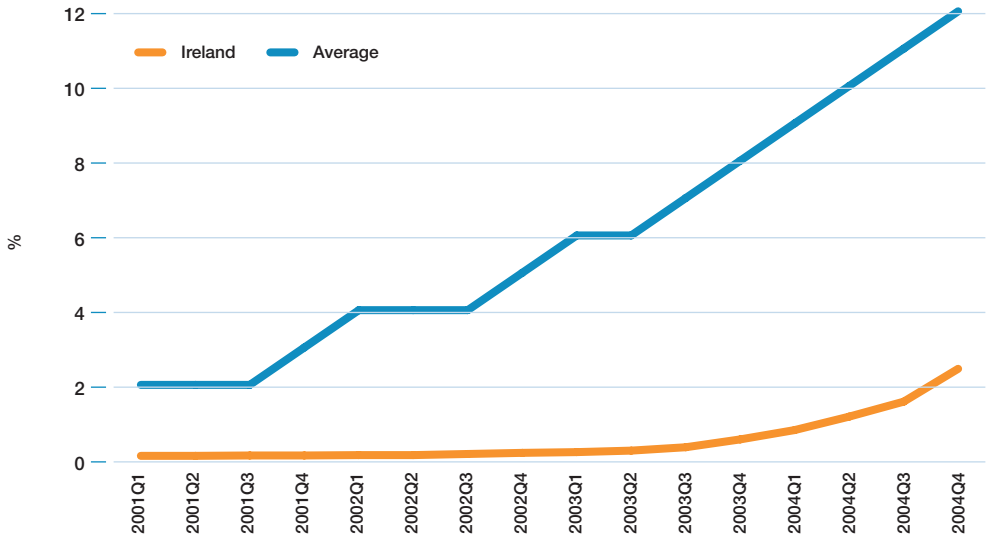
Figure 106: Broadband Subscribers per 100 Inhabitants by Technology, 2004



OECD ICT Indicators

Broadband allows for faster internet connection speeds than narrowband. Key broadband platforms include cable, DSL, wireless and fibre. Ireland is almost exclusively dependent on DSL. The number of broadband subscribers per 100 inhabitants in Ireland is less than half of the OECD average.

Figure 107: Total Broadband Take-Up, 2001-2004

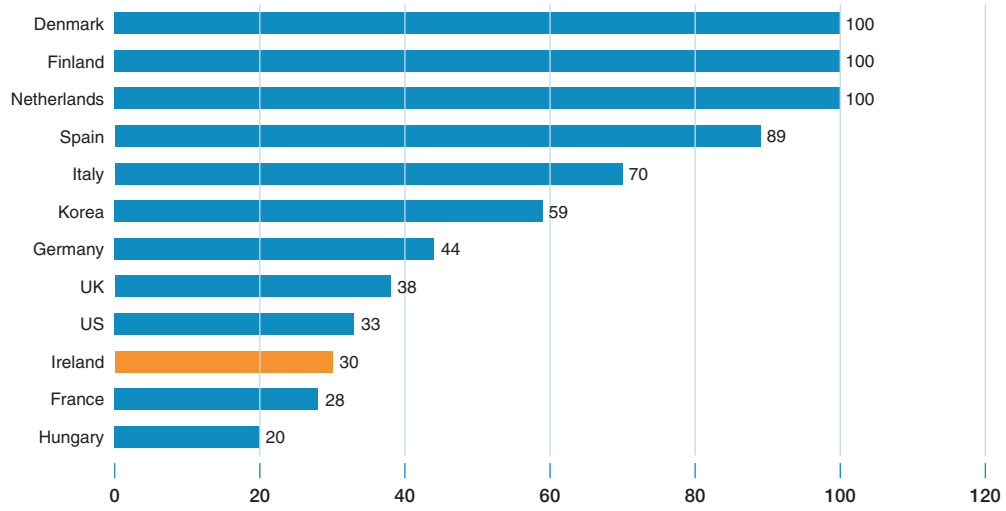


Forfás Broadband Telecommunications Benchmarking Study, Nov 2004

Recently, Ireland has experienced rapid DSL growth, with DSL take-up rising to over 2 per cent by the end of 2004. Despite strong growth, it is estimated that compared to the average of the benchmarked countries, Ireland still has a broadband deficit of 360,000 connections.[16] Eircom has set a target of 500,000 broadband customers by the end of 2007.

16 *In addition to the countries benchmarked in the ACR, the benchmarking group for this indicator includes Japan, Belgium, Canada, Sweden, Austria, Luxembourg, Portugal the Czech Republic and Greece.*

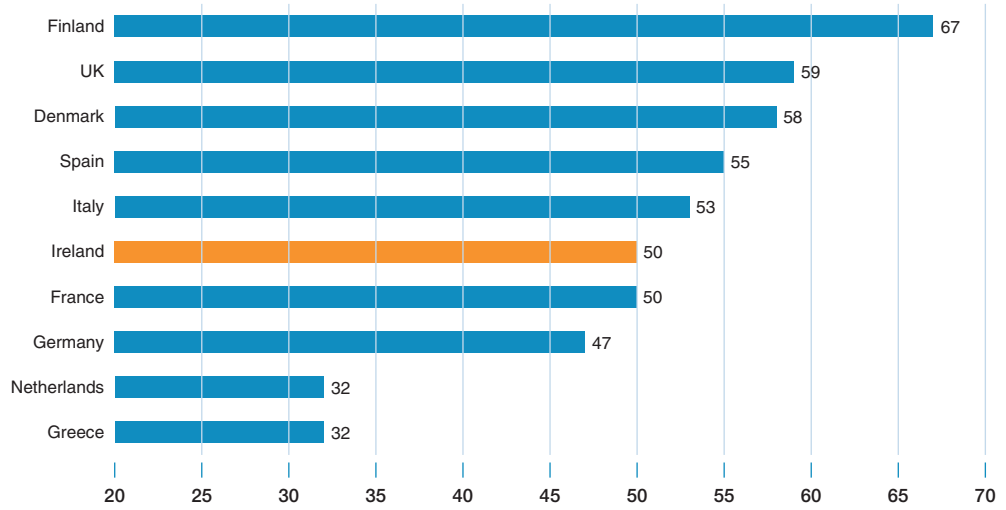
Figure 108: DSL Take-Up by SMEs (%), 2004



Forfás Broadband Telecommunications Benchmarking Study, Nov 2004

DSL take-up by SMEs increased from 11 per cent to 30 per cent between 2003 and 2004. Demand for advanced DSL (2Mbit/s) by SMEs in Ireland is expected to increase further over the next few months. Take-up of advanced broadband services (34Mbit/s) at 0.85 per cent is relatively low by international standards.

Figure 109: Public Services Fully Available Online (%), 2004

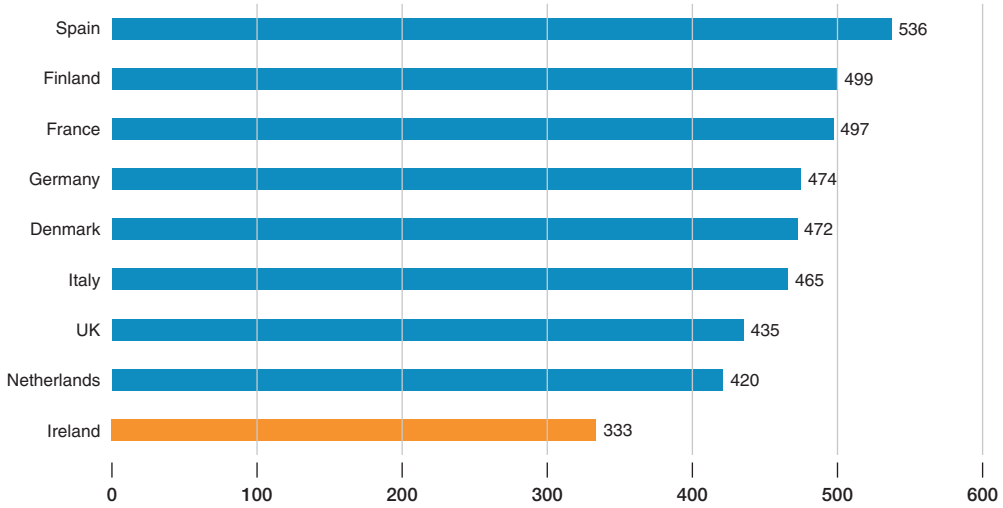


CAP Gemini, 2005

The percentage of public services available online in Ireland is just ahead of the EU 15 average of 49.6 per cent. In terms of online sophistication, a CAP Gemini study ranked Ireland fourth best in Europe behind Sweden, Austria and the UK and well ahead of the EU 15 average.

4.2.4 Housing

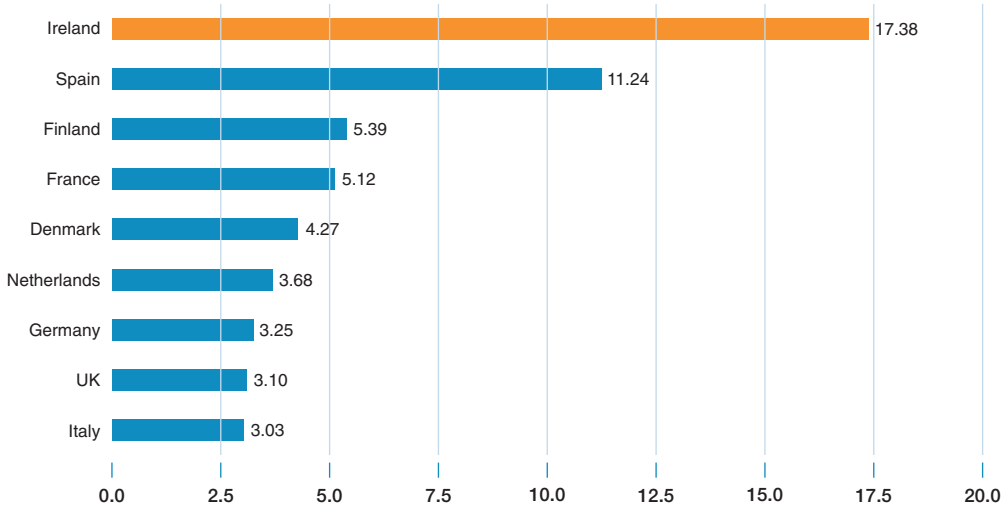
Figure 110: Total Housing Stock, 2003 (Dwellings per '000 of Population)



European Mortgage Federation

In 2003, Ireland's total housing stock was significantly below the EU 15 average of 466.92 dwellings per 1000 of population.

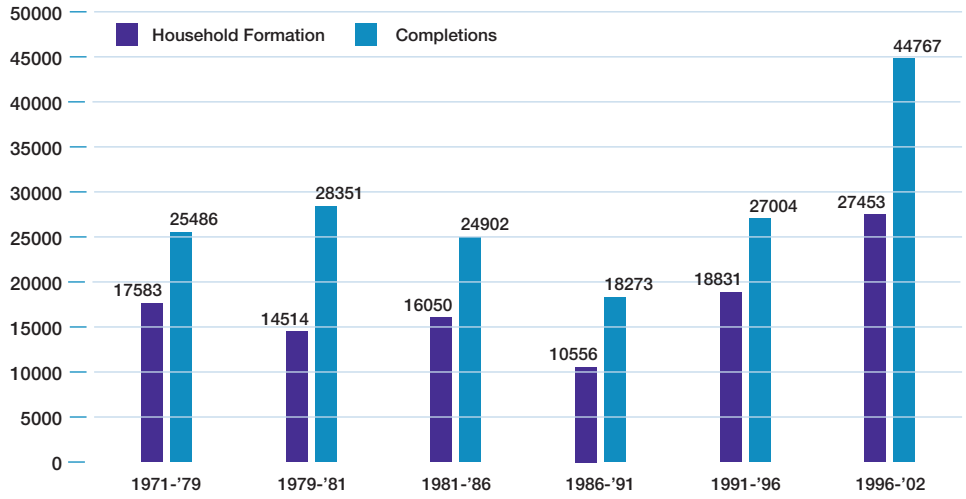
Figure 111: Housing Completions in 2003 (Dwellings per '000 of Population)



European Mortgage Federation

Completion rates in Ireland are four times the European average which implies that Ireland is catching up with other countries in terms of total housing stock per capita. In 2004, 77,000 residential units were completed in Ireland, the equivalent of almost 20 units per thousand of population.

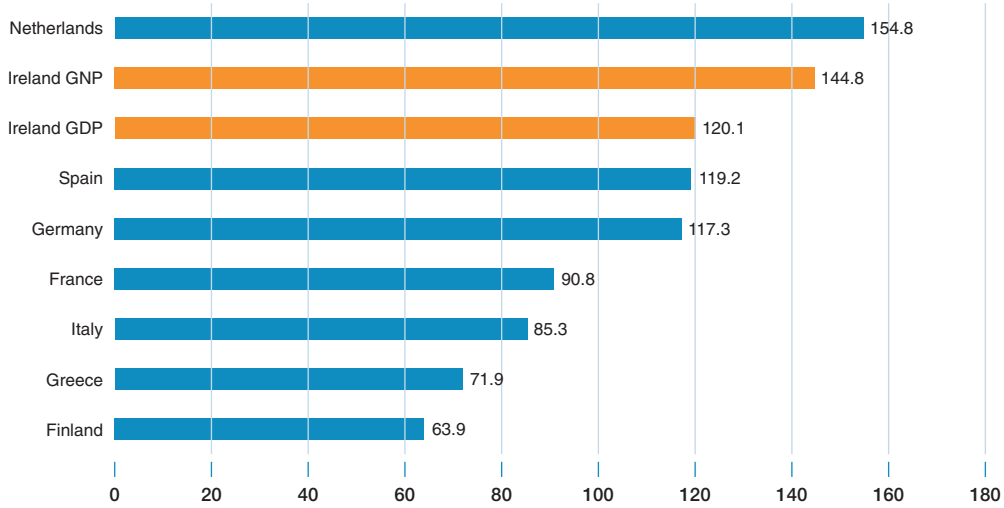
Figure 112: Household Formation and Housing Completions (Annual Averages)



DKM Economic Consultants

Between 1970 and 2002, in every period examined in the chart, more houses were built than were necessary to cater for new households alone. In the 1996-2002 period 61 per cent of new houses were built to satisfy new household formation.

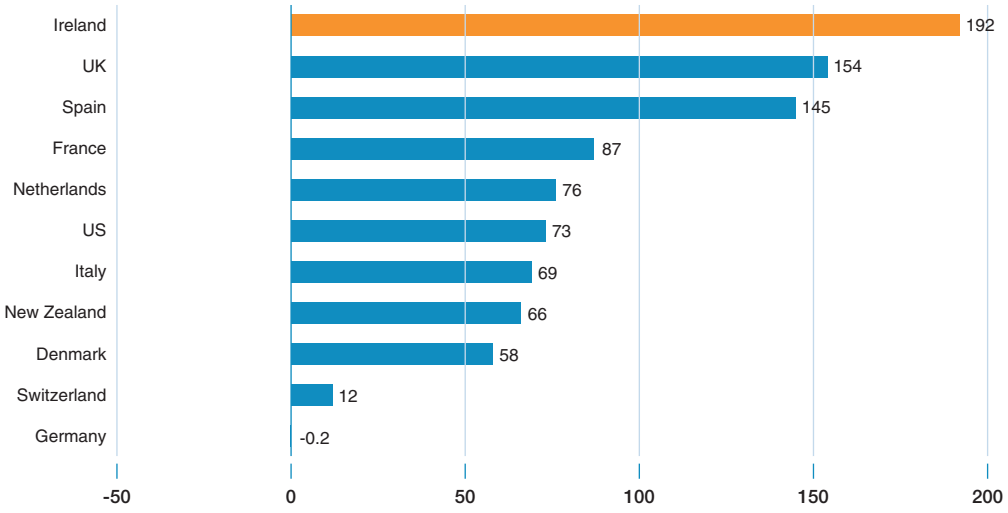
Figure 113: Private Sector Credit (as a % of GDP), 2003



Central Bank of Ireland

Private sector credit (PSC) is all lending by credit institutions to the non-bank public, excluding government. It includes personal credit to non-financial corporations and credit to other financial intermediaries. As of December 2004 the ratio of PSC to GNP stands at 163 per cent in Ireland. In the year ending May 2005, private sector credit grew by 27 per cent.

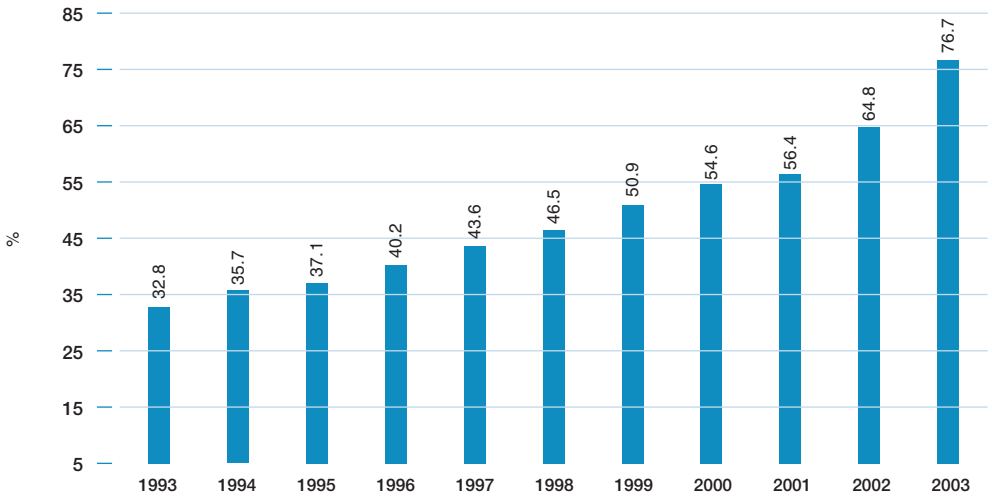
Figure 114: National House Price Index Change (%), 1997-2005



Economist Intelligence Unit

Between 1997 and 2005, the house price index for Ireland compiled by the Economist Intelligence Unit increased by 192 per cent. This was significantly more than the increase in the UK (154 per cent) and in Spain (145 per cent).

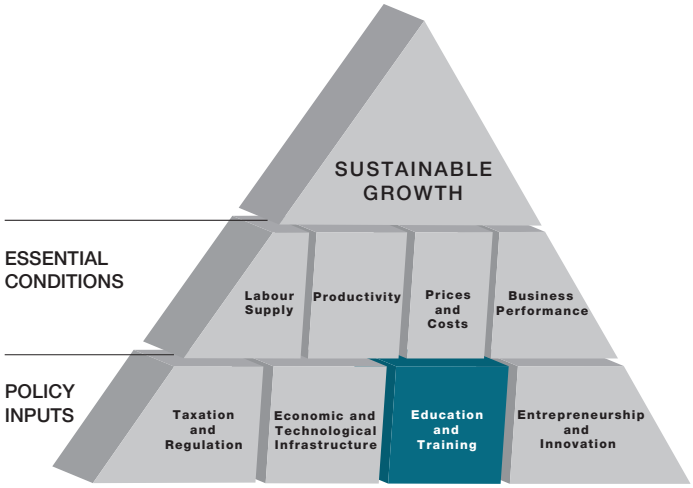
Figure 115: Housing Finance (as a % of Disposable Income), 1993-2003



Central Bank of Ireland

The increase in housing finance as a percentage of disposable income is mainly due to the rapid growth in household debt, with most of the increase coming from borrowing for residential housing. In 2003, housing finance accounted for 34.4 per cent of the total private sector credit (PSC) figure.

4.3 Education and Training



Education is increasingly important to economic performance. Education increases individual incomes, and an increase in a country's average education level positively affects aggregate output.[17] High levels of investment in education lead to a number of other personal and social benefits, including increased social inclusion, lower crime, reduced welfare dependence and better health.[18] This chapter examines Ireland's relative performance in terms of investment levels and performance over the educational lifecycle (pre-primary, primary, secondary, tertiary and life long learning).

4.3.1 Total Investment in Education

Irish investment rates in education at the tertiary level match other OECD countries (7th/13) Ireland invests less in primary (11th/14) and secondary level (11th/14) than the OECD average. Relative to other OECD countries, private expenditure accounts for a marginally lower proportion of tertiary funding, and a significantly higher proportion of pre-primary funding.

4.3.2 Pre-Primary Education

The numbers of students in pre-primary education remains low (11th/11) relative to other countries benchmarked.

4.3.3 Primary Education

Despite a 42% increase in expenditure on primary level students in Ireland over the period 1998 to 2003, the ratio of student to teaching staff remain relatively high in Ireland (11th/14).

17 *"Education for Growth: Why and for Whom", A. Kruger and M. Lindahl, Swedish Economic Policy Review (1999).*

18 *"European Economy No. 6/2003", European Commission (2003).*

4.3.4 Secondary Education

Ireland has made significant progress over time and relative to other countries in term of increasing secondary school participation rates. However, Ireland ranks 9th out of 11 in terms of upper secondary school graduation rates as a percentage of the total population. In terms of reading, scientific and mathematical literacy, Irish 15 year olds rank 4th, 7th and 8th respectively from the 14 countries benchmarked. Ireland has a relatively high ratio of students to computers at upper secondary level (3rd/10).

4.3.5 Tertiary Education

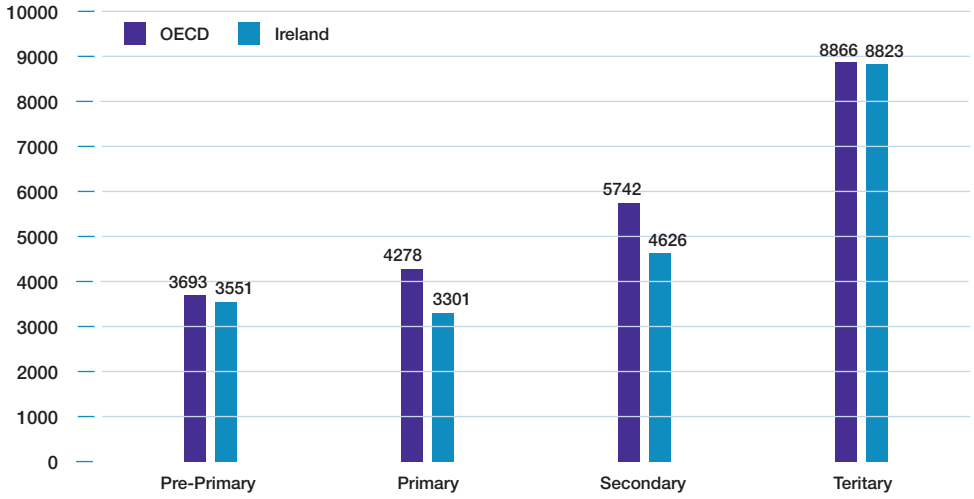
A relatively high proportion of the Irish population in the 25-34 age group has a third level education (6th/15). While Ireland continues to perform well in terms of science and engineering graduates per population (1st/13), Ireland's advantage is deteriorating.

4.3.6 Life Long learning

Life long learning is defined as all learning activity undertaken throughout life, with the aim of improving knowledge, skills and competencies. Adult participation in life long learning remains relatively low in Ireland (6th/11).

4.3.1 Total Investment in Education

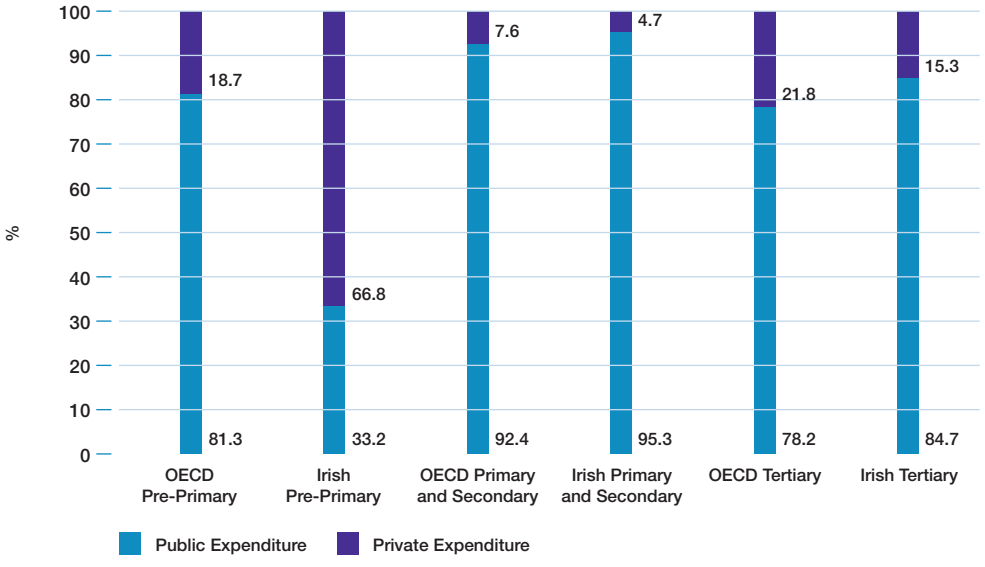
Figure 116: Annual Expenditure on Educational Institutions per Student (€ PPP), 2001



OECD, Education at a Glance 2004

At each level of education, pre-primary, primary, secondary and tertiary, Irish spending per student is below that of the OECD average, most notably for primary and secondary levels. According to the Department of Education and Science public expenditure on education was €5.8 billion in 2003 and increased to €6.6 billion in 2004.

Figure 117: Relative Public and Private Expenditure on Educational Institutions, by level of Education, 2001

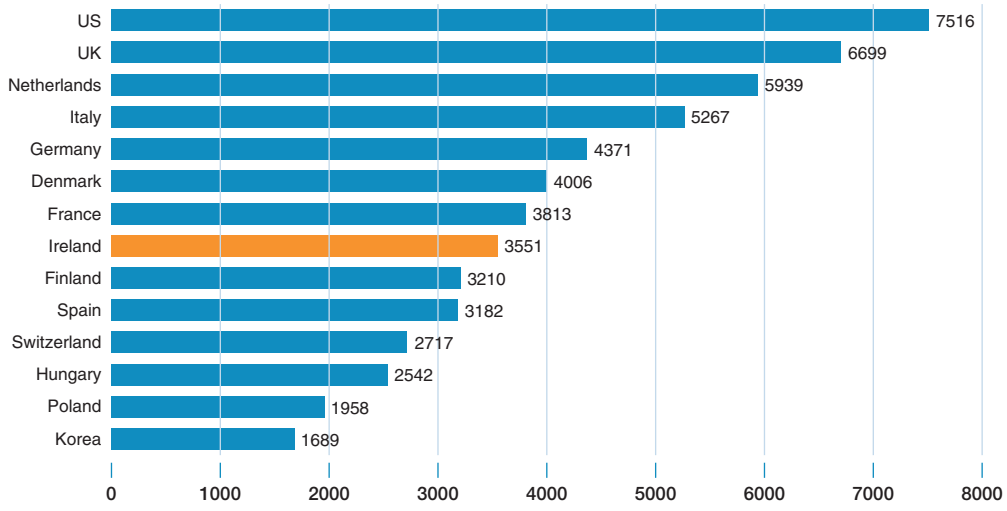


OECD, Education at a Glance 2004

In the OECD 88 per cent of funds for education come from public sources. However, private funding accounts for 43 per cent in Korea, 33 per cent of spending in the United States, and almost 25 per cent of spending in Japan and Australia.

4.3.2 Pre-Primary Education

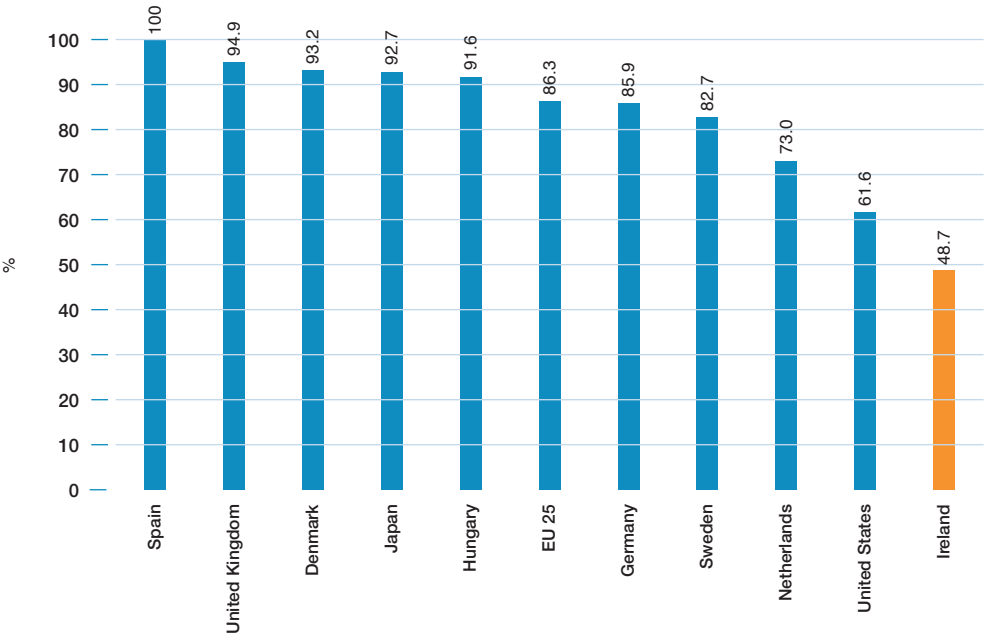
Figure 118: Annual Expenditure on Educational Institutions per Student (€ PPP) – Pre-Primary Education, 2001



OECD Education at a Glance, 2004

Ireland's performance on this indicator is skewed by the low number of children participating in pre-primary education – 1544 students were registered in Ireland's Early Start Pre-School Programme for the academic year 2003/04.

Figure 119: Participation of 4 Year Olds in Education (%), 2003

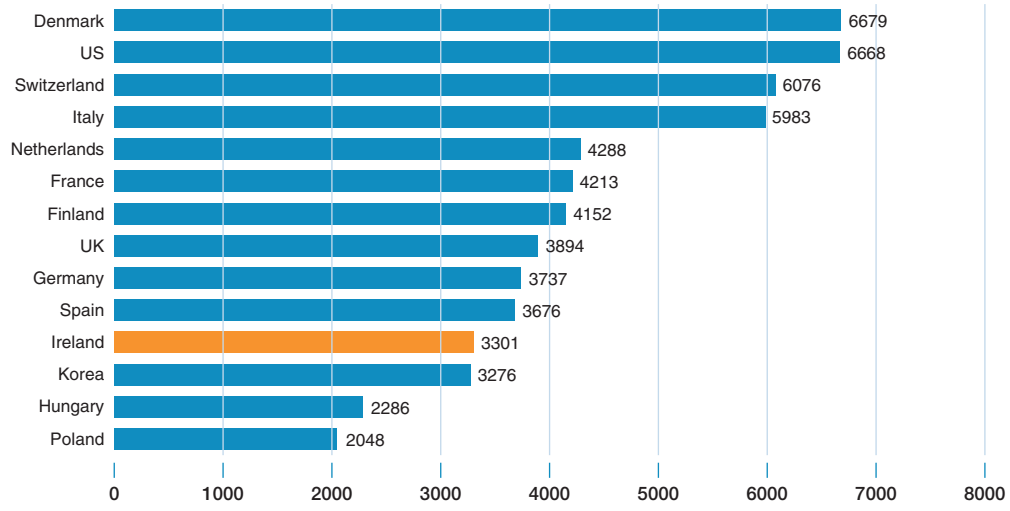


Eurostat

In 2003, half of all Irish 4 year olds were registered in either pre-primary or primary school. All Spanish children were in education at the age of 4 years of age. The vast majority of Irish 5 year olds are in formal education.

4.3.3 Primary Education

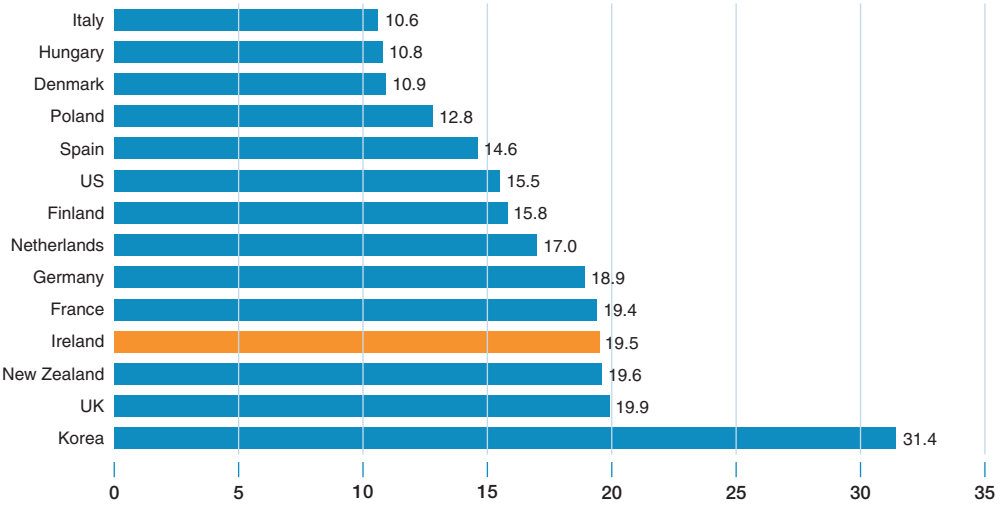
Figure 120: Annual Expenditure on Educational Institutions per Student (€ PPP) – Primary Education, 2001



OECD Education at a Glance, 2004

Expenditure on education per primary level student in Ireland increased in real terms by 42.6 per cent over the period 1998 to 2003, though it remains below that of other benchmarked countries.

Figure 121: Ratio of Students to Teaching Staff in Educational Institutions – Primary Education, 2002

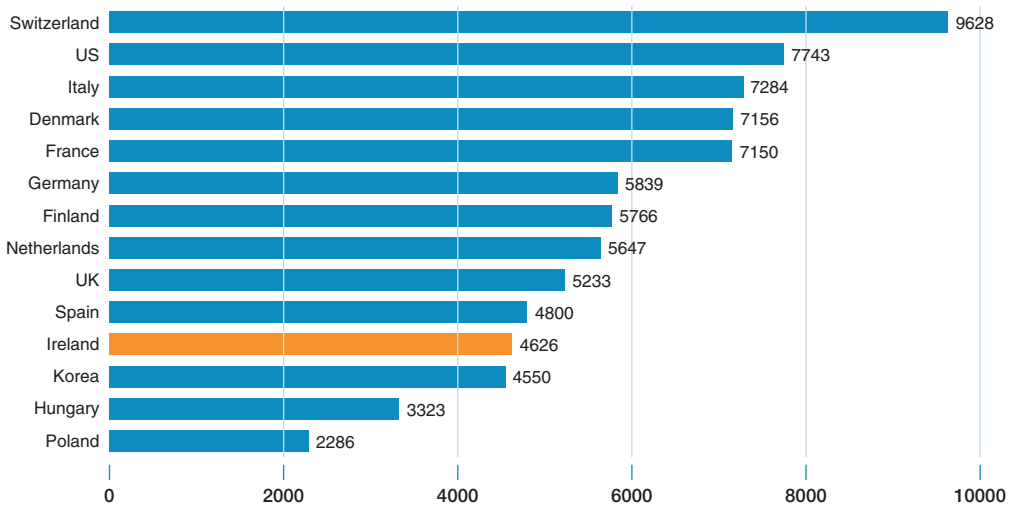


OECD Education at a Glance, 2004

The OECD country mean for the ratio of students to teaching staff in primary school is 16.6 compared with Ireland's 19.5.

4.3.4 Secondary Education

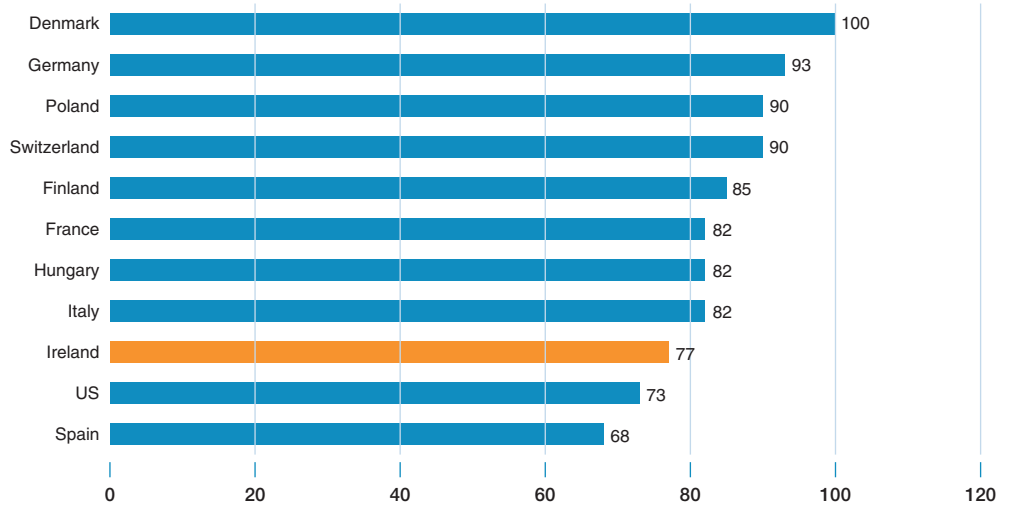
Figure 122: Annual Expenditure on Educational Institutions per Student (€ PPP) – Secondary Education, 2001



OECD Education at a Glance, 2004

Expenditure on education per second level student in Ireland increased in real terms by 38.1 per cent over the period 1998 to 2003, though it remains behind the level of other benchmarked countries.

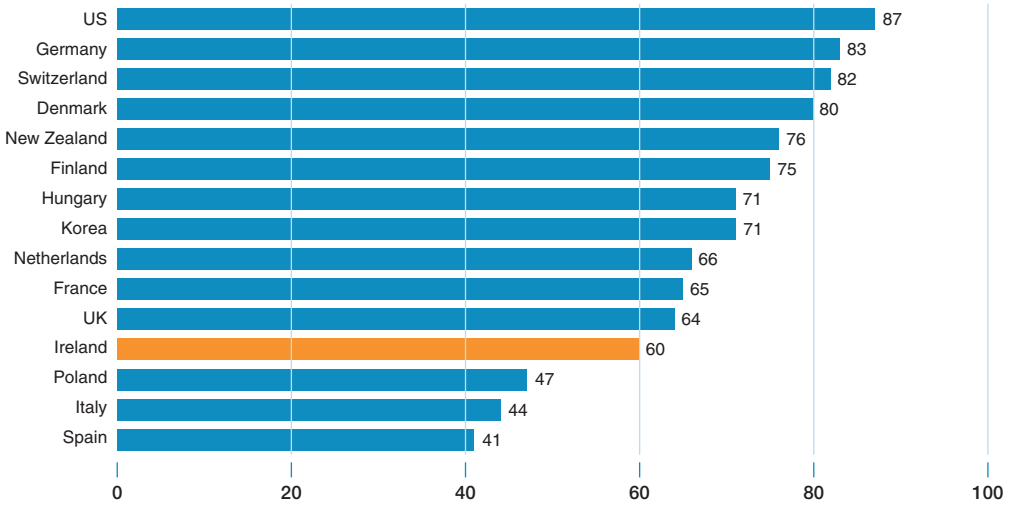
Figure 123: Upper Secondary Graduation Rates as a % of Total Population at Typical Age of Completion, 2002



OECD Education at a Glance, 2004

This figure masks a significant gender divide – just 70 per cent of males, compared with 84 per cent of females graduate each year.

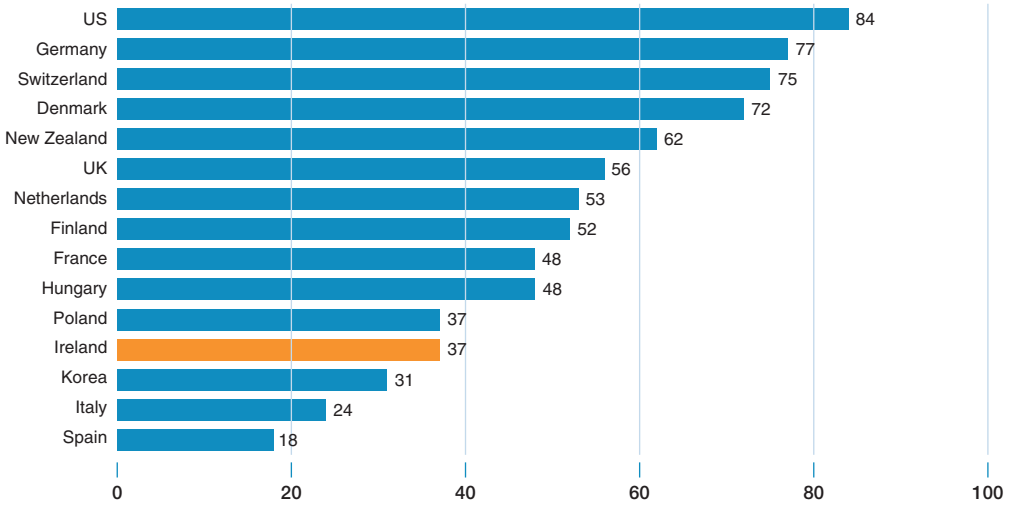
Figure 124: Percentage of the Population Aged 25-64 That Has at Least Upper Secondary Level Education, 2002



OECD Education at a Glance, 2004

60 per cent of the 25-64 age group in Ireland have attained at least upper secondary education.

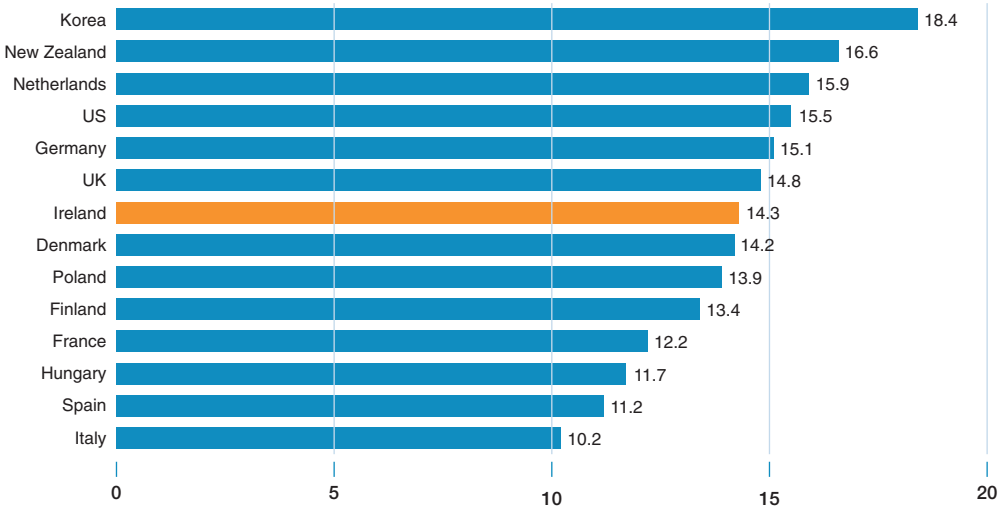
Figure 125: Population Aged 55-64 That Has at Least Upper Secondary Education (%), 2002



OECD Education at a Glance, 2004

37 per cent of the 55-64 age cohort have attained at least upper secondary education. This increases to 51 per cent for 45-54 year olds and 65 per cent for 35-44 year olds.

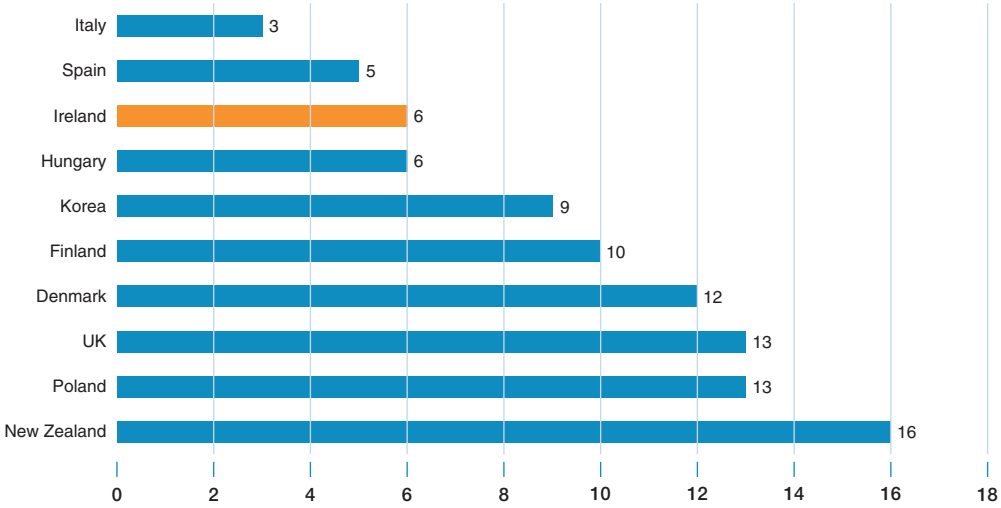
Figure 126: Ratio of Students to Teaching Staff in Secondary Education Institutions, 2002



OECD Education at a Glance, 2004

The OECD country average for the ratio of students to teaching staff in secondary school is 14.4, just ahead of the Irish ratio.

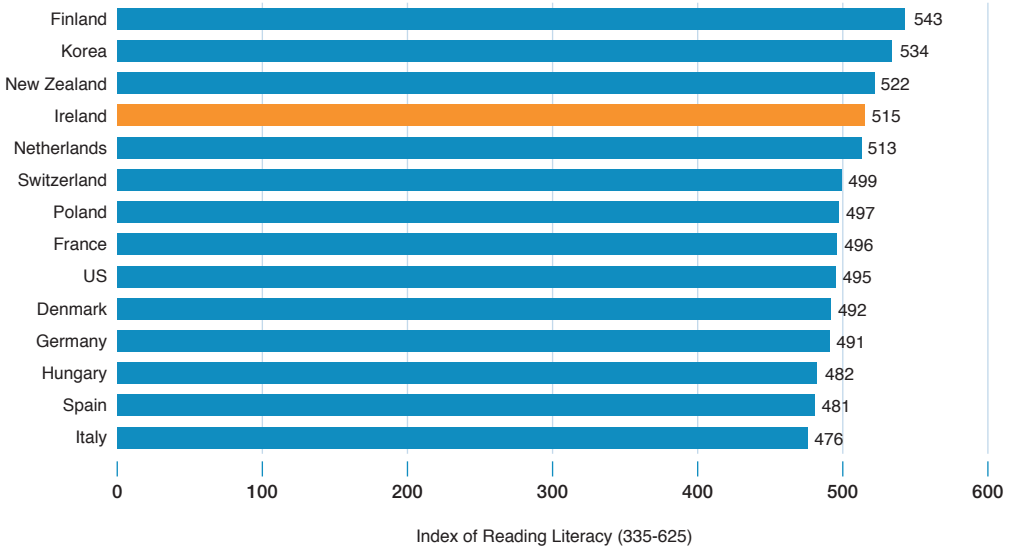
Figure 127: Ratio of Students to Computers in Secondary Education, 2000



OECD Education at a Glance, 2004

Ireland compares well for the ratio of students to computers in secondary schools. Furthermore, a Schools Broadband Access Programme which is to be completed in 2005 will provide broadband access to all primary and secondary schools.

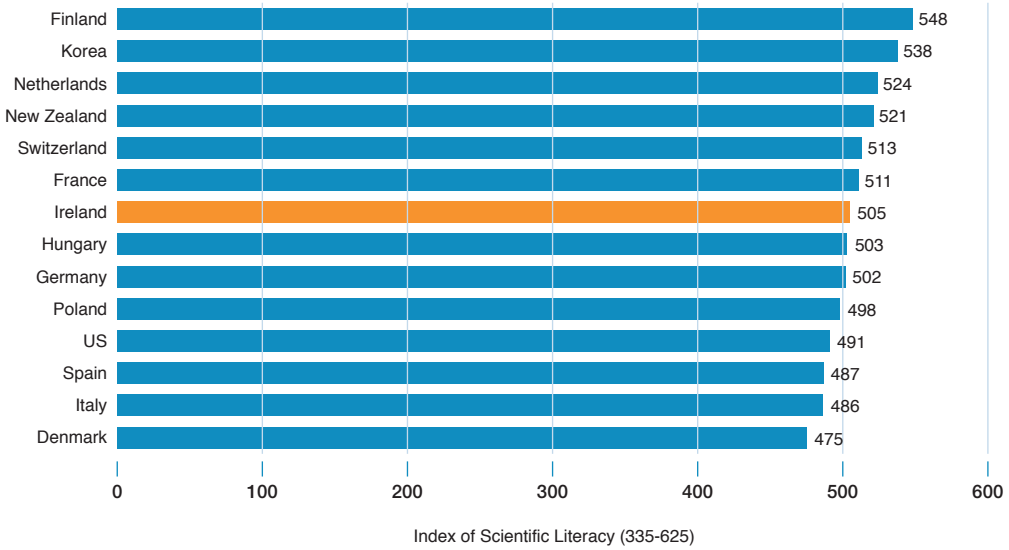
Figure 128: Reading Literacy of 15 Year Olds, 2003



OECD PISA Database, 2004

Irish children aged 15 perform better than the OECD average for reading literacy. Girls in Ireland perform significantly better than boys.

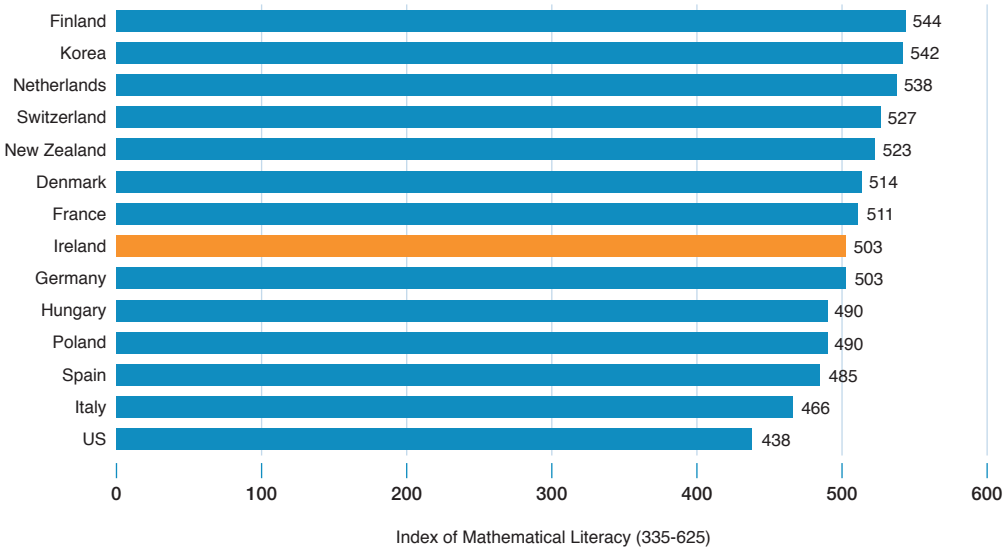
Figure 129: Scientific Literacy of 15 Year Olds, 2003



OECD PISA Database, 2004

Irish children aged 15 perform slightly higher than the OECD average figure in scientific literacy.

Figure 130: Mathematical Literacy of 15 Year Olds, 2003

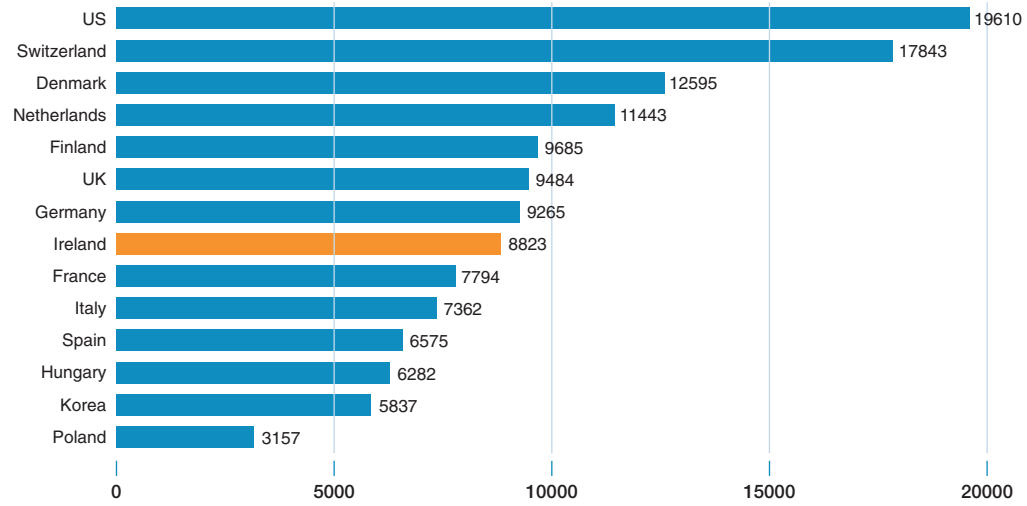


OECD PISA Database, 2004

Irish children aged 15 perform below the OECD average figure for mathematical literacy. Approximately 20 per cent of the Leaving Certificate cohort of 2004 was ineligible to go on to third level as they either failed maths or only completed foundation level.

4.3.5 Tertiary Education

Figure 131: Annual Expenditure on Educational Institutions per Student (€ PPP) – Tertiary Education, 2001

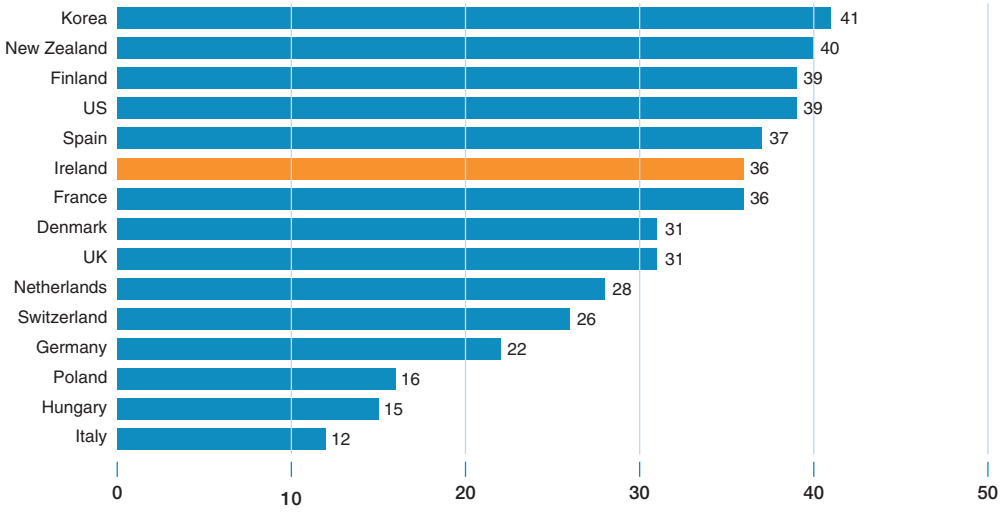


OECD Education at a Glance, 2004

Expenditure per student at third level increased by 5.2 per cent between 1998 and 2003, although it remains below that of leading countries. Ireland has only one institution ranked in the world's top 200 universities, based on variables including peer review and international citations.[19]

19 *'The Sunday Times, World University Rankings', (2004).*

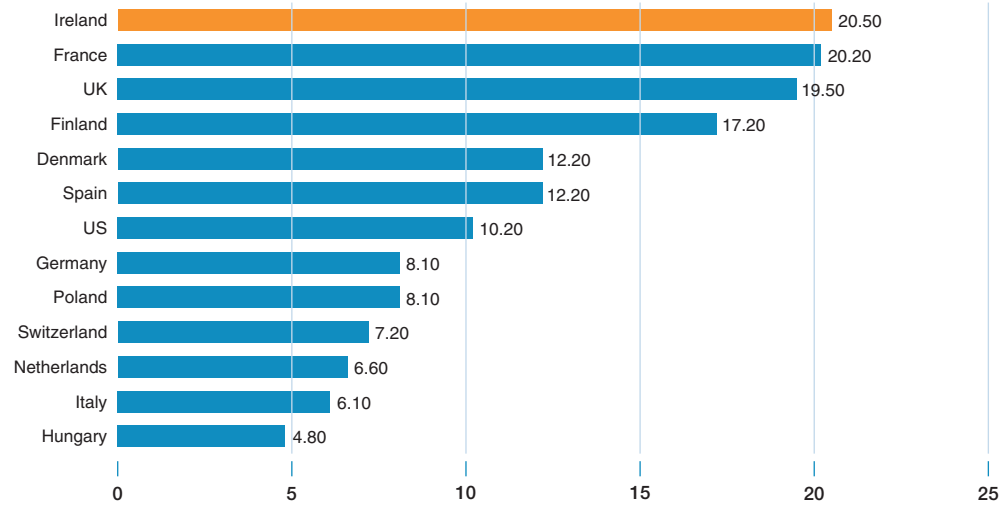
Figure 132: Percentage of Population Aged 25-34 That Has at Least Third Level Education, 2002



OECD Education at a Glance, 2004

A significant gap remains between the proportion of children of wage earners from disadvantaged urban backgrounds entering third level education and the national average. Ireland's poorest counties have the highest proportion of third level entrants.

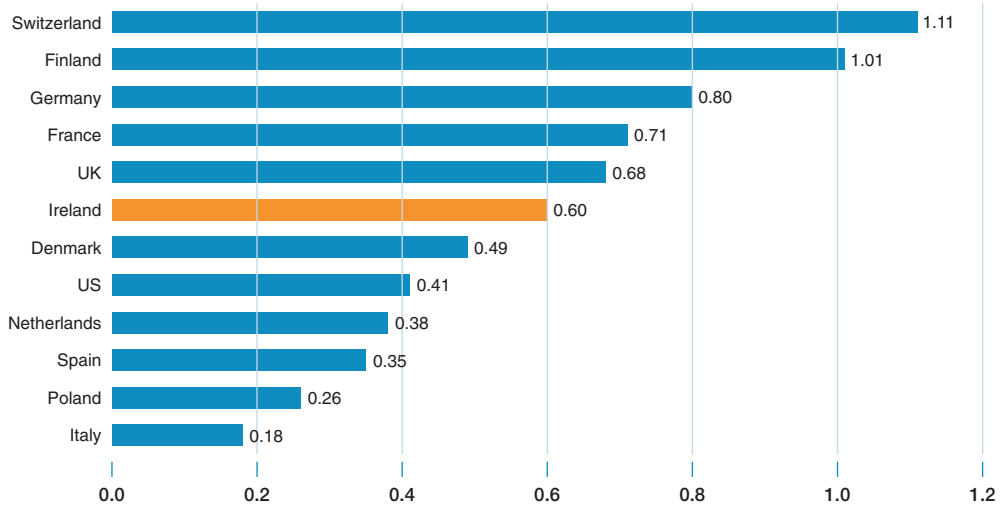
Figure 133: Science and Engineering Graduates (per '000 of Population Aged 20-29), 2002



European Innovation Scoreboard, 2004

Ireland ranks 1st among the countries benchmarked in terms of the number of science and engineering graduates per thousand of the population aged 20-29. Data for Ireland includes certificate, diploma and degree holders. The number of third level first preference applications for science courses of all levels is down by 6 per cent in 2005 on 2003.

Figure 134: Total New Science and Engineering PhDs per '000 of Population Aged 25-34 Years, 2001

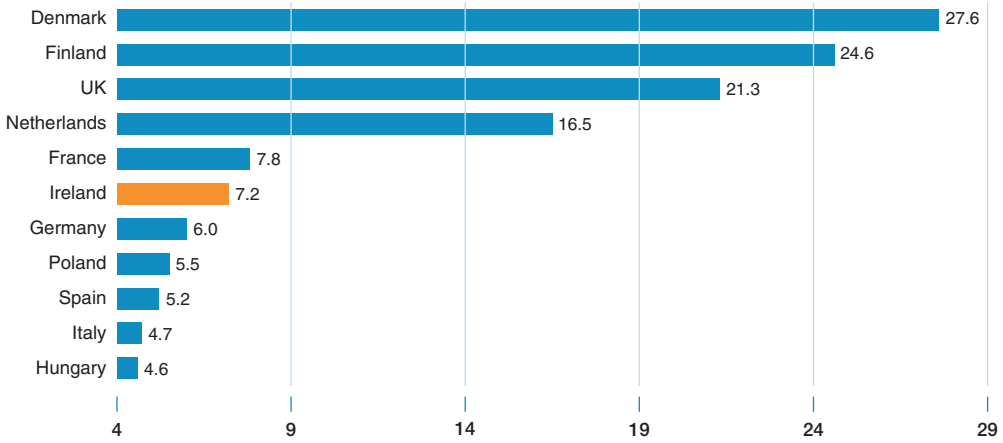


European Commission: Science and Technology Report, 2001

In 2002 Ireland was ranked 8th out of the EU 25 for mathematics, science and technology PhDs awarded per thousand of the population aged 25-34 years.[20]

4.3.6 Life Long Learning

Figure 135: Life Long Learners in EU Member States (% of 25-64 Year Olds), 2004

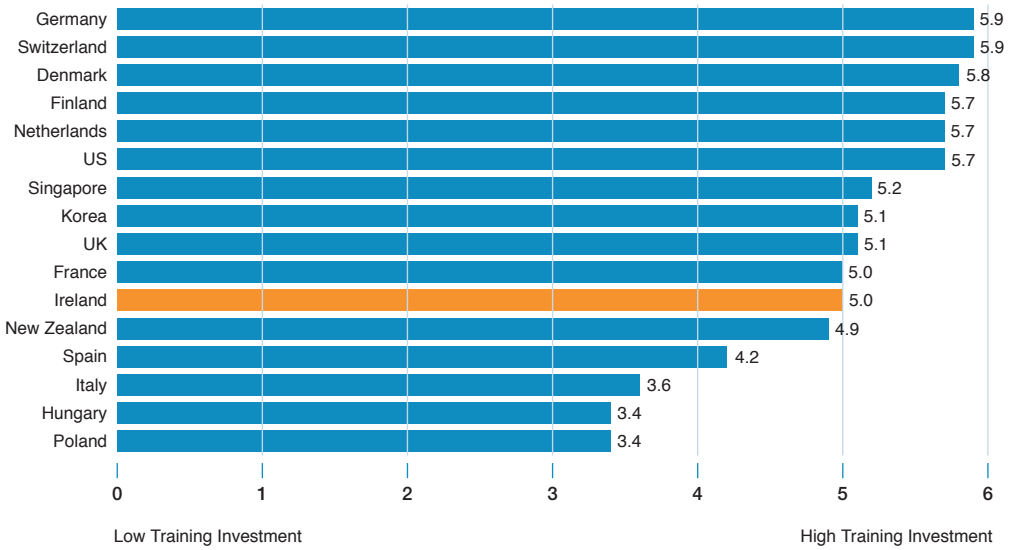


Eurostat 2003

Life Long Learning is defined as all learning activity undertaken throughout life, with the aim of improving knowledge skills and competencies. This indicator measures the percentage of persons aged 25 to 64 in receipt of education in the four weeks prior to the survey and includes both formal and non formal education.

20 *"Measuring Ireland's Progress", Central Statistics Office (2004).*

Figure 136: Extent of Staff Training, 2004 (Scale 1-7)

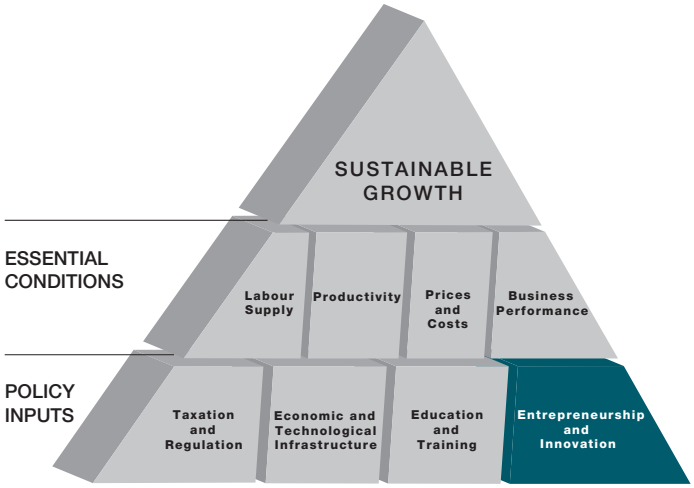


WEF Global Competitiveness Report 2004 / 05

This indicator measures industrialists' perceptions regarding the extent of staff training. Outside of apprenticeship programmes, state funding to support the training of persons in employment was €47 million in 2003. Total expenditure by employers on training costs is estimated to have been approximately €1 billion in 2003.[21]

21 *"Education and Training of Those in Employment in Ireland", Report to Forfás and the Expert Group on Future Skills, Philip J. O' Connell, ESRI (2005).*

4.4 Entrepreneurship and Innovation



Innovation is the creative process that transforms new and existing knowledge and technology into commercial value, and reconfigures existing processes in new ways. Innovation and technological change are the main drivers of long run productivity growth and competitiveness in advanced economies. High rates of entrepreneurship have a positive impact on innovation, productivity and competitiveness because new firms typically use a more efficient mix of labour, capital and technology than existing firms. This chapter examines indicators measuring relative performance in Ireland on entrepreneurship and innovation under the headings business formation and management, investment in research and development, innovation, and clusters and networks.

4.4.1 Business Formation and Management

High levels of enterprise creation have a positive impact on economic growth and employment.[22] This section notes that Ireland has a relatively high rate of entrepreneurial activity (5th/16), but that the availability of capital, particularly for start-ups remains low.

4.4.2 Investment in Research and Development (R&D)

The transition to a knowledge economy requires high levels of investment in research and development, both in terms of capital infrastructure and softer supports and programmes. This section examines various measures of private and public investment in research and development. The main measures of R&D expenditure are:

- Gross Expenditure on R&D (GERD), which measures the combination of business, higher education and government expenditures on R&D (7th/11)
- Business Expenditure on R&D (BERD) (10th/15)
- R&D spending performed in the Public Sector which consists of Higher Education Expenditure on R&D (HERD), and Government Expenditure on R&D (GOVERD) (15th/15)
- Government Budget Outlays or Appropriations of R&D (GBOARD), which measures R&D funds committed by government to be carried out in the business enterprise, government, higher education and private non-profit sectors (13th/14)

22 *"Promoting Entrepreneurship and Innovative SMEs in a Global Economy", OECD (June 2004).*

This section also tracks recent trends in R&D investment and the performance of enterprise by sector and ownership.

4.4.3 Innovation

Innovation is the process of turning knowledge and ideas into commercial value, and is highly dependent on linkages within the enterprise sector and on linkages with research institutions.[23] Innovation can also take the form of developing and applying more dynamic and efficient business processes, thus enhancing industrial productivity.[24] This section notes that despite progress to date, Ireland has a low patent grant level (10th/11) relative to leading countries.

4.4.4 Clusters and Networks

Clusters are geographic concentrations of interconnected companies, specialised suppliers, service providers and associated institutions in a particular field that are present in a nation or region. In theory, large and small companies in a similar industry achieve more by working together in clusters than they would individually, benefiting from common labour pools and suppliers, faster innovation and smoother production processes. This section assesses the strength and depth of clusters and networks in Ireland based on survey data. This section notes that cluster development in Ireland is perceived as being relatively well developed (7th/16), although Ireland's performance is weaker with respect to the availability of specialised research and training services (11th/16).

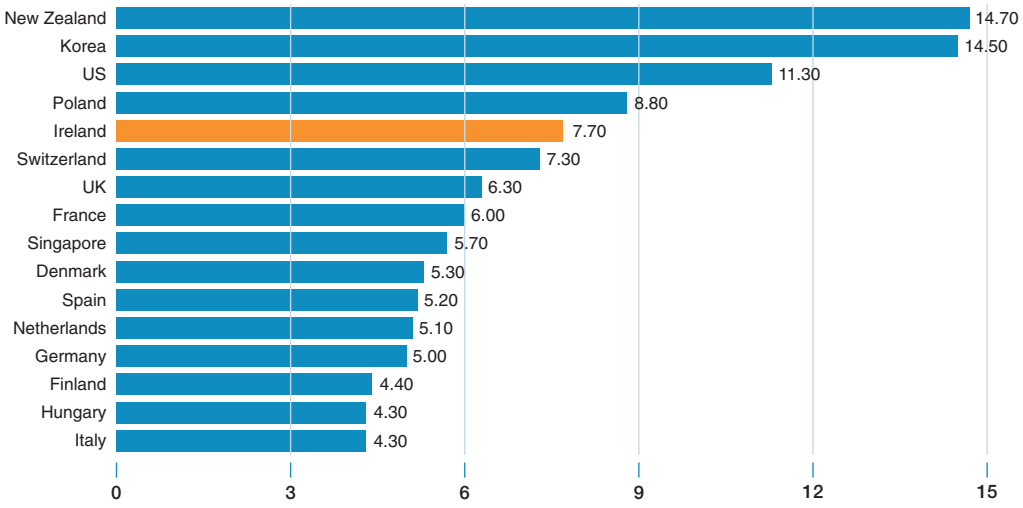
Networks may be formal 'hard' networks involving firms joining together specifically to co-produce, co-market, co-purchase, or co-operate in product or market development; and more informal 'soft' networks involving firms joining together to solve common problems, share information, acquire new skills or jointly provide training. These 'soft' networks may also be defined as nascent or potential business networks, where enterprises may or may not presently trade with each other, although such trade could possibly occur in the future.

23 *"Benchmarking Countries in the Knowledge Economy", World Bank Institute (2004).*

24 *"Improving European Competitiveness", McKinsey Global Institute (2003).*

4.4.1 Business Formation and Management

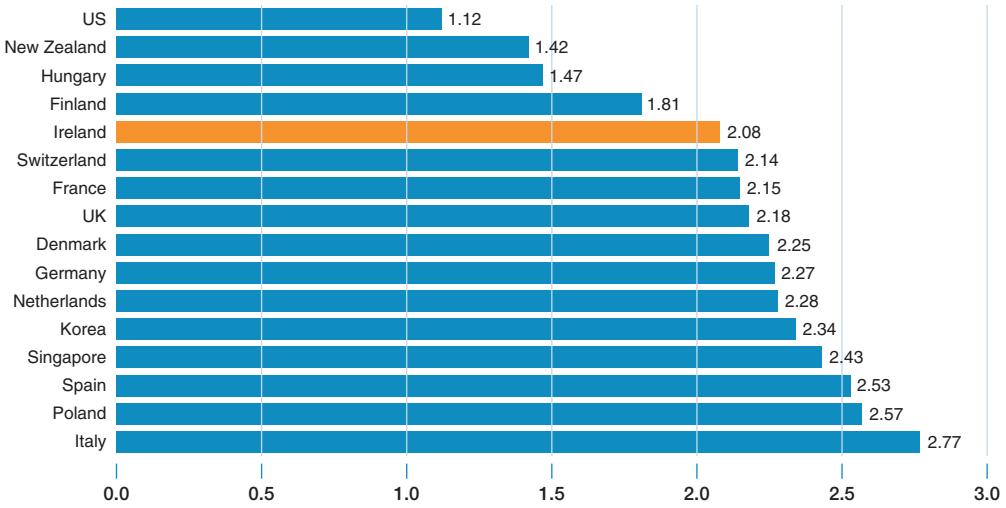
Figure 137: Total Entrepreneurial Activity Rate, 2004



Global Entrepreneurship Monitor 2004

The Total Entrepreneurial Activity (TEA) rate measures the percentage of the adult population engaged in start-up (prior to trade) and 'new' (first 42 months) firms. The 2004 Global Entrepreneurship Monitor points to the positive cultural disposition towards entrepreneurship in Ireland as one of the factors for the relatively strong TEA rate. In 2004, start-up firms employed 193,000 people in Ireland.

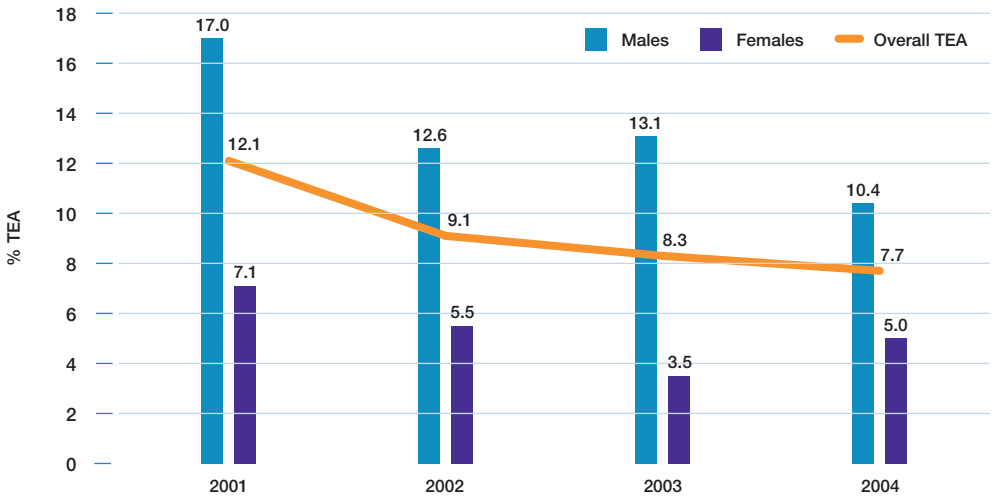
Figure 138: Ratio of Men to Women Entrepreneurs, 2004



Global Entrepreneurship Monitor 2004

As with most countries, men are much more likely than women to become entrepreneurs in Ireland. For every female entrepreneur there are 2.08 males involved in start-up firms. This is a low ratio compared to most other countries.

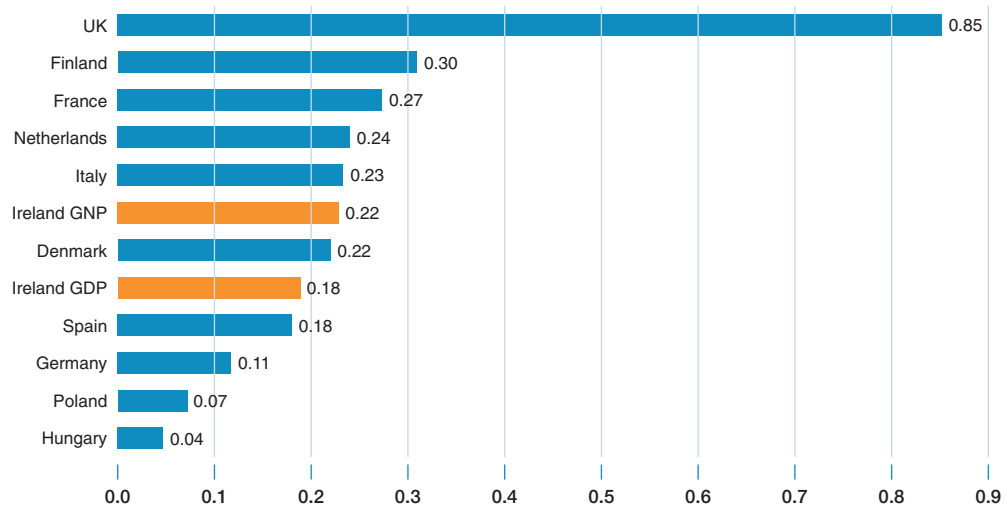
Figure 139: Total Entrepreneurial Activity and Gender Division 2001-2004



Global Entrepreneurship Monitor 2004

The overall TEA rate has fallen from a high of 12.1 per cent in 2001.

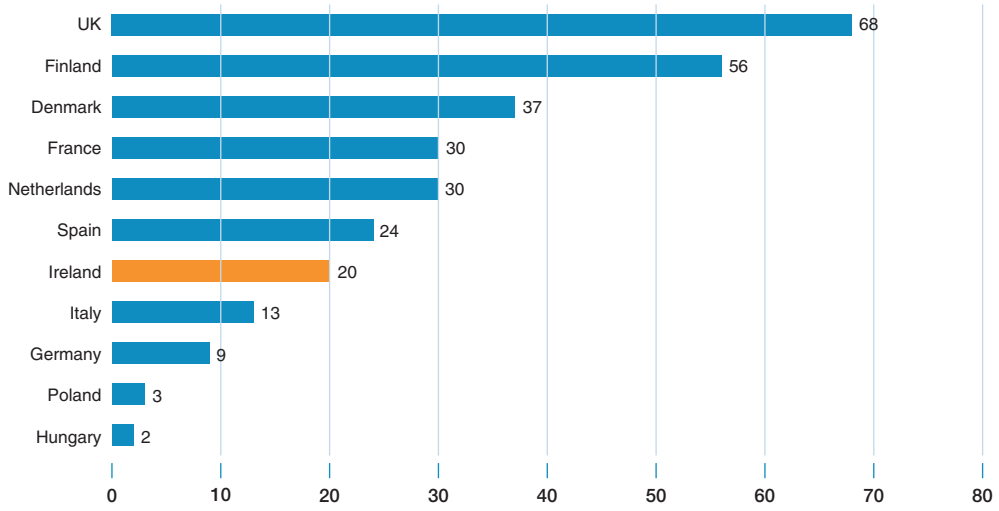
Figure 140: Private Equity Investment (% of GDP), 2003



European Venture Capital Association / PWC

Private equity investment is formal investment outside public capital markets and represents total start up, expansion, turnaround and buyout investments. Private equity investment has increased in Ireland from 0.08 per cent of GDP in 2002 to 0.19 per cent of GDP in 2003.

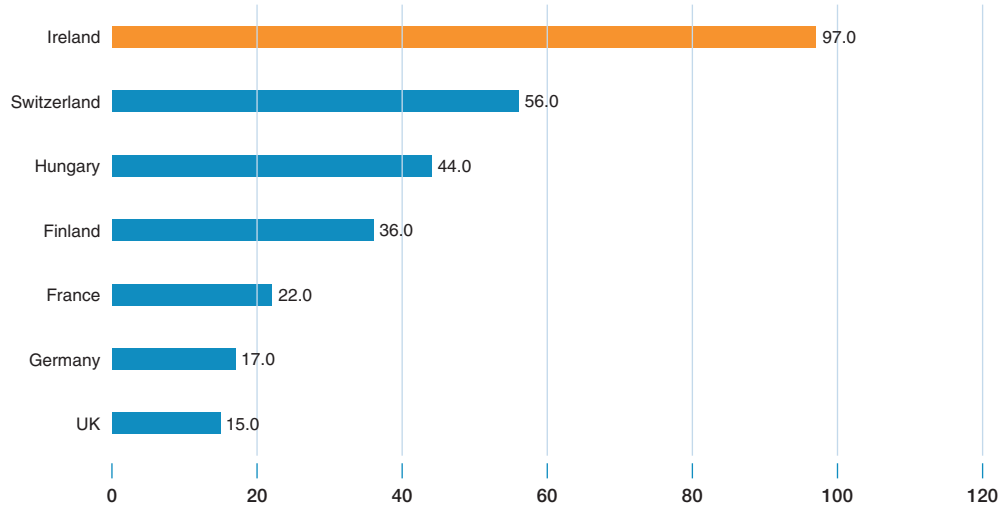
Figure 141: Venture Capital per Capita (€), 2003



European Venture Capital Association / PWC

Venture Capital is private equity investment made at either the start-up or expansion stage of a firm. €140 million has been committed to Seed and Venture Capital Funds under the National Development Plan 2000-2006.

Figure 142: High Tech Investment (% of Total Private Equity Investment), 2003

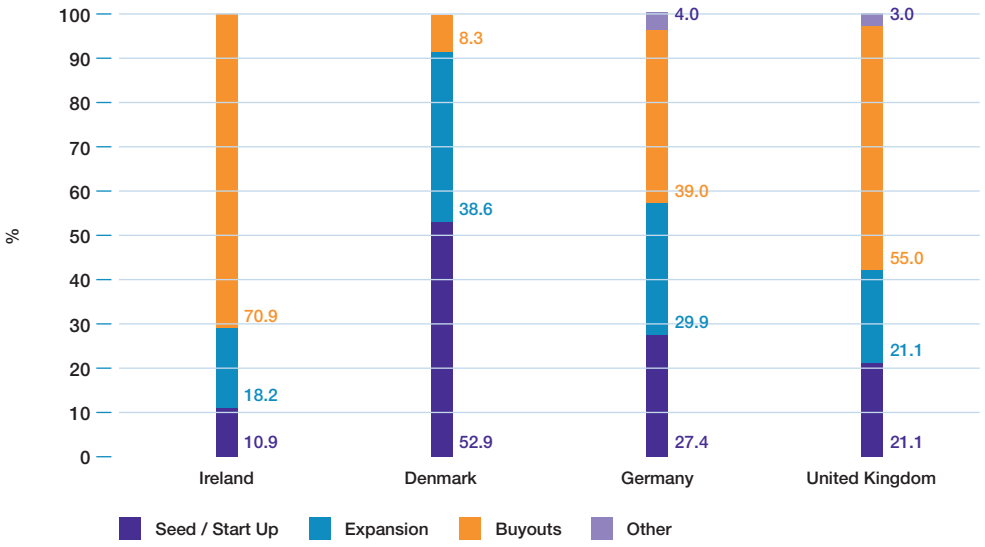


PWC European Technology Investment Report 2004

Technology investment is the identification and funding of technologies with commercial potential. Total technology investment in Ireland was €247 million in 2003. In 2003, 83 per cent of Venture Capital funds in Ireland were invested in the Software and Communications sectors alone.[25]

25 *"Seed and Venture Capital Programme Report", Enterprise Ireland (2003).*

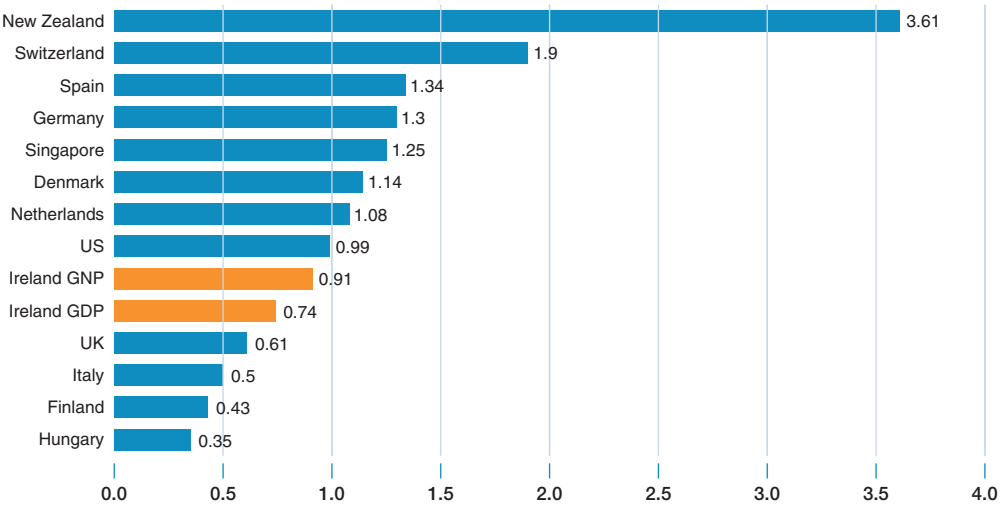
Figure 143: Destination of Private Equity Hi-Tech Investment, 2003



PWC European Technology Investment Report 2004

In 2003, Ireland had the lowest proportion of start-up investment among benchmarked countries. Tax incentives to support start-ups and business growth provided by the extension of the Seed Capital Scheme and Business Expansion Scheme were extended in 2004 to 2006.

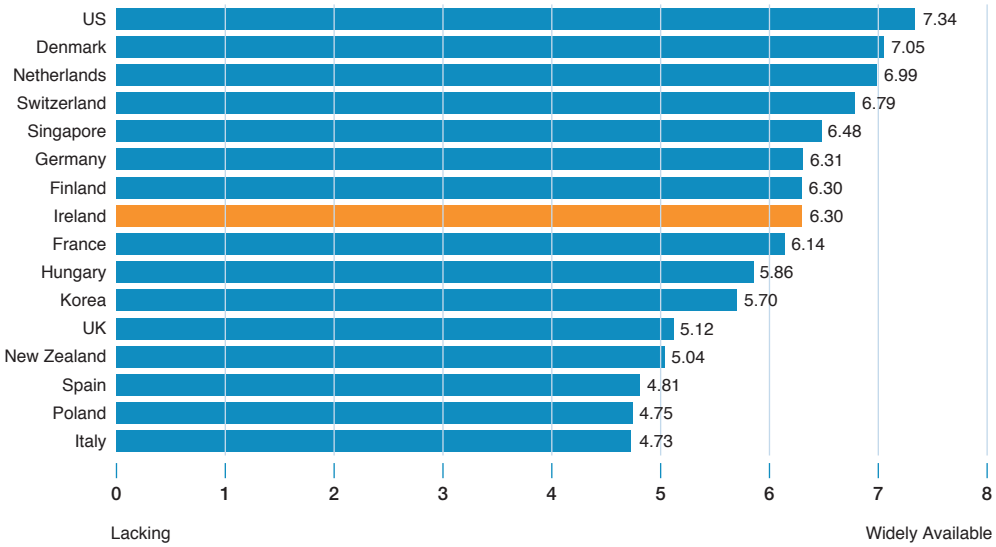
Figure 144: Domestic Informal Investment (% of GDP), 2002



GEM 2003 Financing Report

Informal investments (funds sourced from family, friends or associates) are distinct from formal private equity investments by companies and have fallen in Ireland since 2001 due to wider availability of formal venture capital and institutional lending.

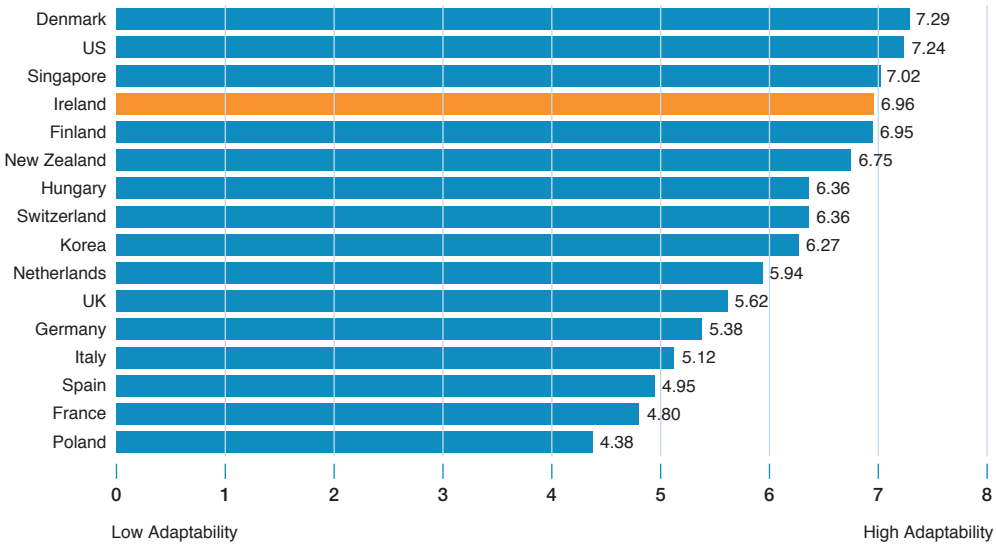
Figure 145: Competent Senior Managers, 2005 (Scale 1-8)



IMD World Competitiveness Yearbook 2004 / 05

This indicator is based on survey data measuring the opinion of executives regarding the availability of competent managers in an economy. In 2004, the Enterprise Strategy Group recommended that many Irish managers seek more guidance and training, particularly in strategic development and implementation.[26]

Figure 146: Adaptability to Market Changes, 2005 (Scale 1-8)

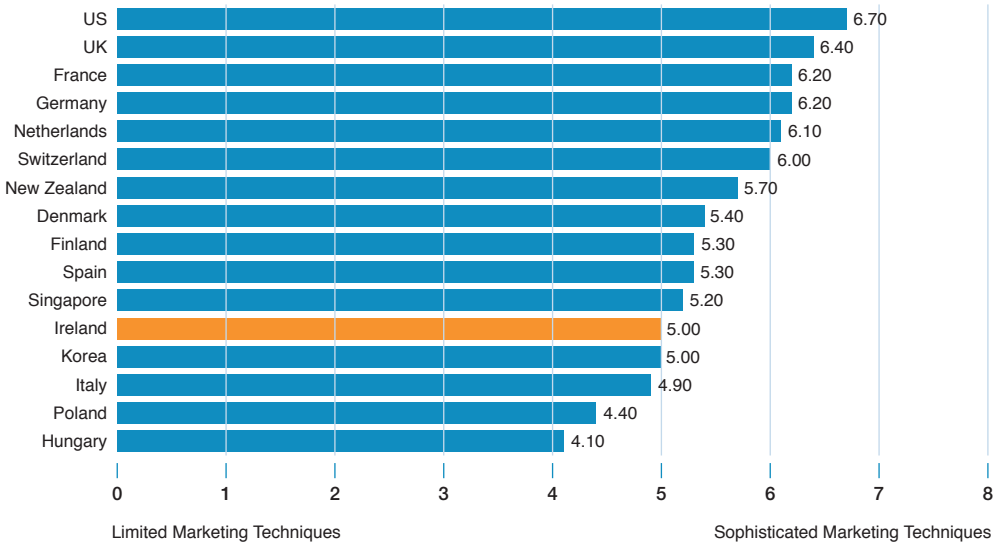


IMD World Competitiveness Yearbook 2004 / 05

This indicator is based on survey data and suggests that firms in Ireland are highly adaptable to changing market conditions.

26 *"Ahead of the Curve – Ireland's Place in the Global Economy", Enterprise Strategy Group, Forfás (2004).*

Figure 147: Extent of Marketing, 2004 (Scale 1-7)

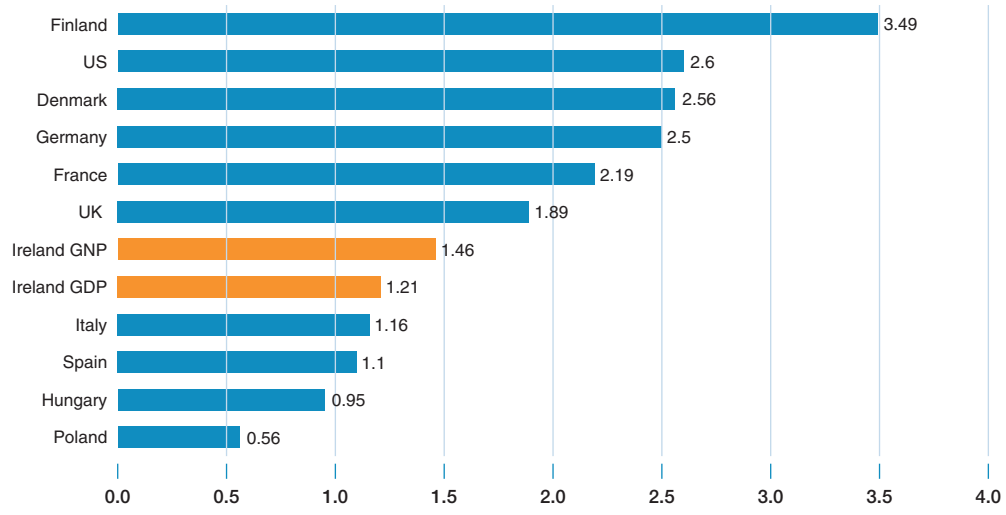


WEF Global Competitiveness Report, 2004 / 05

This indicator is based on survey data measuring the opinion of executives regarding sophistication of marketing tools and techniques in an economy. Ireland ranks among the lowest across the countries benchmarked. A 2004 Forfás report indicates that 42% of SMEs in Ireland do not prepare detailed marketing plans.[27]

4.4.2 Investment in Research and Development (R&D)

Figure 148: Gross Domestic Expenditure on R&D (GERD) (% of GDP), 2003



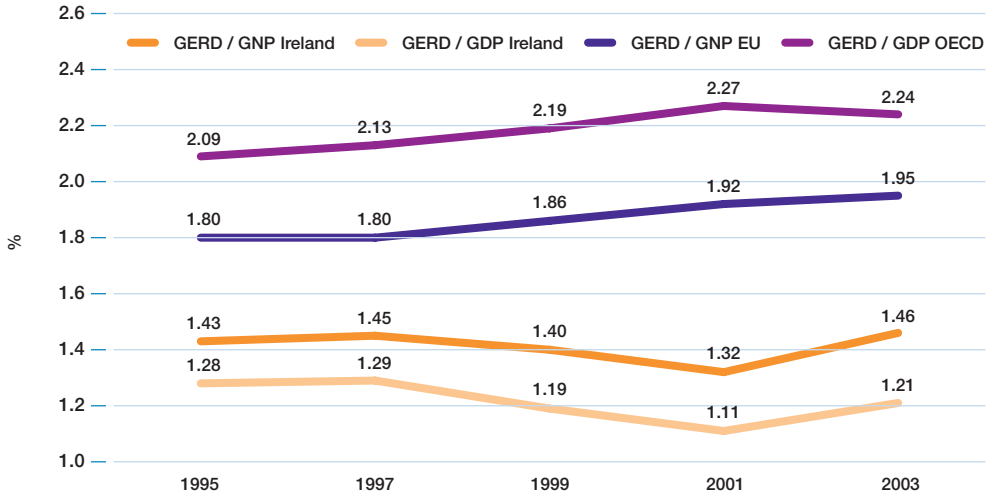
Eurostat Science and Technology Statistical Yearbook 2004

As an integral part of the Lisbon Strategy, in 2000 the European Council set a target that 3 per cent of EU GDP would be invested in R&D by 2010. The Irish Action Plan for Promoting Investment in R&D sets a target of 2.5 per cent of GNP expenditure on R&D by 2010 and sets a vision that "Ireland by 2010 will be internationally renowned for the excellence of its research".[28]

27 *"Innovate Market Sell", Forfás (2004).*

28 *"Building Ireland's Knowledge Economy – The Irish Action Plan for Promoting Investment in R&D to 2010", Forfás (2004).*

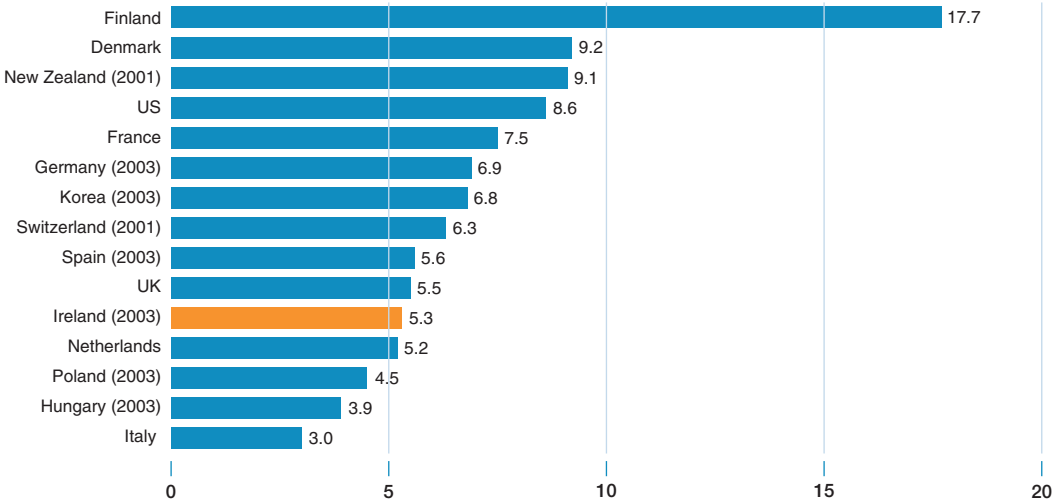
Figure 149: Gross Expenditure on R&D (% of GDP), 1995-2003



OECD Main Science and Technology Indicators, 2004.

Progress has been made in narrowing the GERD gap between Ireland and the EU and OECD averages between 2001 and 2004. Substantial increases in R&D investment by both the private and state sectors will be necessary if Ireland is to reach its target of 2.5 per cent of GNP investment in R&D by 2010.

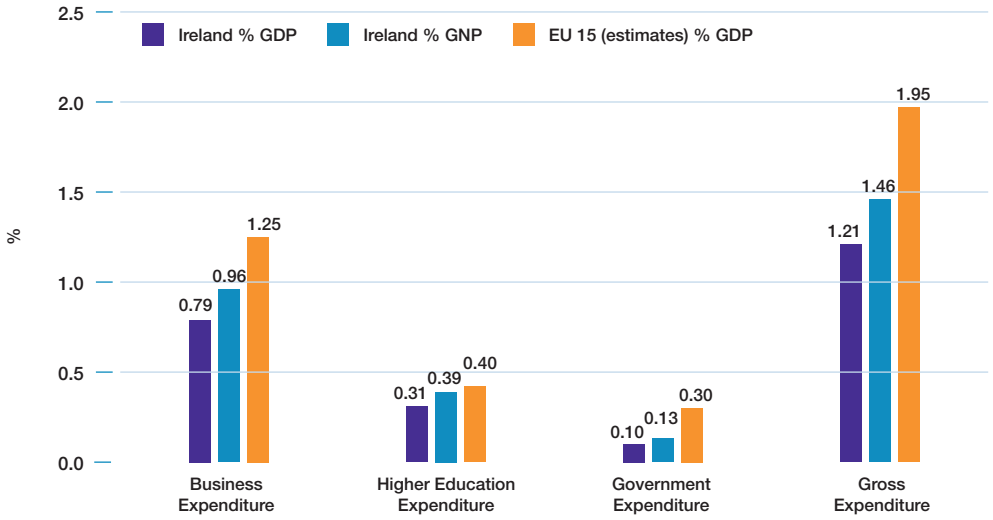
Figure 150: Researchers per '000 Total Employment, 2002



OECD Main Science and Technology Indicators, 2004

The 2010 Action Plan for promoting Investment in R&D has set a target of 9.3 researchers per 1000 of total employment by 2010, almost double the current Irish figure. Some progress has been made, with the number of researchers growing from 5 per 1000 total employment in 2001 to 5.3 in 2003.

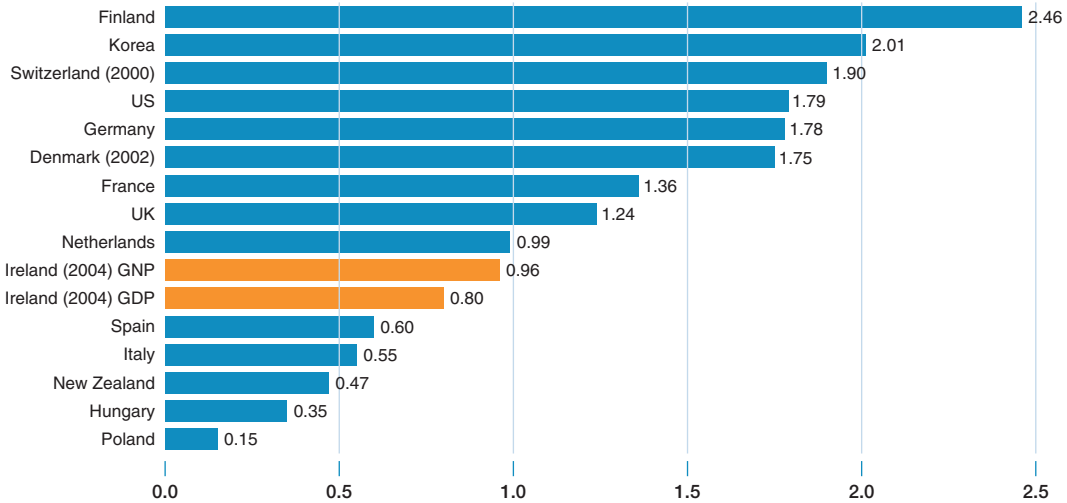
Figure 151: Distribution of Gross Expenditure on R&D (% of GDP), 2003 – Ireland and EU 15



OECD Main Science and Technology Indicators 2004

Business Expenditure on R&D accounts for the great majority of overall R&D expenditure in Ireland and the EU. The focus of Irish R&D policy to 2010 is to develop a national pro-innovation culture that encourages widespread R&D among indigenous and FDI companies.

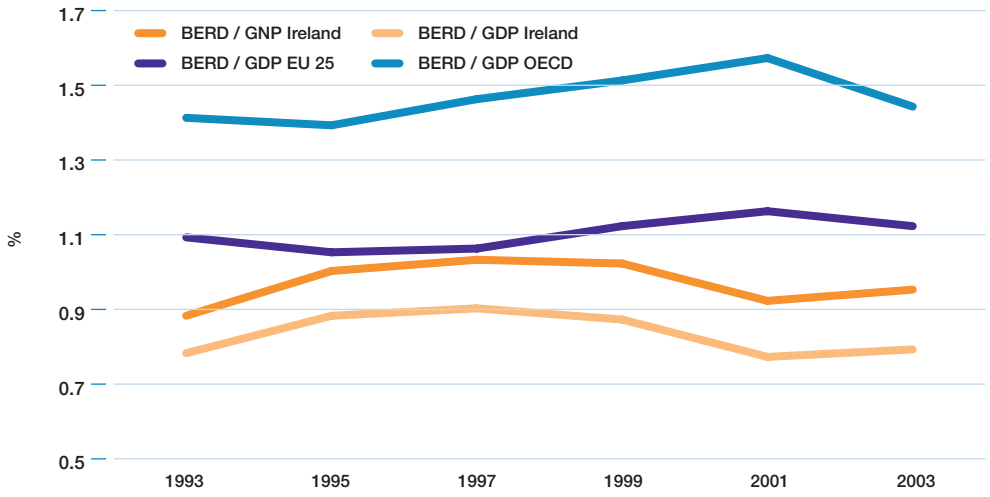
Figure 152: Business Expenditure on R&D (BERD) (% of GDP), 2003



OECD Main Science and Technology Indicators, 2004

The 2010 Action Plan for R&D sets a target of €2.5 billion, or 1.7 per cent of GNP, for business expenditure on R&D by 2010.

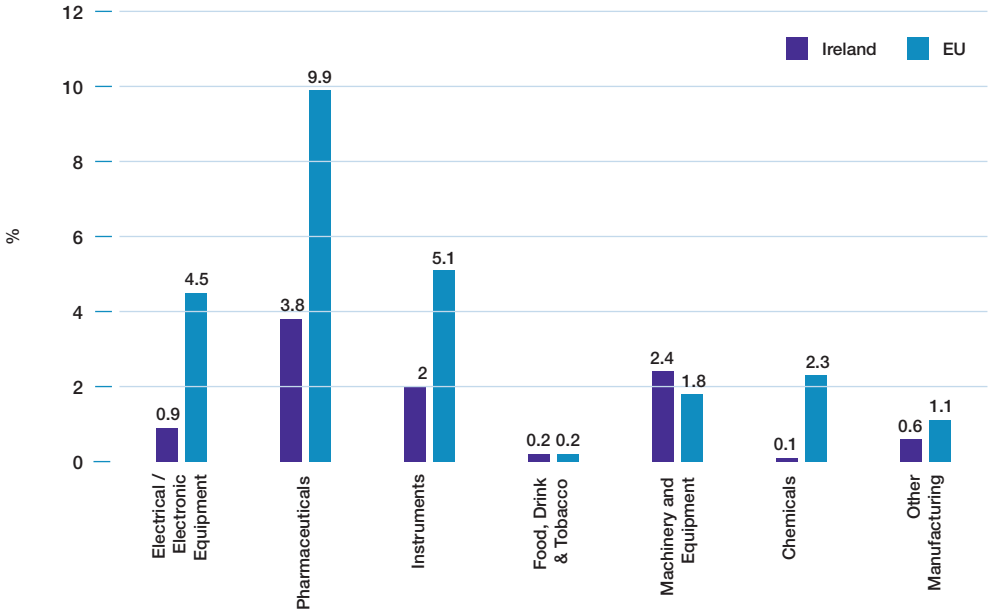
Figure 153: Business Expenditure on R&D (% of GDP), 1993-2003



Forfás, Business Expenditure on Research and Development

In 2003, Business Expenditure on R&D in Ireland stood at €1,075.6 million. This represents a nominal average annual growth rate of 19.4 per cent over the previous two years. In 2003, the Government introduced R&D tax credits to encourage enterprises to invest in research and technological developments.

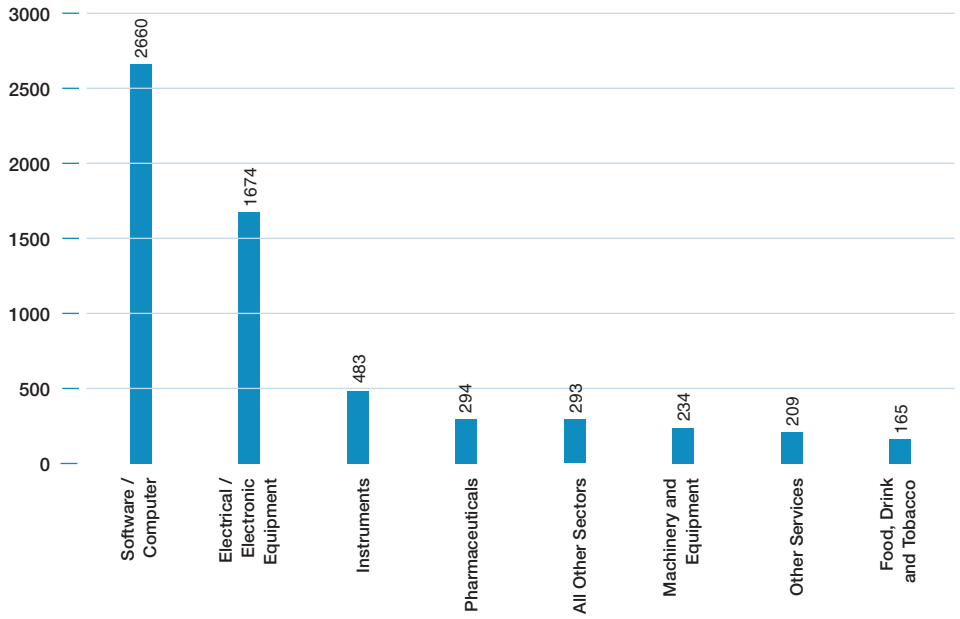
Figure 154: R&D Intensity (as a % of Industrial Output) – Ireland and EU, 2003



Forfás, Business Expenditure on Research and Development

R&D intensity in the pharmaceuticals sector has increased from 1.3 per cent in 2001 to 3.8 per cent in 2003. R&D intensity in the machinery and equipment sector has grown from 1.4 per cent in 2001 to 2.4 per cent in 2003. These sectors are dominated by multinationals.

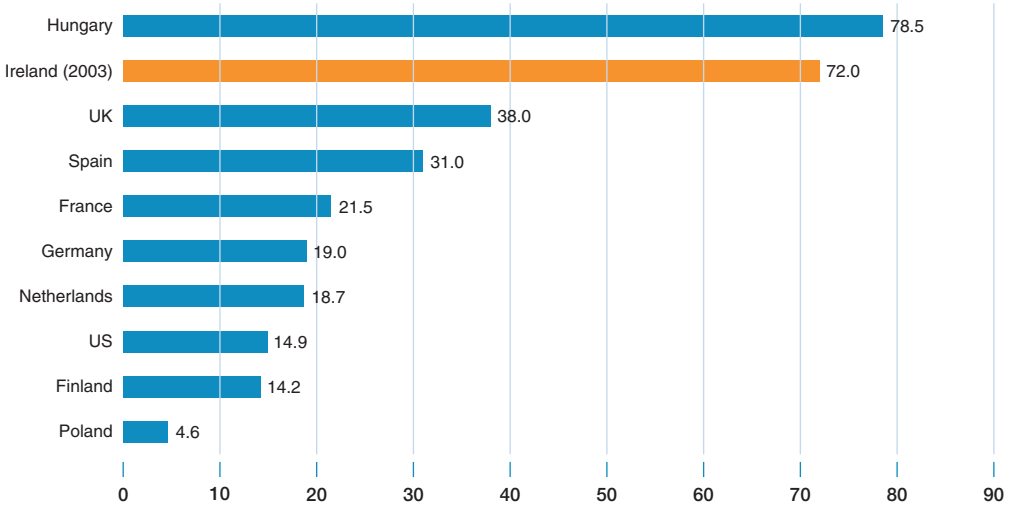
Figure 155: Total Business Research Personnel (PhD and Non-PhD) by Sector, 2003



Forfás, Business Expenditure on Research and Development

The 2010 Action Plan for promoting Investment in R&D projects that 11,100 researchers are required in the private sector and 18,310 in total are needed if Ireland is to achieve the target of 2.5 per cent of GNP expenditure on R&D by 2010. In 2003, there were 6,012 business research personnel in Ireland.

Figure 156: R&D Expenditure of Foreign Owned Companies (% of National BERD), 2002

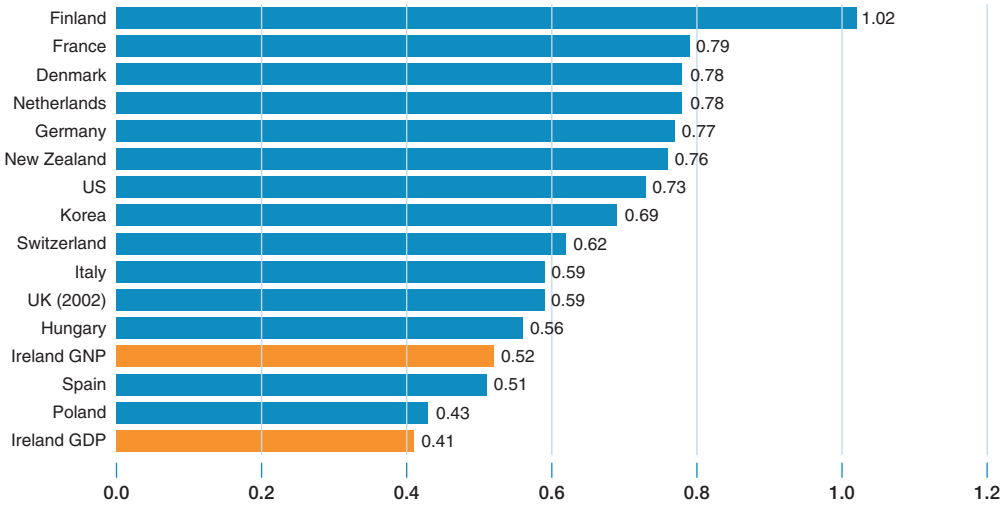


OECD Main Science and Technology Indicators, 2004

Most business expenditure on R&D in Ireland is undertaken by foreign-owned companies. 36 MNCs spend more than €5 million annually on R&D in Ireland and account for 79 per cent of total foreign business expenditure on R&D in Ireland.[29]

29 *"Business Expenditure on Research and Development 2003", Forfás (2005).*

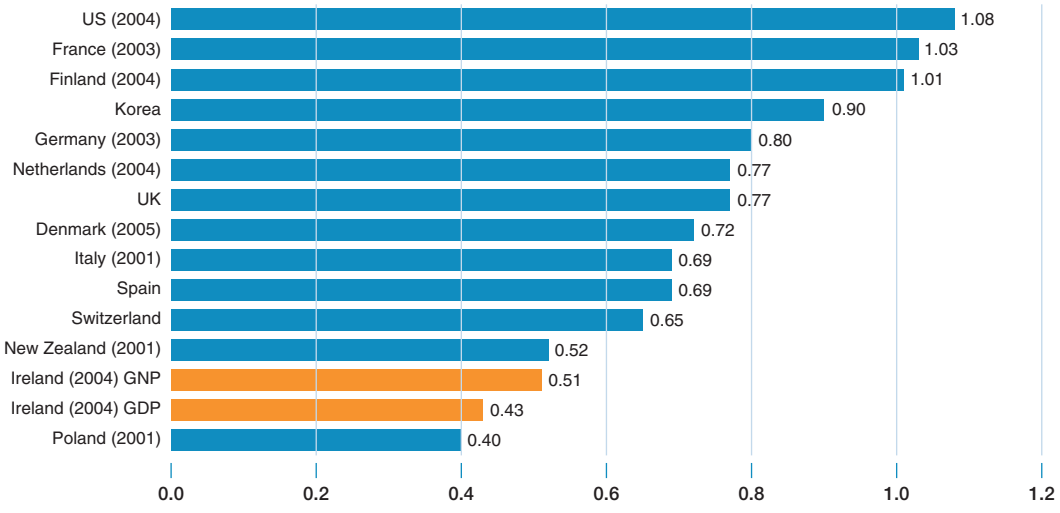
Figure 157: R&D Spending Performed in Public Sector including GOVERD and HERD (% of GDP), 2003



Forfás / OECD Main Science and Technology Indicators, 2004

Public expenditure on R&D has grown significantly in recent years in nominal terms. GOVERD has increased from €95 million in 2000 to €138 million in 2004. HERD has increased from €238 million in 2000 to €322 million in 2002.[30]

Figure 158: Government R&D Appropriations (GBOARD) (% of GDP), 2002



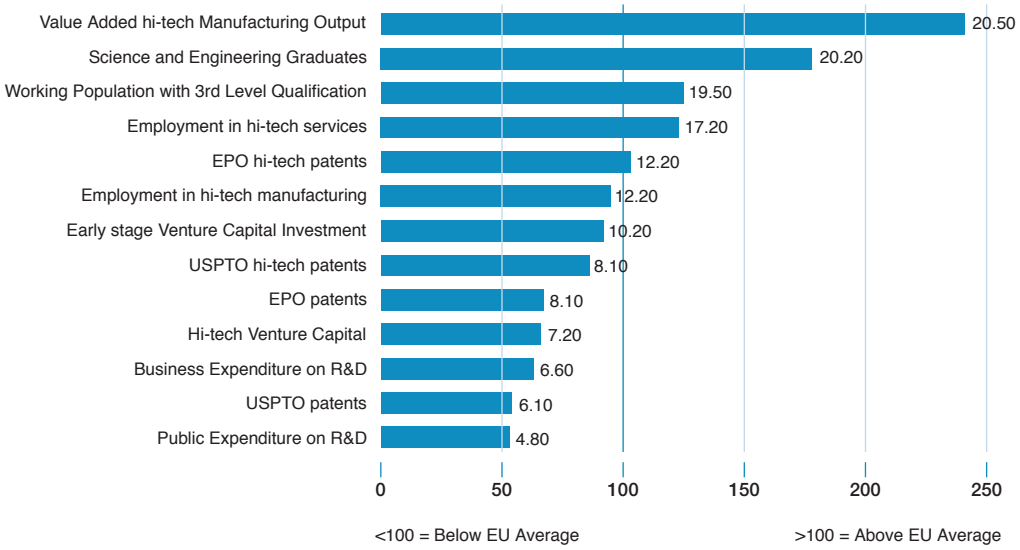
Forfás / OECD Main Science and Technology Indicators, 2004

The National Development Plan 2000-2006 allocated €2.5 billion to public investment in R&D. Increased outlays have enabled long-term research support programmes and centres such as the Programme for Research in Third Level Institutions (PRTLI) and Science Foundation Ireland (SFI). To date, €600 million has been invested in the PRTLI and the NDP allocated €648 million to SFI.

30 *"Building Ireland's Knowledge Economy – The Irish Action Plan for Promoting Investment in R&D to 2010", Forfás (2004).*

4.4.3 Innovation

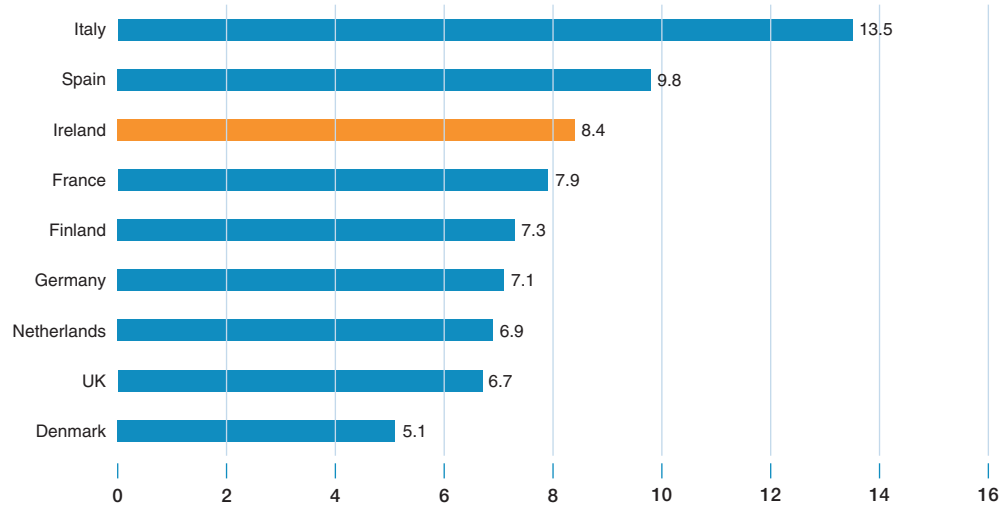
Figure 159: Innovation Performance Relative to EU 25 (100=EU Average), 2004



European Innovation Scoreboard, 2004

This chart assesses Ireland's performance relative to the EU on a range of innovation indicators, including hi-tech manufacturing output and employment, investment in R&D, availability of venture capital, and patents awarded by the European Patent Office (EPO) and the United States Patent and Trademark Office (USPTO).

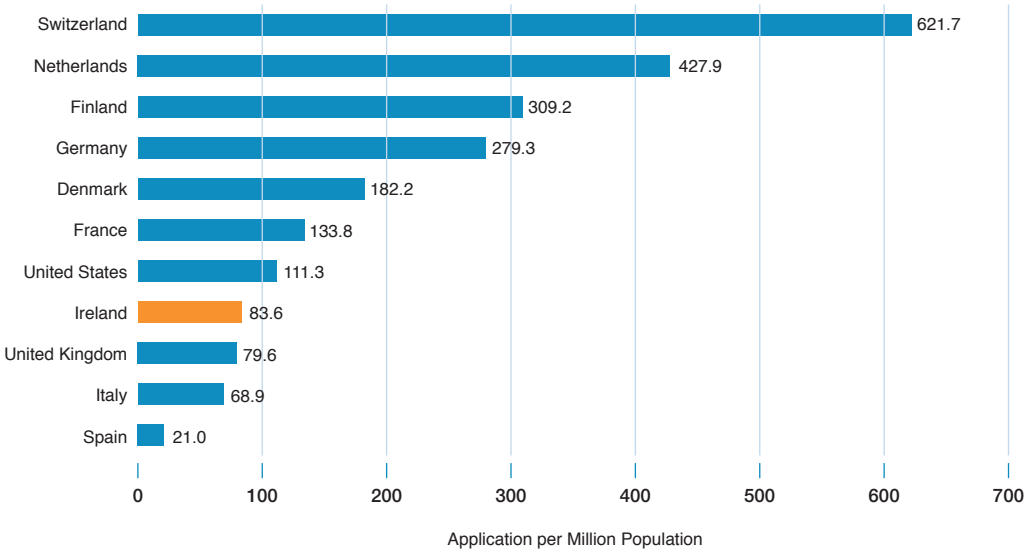
Figure 160: New to Market Products (% Turnover in All Manufacturing), 2002



European Innovation Scoreboard 2003

The 2004 European Commission 'Innobarometer' survey reports that 75% of Irish firms surveyed successfully introduced new or significantly improved products or services during 2004.

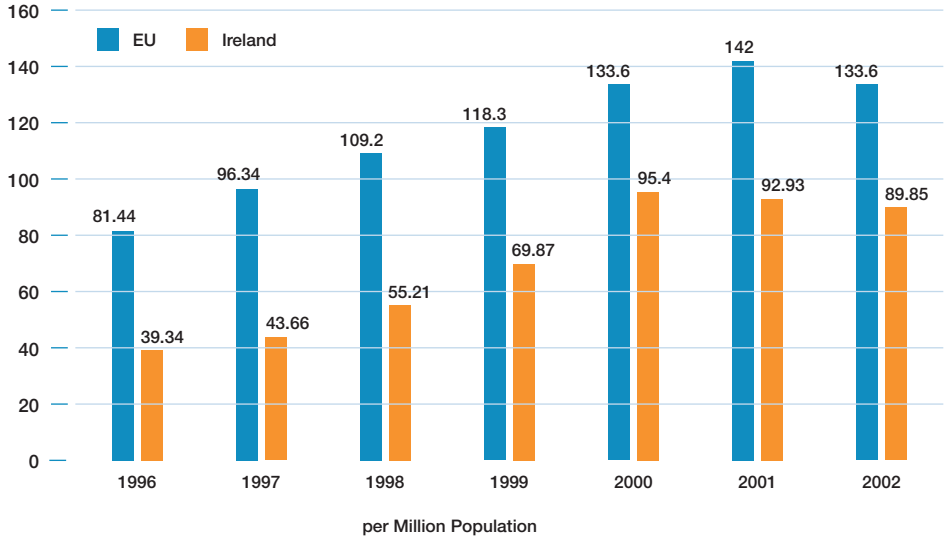
Figure 161: European Patent Office Applications, 2004



European Patent Office, 2004 Annual Report

Ireland ranks 8th out of 11 benchmarked countries for the level of European Patent Office (EPO) applications, significantly behind Switzerland, the Netherlands and Finland.

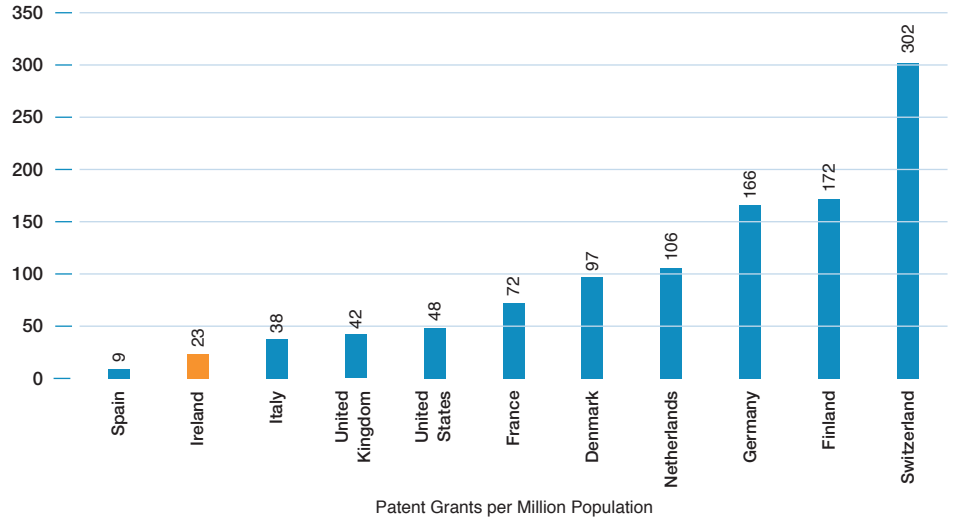
Figure 162: European Patent Office Applications, Ireland and EU 1996-2002



Central Statistics Office

There is an improvement in the level of Irish patent applications over time. Irish patent applications to the European Patent Office have increased by 228 per cent since 1996. The gap between Ireland and the EU has closed from 48 per cent of the EU average in 1996 to 67 per cent in 2002.

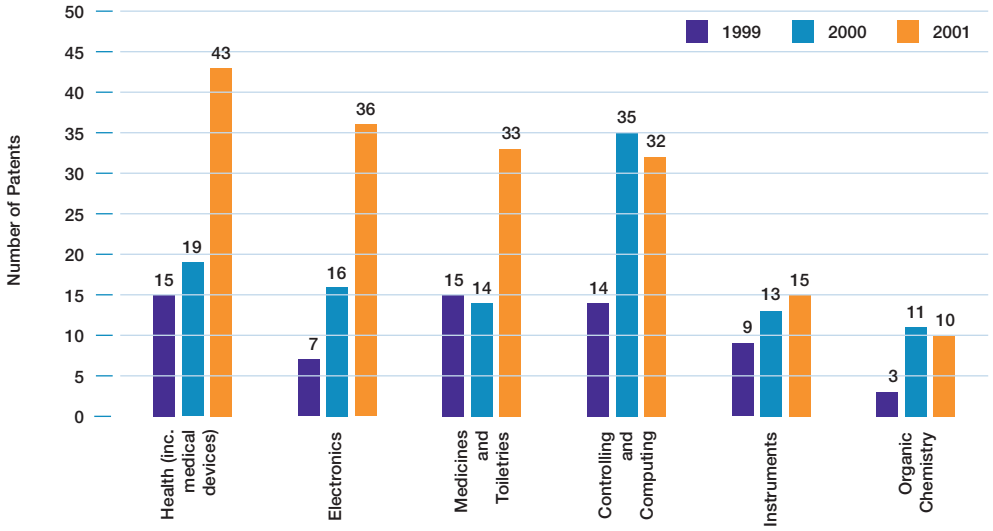
Figure 163: European Patent Office Patents Granted, 2004



European Patent Office Annual Report 2004 / Forfás

The level of patents granted is a more definitive measure of innovation than patent applications. Ireland has a low patent grant level relative to applications. A Forfás study suggests that one reason for this poor conversion rate is a lack of funding to see the patent programme through to grant level.[31]

Figure 164: Main Technology Classifications of EPO-Granted Patents Originating in Ireland

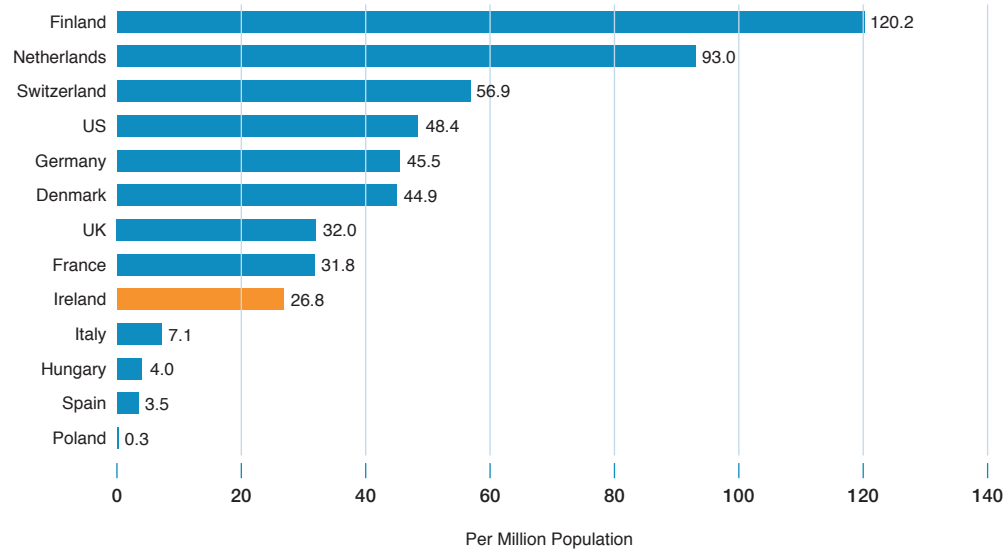


European Patent Office Annual Report 2003 / Forfás

As almost all MNC patenting is lodged through the country of the parent company, the level of patent grants is a good indicator of indigenous sectoral research activity. In recent years, growth in patent applications is most noticeable in high tech sectors of computing, electronics, medical devices and medicines.

31 *"From Research to Marketplace – Patent Registration and Technology Transfer in Ireland", Forfás (2005).*

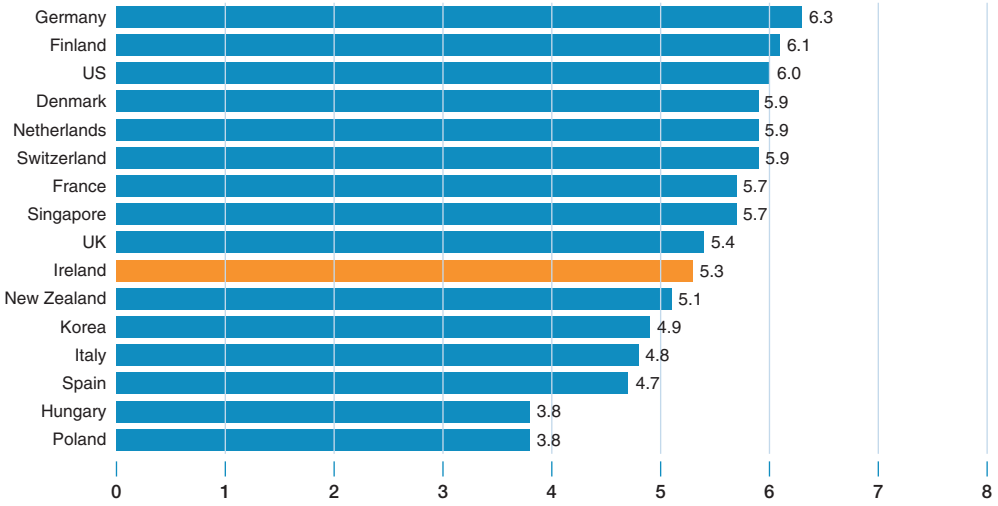
Figure 165: European Patent Office Applications, High-Tech, 2002



European Innovation Scoreboard, 2004

The level of high-tech patent applications is much lower in Ireland relative to leading economies such as Finland and the Netherlands, though the Irish performance is 3% above the EU average.

Figure 166: Production Process Sophistication, 2004 (Scale 1-7)

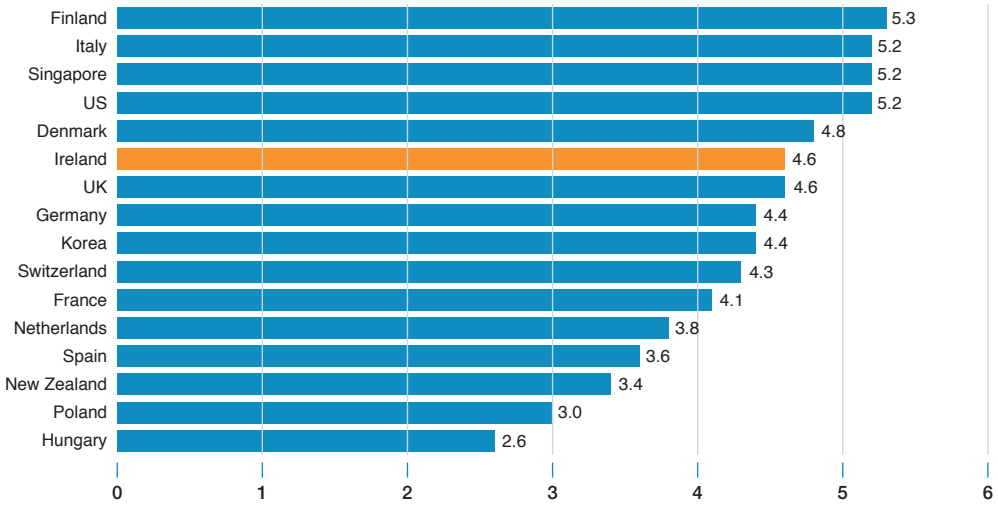


WEF Global Competitiveness Report, 2004 / 05

This indicator is based on survey data that measures industrialists' perceptions of the level of technology intensity in production.

4.4.4 Clusters and Networks

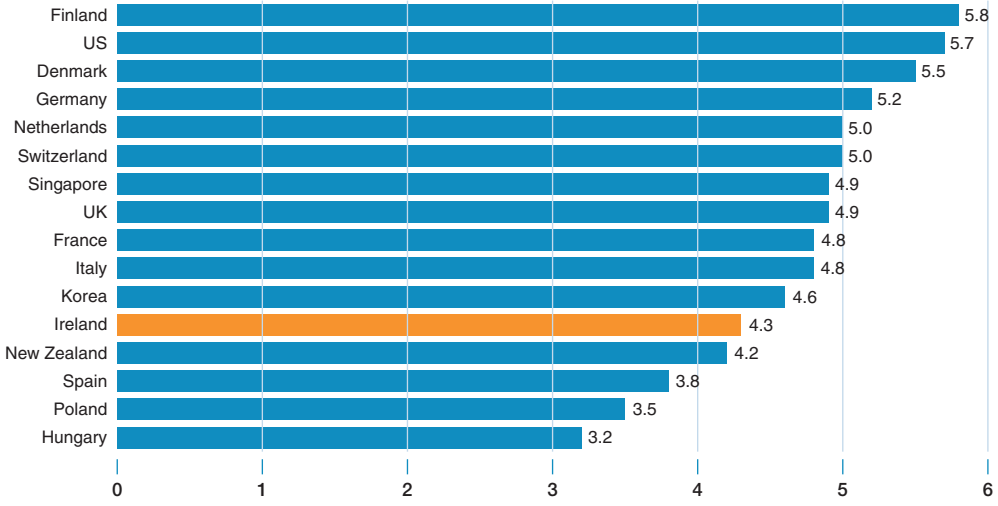
Figure 167: State of Cluster Development, 2004 (Scale 1-7)



WEF Global Competitiveness Report 2004 / 05

This indicator is based on survey data. Direct stimulation of clusters has become an important focus of innovation policy in many countries. Research evidence has shown that clusters and networks provide benefits to firms, particularly SMEs.[32]

Figure 168: Extent of Collaboration Among Clusters, 2004 (Scale 1-7)

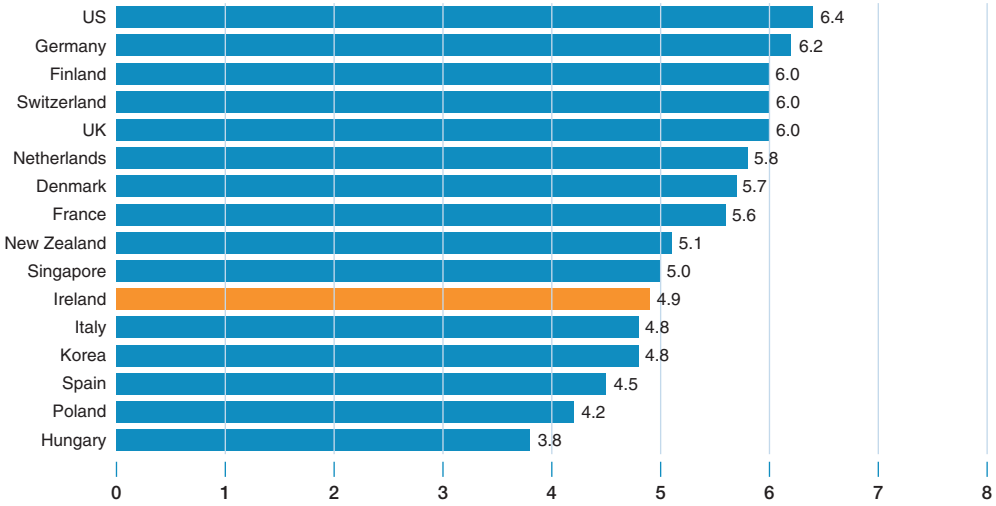


WEF Global Competitiveness Report 2004 / 05

The perceived extent of collaboration among clusters is perceived to be low in Ireland relative to most other countries benchmarked.

32 *"Innovation Networks", Forfás (2004).*

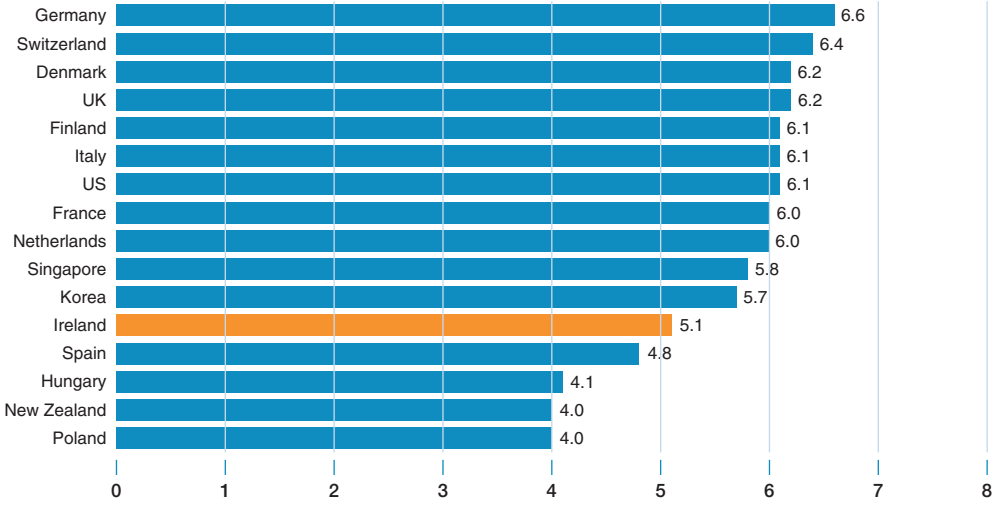
Figure 169: Local Availability of Specialised Research and Training Services, 2004 (Scale 1-7)



WEF Global Competitiveness Report 2004 / 05

The availability of specialised research and training services in Ireland is perceived as relatively low in Ireland. However, there is evidence of progress in this area. For example, "Skillsnets" brings groups of companies together to jointly address training needs. Skillsnets has 5,000 members, over 90 Training Networks and has secured €50 million in government funds for training resources to 2010.

Figure 170: Value Chain Presence, 2004 (Scale 1-7)

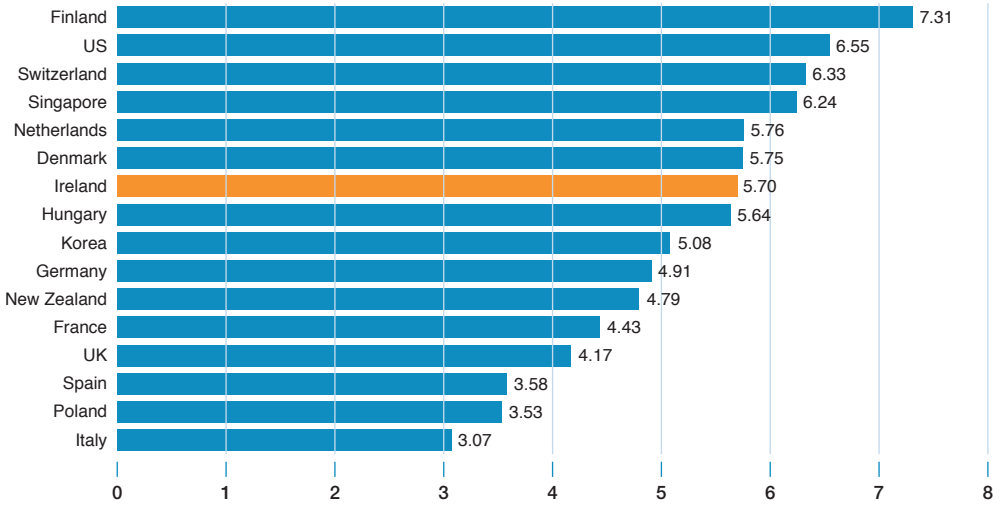


WEF Global Competitiveness Report, 2004 / 05

This survey based indicator measures the perceived presence of sophisticated business processes in Ireland such as product development and marketing. The Enterprise Strategy Group stressed the need for enterprise in Ireland to focus more on R&D/technology and sales/marketing functions in addition to manufacturing/operations.[33]

33 *"Ahead of the Curve – Ireland's Place in the Global Economy", Enterprise Strategy Group, Forfás (2004).*

Figure 171: Knowledge Transfer Between Companies and Universities, 2005 (Scale 1-8)



IMD World Competitiveness Yearbook 2004 / 2005

The 2004 Forfás Innovation Networks Report identified several barriers to more effective knowledge transfer between academia and enterprise in Ireland including lack of widespread knowledge of third level research projects, difficulties in drawing up intellectual property rights contracts, gaps in technology time horizons, and differences between industrial and academic cultures.

5 Appendices

Appendix 1 – ACR Data Sources

OECD Education at a Glance (2004)

Education at a Glance: OECD Indicators provides a comparable and up-to-date array of indicators on the performance of education systems. The focus is on the quality of learning outcomes, the policy levers and contextual factors that shape these outcomes, and the broader private and social returns that accrue to investments in education. The publication also provides indicators on how the labour market returns to education have evolved over time as education systems have expanded. The picture is not limited to aggregate country performance, but also incorporates variations within countries. This allows for an examination of issues of equity in the provision and outcomes of education, on dimensions such as gender, age, socio-economic background, type of institution, or field of education. This report is published in autumn every year, and the figures in the 2004 report generally relate to 2001-2002.

OECD Programme for International Student Assessment (PISA)

The Programme for International Student Assessment (PISA) was set up by the OECD in 2001 to assess the performance of 15 year olds in reading literacy, mathematical literacy and scientific literacy in its member countries. PISA assesses the extent to which students near the end of the compulsory education cycle have acquired skills deemed essential for full participation in society. The domains of reading, mathematical and scientific literacy are covered in each survey, both in terms of mastery of the school curriculum, as well as essential knowledge and skills deemed necessary in adult life. The survey was implemented in 41 countries in 2003, and at least 58 countries will participate in the 2006. Tests are typically administered to between 4,500 and 10,000 students in each country.

IMD World Competitiveness Yearbook (2004, 2005)

The stated aim of the World Competitiveness Yearbook is to analyse and rank the ability of nations to create and maintain a competitive enterprise environment. It features 51 industrialised and emerging countries and provides 323 different competitiveness criteria grouped into four 'Competitiveness Factors' (Economic Performance, Government Efficiency, Business Efficiency, and Infrastructure). Indicators are derived from both hard data taken from international, national and regional organisations and private institutes, and survey data drawn from the annual Executive Opinion Survey (over 4,000 respondents). This report is published every summer, and the figures in the 2005 report generally relate to 2004 and 2005 data.

European Innovation Scoreboard (2004)

The European Innovation Scoreboard (EIS) is the instrument developed by the European Commission, under the Lisbon Strategy, to evaluate and compare the innovation performance of the Member States. The EIS 2004 includes innovation indicators and trend analyses for all 25 EU Member States, as well as for Bulgaria, Romania, Turkey, Iceland, Norway, Switzerland, the US and Japan.

The EIS reports on 20 indicators. They are combined into a composite indicator, namely the Summary Innovation Index (SII), which provides an overview of the relative national innovation performances. The SII is calculated for all countries, based on a number of available indicators, which can vary from 12 to 20 depending on the country. However, data are unavailable for a number of indicators for several new Member States, the Applicant Countries, the US and Japan. Consequently, the innovation rankings based on the 2004 SII need to be interpreted with caution. Furthermore, the SII is a relative instead of an absolute ranking. As such, caution should be exercised in interpreting quantitative differences in variables. The scoreboard is published annually and the figures in the 2004 scoreboard generally relate to 2003.

PWC European Investment Technology Report (2004)

This analysis of European private equity and venture capital in the technology industry is based upon the results of a detailed survey conducted by Thomson Venture Economics (TVE) and PricewaterhouseCoopers (PwC) for the European Private Equity and Venture Capital Association (EVCA). This research involved around 1,600 private equity and venture capital firms in 20 Western and Central European countries, plus 7 additional Central European countries which are currently treated as pilots and are not included in the overall data. The survey results represent participants in the industry, regardless of membership in EVCA or any national venture capital association. The data has been gathered and analysed by TVE and PwC with the support of EVCA but has not been subject to independent review or audit by TVE or PwC. This report is published in June every year, and the figures in the 2004 report generally relate to 2003.

Global Entrepreneurship Monitor (GEM) Report (2004)

The GEM reports a set of harmonised measures of entrepreneurial activity. Specifically, GEM considers that national economic growth is the result of two parallel sets of interrelated activities, those associated with established firms, and those related directly to the entrepreneurial process. The GEM 2004 data set is based on the following types of data collection.

- Representative samples of randomly selected adults, groups ranging in size from 1,000 to almost 27,000 individuals.
- Standardised national data were obtained from international data sources such as World Bank, International Monetary Fund and United Nations.
- Each GEM national team conducted up to 50 face-to-face interviews with experts in their respective countries chosen to represent nine entrepreneurial framework conditions. The national experts also completed a standardised questionnaire in order for GEM to obtain a quantitative measure of their opinions concerning their country as a suitable context for entrepreneurial activity.

This report is published around April every year, and the figures in the 2004 (published in April 2005) report generally relate to 2004.

World Economic Forum (WEF) Global Competitiveness Report (2004-2005)

The Global Competitiveness Report measures the competitiveness of nations through two main indices developed by the WEF team, the Growth Competitiveness Index (GCI) and the Business Competitiveness Index (BCI). Both indices are derived from a combination of publicly available hard data, and information provided in the Forum's Executive Opinion Survey, which annually conveys information about the obstacles to growth in 103 countries. Through the survey, 8,695 business executives in these countries assess the importance of a broad range of factors central to the business environment. The response rate to the survey averages over 80 respondents per country. The ACR mainly uses WEF survey data to supplement statistical information about the innovation, enterprise and general business climates. This report is published every year and the figures in the 2005 report generally relate to 2004-2005.

United Nations (UN) Human Development Report (2004)

This report presents two types of statistical information: statistics in the human development indicator tables, which provide a global assessment of country achievements in different areas of human development, and statistical evidence on the thematic analysis in the chapters. The Human Development Report Office is primarily a user, not a producer, of statistics. It therefore relies on international data agencies with the resources and expertise to collect and compile international data on specific statistical indicators. This report is published annually and the figures in the 2004 report generally relate to 2001-2002.

Appendix 2 – Key Data Bases

OECD

The OECD groups 30 member countries which are characterised by democratic government and adherence to the market economy. It also maintains an active relationship with some 70 other countries, NGOs and civil society. Its work covers economic and social issues from macroeconomics, to trade, education, development and science and innovation. The OECD provides statistical data for member countries on a wide range of economic and social indicators.

http://www.oecd.org/statistics

Eurostat

Eurostat is part of the European Statistics System (ESS). The ESS comprises Eurostat and the statistical offices, ministries, agencies and central banks that collect official statistics in EU Member States, Iceland, Norway and Liechtenstein. Member States collect data and compile statistics for national and EU purposes. The ESS functions as a network, in which Eurostat's role is to facilitate the harmonisation of statistics in cooperation with the national statistical authorities. The ESS also coordinates its work with international organisations such as OECD, the UN, the International Monetary Fund and the World Bank.

http://www.europa.eu.int/comm/eurostat/

AMECO

AMECO is the Annual Macro Economic database provided by DG Economic and Monetary Affairs. Its activities include economic surveillance, monitoring budgetary policy and public finances, economic policy coordination, and legal, practical and institutional aspects of the euro.

http://europa.eu.int/comm/economy_finance/about_en.htm

International Energy Agency

The International Energy Agency is the energy forum for 26 industrialised countries. IEA Member governments have agreed to share energy information, to co-ordinate their energy policies and to co-operate in the development of rational energy programmes. These provisions are embodied in the Agreement on an International Energy Program, which established the Agency in 1974.

http://www.iea.org/Textbase/subjectqueries/index.asp

Central Statistics Office (CSO) Ireland

The Central Statistics Office serves as Ireland's national statistical agency. The Office exists primarily to meet the needs of Government for quality statistical information that is a vital input to the formation, implementation and monitoring of policy and programmes at national, regional and local levels in a rapidly changing economic and social environment. It also serves the needs of the wider national and international community (i.e. business, EU, international organisations, media, researchers, and the public generally) for impartial and relevant information on social and economic conditions.

http://www.cso.ie

Appendix 3 – Glossary of Terms

BERD

Business Expenditure on Research and Development

CLUSTERS

A geographically proximate group of companies and associated institutions in a particular field, linked by commonalities and complementaries.

CPI

Consumer Price Index
Index which measures the price that consumers pay for a representative basket of goods.

DSL

Digital Subscriber Line
A family of similar technologies which allow ordinary telephone lines to be used for high speed broadband communications.

EGFSN

Expert Group on Future Skills Needs
Established by the government in 1997 to develop national strategies to tackle the issues of skill needs, manpower needs estimation, and education and training for business.

ENTERPRISE IRELAND

State agency with primary responsibility for the development of Irish-owned business in manufacturing and internationally-traded services.

EPO

European Patent Office

ESRI

Economic and Social Research Institute
Ireland's national independent think-tank undertaking economic and social research, with the aim of informing policy formation and societal understanding.

FÁS

Foras Áiseanna Saothair
The Training and Employment authority established in 1998 responsible for increasing the employability, skills mobility of jobseekers and employees to meet labour market needs.

FDI

Foreign Direct Investment
Investment by a multinational company in establishing production, distribution or marketing facilities abroad.

FORFÁS

State agency responsible for providing policy advice on enterprise, trade, science, technology and innovation and for advising and co-ordinating the functions of IDA Ireland, Enterprise Ireland and Science Foundation Ireland.

GBOARD

Government Budget Outlays and Appropriations for Research and Development
Funds committed by Government for R&D to be carried out in the enterprise, government, higher education, private non-profit sectors at home or abroad.

GDP

Gross Domestic Product
The total money value of all final goods and services produced in an economy over a defined period.

GENERATION ADEQUACY

A deficit in generation adequacy means what while future blackouts are not a certainty, there is an unacceptable level of risk that supply will be insufficient to meet demand.

GERD

Gross Expenditure on Research and Development
Total public and private expenditure on R&D.

GINI COEFFICIENT

The Gini Coefficient is a measure of income distribution whereby a score of zero indicates perfect equality, and 100 indicates that all national income in enjoyed by one person.

GNP

Gross National Product
The value of all final goods and services produced within a nation in a given year, plus income earned by its citizens abroad, minus income earned by foreigners from domestic production.

GOVERD

Government Expenditure on Research and Development

HEA

Higher Education Authority
The statutory body responsible for the funding of universities and designated third-level education institutions. Its functions include the development of third level education to meet the needs of the community and advice in relation to all higher-level education.

HERD

Higher Education Expenditure on Research and Development

HDI

Human Development Index
Composite index which combines measures of life expectancy, school enrolment, literacy and income.

IBEC

Irish Business and Employers Confederation
IBEC represents and provides economic, sectoral, regional, commercial, employee relations, social affairs and information services to companies and organisations from all sectors of economic and commercial activity.

ICSTI

Irish Council for Science, Technology and Innovation
Established in 1997 to advise Government on all aspects relating to the strategic direction of science, technology and innovation policy.

ICT

Information and Communications Technology

IDA IRELAND

State agency responsible for attracting inward investment in manufacturing and internationally-traded services sectors.

IP

Intellectual Property
The asset which arises where innovation or creative activities lead to an invention, design or process sufficiently unique or original to be considered confidential or valuable or both.

LINKAGES

Systems of networked links and collaboration between firms in key sectors between Irish and Foreign companies, and between enterprise and academia.

NDP

National Development Plan
The NDP involves an investment of over €52 billion of public, private and EU funds over the period 2000-2006 in health services, social housing, education, roads, public transport, rural development, industry, water and waste services in Ireland.

NETWORKS

Groups of firms and other organisations that are organised, formally or informally, around common interests. The firms may share interests in, for example, technology, standards or regulations; they may co-operate to commission research, to articulate skills requirements or to purchase equipment; they may share information on markets or they may form a consortium to address a customer need that none of them could address on their own.

OECD

Organisation for Economic Cooperation and Development
A global body dedicated to the promotion of democratic government and the market economy. It has 30 member states and active relationships with some 70 other countries, NGOs and civil society. Its work covers economic and social issues from macroeconomics to trade, education development, and science and innovation.

PPP

Purchasing Power Parity
PPP is a method of measuring the relative purchasing power of different countries' currencies over the same types of goods and services. Goods and services may cost more in one country than in another, hence PPP allows us to make more accurate comparisons of standards of living across countries.

PRODUCTIVITY

The relationship between the output of an economic unit and the factor inputs that have gone into producing that output. Productivity is usually measured in terms of output per man hour raised.

PRTLI

Programme for Research in Third Level Institutions
An initiative to boost research capabilities in the higher education sector, PRTLI supports research in humanities, science, technology and social sciences.

PSC

Private Sector Credit
All lending by credit institutions to the non-bank public, excluding government.

R&D

Research and Development
Creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications. (OECD).

SFI

Science Foundation Ireland
Established by the Government in July 2003 to invest €648 million between 2000 and 2006 in academic researchers and research teams to generate knowledge, leading-edge technologies and competitive enterprises in the fields underpinning biotechnology and information and communications technology.

SUSTAINABLE DEVELOPMENT

Development that meets the needs of the present population without compromising the ability of future generations to meet their own needs (UN definition).

TEA RATE

Total Entrepreneurial Activity Rate
Measurement of the percentage of the adult population engaged in start-up and new firms.

ULC

Unit Labour Cost
Measures the cost of labour required to produce one unit of a good.

Appendix 4 – NCC Publications

Annual Competitiveness Report, 1998	March 1998
The Competitiveness Challenge Summary Statement	March 1998
Statement on Telecommunications: A Key Factor in Electronic Commerce and Competitiveness	November 1998
Statement on Skills	December 1998
Annual Competitiveness Report, 1999	May 1999
Report on Costs	June 1999
Statement on Social Partnership	September 1999
Proposals on Transport Infrastructure, the Planning Process and Public Transport	March 2000
The Competitiveness Challenge	May 2000
Annual Competitiveness Report, 2000	May 2000
Statement on Telecommunications, e-Business and the Information Society	July 2000
Statement on Regulatory Reform	July 2000
Statement on Labour Supply and Skills	September 2000
The Competitiveness Challenge, 2001	December 2001
Annual Competitiveness Report, 2001	December 2001
The Competitiveness Challenge, 2002	November 2002
Annual Competitiveness Report, 2002	November 2002
Statement on Inflation	May 2003
The Competitiveness Challenge, 2003	November 2003
Annual Competitiveness Report, 2003	November 2003
Statement on Prices and Costs	September 2004
The Competitiveness Challenge, 2004	October 2004
Annual Competitiveness Report, 2004	October 2004