

Annual Competitiveness Report 2007

Volume 2
Ireland's
Competitiveness
Challenge



National
Competitiveness
Council



Introduction to the NCC

The National Competitiveness Council (NCC) was established in 1997 as a Social Partnership body. It reports to An Taoiseach on key competitiveness issues facing the Irish economy, together with recommendations on policy actions required to enhance Ireland's competitive position.

Each year the NCC publishes the two-volume Annual Competitiveness Report.

- Volume One, **Benchmarking Ireland's Performance**, is a collection of statistical indicators of Ireland's competitiveness performance in relation to 16 other economies and the OECD and EU averages.
- Volume Two, **Ireland's Competitiveness Challenge**, uses this information along with the latest research to outline the main challenges to Ireland's competitiveness and the policy responses required to meet them.

As part of its work, the NCC also publishes other papers on specific competitiveness issues.

This report is Volume 2, **Ireland's Competitiveness Challenge**. This report assesses Ireland's current economic performance and the opportunities and challenges facing Ireland's competitiveness. In this report, the NCC focus on three broad challenges where significant issues remain that are important to supporting the competitiveness of Ireland's exporting sectors. These are entitled; supporting cost competitiveness, enhancing productivity and building innovative enterprises. In each area the challenges and required responses are multi-faceted, involving both the public and private sector.

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Foreword by An Taoiseach



Ireland's international competitiveness has played a critical role in our successful economic performance. As economic growth and social progress are intrinsically linked, this economic success has brought many benefits to our society. As this report highlights, Ireland has experienced significant and widespread improvements in living standards and continues to create high quality jobs. It is for these reasons that competitiveness remains a key priority of Government policy as we seek to continually improve the living standards of everyone in Ireland.

Since the mid-1990s, Ireland's economic performance has been excellent and current predictions for the next five years suggest that the Irish economy will continue to perform well. However, it is clear that we are entering a period of more challenging economic conditions. The challenge is to restore Ireland's internationally trading firms in manufacturing and services as key drivers of growth. It is important, therefore, that we focus our efforts in the development of policy and programmes, and in social partnership, to restore and renew our competitiveness across all dimensions.

This is core to the new Programme for Government. As the Council's 'Competitiveness Pyramid' shows, it encompasses policies on the regulatory environment, including taxation, competition and the labour market, on Ireland's physical infrastructure, including transport, ICT and housing, and on Ireland's knowledge infrastructure, including all levels of education as well as R&D.

The National Competitiveness Council provides valuable advice to the Government on competitiveness issues. I would like on behalf of my colleagues in Government to thank the council for its important work, and I am pleased to introduce *Ireland's Competitiveness Challenge, 2007*.

A handwritten signature in black ink, which appears to read 'Bertie Ahern'.

Bertie Ahern, T.D.

Taoiseach

Chairman's Preface



Ireland has made remarkable economic progress over the past 15 years. This has led to rising standards of living and low unemployment. However, our competitiveness performance has weakened in recent years. The expected slowdown in domestic sectors of the economy which have driven economic growth in more recent years underlines the importance of reinstating Ireland's exporting sectors as key drivers of growth and living standards. The NCC believes we are well placed to address this challenge with the resources that are now available to us, developed through our economic prosperity but we must put policies in place to drive sustainable growth through our exporting sectors.

The *Competitiveness Challenge* calls for a number of policy actions in three key areas vital to Ireland's success.

Supporting Cost Competitiveness: In recent years, Ireland has experienced a loss in international price competitiveness due to an appreciation of the euro against many of our trading partners and rising inflation in Ireland. Tackling high and increasing costs is challenging and there are no simple solutions. The NCC believes it is appropriate to develop a national programme to restore cost competitiveness. This should include setting a national inflation target close to the ECB two percent target. It is also critical that we manage our labour costs to ensure there is enough flexibility in the labour market to safeguard competitiveness. This will require coordination to manage both consumer and pay inflation. Promoting competition in the internal market to reduce inflationary pressures and the continued sound management of Government spending are important anti-inflationary policies.

Enhancing Productivity: In the long run, productivity growth is critical to ensuring a high level of living standards. While productivity levels in Ireland remain strong, achieving higher growth rates in productivity than our competitor countries will be important for international competitiveness and securing sustainable wage growth. However, our productivity growth rates have weakened in recent years. Re-invigorating productivity growth requires a number of actions across a broad range of areas. Policies that enhance competition and reduce barriers to competition must be pursued relentlessly. We must also encourage the increased and more effective use of ICT. Of course without the necessary re-organisation of firms' structures and operations these benefits will not accrue. It is important that management development remains a key focus. At a sectoral level, it is important that Ireland has strategies in place to develop the existing base of firms and to develop and attract new firms and sectors by ensuring that sector specific business environment factors are in place. In terms of improving public sector productivity, the NCC makes a number of recommendations with respect to public sector management, existing organisational structures and the system of local government.

Building Innovative Enterprises: Developing an innovation intensive environment is important to enabling Ireland to succeed in the face of growing international competition. We must continue to drive forward our innovation agenda for the future. This requires a number of concerted actions. Increased focus by development agencies on both technological and non-technological innovation must be continued. In light of the increasing importance of international services, increasing supports for new and emerging international services opportunities is important. The exploitation of the large markets for selling education services overseas arising from the 'internationalisation of education' presents significant growth opportunities for Ireland in terms of growing our foreign earnings, but for this to be achieved, we need to create a proactive, consistent and supportive policy framework. Equipping people with the skills for an innovative economy, continued investment support for research and development, and development of an environment conducive to innovation are vital to achieving an innovation driven economy.

Driven by globalisation, Ireland and the world economy continue to change rapidly. As a small outward oriented economy, Ireland is very well placed to continue to benefit from these developments. Of course, the Irish economy is also exposed to risks arising in the global economy. The NCC believes that the implementation of the recommendations in this report will help to mitigate these risks and to maintain and promote Ireland's competitiveness.

I would like to thank all of the members of the National Competitiveness Council and the senior advisers from Government departments for their valuable contributions and assistance in producing this report. I would also like to thank Forfás, which provides us with first class research and secretariat support.

Dr Don Thornhill

Chair, National Competitiveness Council

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1. Background and Introduction

1.1 What is Competitiveness and Why is it Important?

The National Competitiveness Council defines competitiveness as the ability of Irish-based firms to achieve success in international markets, so as to provide Ireland's people with the opportunity to improve their living standards and quality of life. Improving living standards depends on, among other things, raising incomes through strong productivity growth and providing high quality employment opportunities for all. Given Ireland's small domestic market this requires a healthy exporting sector. For a vibrant exporting sector, Ireland must maintain and develop its international competitiveness.¹

'Towards 2016' developed a shared vision for Ireland as a "dynamic, internationalised and participatory society and economy, with a strong commitment to social justice, where economic development is environmentally sustainable and internationally competitive".² An economy that is internationally competitive needs to be supported by a business environment and broader socio-political climate that encourages high levels of investment in enterprise, public infrastructure, and skills and knowledge, and that provides the appropriate incentives and flexibility for economic actors to respond to change.

The role of the NCC is to report to Government on key competitiveness issues facing the Irish economy and to identify policy actions required to enhance Ireland's competitive position. In this report, the NCC assesses Ireland's current economic performance and the opportunities and challenges we face in terms of competitiveness. It identifies three areas essential to improving our competitiveness position; costs, productivity growth and promoting an innovation intensive economy.

1.2 Ireland's Current Economic Performance

Ireland has made remarkable economic progress over the past 15 years and current growth rates remain strong. However, the NCC is concerned that non-sustainable domestic factors, rather than international competitiveness, have driven our economic growth in recent years. Maintaining and improving our living standards will depend on improving our competitiveness performance through reinstating exports as a key driver of growth. This rebalancing of growth is dependent on remaining competitive.

Over the past 15 years, the drivers of Irish growth have changed significantly. Growth in the early 1990s was set in motion by high levels of investment in high value-added exporting sectors in Ireland by multinational companies, attracted to Ireland by our membership of the EU and government policies in areas such as taxation, education, international trade and social partnership which were supportive of enterprise.

Since 2000 economic growth rates have remained strong. Export success combined with low interest rates and rising national confidence stimulated household and government spending and investment in construction. During the past few years, this domestic growth has driven the economy and export growth has trailed that of other countries with which we compete. This is in part a result of a decline in Ireland's international competitiveness, as represented in Figure 1.

Figure 1:
International Competitiveness Rankings - Where does Ireland stand?



Source: World Competitiveness Yearbook, Institute of Management Development (IMD); Global Competitiveness Report, World Economic Forum (WEF)

While Ireland still ranks among the most competitive economies globally, our competitiveness rankings have fallen since 2000. Of the 55 countries benchmarked by the IMD, Ireland ranks 14th overall in 2007, a fall of 10 places since 2000. In the World Economic Forum (WEF) report, Ireland ranks in the top quartile (22nd of 131 countries), but has fallen 17 places since 2000.³

So why should we be concerned with our declining competitiveness? Increases in consumption and investment rather than strong export growth have driven our economic growth in recent years. For the future, as the domestic economy slows, increasing living standards will depend more on success in restoring the competitiveness of Ireland's exporting sectors.

Overall, the outlook is positive as the Irish economy continues to perform very well by the standards of other developed countries and our competitiveness remains relatively strong. However, there are a number of aspects of our current performance that are of concern:

- As Figure 2 shows, Ireland's current account balance, the balance between Ireland's foreign earnings and expenditure, has developed a large and growing deficit as Irish people are borrowing heavily internationally to pay for current consumption and investment. Future exports and other (factor) income from abroad must be generated to pay for current borrowings. In terms of household debt, Ireland is now the second most indebted Eurozone member, both relative to national income and on a per capita basis. While the rate of growth in private debt, most of it to fund property purchases, is slowing, it remains high.⁴

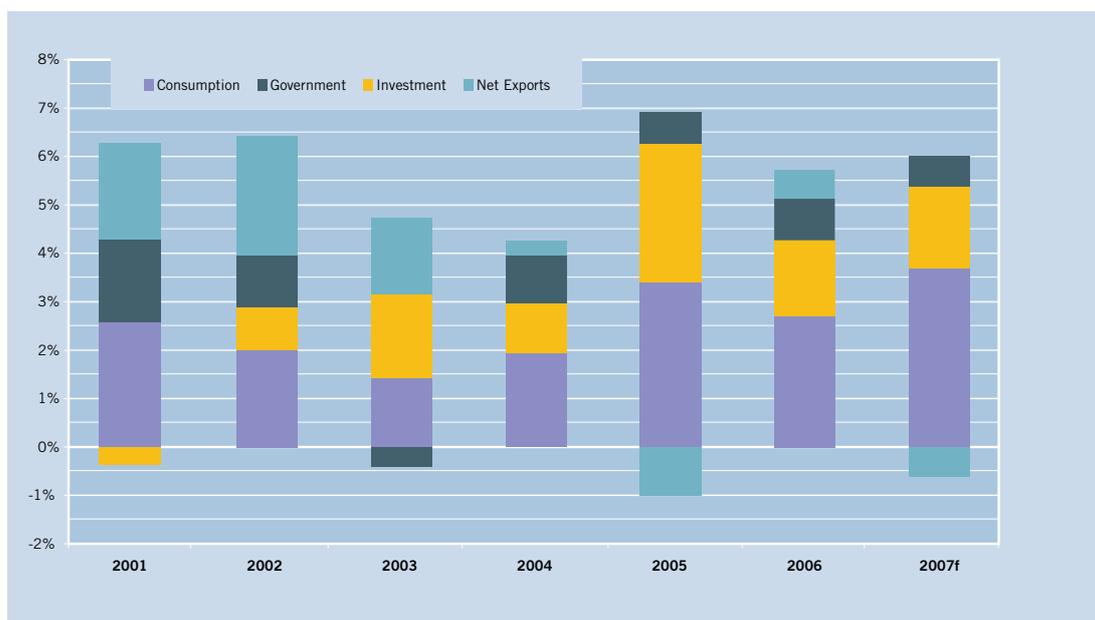
Figure 2:
Current Account Balance, €m (2000-2007f)



Source: Forfás calculations; Central Statistics Office; Economic & Social Research Institute

- Since 2000, the bulk of new jobs created in Ireland have been in domestically trading sectors, with 65 percent of new jobs created in public services and construction. Manufacturing, both traditional and modern, and agriculture lost jobs over the same period.⁵ Ireland remains highly dependent on construction employment, which employs almost one in seven Irish workers, compared to one in 12 in the EU-15.
- Irish productivity growth has slowed in recent years, particularly in high-tech sectors and productivity levels in domestic services sectors remain below international benchmarks.⁶
- Ireland's cost base is rising. Ireland is the second most expensive location for consumers in the EU-15 and has the third highest inflation rate.⁷ Combined with this, Ireland's relative labour cost competitiveness has deteriorated significantly since 2000. While Dublin is among the higher labour cost locations in the EU-15, regional Irish cities such as Cork, Galway and Limerick continue to demonstrate an overall labour cost advantage against most EU-15/US locations. However, labour costs in Ireland are substantially higher than those in Eastern Europe and Asia.
- The contribution of trade, i.e. net exports, to economic growth has been small or negative in recent years (Figure 3).

Figure 3:
Contribution of Growth in Net Exports to Irish Economic Growth (GDP), 2001- 2007f



Source: Forfás calculations, Central Statistics Office, Annual National Accounts

Domestically driven growth is currently decelerating, as increasing Eurozone interest rates combine with high household debt levels to reduce domestic demand. There are clear signs that residential construction activity is slowing from the extraordinary levels of recent years.⁸ Construction will continue to remain an important part of the economy, particularly given that Ireland's per capita housing stock remains below the EU average and population growth remains strong. In addition, the Government's ambitious capital programme (NDP 2007-2013) will also be an important stimulus to the construction sector as well as underpinning future competitiveness.⁹

1.3 Assessment of Ireland's Recent Trade Performance

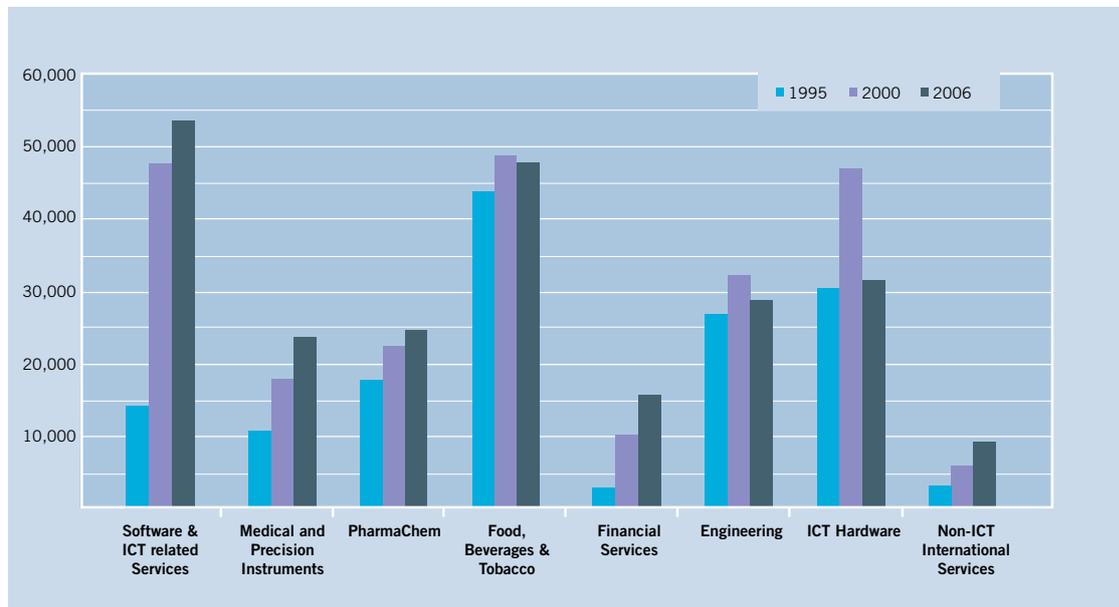
Restoring the competitiveness of exporting sectors, both goods and services, needs to remain a critical focus of public policy in driving Ireland's long-term economic growth. This section reviews Ireland's recent trade performance.

The composition of Irish exports, which reached over €138 billion in 2006, is changing rapidly. Services exports are growing at two to three times the rate of exports of goods, and as a result are increasing their share of overall exports. In 2000, the export of services from Ireland accounted for 15.9 percent of total foreign earnings. By 2006, services earnings accounted for 27 percent of total foreign earnings, with growth being driven by high value-added and knowledge-intensive exports in computer services, financial and insurance services, trade-related business services, operational leasing, other business services and tourism. The composition of manufacturing exports is also changing. Increases in exports of chemicals, in particular medicinal and pharmaceutical products have been offset by falls in a range of other manufacturing sectors, particularly in the ICT hardware sector. Encouragingly, a range of sectors, not traditionally viewed as potential drivers of future export earnings, have increased their export values noticeably since 2000, including environmental services and construction e.g. prefabricated buildings.¹⁰

Exports by IDA and Enterprise Ireland supported manufacturing and internationally traded services enterprises account for almost two-thirds of total Irish exports. Total exports of indigenous enterprises amount to circa 11 percent of total exports. Food and drink exports continue to account for the largest share of indigenous exports (54 percent), and a further one-fifth of indigenous exports come from software development and other internationally traded services.¹¹ Almost 89 percent of Irish exports are derived from a small number of foreign owned firms operating from Ireland. These exports were driven by foreign firms in the chemicals, electrical and electronic equipment, and software development sectors. Hence, maintaining Ireland as an attractive location for existing and new overseas investors is crucial.

The distribution of employment in internationally trading sectors has also changed over the last decade, as illustrated in Figure 4.¹²

Figure 4:
Employment in Key Strategic Sectors

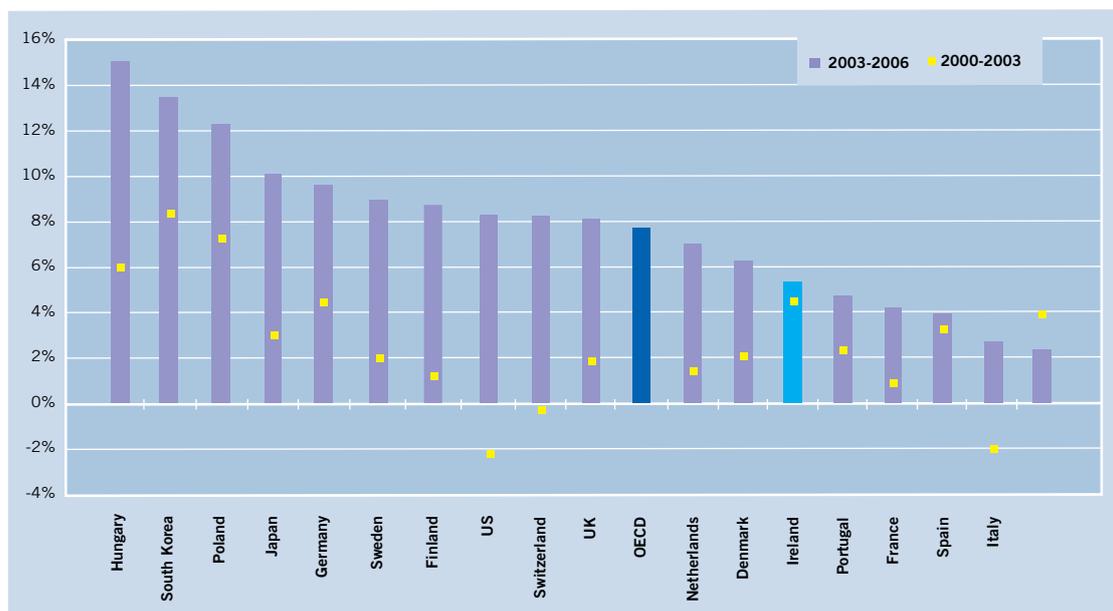


Source: Forfás calculations; Central Statistics Office; Economic & Social Research Institute

Employment growth in internationally trading services has been significant over the past ten years, albeit from a low base. Growth has been particularly strong in software and ICT related services (e.g. data processing), financial services and other non-ICT related services (dominated by legal, accounting, consultancy, market research and education services). While employment levels in the pharmaceuticals/chemicals and medical technologies sectors have grown, employment in ICT hardware and engineering has declined significantly since 2000. The food sector achieved modest growth over the decade.

While the potential for continued growth in services exports is strong as services markets open internationally to competition, the ability of enterprises from Ireland to compete in those markets will critically depend on Ireland's competitiveness. The recent decline in Ireland's competitiveness is reflected in the slowdown in goods exports, to rates that are now below those in peer countries. This is disappointing given the strong growth in key international markets including the UK, the EU and the USA. As outlined in Figure 5, Ireland's overall export growth performance is now below the OECD average.

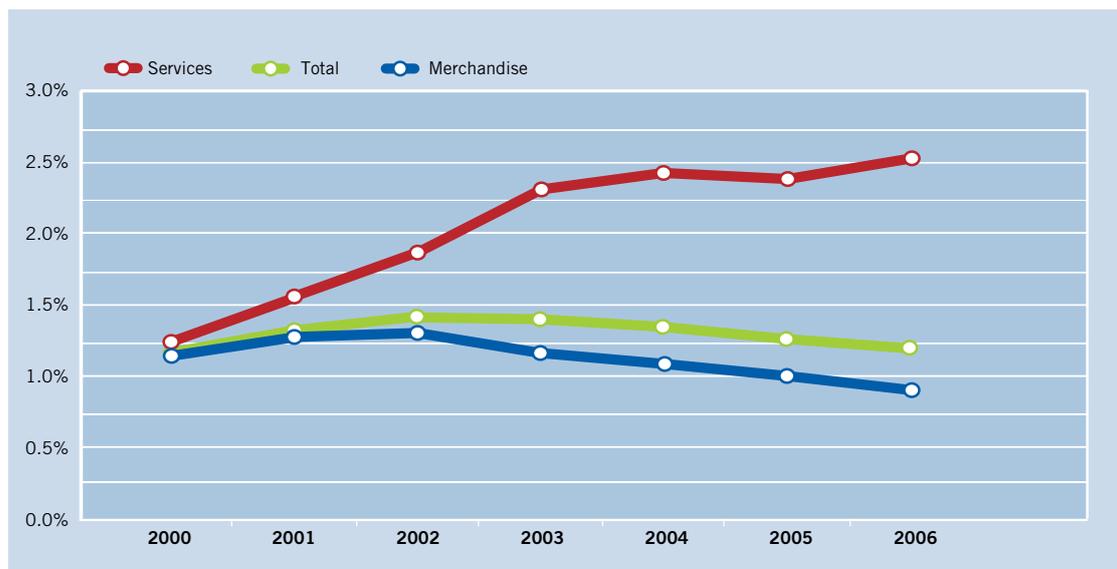
Figure 5:
Growth in Exports of Goods and Services (%), 2000-2006



Source: World Trade Organisation; OECD

As a consequence, Ireland is losing some of its share in world markets.¹³ This is primarily due to a loss of market share in merchandise trade, where Ireland's share has fallen since 2002 (Figure 6). On the positive side, Ireland's share of world services trade, a growing component of Irish trade, is continuing to increase.

Figure 6:
Ireland's Share of World Trade (%), 2000-2006



Source: World Trade Organisation

1.4 Assessment of the International Environment

Increasingly, our economic prospects will depend on restoring the competitiveness of our exporting sectors as a key driver of economic growth. In that regard, the international environment looks broadly positive but there are also threats emerging which are increasing uncertainty:

- Ireland's key international markets are continuing to grow, which provides an environment conducive to international trade. Following the successful restoration of power sharing in Northern Ireland, significant economic potential also exists for further trade and development on an all island-basis;
- The importance of international trading services, sectors where Ireland is developing significant strengths, is likely to continue to grow. Progress on the services aspects of the current round of world trade talks (Doha) would boost potential further;
- The continuing strength of the euro against the dollar and currencies pegged to the dollar is making Irish exports more expensive outside the Eurozone. A further weakening of the dollar could significantly reduce Eurozone and Irish competitiveness. While growth within the Eurozone may mitigate some of the impact of this loss of competitiveness, research suggests that Ireland may be more exposed than other Eurozone countries given our trade and investment links with the USA.¹⁴ Similarly, the competitiveness of many firms, particularly indigenous firms, is influenced by the euro-sterling exchange rate;
- Energy prices remain high and volatile due to growing international demand, refinery problems and political uncertainty. Ireland remains particularly exposed given our dependence on imported fossil fuels; and,
- Finally, uncertainty as to interest rate movements may reduce demand in Ireland and other Eurozone economies with potential negative implications for house prices, employment in the construction sector and government revenues derived from construction activities. International financial markets are also likely to remain volatile for some time given potential risks arising from the international housing boom, high levels of household debt and particular concerns in the sub-prime market. Concerns also exist that higher interest rates and difficulties in the venture capital market may hinder raising new funds to support growing firms.

1.5 Strengths and Weaknesses of Ireland's Enterprise Base

While the international outlook is broadly positive, it is perhaps more uncertain for enterprises engaging in international markets than in recent years. Ireland's enterprise base has gone through a period of significant structural change over the last decade and is developing a range of strengths that are driving the internationalisation process; but serious weaknesses also exist in their capacity to compete internationally. Table 1 assesses the strengths and weakness of Ireland's exporters.

Table 1: Strengths and Weakness of Ireland's Exporters	
Strengths	Weaknesses
<ul style="list-style-type: none"> » Existing base of high performing manufacturing firms. Strong track record in large scale process facility construction and operation. » A growing internationally trading services sector. » Relatively high rates of entrepreneurship. » An adaptable workforce that exhibits flexibility, creativity and a 'can do' attitude. » A deepening pool of skills. » An international reputation for flexibility and responsiveness. » A culture of openness to new ways of working, ideas and people. » A reputation as a secure location to manage intellectual property (IP) and regulatory matters. » A growing reputation in a range of emerging activities such as managing regional headquarters' functions, IP management and distribution, hosting and management of digital content, online sales, high value customer management, supply chain management (SCM) and research and innovation. 	<ul style="list-style-type: none"> » Limited management expertise in innovation and international sales and marketing. The majority of people employed in MNC manufacturing are employed in production rather than activities such as R&D, SCM, or marketing and sales. » Adoption of best practice management techniques among Irish owned firms, while improving, remains relatively low. » Given international competition, many firms have limited ability to increase output prices, despite growing input costs. » Some MNCs' subsidiaries have limited authority from overseas headquarters to add functions to their operations in Ireland. » Many indigenous exporters are dependent on a limited number of international markets and customers. » A limited number of Irish services companies have grown real scale. Given low profitability, for most of these companies, shareholder value is released through trade sale rather than dividends. » Under-exploitation of ICT, particularly among smaller firms. » Limited capabilities to absorb the output from State funded R&D.

Sources: Annual Competitiveness Report: Benchmarking Ireland's Performance 2007, Enterprise Strategy Report, and various Forás sources.

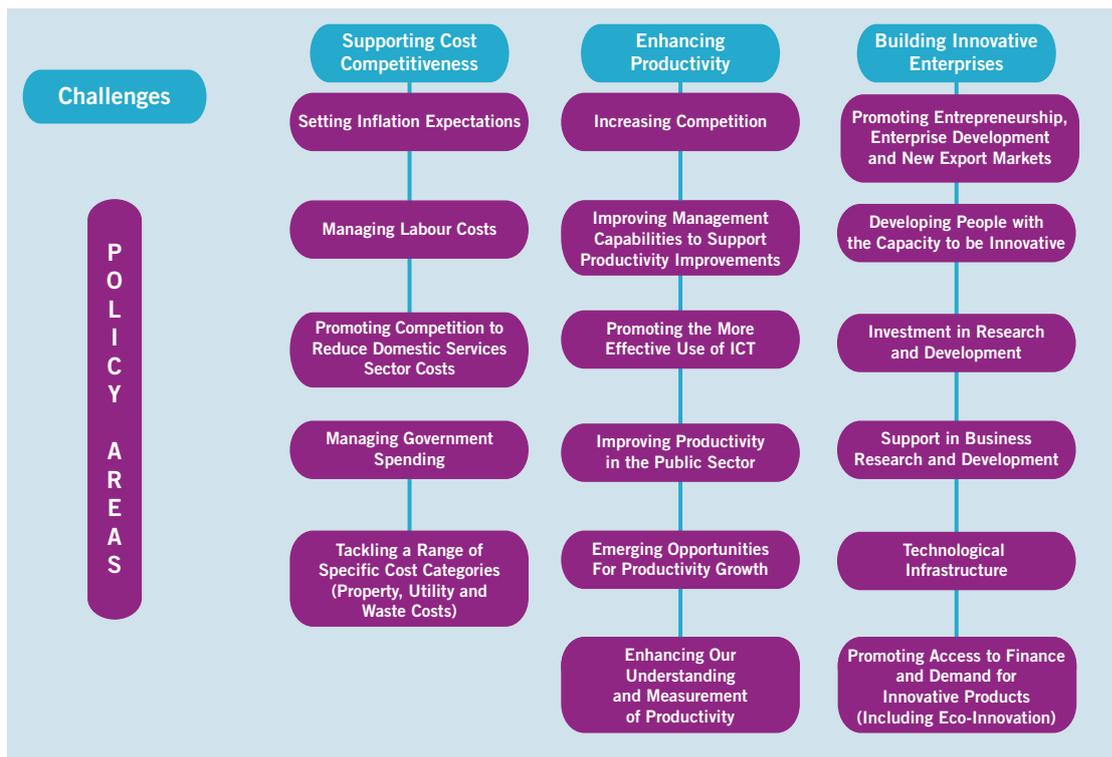
The NCC's report Benchmarking Ireland's Performance assesses the strengths and weaknesses of Ireland's competitive environment in some detail.¹⁵ Ireland has many strengths, including the growth potential of the economy, the stability of public finances, the strength of the labour market - both in terms of creating jobs and tackling long-term unemployment, the flexibility of Ireland's market and regulatory framework and the positive attitudes and values in Irish society to globalisation and competitiveness. However, weaknesses continue to exist in areas such as increasing costs and infrastructure capacity and levels of service, while Ireland's rankings in innovation and R&D are below those of other leading countries.

1.6 Key Policy Areas

Looking forward, the NCC is positive about the policy response to the challenges of enhancing our competitiveness. The Government has already put in place a wide range of policies that are essential to enhancing Ireland's competitiveness, including the National Development Plan (2007 – 2013), Transport 21, the White Paper on Energy, actions to develop the all-island economy, the Strategy for Science, Technology and Innovation, the National Skills Strategy and cross-Departmental implementation of the Enterprise Strategy Group Action Plan. The Council wishes to emphasise the importance of these policies and strongly supports the clearly stated commitments in the Programme for Government to pursue these initiatives.

In this report, the NCC focus on three broad challenges where significant issues remain that are important to supporting the competitiveness of Ireland's exporting sectors. In each area the challenges and required responses are multi-faceted, involving both the public and private sector. Figure 7 highlights these three challenges and the key policy areas where the NCC has focused its recommendations.

Figure 7:
Outline of the Competitiveness Challenge



The remainder of this report addresses these challenges. A summary at the start of each chapter outlines the key findings and recommendations.

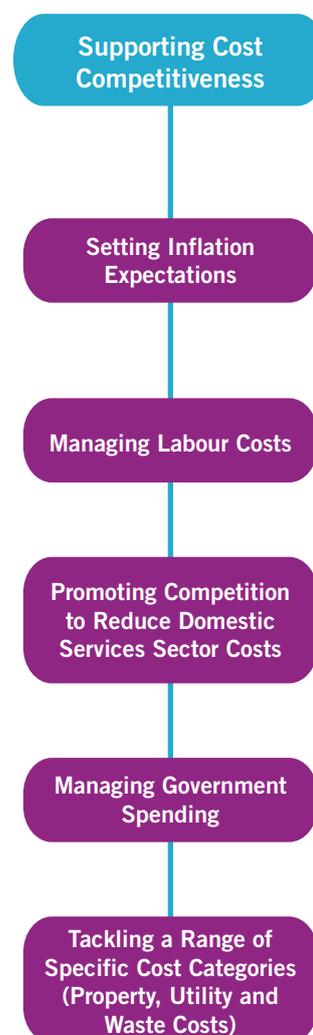
2. Supporting Cost Competitiveness

Summary

Cost competitiveness remains key to the success of Irish based firms in export markets. Recent external factors such as the decline in the value of the dollar against the euro and rising oil prices continue to challenge Ireland's cost competitiveness. Business costs in Ireland are high relative to competitor locations. Irish labour costs have increased by substantially more than the Eurozone average in recent years. Irish consumer price levels are almost 20 percent higher than the EU-15 average and inflation influenced by a number of domestic factors, has been growing at a faster rate than the EU-15 average.

The NCC believes that policy actions are required in a number of key areas to moderate increases in Ireland's cost base:

- **Setting Inflation Expectations:** There is a risk of high inflation in Ireland becoming embedded in public expectations. The Council believes that it is appropriate to develop a national programme to restore cost competitiveness that includes setting inflation targets close to the Eurozone target rate of inflation of two percent.
- **Managing Labour Costs:** A key challenge for Government and the social partners is to ensure that pay costs are flexible enough to safeguard competitiveness. This will require coordination to manage both consumer and wage inflation. Over the longer term, potential exists to increase labour force participation rates to address skills and labour shortages.
- **Promoting Competition to Reduce Domestic Services Sector Costs:** Continued efforts are required to promote greater competition in domestic services, which are driving Irish inflation.
- **Managing Government Spending:** With economic growth predicted to remain relatively strong, easing growth in public spending could help restrain inflationary pressures. Efficient implementation of the NDP will also ensure that its delivery is not inflationary.
- **Tackling a Range of Specific Cost Categories:** The Council also highlights the need for further reforms to tackle a range of specific cost categories, in particular property costs, utility costs, and waste management costs. These include the development of strategically planned towns, the rapid implementation of the Government's White Paper on Energy, and the delivery of key waste management infrastructure.



2.0 Introduction

In recent years, Ireland has experienced rapid increases in both living standards and our cost base. While productivity is the key determinant of living standards, in the short-run rising costs can have an important impact on the competitive performance of a nation's firms. It is notable that many internationally trading firms from Ireland are facing continued downward pressure in world markets on the prices they receive for goods and services, while the costs of essential domestic inputs they require are increasing at rates above those of their international competitors. High costs due to supply-side restrictions, for example due to weak competition, weak regulation and poor infrastructure, pose a direct threat to the ability of Irish companies to compete successfully in export and domestic markets. Hence, cost competitiveness remains critical to ensuring that companies based in Ireland can compete successfully in international markets.

High and rising business costs also affect competitiveness through a number of other channels:

- High costs reduce the relative attractiveness of Ireland as an investment location for new foreign investment and our ability to retain and develop the existing base;
- High costs weaken the attractiveness of Ireland as a tourist location;
- Inflation creates uncertainty for businesses in their investment and operational decisions, thus diminishing prospects for growth;
- Inflation complicates the Government's economic strategy, particularly with respect to planning and investing in infrastructure projects;
- Inflation and a high cost base reduces the flexibility of the economy to cope with adverse economic shocks; and,
- Inflation is putting Ireland's social partnership model under considerable strain.

Further declines in the value of the dollar (or sterling) against the euro would weaken Ireland's international price competitiveness. In addition, a range of low cost countries from Eastern Europe and Asia are increasingly competing with Ireland and other developed countries for trade and investment opportunities.

This section assesses Ireland's performance in terms of business costs, pay cost and consumer costs. It then outlines a range of potential policy areas that could enhance Ireland's cost competitiveness.¹⁶

2.1 Ireland's Current Cost Competitiveness Performance

2.1.1 Business Costs

The NCC has recently assessed the cost competitiveness of a number of Irish regions relative to international locations for a number of firms in key sectors.¹⁷ Of fourteen cities benchmarked, Dublin is ranked third most expensive for firms in the telecommunications software, fund administration and biotechnology sectors, fourth in the medical technologies, engineering, business hotels and biopharmaceuticals sectors, and fifth in the food processing sector.¹⁸ Cork, Galway and Limerick, continue to demonstrate an overall cost advantage against most EU-15/US locations. Costs in all high-income cities benchmarked in the EU and US are substantially higher than those in cities benchmarked in Eastern Europe, India and the Far East, countries that we are increasingly competing with for trade and investment.

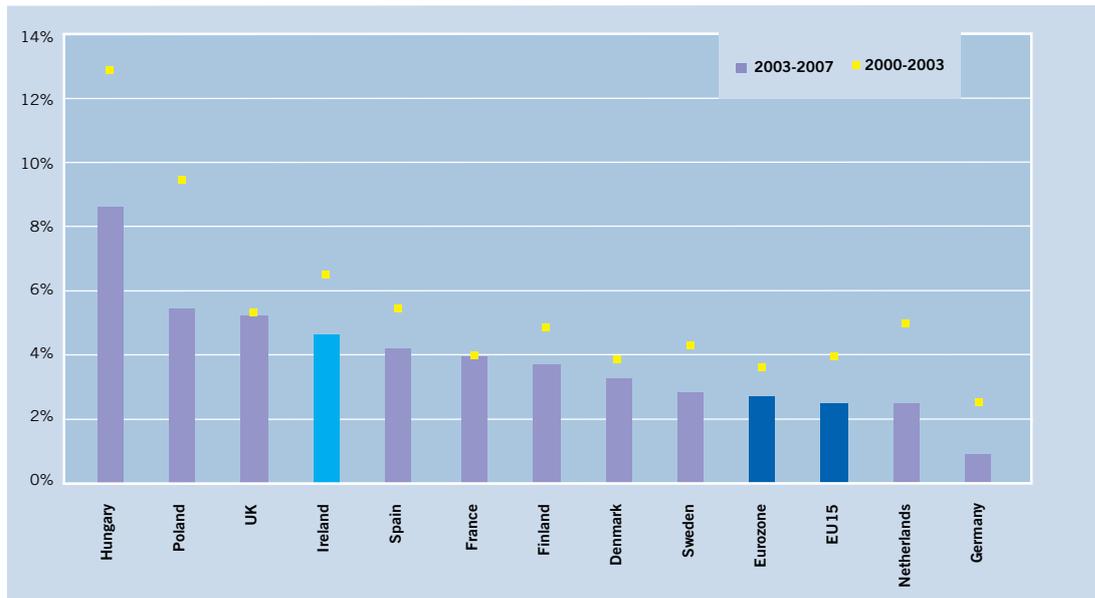
A number of key business inputs are weakening Ireland's price competitiveness performance. These include property costs, utility costs, particularly electricity, water and waste disposal, and a range of domestic services, including IT, accountancy and legal services.¹⁹ For manufacturing firms, while labour accounts for a smaller proportion of total costs than in services firms, property costs and utilities costs are relatively more important – key cost categories where Ireland's cost base is high.

2.1.2 Pay Costs

Labour costs are the single largest cost category across all the sectors benchmarked. While Dublin is among the higher labour cost locations in the EU-15, Cork, Galway and Limerick continue to demonstrate an overall labour cost advantage against most EU-15/US locations. Derry and Belfast also compare favourably across most job categories to other international locations. As with business costs in general, labour costs in Ireland are substantially higher than those in Eastern Europe, India and the Far East.

Figure 8 charts average growth in labour costs across a range of European countries, and highlights that Irish labour costs have increased by substantially more than the Eurozone average since 2000. At a sectoral level, Irish wage inflation is growing by more than double the Eurozone average in a range of domestically trading sectors, including utilities and other services sectors.

Figure 8:
Average Growth in Labour Costs, 2000-2007



Source: Eurostat, General and Regional Indicators, 2007

Higher wages contribute to higher living standards where these higher wages are supported by productivity increases. Overall, against a backdrop of relatively high inflation in the economy, average unit labour costs (ULCs), which measure the change in labour costs relative to output, in Irish manufacturing have not increased significantly since 2003. In these sectors, wage growth has been relatively modest and productivity growth has supported these increases. However, since 2003 unit labour costs have increased in a range of other sectors, (e.g. construction, wholesale/retail trade and transport and communications) as firms in these sectors experienced high labour costs growth and limited productivity growth.²⁰ Overall labour costs remain competitive relative to the EU-15 average.²¹

Forecasts suggest that, given a relatively tight labour market in Ireland, Irish pay increases in 2007 (estimated at 4.5 percent) will outstrip all other EU-15 countries except Greece and the UK.

2.1.3 Consumer Goods and Services

Recent ESRI research suggests that Irish consumer price inflation feeds quickly into higher wage demands, with 50 percent of the increase in the consumer price index (CPI) reflected in wage increases within three months.²² Ireland's performance in terms of consumer price levels is continuing to dis-improve. Ireland's position in the top right quadrant of Figure 9 indicates that it is now both an expensive country (first in the Eurozone and second in the EU-15) and one where prices continue to rise faster than in most other EU countries (fifth in the Eurozone and third in the EU-15).²³

Figure 9:
Consumer Price Level 2006, and Inflation 2003-2007



Source: Eurostat, *Economy and Finance Indicators*

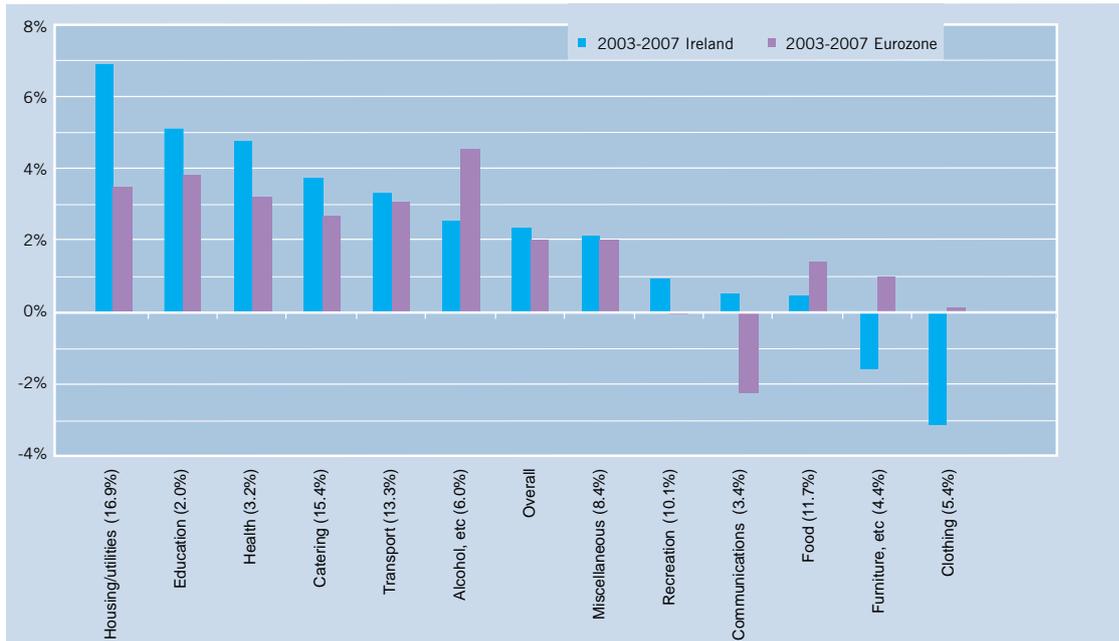
Irish consumer price levels are 20 percent higher than the Eurozone average. Assessing Ireland's price level in greater detail indicates that Irish services price levels were 23 percent above the EU-15 average and goods prices were 13 percent above the EU-15 average in 2005.²⁴

In terms of inflation, between 2000 and 2007, Irish consumer prices as measured by the harmonised index of consumer prices (HICP) increased by 24 percent, compared to 16 percent in the EU-15.²⁵ While Irish inflation was particularly high at the start of the decade, from 2003 to 2005 inflation grew at a rate closer to the EU-15 average. However, from the beginning of 2006 and continuing on into 2007, the gap between Irish HICP, which excludes mortgage interest and a number of country-specific items, and the EU-15 average has started to grow again. Between August 2006 and August 2007, Irish HICP grew by 2.3 percent while European HICP grew by 1.7 percent.

Assessing factors that are driving Ireland's consumer inflation performance indicates that while international factors such as higher oil prices and interest rates heavily influence inflation, a range of domestic factors are also critical. When the effects of energy prices are stripped out of Irish and EU HICP rates, it is notable that the differential between Irish and Eurozone inflation widened quite significantly during 2006 and 2007, reaching 1.6 percent in the month of August 2007.²⁶

To assess these domestic factors, Figure 10 highlights the main drivers of inflation by sector in Ireland. The numbers in brackets indicate their relative weighting in the consumer price index. Irish inflation is higher than Eurozone inflation in sectors that comprise 74 percent of the index. Sectors that are driving recent Irish inflation include housing/utilities, catering, recreation and to a lesser extent health and education.²⁷ Some sectors have experienced limited inflation or deflation in recent years including food, clothing, furniture and communications.

Figure 10:
Main Drivers of Inflation Ranked by CPI Weighting (2003- 2007)



Source: Eurostat, *Economy and Finance Indicators, 2007*

Sectors with high inflation rates share a number of common characteristics. They are generally services sectors, domestically traded with limited international competition, labour intensive and make relatively limited use of technology. Services in some sectors are provided predominately by the State, for example utilities and public transport.

The Central Bank has recently examined cost increases in administered services which comprise of local authority rents and charges, public transportation and toll charges, examination fees, hospital charges and health insurance, library and postage charges, television license, driving test, passport and birth certificate fees. These charges increased significantly during 2002 and 2003, with more modest increases over the period 2004-2006. Nevertheless, the rate of increase in administered services remained high in 2006, at around five percent.²⁸

Various forecasters expect to see some moderation in Irish consumer inflation rates in 2007 and early 2008 due to the impact of expected lower average oil prices and a peaking of Eurozone interest rates. However, domestic inflationary pressures are expected to remain quite strong, particularly in locally traded sectors of the economy. It is also expected that food prices will increase.

2.1.4 Summary Measure of International Price Competitiveness

The harmonised competitiveness indicator, outlined in Figure 11, combines changes in price levels and exchange rates to give a single measure of changes in international price competitiveness. A higher score indicates a weakening cost competitiveness performance. The bulk of Ireland's loss in competitiveness occurred between 2002 and early 2004 when the euro strengthened considerably against the dollar. However, the inflation differential between Ireland and our key trading partners combined with a stronger euro has weakened Ireland's cost competitiveness in the past two years.

Figure 11:
Harmonised Competitiveness Index, 2001-2007 (2004=100)



Source: Central Bank of Ireland

2.2 Policy Actions

Ireland's cost competitiveness must remain a key economic policy priority. The success of Ireland's export-based growth model is conditional on sustaining the competitiveness of tradable goods and services enterprises in global markets. In the context of ensuring export success in a currency union, production costs should not grow faster than in Euro area competitors.²⁹

Tackling high and increasing costs is challenging and there are no simple solutions. Recent increases in Eurozone interest rates are likely to improve Ireland's long term inflation performance through reduced domestic demand.³⁰ International commodity prices, such as oil and gas, are outside our control. However, as highlighted in section 2.1.3, a range of domestic factors also influence our inflation performance, which can to some degree be influenced by national policy. This section addresses these diverse policy areas under the following headings:

2.2.1 Setting Inflation Expectations

2.2.2 Managing Labour Costs

2.2.3 Promoting Competition to Reduce Domestic Services Sector Costs

2.3.4 Managing Government Spending

2.3.5 Tackling a Range of Specific Cost Categories

2.2.1 Setting Inflation Expectations

There is a risk that relatively high inflation in Ireland is becoming embedded in public expectations. Expectations of continued high inflation can be self-fulfilling, as higher inflation rates feed into higher wage demands as workers see the real value of their pay fall. A wage-price spiral could severely damage competitiveness. Together with the risk of further declines in the value of the dollar against the euro, these challenges present a continuing threat to jobs and growth in internationally trading sectors of the Irish economy. The Council believes that it is appropriate to develop a national programme to restore cost competitiveness that includes setting inflation targets close to the Eurozone target rate of inflation of two percent. The social partnership process could play a key role in steering Irish inflation rates towards this target.

2.2.2 Managing Labour Costs

Labour costs are a key cost category for most firms, particularly services firms. Given the open and flexible nature of the Irish labour market, the Government has limited ability to influence economy wide wage rates and wage increases. However, there are a number of areas where the Government can have a direct impact.

Ireland's national partnership agreements set pay levels in the public service and are a benchmark for the broader economy. A key challenge facing the Government and the social partners is to ensure that pay costs are flexible enough to safeguard competitiveness and employment levels from the effects of exchange rate volatility and other potential shocks (e.g., sharp slowdown in construction activity and employment, increases in energy prices, etc). If employment growth rates and productivity growth continue to slow, it will be critical that future wage agreements are sensitive to weakening economic circumstances and the pressures of international competitiveness.

Employee financial participation (EFP) provides employees with access to exceptional rewards in excess of the typical returns from employment in return for improvements which deliver exceptional performance. International evidence supports the contention that there is a positive relationship between EFP and productivity improvements at firm level. Data indicates that EFP is greater among larger, typically foreign owned firms as smaller firms are reluctant to use EFP both due to a general lack of awareness as to the benefits and to perceived and actual complexity of revenue approved schemes. Encouraging greater awareness and education of the current voluntary schemes available could improve their take-up in line with agreed commitments under previous social partnership agreements. They can also deliver important benefits in terms of managing labour cost pressures for enterprises.

In the longer term, higher participation rates in the labour force can help to moderate skills shortages and excessive wage inflation. While average Irish participation rates are close to the OECD average, participation rates are significantly lower among a number of specific socio-economic groups such as lone parents and older workers.³¹ Reforms of Ireland's labour tax system and the improvements in childcare facilities and re-training interventions as outlined in 'Towards 2016' are central to encouraging increased participation.

2.2.3 Promoting Competition to Reduce Domestic Services Sector Costs

The high costs charged by a range of domestic services providers weaken the cost competitiveness of internationally trading firms from Ireland. Enhancing competition in domestic services sectors of the economy is critical to improving the cost competitiveness of Irish based firms that trade internationally. Enhancing competition can also improve Ireland's productivity performance - section 3.2.1 sets out a range of activities to enhance competition in the Irish market.

2.2.4 Managing Government Spending

In the absence of an independent monetary policy, fiscal policy (comprising government spending, taxation and borrowing) is a key policy tool available to influence demand and prices in the economy. In relation to fiscal policy, the NCC recommends the following:

- Given that economic growth forecasts for the economy remain strong, easing growth in public spending could help to restrain inflationary pressures;³²
- Implementation of the National Development Plan (2007-2013) is essential to promoting competitiveness, but its delivery has the potential to be inflationary. The NCC supports the full implementation of the NDP in an efficient manner, and makes a number of recommendations in this regard:
 - To reduce the potentially inflationary impact of Ireland's ambitious programme of public investment, efforts should be made to offset increased capital expenditure with tighter management of current spending growth;
 - In order to ensure that key projects are delivered in an efficient manner, the Council recommends that projects for tender are sufficiently large to be attractive to international consortia. This can enhance competition and capacity to deliver;

- Relatively low corporation and labour taxes enhance the cost competitiveness of all internationally trading businesses in Ireland. However, local authority charges, for example water, waste, commercial rates, development charges, etc., offset these advantages to some degree, particularly for early stage start-up firms. It is important that these charges on enterprise are transparent, consistent, applied fairly and relate to the economic costs of providing the service in an efficient manner. The NCC acknowledges the growing demands being placed on local authorities given rapid population and economic growth. In this regard, a widening of the revenue base for local authorities, subject to efficiency gains and value for money, could be of benefit; and
- Finally, in respect of tax policy, the NCC welcomes commitments that any potential new tax relief incentives will be informed by a cost benefit analysis. The costs/benefits of alternative options, including direct public expenditure, should be considered prior to new reliefs being introduced.³³

2.2.5 Tackling a Range of Specific Cost Categories

Property Costs:

NCC research indicates that property costs in Ireland are expensive compared with other benchmarked locations and are continuing to grow.³⁴ Property costs (purchasing, construction, and rental costs) in Ireland are now nearing levels in high cost locations such as London.

Property costs are a key cost category, particularly for manufacturing firms that require a significant amount of land. Higher land and house prices also feed directly into pressures for wage increases, and are impacting negatively on the ability of the State to deliver the NDP within budget. More competitive land prices could also help support continued demand for housing and construction employment. The focus of this section is on measures to increase the availability of development land, increase the supply of affordable housing and reduce the cost pressures in our cities.

The unprecedented economic expansion and increase in population in Ireland has inevitably resulted in an explosion in demand for land since the early 1990s. Substantial increases in the costs of land in recent years suggest that the availability of zoned and serviced land has not kept pace with this demand in certain areas. In addition, much of the demand for housing in Dublin has been absorbed by other areas of Leinster and south Ulster in recent years.³⁵ Looking forward, increasing the availability of zoned and serviced land in key areas is important as it could help to moderate land price increases. Anecdotal evidence also suggests that there has been significant hoarding of development land adjacent to key urban centres. The NCC welcomes the commitment in the Programme for Government to bring forward legislation on foot of recommendations from the All-Party Committee on the Constitution on Property Rights.³⁶

A range of actions could potentially increase the supply of competitively priced housing. Stronger support for increasing density should be considered in the upcoming review of housing densities.³⁷ Carefully located and designed high density developments, with social, educational and recreational facilities, together with world class transportation connections offer the possibility of increasing the supply of both commercial and residential property in a more cost effective and environmentally sustainable manner. Integrated housing and economic planning can also support the development of dynamic communities and clusters, for example, the Digital Hub in Dublin. The development of strategically designed towns such as Adamstown should also be advanced, as they provide for the integration of social, retail and transportation services into communities from the outset. In this context the NCC welcomes the intention under Transport 21 to establish a Dublin Transport Authority (DTA) which will have the responsibility for surface transport in the Greater Dublin Area. It will be important that the DTA has the necessary powers to deliver a fully integrated transport system for Dublin. As noted by the Dublin Transport Authority Establishment Team, the integration of land and transport planning will be a critical function.

Finally, property costs are considerably cheaper outside Dublin. Greater coordination and implementation of the National Spatial Strategy at national level and the development of the gateways in particular, could potentially reduce costs pressures on Dublin.

Utility Costs:

Research commissioned by the NCC indicates that a range of Irish utilities costs weaken our cost competitiveness. Ireland performs particularly poorly in terms of the cost of electricity, waste and water compared with international competitors.

While cost increases are in part required to fund the major investments underway in public infrastructure, the NCC is concerned that cost increases are also in part related to inefficiencies in delivery.³⁸ By eliminating inefficiencies and raising productivity, the State can facilitate continued improvements in public services and infrastructure without adding to inflation. In terms of specific utilities:

Energy Costs: Energy costs in Ireland have increased dramatically in recent years, and are a key concern of the enterprise sector. The price of electricity in Ireland has gone from 3.9 percent below the EU-15 average in 1997 to 18.7 percent above in 2007. Inflation in electricity costs in Ireland averaged 5.2 percent per year over the decade to 2007, significantly higher than the EU-15 average (2.95 percent). Part of this increasing price level has reflected the need for high levels of investment in recent years.³⁹ In addition, 90% of our energy (oil and gas) is imported and our fuel mix is heavily based on fossil fuels due to limited use of renewable energy and no nuclear.

Implementation of the Energy White Paper combined with the completion of the all-island electricity market should drive greater efficiency and cost competitiveness over the medium term. In the short term, the NCC recommends the following:

- Greater interconnection is crucial to moderating electricity prices, to supporting security of supply and the development of renewable energy. As the NDP and White Paper on Energy open the possibility of Exchequer funding for interconnection infrastructure, funding should be allocated to avoid increases in user charges. It is also critical that the planned interconnectors are of sufficient scale to influence the development of competition in the domestic market;
- All EU member states have endorsed a target of a 20 percent reduction in energy use as part of the European Commissions Energy Policy package. Improving the efficiency of both the production and use of energy will be key factors for the future competitiveness of the Irish economy.⁴⁰ A stronger partnership between relevant government departments and the enterprise sector, focused on the delivery of innovative solutions and demand management, could play a key role;
- Electricity generation price inflation in Ireland comprises both controllable e.g. efficiency of the Irish electricity sector and uncontrollable factors e.g. international costs of oil/ gas, etc. In terms of controllable costs, which account for 30 percent of the difference from EU costs, the regulator should rigorously promote efficiency as a way to help reduce costs.⁴¹ Increases in uncontrollable factors should be passed on to consumers in a fair and transparent manner. In the medium term, potential may exist to alter the fuel mix to improve price competitiveness and security of supply; and,
- The White Paper target on renewable energy can help to reduce Ireland's current dependence on imported fossil fuels. However, meeting this target is likely to require significant investment in back-up generation capacity and grid enforcement. It is critical that the targets for renewable energy are implemented in a fashion that does not impact negatively on electricity prices and security of supply.

Waste Management Costs: Ireland's comparatively poor cost performance in waste management can be traced back to delays in the delivery of key waste management infrastructure and in developing the market. The Programme for Government sets the goal of driving down the cost of waste management to households and enterprises by ensuring that our waste management sector is competitive and uses all available technologies to achieve this. The prioritisation of investment in waste management infrastructure in the NDP, the coming into force of key sections of the Planning and Development (Strategic Infrastructure) Act 2006 and the publication of the Market Development Programme should address many of the impediments in developing the market. The NCC also supports the goal in the Programme for Government to undertake an international review of waste management plans, practices and procedures and to act on its conclusions.

3. Enhancing Productivity

Summary

Productivity growth will increasingly determine Irish living standards. Overall, Ireland's productivity growth since 1990 has been among the highest in the world. However, annual productivity growth rates have slowed in recent years and were below the OECD average between 2003 and 2006. Productivity growth in some of Ireland's most productive, generally high-tech sectors has fallen; few of Ireland's large domestic sectors have strong productivity growth rates, while employment growth has been highest in some of Ireland's least productive sectors.

Re-invigorating Ireland's productivity performance requires a multi-faceted approach. The Government's major policy initiatives, as set out in the NDP and Towards 2016, will enhance the economy's productivity potential. In addition, the NCC suggests a number of priority areas including:

- **Increasing Competition:** Programmes to enhance competition and reduce barriers to market entry should be pursued vigorously, particularly in locally traded sectors of the economy where inflationary pressures are greatest. Existing laws, rules and customs should be reviewed to ensure that they are not anti-competitive.
- **Improving Management Capabilities to Support Productivity Improvements:** The NCC welcomes the establishment of the Management Development Council which will address the dual challenges of both improving the supply of management development courses, supports and initiatives and stimulating the demand for management development. It will be important that allocated NDP funds are utilised to support management development.
- **Promoting the More Effective Use of ICT:** While evidence suggests that ICT does have a role to play in boosting productivity, any efforts to promote ICT by public policy must recognise the importance of a corresponding reorganisation of an industry or company to take advantage of these technologies. The creation of stronger industry networks to develop standards and promote take-up and the development of advanced e-Government services can enable businesses to reap the full productivity benefits of new technologies.
- **Improving Productivity in the Public Sector:** Growing demands are being placed on the public administration system which necessitates continuous change in public sector management, organisational structures and the system of local government.
- **Emerging Opportunities for Productivity Growth:** It is important that Ireland has strategies in place to develop the existing base of firms and to develop and attract new firms by ensuring that sector specific business environment factors are in place such as skills, infrastructure, regulation etc.
- **Enhancing Our Understanding and Measurement of Productivity:** There is a continuing need to improve the measurement of productivity, particularly in domestically trading sectors and the public sector.



3.0 Introduction

Productivity is defined as the amount of output created per unit of input used, and is typically measured as output per worker or output per labour-hour. Economic growth is the result of the combined forces of productivity growth and employment expansion. Ireland's recent economic success has been driven by increases in both numbers employed and by growth in the productivity of those at work. Productivity growth is essential to enabling pay increases in firms while maintaining cost competitiveness. Therefore, increasingly productivity is the key to improving living standards.

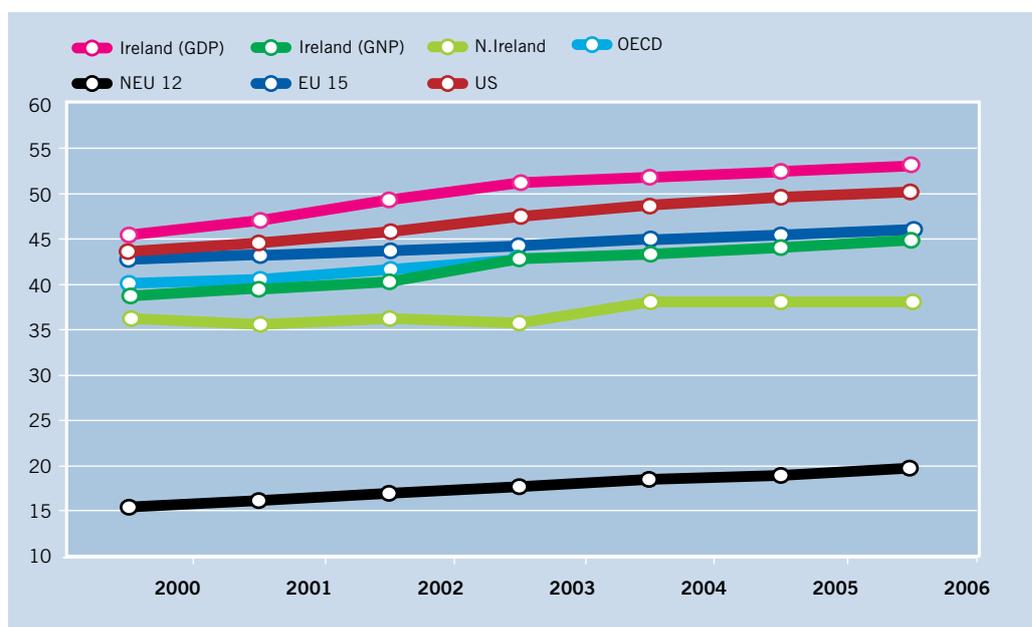
A wide range of factors determine national productivity growth rates. These stem from decisions made at both government and firm level. From a government perspective, institutional structures and policies that support investment, entrepreneurship, competition, innovation and structural change all enhance productivity growth. The existence of a stable macroeconomic environment with well-managed public finances, price stability, a regulatory environment that promotes competition and minimises unnecessary administrative costs, and a flexible labour market are important. The government can also directly influence national productivity by delivering productivity improvements where it is an employer.

At the firm level, productivity improvements centre on product, process and organisational innovation, the best use of technology (ICT, automation, etc.), continuous investment in training and staff development, and the adoption of world class management practices. Structural change can also play an important role as productive firms grow and unproductive firms decline or fail.

3.1 Ireland's Productivity Performance

Ireland's productivity growth performance since 1990 has been very strong. Figures for GDP per hour worked indicate that Irish productivity has been among the highest in the world since the late 1990s. Using GNP per hour worked figures, which adjust for the effects of MNCs, suggests that Irish productivity levels have converged with the OECD average (Figure 12).⁴²

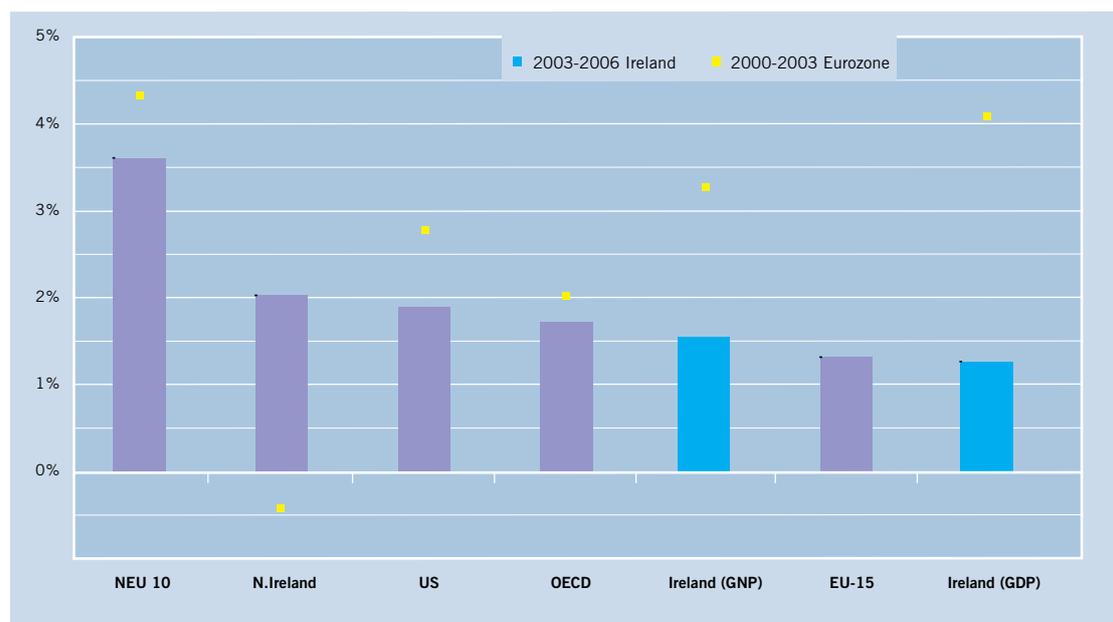
Figure 12:
Per Hour Output, 2000-2006 (€ value added)



Source: Forfás Calculations; Groningen Growth & Development Centre, Total Economy Database, January 2007; United Kingdom, Office for National Statistics, 2007 [online]; Northern Ireland Department of Enterprise, Trade & Investment, Northern Ireland Labour Force Survey: Historical Supplement Spring 1984 – Spring 2006.

While productivity levels in Ireland remain strong, achieving higher growth rates in productivity than our competitor countries will be important for international competitiveness and securing sustainable wage growth. Average productivity growth in Ireland is now below the OECD average and in line with the EU-15 average. Annual productivity growth during the period 2003-2006 was below the OECD average and well below the Irish average between 2000 and 2003 (Figure 13).

Figure 13:
Annual Average Growth in Output per Hour Worked, 2000-2006

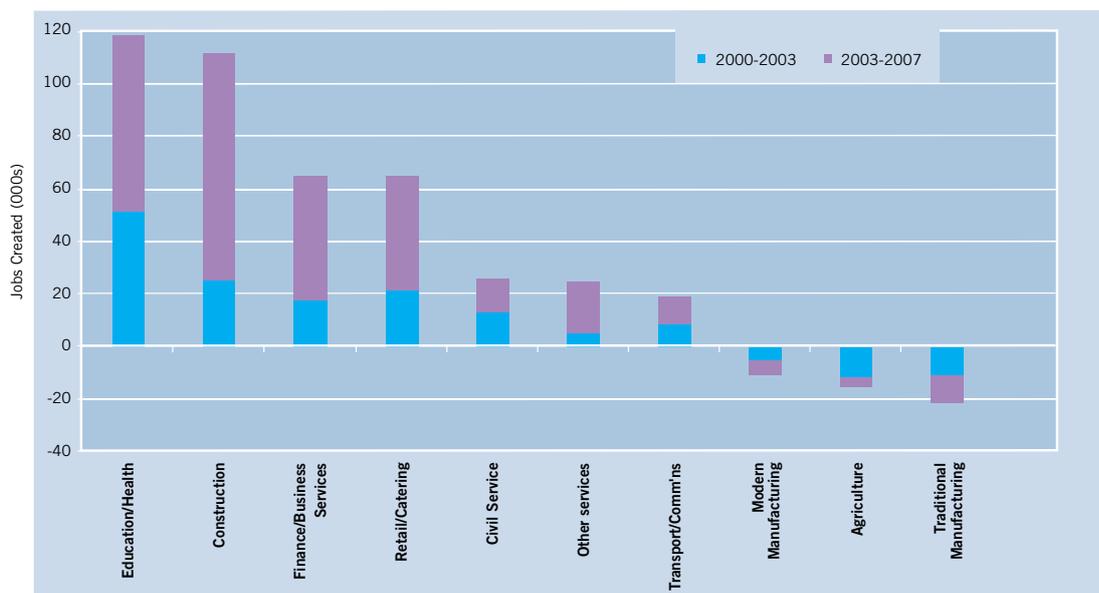


Source: As per Figure 12.

There are three main reasons why Ireland's national productivity growth rates have weakened:

- Productivity growth in some of Ireland's most productive sectors has slowed in recent years. Mirroring international trends, Irish productivity growth rates have been highest in a narrow range of technology intensive manufacturing and services sectors. Annual growth rates in these sectors, particularly modern manufacturing fell sharply during the 2000-2004 period compared to the 1995-2000 period;⁴³
- Despite showing signs of improvement in recent years, few of Ireland's larger, mostly locally trading service sectors have shown strong productivity growth rates; and,
- Finally, while employment in some of Ireland's more productive sectors has reached a plateau or has fallen, employment in many large domestic service sectors is growing. Figure 14 shows the number of jobs created by sector in Ireland between 2000 and 2007. Modern and traditional manufacturing and agriculture have contracted, while education, health, construction and finance have expanded strongly, particularly since 2003.

Figure 14:
Job Creation by Sector in Ireland (2000-2007)



Source: Central Statistics Office (by 2 digit NACE codes)

Future projections suggest a small improvement in Ireland's productivity growth rates. However, this growth is based on assumptions of people shifting sectors (structural change) from construction – a relatively weak productivity performer – to more productive sectors.

3.2 Policy Actions

As indicated above, a wide range of factors influence a country's productivity growth rates. To support the continued growth of productivity in Ireland, the NCC suggests a number of priority areas that need to be addressed. This section addresses these diverse policy areas under the following headings:

- 3.2.1 Increasing Competition;
- 3.2.2 Improving Management Capabilities to Support Productivity Improvements;
- 3.2.3 Promoting the More Effective Use of Information and Communications Technology (ICT);
- 3.2.4 Improving Productivity in the Public Sector;
- 3.2.5 Emerging Opportunities for Productivity Growth;
- 3.2.6 Enhancing Our Understanding and Measurement of Productivity.

3.2.1 Increasing Competition

Competition promotes productivity growth in a number of ways. Competition stimulates productivity as firms invest in the development of new products and processes and as they reorganise to create competitive advantage. Secondly, competition encourages efficiency. As firms face robust competition, they must reduce costs in order to compete for customers. Finally, competition promotes innovation and the diffusion of new technology as firms seek to achieve competitive advantage by improving productivity through adopting best practice or developing new processes, products or improving existing ones.⁴⁴

Internationally trading businesses in Ireland face a wide range of competitors. The benefits of being able to compete internationally are clear - the creation of the European single market has been critical to raising Irish productivity levels and living standards. While there are a number of examples of the benefits of greater competition in domestic markets, e.g. air travel,⁴⁵ inter-city bus routes, taxis, telecommunications, a wide range of sectors in Ireland are relatively protected from competition. There are a number of reasons for this including the power of producers in these sectors, the nature of the good/service produced, the limited potential for competition, e.g. natural monopolies, small size of the Irish market, etc., the role of government and the power of regulators, and weak consumer voice and action.

Domestic trading sectors should be as competitive as possible. The restriction of competition allows dominant providers to produce goods and services inefficiently and/or to inflate prices artificially. Market entry by new firms and firm rivalry promotes price competition, improves quality and service and encourages innovation.

In order to improve competition in the Irish market, the NCC suggests that actions are needed in a number of related policy areas, including:

- The active pursuit of measures to enhance competition, particularly in locally trading sectors of the economy, e.g. engineers, architects, solicitors, barristers, banking and non-life insurance, transport, energy and waste services, medical and paramedical professions etc. Current laws, rules and customs should be reviewed to ensure that they are not anti-competitive. Anti-competitive practices take many forms; for example, they can restrict the ability of people to enter these sectors e.g. limited training places / limited recognition of overseas qualifications, of individuals and firms to advertise, and of customers to switch providers easily, etc.
- In recent years the Competition Authority has reviewed many of these sectors and has recommended a range of actions to promote greater competition. In this context, the development of structures to coordinate responses to these recommendations would be of value. The coordinated preparation of responses to Competition Authority reviews from Government would also serve to highlight progress made and identify outstanding areas.
- Continued efforts are required to ensure regulatory structures and systems are strongly oriented towards consumer interests rather than producer interests. It is critical that regulators have clear targets that are reviewed periodically, and that unnecessary ongoing regulatory costs are avoided. Potential also exists to review the role of informal regulators within Government Departments to ensure consistency in terms of strategy, for example consumer focus and operational best practice, and where new regulation is required, it should be designed to promote competition; and,
- At an international level, Ireland should continue to support the development of EU competition law in order to promote open and competitive international marketplaces for exporters from Ireland. Implementation of the agreed EU Services Directive will also promote cross country competition.

3.2.2 Improving Management Capabilities to Support Productivity Improvements

There is a strong positive relationship between high standards of management practice and high levels of productivity in businesses.⁴⁸ Improvements in management capabilities have been found to increase productivity, returns on capital employed, sales and market share, irrespective of the country of operation, sector, firm size or other similar characteristics.⁴⁹

Well managed firms increase productivity through a number of different channels. Firms with skilled and experienced management teams are more likely to attract higher skilled staff, to effectively use other determinants of productivity such as ICT, and to excel at both operational and strategic management.⁵⁰ Simply put, those in well managed firms work more effectively than those in poorly managed firms. Management development has also been shown to significantly cut the failure rates of small businesses.⁵¹

External factors can influence variations in the quality of management and practices between sectors and countries. For example, regulations can restrict companies' hiring practices and create barriers to foreign ownership. Companies that operate in more competitive sectors tend to display significantly better management practices as competition eliminates poorly managed companies, prompts managers to work harder to succeed, and attracts emerging companies who often deploy innovative approaches and better management practices than existing companies.

Research by the Expert Group on Future Skills Needs (EGFSN) indicates that the level of general management skills in Irish SMEs is perceived to be relatively poor.⁵² The EGFSN identified deficiencies in specific functional skills – particularly human resources, marketing and finance. Strategic management skills were also assessed as 'very weak'. The Enterprise Strategy Group report identified marketing and innovation management as areas of weakness for many firms based in Ireland. A strong focus is required on ensuring that indigenous enterprises adopt best management practices in areas such as quality management, lean manufacturing, logistics and supply chain management, etc.

Identified barriers to management development include financial constraints and a lack of awareness of the benefits of management training. The Department of Enterprise, Trade and Employment announced the establishment of a Management Development Council in May 2007. The NCC welcomes the establishment of the Council. There is a need to stimulate the demand for management development, much of which remains latent, while at the same time improving the supply side to improve the relevance of the management development products on offer. The public money available for in-company training under the National Development Plan 2000- 2006 has so far been substantially under spent.⁵³ It will be important that future resources are utilised effectively to support management development.

3.2.3 Promoting the More Effective Use of Information and Communications Technology (ICT)

ICT is regarded as being one of the main drivers of productivity in modern economies. The European Union regards ICT as being one of the key mechanisms for implementing the Lisbon strategy, which aims to make the European Union 'the most competitive and dynamic knowledge-based economy in the world by 2010'.⁵⁴

The US economy has grown faster than the EU for a number of years. This growth has been significantly driven by higher productivity growth in US sectors that both produce ICT products and services and sectors that use these technologies.⁵⁵ The success of US ICT-using sectors reflects a greater absorptive capacity on their part than their European competitors. For example, in wholesale and retail trade, the two ICT-using sectors with the highest productivity growth, economies of scale and greater competition benefited the US compared to the still fragmented and more regulated services sector in Europe. Fragmented EU markets and regulations (product and labour) significantly reduce the effectiveness of ICT investment in Europe. Therefore, continued efforts to create single European markets can boost both Irish and EU productivity.

Within Irish firms, the evidence suggests that overall business and ICT strategies, coupled with support for efficient ICT investment and managers with both people and ICT management skills achieve the highest productivity gains.⁵⁶ Ongoing organisation change and restructuring is also essential.

While ICT adoption does have a role to play in boosting productivity, policies that aim to transpose such technologies into a static regulatory or management environment are unlikely to succeed in increasing productivity. Efforts to promote ICT use must recognise the importance of a corresponding reorganisation of an industry or company to take advantage of these technologies. Public sector organisations in particular need to become more open to re-organisation and re-training in order to reap the full benefits of ICT.

In relation to creating a more conducive environment to support the effective use of ICT in the workplace, the NCC recommends that:

- Open competitive markets are essential to create incentives for firms to invest in ICT and to develop the absorptive capacity to maximise the benefits of these investments. In addition to developing competition in domestic markets, the implementation of the agreed EU Services Directive and other initiatives to create more competitive international markets should be supported, e.g. single EU financial services markets, Doha Trade talks, etc.;
- Organisations need to recognise the importance of reorganising themselves internally to take full advantage of ICT investments – particularly the public sector where the incentives for such reorganisations are not as strong;
- There needs to be a greater recognition of the effect that complementary inputs like management skills, education and R&D have on determining the impact of ICT investments. The NCC welcomes the introduction of a subsidised ICT audit scheme as recommended by the Small Business Forum, where firms will be assisted in the assessment of their ICT capabilities. Incorporating ICT into broader development agency supports will complement ICT specific programmes;
- The development of stronger business networks in Ireland could enable many industries to reap the full productivity benefits of new technologies. For example, in industries characterised by many small firms (e.g. road freight, construction, etc.), industry networks that can agree standards/ common ICT practices could facilitate the greater adoption and effective utilisation of ICT; and,
- Government can promote the take-up and development of best practice in ICT by further developing the quality and availability of e-Government services. This would help improve public sector productivity and the performance of private enterprises that use these services.

3.2.4 Improving Productivity in the Public Sector

The State plays an important role in the Irish economy by providing goods and services, regulating economic activity and by direct intervention. More than one in five Irish workers are employed in the public sector; this is higher than in either manufacturing or construction. A well managed, innovative and efficient public administration system is essential to driving Ireland's productivity growth rates. The challenge for Government and for the public sector is to achieve the reforms necessary without the discipline which drives change in the private sector. This will require a commitment to the substantive changes needed to meet emerging social and economic requirements and an effective programme to bring about such changes at every level of public administration.

It is notable that the challenges facing the public administration system have grown in recent years, due to a wide variety of factors, including:

- Growing complexity of policy issues and cross-governmental interdependencies in policy making and delivery. For example, the activities of a wide range of Government Departments impact on the success of competitiveness policy. In this regard, the NCC welcomes the recent appointments of Ministers for State with responsibility for innovation, life long learning policy and integration policy;
- Growing demands/expectations from the Government, the public and the business community; and,
- Growing responsibilities and obligations from supra-national agencies, e.g. the EU, WTO, etc.

However, given Ireland's recent economic success, the human and financial resources available to the State to meet these challenges have also increased dramatically.

The Irish public administration system has continued to evolve to meet changing circumstances and requirements. The NCC welcomes plans for Government Departments to produce annual statements on their objectives and outputs. The OECD review of the Irish public service is also an important and welcome initiative. In this context, the NCC highlights a number of key areas towards enhancing the productivity in the public sector.

The management of public sector bodies may be more complex than many private sector bodies given their multiple objectives and wide range of stakeholders:

- The principles of the strategic management initiative need to be re-invigorated and applied more widely across public sector bodies, including local authorities;
- Greater client focus is required. The client-base for different areas of public service provision should be clearly identified and involved, through representative groups or otherwise, in monitoring the effectiveness of services provided; and,
- The remuneration for key management posts should have a performance element. Further efforts are also required to ensure the adoption of merit based promotion in all cases and to promote the entry of talent from outside the public administration system⁵⁸ and salaries should be competitive.

As the challenges facing the public service change, it is important that organisational structures adapt. This presents a number of issues:

- As the activities of a wide range of Government Departments impact on the success of enterprise policy, Ireland needs to have structures and processes that ensure that these departments act in mutually complementary and supportive ways. To date, the public service has successfully brought together ad-hoc groupings to devise key strategies. However, it is perceived that there has been less success in developing similar groups to progress the implementation of strategies;
- In line with international trends, the number of sectoral regulators in Ireland has grown in recent years. They play an important role in regulating economic sectors that supply key inputs to internationally trading firms. It is important that clear criteria are set to guide the establishment of regulators, that subject to the specific needs of different sectors consistent legislation and structures are set across regulators, and that best practice is adopted. There should also be periodic reviews to assess if the number or roles of regulators requires amendment and whether potential exists to merge regulators or regulatory activities;
- The process of moving public service offices and services from Dublin to locations throughout the country needs careful management. Care should be taken to ensure that the efficiency of the public service is not reduced. It is also important that the policy roles of the civil service and public agencies are strengthened and not weakened through dispersion; and,
- A wide range of new State bodies have been established in recent years and it is important that appropriate structures are in place to evaluate public bodies – the degree to which they have clear objectives and how successful they are in achieving them.

Ireland's system of local government has served us well over many years. Given recent growth, the demands on it have increased significantly. Local Government faces a number of challenges that are relevant for national competitiveness, including:

- How best to ensure that local authorities work together collaboratively to support the delivery of national objectives, e.g. supporting the development of the nine gateway towns identified in the National Spatial Strategy;
- Building on initiatives to date, how to ensure the consistent adoption of best practice across multiple bodies and to develop and set benchmarks to assess performance;
- How best to centralise some activities that could perhaps be better dealt with at national level (e.g., waste management, water, etc.);
- Given the substantial increase in Local Government expenditure in recent years, consideration needs to be given towards how best to provide assurance that public money is properly administered and spent to good effect;
- How to separate the multiple roles of local authorities in some areas. For example, in the area of waste collection, local authorities often act as providers, planners and regulators of private sector competitors; and,
- How to widen the funding base for local authorities, given their current dependence on central Government and charges on businesses.

3.2.5 Emerging Opportunities for Productivity Growth

In recent decades Irish productivity growth has benefited significantly from structural change as the economy shifted from low productivity sectors into higher productivity manufacturing, e.g. chemicals, electronics, medical devices and tradable services (e.g. communications, financial services, computer services sectors). However since 2000, strong employment growth in domestic services, construction and the public sector – sectors that record poor productivity performances - have had the effect of reducing national productivity growth. It remains important that existing manufacturing and tradable services sectors continue to be developed and that we identify and develop new emerging sectors.

In this sense it is important that Ireland continues to implement strategies to develop the existing base of firms into new parts of their value chains and to develop and attract new firms in emerging knowledge-intensive sectors. IDA Ireland and Enterprise Ireland are working with enterprises to grow our strengths in new areas such as more sophisticated financial services activities, managing regional headquarters' functions, IP management and distribution, hosting and management of digital content, online sales, high value customer management, supply chain management and product, process and service innovation. It is imperative that Ireland provides an attractive environment for these activities to grow. Understanding and ensuring that sector specific business environment factors are in place, such as the required skills, infrastructure, regulation, etc., are essential to exploiting new areas of opportunity for strong productivity growth.

3.2.6 Enhancing Our Understanding and Measurement of Productivity

In terms of analysing Ireland's current productivity performance, we have limited data on productivity levels and growth rates. This problem is not unique to Ireland. Traditionally economists have measured labour productivity by calculating the value added per worker divided by a measure of labour. By this measure, the higher the value added in a sector or firm, the higher its productivity. This presents two challenges. Firstly, the estimates of output and productivity for exporting sectors in Ireland can be affected by the treasury operations of multinational firms. Secondly, this data is of limited value for measuring productivity in sectors which do not face international competition. The value-added in these sectors can reflect domestic wages and profitability levels, rather than productivity. Finally, public sector productivity is often assessed based on how much is spent (rather than outputs).

The NCC believes that there is a strong case for devoting more attention and resources to improving the measurement of productivity, particularly in the domestically trading sectors, including the public sector.

4. Building Innovative Enterprises

Summary

Developing an innovation intensive economy is essential to enabling Ireland to succeed in the face of growing global competition, particularly in the context of the high cost environment that Irish firms now operate within. Ireland's innovation performance is improving when measured in terms of investment levels and activity; however, the returns from firm level innovation activity remain relatively low. Developing successful entrepreneurs and world-class enterprises are essential ingredients in any economy based on innovation. Ireland's comparative performance in these areas is mixed.

In tandem with the Irish Government's appointment of a Minister for Innovation Policy, Ireland needs to continue the process of re-conceptualising its vision of innovation, placing enterprise and individuals at the centre of driving our innovation performance. Promoting an innovation agenda is multi-faceted given the range of factors that influence its development. These factors include:

- **Promoting Entrepreneurship, Enterprise Development and New Export Markets:** A continued reorientation of development agencies supports towards a broader definition of innovation (i.e., technological and non-technological innovation) is important. There is a need to continue focusing on the specific innovation needs of individual sectors and increase support for new and emerging international services opportunities.
- **Developing People with the Capacity to be Innovative:**
 - The NCC supports the development of a national policy framework that provides third level institutions with the autonomy required to be responsive to all stakeholder needs;
 - To increase life long learning rates, consideration should be given to the efficient implementation of individual learning accounts and brokerage services to help workers and employers identify future skills development needs;
 - Further efforts are required to increase the quality and time spent teaching mathematics, science and ICT skills in Irish schools;
 - Further progress is required to develop a culture of continuous learning within enterprises;
 - Continued efforts are required to develop an attractive environment for skilled migrants, including the recognition of their qualifications and the development of their language skills.
- **Investment in Research and Development:** It is important that public investment remains focused on enhancing the innovation capacity and capability of firms, that public R&D investment is oriented to meeting the current and future human capital and related needs of enterprise in Ireland, and the links and levels of knowledge transfer between the research and enterprise base are greatly improved.



- **Supporting Business Research and Development:** The exploitation of publicly funded R&D schemes to encourage businesses to invest in R&D and the creation of strong industry networks are critical to enhancing the innovative capabilities of firms based in Ireland.
- **Technological Infrastructure:** Increased investment and use of ICT and high quality broadband by firms and the public sector can enhance Ireland's innovative performance.
- **Promoting Access to Finance and Demand for Innovative Products (including Eco-Innovation):** A range of market factors are also important in developing an environment conducive to innovation. For example, developing an accessible finance environment for entrepreneurs and the creation of greater market demand for innovative products and services.

4.0 Introduction

Innovation is the creative process of transforming ideas, into commercial value. Today, business innovation is defined in its broadest sense to include the development of new products and services, new ways of working, new commercial arrangements with the marketplace and ways of getting the best out of people.⁵⁹ In this context, interactions with customers, suppliers, competitors and others, in addition to R&D are drivers of innovation performance. It is also notable that most innovation is incremental - a succession of individual improvements to products/services and processes.⁶⁰ Individuals and enterprises are at the heart of the innovation process and the national innovation system.

Developing an innovation intensive economy can enable Ireland to succeed in the face of growing global competition, particularly in the context of the high cost environment within which Irish firms now operate. To compete, it is essential that enterprises in Ireland are responsive to the needs of international markets, react better and faster, and continuously innovate in products and processes, as part of a constant renewal process. Therefore responsibility to innovate rests primarily with enterprises and individuals themselves. However, public policies that support and enable innovation are also important.

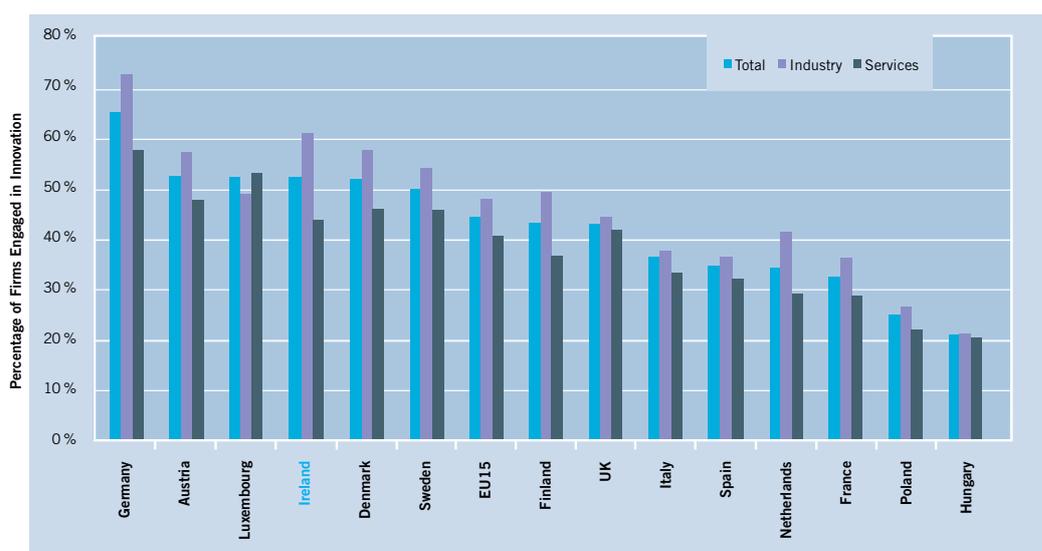
4.1 Ireland's Innovation Performance

This section benchmarks Ireland's innovation performance. It also assesses Ireland's performance in terms of developing successful entrepreneurs and world-class enterprises, a key outcome of successful innovation.

Ireland's innovation performance is improving when measured in terms of investment levels, activity and returns from innovation.⁶¹

- Total innovation expenditure by enterprises in Ireland was €5.72 billion in 2004. It was driven by investment in machinery and equipment (60 percent), in-house R&D (24 percent), expenditure on external knowledge (12.7 percent) and external R&D (3.3 percent). Ireland ranks eight in the EU-15 in terms of spend per capita.

Figure 15:
Percentage of Firms Engaged in Innovative Activity by Sector, 2004



Source: Community Innovation Survey, Eurostat, 2004

- Overall, Ireland ranks very well for firm level innovation activity, ranking fourth out of the EU-15. Figure 15 provides an international comparison of Ireland's innovation activity.⁶² Forfás data indicates that 52 percent of Irish enterprises are 'innovation active', i.e., carried out a product (38 percent), process (43 percent) or an organisational innovation (50 percent) between 2002 and 2004. In manufacturing, innovative activity is highest in chemicals (80 percent) and lowest in furniture (47 percent). Innovative activity in internationally tradable services is highest in computer related services (78 percent) and lowest in financial services (30 percent).
- Turnover from 'new to market products' and 'new to firm products' are indicators of success from innovation. The returns from innovation in Ireland are lower than other EU countries. In Ireland, 5.6 percent of total turnover was derived from new to market product innovations in 2004 while 4.5 percent of total turnover was attributable to new to firm products.
- In conclusion, enterprises in Ireland spend close to the EU average on innovation and they appear more innovation active than the EU average, but the returns from innovation activity in Ireland are relatively low compared to the EU average.

In terms of developing entrepreneurs and world-class enterprises, essential ingredients to an innovation driven economy,⁶³ Ireland ranks seventh among 22 OECD countries for the number of people involved in early stage entrepreneurial activity (7.4 percent of the working age population versus an OECD average of 6.4 percent).⁶⁴ It is likely that this relatively strong performance reflects a number of factors, including the improved incentives for risk-taking as a result of changes to Ireland's tax structure, the development of more competition in Ireland's financial market which has resulted in greater access to credit, relatively low start-up costs and regulations, more positive cultural attitudes towards entrepreneurship, and the belief by one in two Irish people that they have the skills and knowledge required to start a business. However, the 2007 Global Entrepreneurship Monitor and data on new business VAT registrations indicate that entrepreneurship rates may be moderating somewhat in Ireland,⁶⁵ perhaps related to the moderation in construction activity.

Measures of enterprise development are less encouraging. Employment in internationally trading sectors of the Irish economy, that traditionally drive innovation, increased from 292,745 in 1997 to a peak of 352,318 in 2000 and fell to 331,166 by 2003. Employment has since recovered to reach 341,281 in 2006, although the rate of recovery appears slower than that achieved in some other leading technology centres.⁶⁶

Assessing Ireland's performance based on firm ownership indicates that only a small number of indigenous Irish firms have grown into highly competitive world players in their sectors.⁶⁷ Increasingly, these companies are becoming more prominent as outward direct investors from Ireland. However, large sections of indigenous Irish enterprise are characterised by low levels of R&D, low productivity levels and growth, limited sales and marketing capabilities, and a strong concentration in traditional sectors and on the domestic and UK markets.⁶⁸ Addressing these issues and changing the focus of enterprise from cost to innovation is central to self-sustaining growth in the enterprise base.

In terms of foreign owned enterprises, Ireland continues to win new overseas foreign direct investment projects in selected sectors, particularly in the life-sciences and services sector. While this success is increasingly due to the availability of high-level skills and Ireland's developing innovation environment, the attractiveness of Ireland's fiscal environment remains important in decision-making by MNCs. The significant challenge is to drive productivity and growth in the existing base of foreign affiliates in Ireland, through for example increasing levels of automation, to attract new product mandates in higher-margin and more knowledge intensive parts of the value-chains for these operations and to develop centres for manufacturing excellence and supply chain management. The Enterprise Strategy Report highlighted the need to develop the R&D and marketing capabilities of foreign affiliates in Ireland.⁶⁹ In this regard, the major increase in the number of R&D projects supported by IDA Ireland in recent years is welcomed.⁷⁰

4.2 Policy Actions

In tandem with the Irish Government's appointment of a Minister for Innovation Policy, the NCC believes that Ireland needs to continue the process of re-conceptualising its vision of innovation. This needs to place enterprise and individuals at the centre of driving our innovation performance, with a broad variety of Government actions supporting their development. Promoting an innovation agenda is difficult given the range of factors that influence its development. This section addresses these diverse policy areas under the following headings:

- 4.2.1 Promoting Entrepreneurship, Enterprise Development and New Export Markets;
- 4.2.2 Developing People with the Capacity to Innovate;
- 4.2.3 Investment in Research and Development;
- 4.2.4 Supporting Business Research and Development;
- 4.2.5 Technological Infrastructure;
- 4.2.6 Promoting Access to Finance and Demand for Innovative Products (including Eco-Innovation).

4.2.1 Promoting Entrepreneurship, Enterprise Development and New Export Markets

The development agencies (Enterprise Ireland, IDA Ireland, Forfás, County Development Boards, InterTradeIreland, Shannon Development and Údarás na Gaeltachta, etc.) play a key role in the attraction and promotion of entrepreneurship and enterprise development in Ireland and in underpinning the development of competitive clusters. In this context the NCC looks forward to the release of the Entrepreneurship Policy Statement by the Department of Enterprise, Trade and Employment, and Enterprise Ireland's upcoming strategy for the period 2008–2012. In order to further develop Ireland's innovation potential, it is important that there is continued progress in development agency supports towards:

- The continued reorientation of financial supports around a broader definition of innovation in manufacturing and services firms to include technological and non-technological development such as design, organisational, process and business model innovation. This may require additional programmes to enable companies to benchmark their current performance, identify deficiencies, and additional initiatives to encourage enterprises to adopt best practices in areas such as lean manufacturing, supply chain management and automation;
- There is also a continuous need to focus on the specific needs of individual sectors. Greater potential exists to reorient funding toward industry clusters initiatives, for example competency centres that would be well placed to identify and address sectoral requirements;
- Further developing product offerings. In order to rebalance the economy away from construction and domestic spending, growing export sales must be a key priority. In addition, outsourcing, off-shoring and on-lining have become established business practices. The development agencies need to develop policies with respect to these forms of innovation. There is potential to review and simplify product offerings in order to increase their attractiveness and reduce costs for agency supported firms; and,
- Increasing supports for new and emerging international services opportunities, given their increasing importance to the economy generally and their increasing role in international trade and investment. For example, two-thirds of global FDI inflows are now in services. It is notable that Enterprise Ireland is developing stronger capabilities to exploit opportunities in new sectors such as environmental goods and services markets. The internationalisation of education provides a good example of a significant growth opportunity for Ireland (Box 1).

Box 1: Potential New Opportunities from the Internationalisation of Education

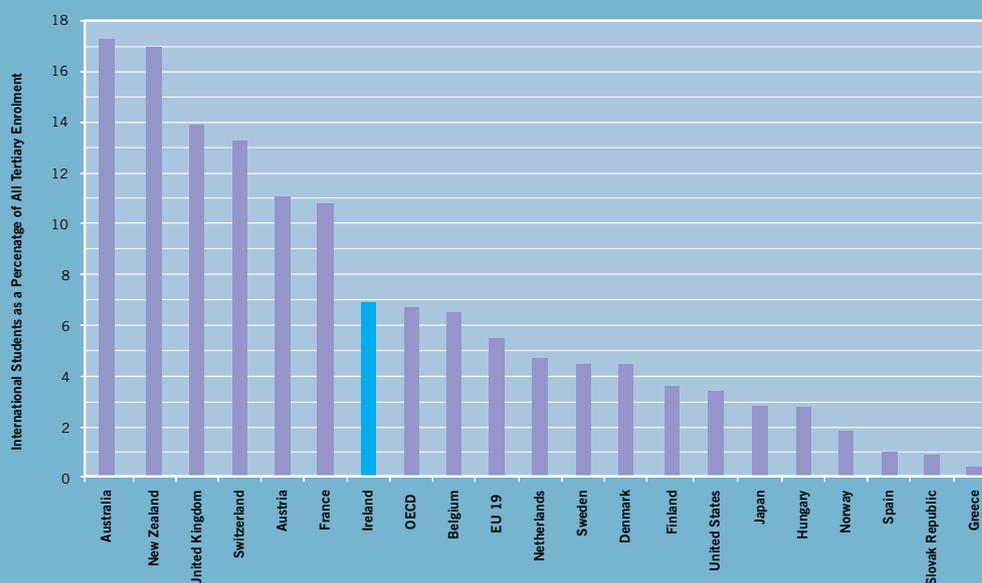
The 'internationalisation of education' presents significant growth opportunities for Ireland in terms of growing exports and other foreign earnings. Recent UK research has highlighted that the UK higher education sector is a significant export industry in its own right (£3.74 billion), outstripping the export value of textiles (£2.8 billion), clothing (£2.5 billion), publishing (£2.3 billion) and cultural and media industries (£3.7 billion in 2006).⁷¹ In both Australia and New Zealand, the generation of foreign earnings from education have now become major contributors to the economy.

Ireland has major potential strengths in this area. We are English speaking with an education system which is well regarded internationally. Our membership of the EU and our strong links with the United States are also major potential attractions. This is a very attractive area of economic potential with high value added content – as a very high proportion of the employment generated is at graduate and postgraduate level.

In Ireland, total income of €335 million was generated by international students in the academic year 2005/06 according to the International Education Board Ireland (IBEI). Of this €335 million, just under €154 million was generated by the higher education institutions in tuition fees from international students, with the remaining €181 million generated through expenditure on accommodation and living expenses. This equates to an average spend per year of €9,715 per student on living expenses.⁷²

Despite progress to date, Ireland is behind leading countries in terms of the attraction of overseas students. Other countries have moved ahead in terms of developing their education systems as an international service, in addition to meeting primary domestic needs (Figure 16).

Figure 16:
International Students as a Percentage of all Tertiary Enrolment



Source: OECD, *Education at a Glance*, 2007

While there has been considerable policy consideration given to this issue (Higher Education Authority and Interdepartmental Working Group),⁷³ there is an absence of a “joined up” and consistent policy framework which would allow for a coherent national approach to this area of activity side by side with the continued development of education as a major instrument of national social and economic development. The Council recommends that priority attention be given to the creation of a proactive, consistent and supportive policy framework in this potentially important area of development.

4.2.2 Developing People with the Capacity to Innovate

Ireland's education system has been a key contributor to productivity growth and improvements in standards of living. In 2005, almost one third of the Irish labour force (aged 25-64) had completed some form of higher education, compared to an estimated four percent in the early 1970s. In addition, there has been a decrease in persons with 'primary education or less' from an estimated 60 percent in the early 1970s to 11 percent in 2005.⁷⁴ Reforms and increases in education investment as far back as the 1960s in second level education and more recently in third-level institutions provided the necessary human capital for Ireland to take advantage of new business opportunities. However, statistics indicate that among firms that are engaged in innovative activity, a lack of qualified personnel is acting as a barrier to innovation (18.3 percent of innovative firms cited a lack of skills as a key constraint).⁷⁵

In addition to the need to increase the supply of high-end skills, with 60 percent of today's labour force expected to be in the labour force in 2020, the Government's National Skills Strategy (Tomorrow's Skills: Towards a National Skills Strategy) identifies the challenge of moving over 500,000 people with low qualification/skill levels one-step-up in terms of their qualifications so they can participate fully in the labour force into the future. In this regard, the NCC also welcomes the increased focus on human capital development in the NDP. It is imperative that the deployment of resources available under the human capital programme of the NDP be in line with the recommendations in the national skills strategy.

Investment and reform in all areas of Ireland's education system have the potential to boost Ireland's long term innovation potential. However, this report focuses on a small number of critical challenges.

Developing the Higher Education Sector

The higher education sector is critical to developing an innovation intensive economy. As participation rates in higher education have increased significantly in recent years, the key challenge is to continue to improve the quality of the education that students receive.⁷⁶

The European Commission has highlighted that "European universities are not currently in a position to achieve their potential As a result, they are behind in the increased international competition for talented academics and students, and miss out on fast changing research agendas and on generating the critical mass, excellence and flexibility necessary to succeed. These failures are compounded by a combination of excessive public control coupled with insufficient funding."⁷⁷ The NCC believes that these issues are also relevant for Ireland.

Building on progress to date, the NCC supports the development of a national policy framework that would clearly identify the expected outcomes to be achieved by the sector over the next decade from a public policy perspective and in terms of promoting economic and social well-being and that would provide the education sector with the autonomy required to achieve those outcomes.⁷⁸ A critical part of this strategy should be the development of greater clarity on the intrinsic links between the third and fourth level sectors. There is a need to maintain the balance between investment in fourth level skills development and sustaining excellence in third level teaching.

Adequate funding is essential to enabling Irish higher education institutions to achieve excellence and high performance across the full range of activities in order to equip Irish students with the highest quality of education available. In this context, the NCC would support an 'investment needs' analysis to determine the necessary funding required to meet this goal. Additional funding if required will have to come from either public and/or private sources and the full range of options should be explored, including philanthropy and tuition fees. If the introduction of tuition fees is required, it would be important to ensure that such a measure does not act as a barrier to participation in third level.⁷⁹

Life Long Learning

Life long learning can play a key role in enabling innovation, both for recent graduates, who increasingly need to update their skills on a regular basis and the labour force in general. Adult participation in life long learning remains lower in Ireland at 8 percent than both the EU-25 average (10.8 percent) and the EU Lisbon target (12.5 percent).⁸⁰

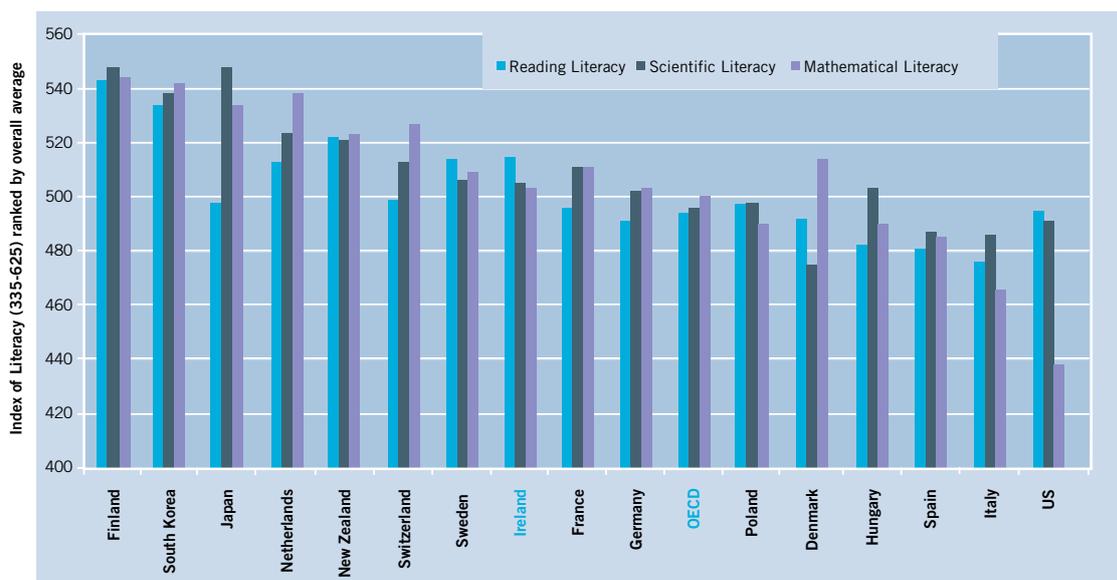
Increasing participation may require additional policy initiatives. As identified in the National Skills Strategy, consideration should be given to the efficient introduction of individual learning accounts and brokerage services to help employers and workers identify future skills development needs.

Skills for the Knowledge Economy

The continued supply of people with high levels of mathematics, science and ICT skills is crucial to the success of Ireland's strategy to facilitate the development innovative knowledge intensive sectors and to enable Irish people to live and work in a knowledge society. Ireland is the leading EU country in terms of mathematics, science and technology graduates (24.2 MST graduates per 1000 of population in the 20-29 age group versus an OECD average of 12.3 in 2003). However as in most western countries, enrolment at third level in these areas is declining. A range of challenges are apparent:

- At leaving certificate level, participation in chemistry and physics is falling;⁸¹
- The amount of time spent teaching mathematics, science and technology to 9-11 year-olds in Ireland is among the lowest of the OECD countries, despite a high number of total teaching hours;
- In 2006, Ireland has fewer computers per student than the EU-15 average; and,
- Finally, as Figure 17 shows, Irish 15 year-olds rank well among OECD countries in terms of reading literacy (6th) but less well in terms of scientific literacy (13th) and mathematical literacy (16th). Ireland's scientific literacy ranking has fallen four places between 2000 and 2003.⁸²

Figure 17:
Scientific, Mathematical and Reading Literacy of 15 Year Olds, 2003



Source: OECD, PISA Database, 2003

A strong focus is required on improving mathematics, science and ICT skills. Specifically the NCC is of the view that further efforts are required to increase the quality and time spent teaching these subjects in Irish schools.

There are also a number of more complex issues to be addressed in relation to science teaching. These relate to the second level syllabus, teaching of science at primary level, the limited number of more general first year entry courses at third level, the role of industry in highlighting skills needs and career opportunities and the need for interdisciplinary programmes. In response to a decline in interest in science studies, the Task Force on the Physical Sciences was established to report to Government on identifying key elements to be addressed across the education system. While good progress has been made on a number of elements of the Task Force's report, it is important that progress on improving teaching and learning in science and technology is accelerated.

Specific concerns exist in relation to mathematics. The Department of Education and Science has recently accepted recommendations made in the National Council for Curriculum and Assessment's review of mathematics in post-primary education.⁸³ The NCC believes that continuing efforts are required to reform the curriculum to encourage greater creativity and problem solving, thus emphasising the ability of students to use and apply mathematics in the real world.

In terms of ICT, while the NDP 2007-2013 has allocated €252 million for ICT development in schools, concerns have been expressed that this will be insufficient. There is also a concern that a policy to integrate ICT into the curriculum and teaching practice is not yet in place in respect to a number of important areas such as curriculum reform, networking, and maintenance of equipment, etc. It will be important that the ICT in Schools initiative is driven by pedagogical considerations and is not infrastructure led. Ensuring success through the professional development of teachers is essential.

Learning Enterprises

Research from the National Centre for Partnership and Performance (NCP) highlights that in response to greater competitive pressures, enterprises are increasingly introducing new products and services and are improving goods or services already provided. Firms are also focusing on training and development and encouraging greater flexibility in their workforce.⁸⁴ However, NCP research indicates that further progress is required in developing a culture of continuous learning which incorporates employee participation and training and development practices. The NCP's workplace innovation fund needs to be strongly promoted as well as a partnership approach at enterprise level to develop appropriate action plans.

Attraction and Retention of Skilled Migrants

Finally, the continued attraction and retention of skilled migrants can complement Ireland's existing skills base. Continued efforts are required to develop efficient processes for workers moving to Ireland, to recognise overseas qualifications, and to enable migrants to develop their English language skills where necessary. In this context the NCC supports the continued work of the National Qualifications Authority of Ireland to facilitate international comparisons of qualifications through the establishment of Qualifications Recognition Ireland. Further efforts are needed to improve awareness among employers of the skills levels of the migrant population. The NCC welcomes the employment of 1,400 teachers to assist English language development among newcomer children in schools and the study jointly commissioned by the Department of Education and Science and the Reception and Integration Agency on the development of a policy framework on the language needs of adult newcomers.

4.2.3 Investment in Research and Development

Ireland has made significant investments in research and development in recent years and the NCC welcomes the commitment through the NDP to the implementation of the Government's Strategy for Science, Technology and Innovation (SSTI).⁸⁵ The SSTI is focused on the creation of advanced skills for the economy, the conversion of knowledge into new products and services for world markets and increasing the innovation performance of firms – critical elements of an innovation economy.

As relative latecomers, catching up with other countries will necessitate that to a reasonable extent, resources are focused on the areas that will contribute the most to economic and social well-being. We must continue to place the highest priority on supporting excellent people, teams and ideas in research and in fostering meaningful collaborations between the research base and enterprise. Weaknesses remain in the higher education and national research infrastructures in terms of the facilities and equipment available to support excellence in education and research. These need to be addressed for Ireland to achieve its full potential. Recognising that as a small country most of the new knowledge will be generated elsewhere, a strategic approach will also be required to foster effective links between the research base in Ireland and centres of excellence internationally.

4.2.4 Supporting Business Research and Development

The Strategy for Science, Technology and Innovation envisages that two-thirds of additional R&D investment and performance in Ireland will be driven by the business sector and that turnover from new products and processes among enterprises in Ireland will double by 2013. This presents a number of key challenges.

Promotion of Business R&D

Business R&D intensity in key sectors of the economy is not commensurate with the norms for those sectors in other countries or at the levels required for self-sustaining growth in those sectors in Ireland. In addition, most business expenditure on R&D in Ireland is undertaken by foreign-owned companies. This is a reflection of the increased internationalisation of R&D which has led to an increasingly competitive global market for R&D activities. A major challenge to be addressed is the transformational change needed in enterprise to enhance its ability to innovate, to respond to market needs and to absorb knowledge and ideas from all sources, including publicly funded research in Ireland and abroad, and that of other enterprises.

People are the key means for the transmission of new knowledge, both by interactions between researchers and enterprises and increased mobility between the two. The NCC welcomes new measures such as the Enterprise Ireland innovation vouchers for first time innovators and potential exists to build on the successful ITI Fusion project⁸⁶ which places researchers in firms. The effectiveness of the R&D tax credit system needs to be kept under review to ensure it is effective, competitive and appropriate to incentivise innovation in SMEs.

Exploitation of Publicly Funded R&D

Ultimately the success of public investments in research will be judged by the extent to which it stimulates economic growth. This will be done through successfully capturing the returns from human capital formation and greater innovation in the enterprise base. The initial indications are of a positive response by the enterprise sector.

Building on the base of research in place, research priorities for publicly funded R&D need to be sufficiently aligned with the needs of enterprises and developing clusters. The NCC welcomes proposals to develop competency centres where industry led networks can direct research funding. It will be important that these are developed strategically to meet the needs of key sectors. Developing effective linkages between the STI research base and services enterprises, such as in finance, health, logistics and tourism and the development of a services research and innovation policy should be prioritised. In this context, the NCC welcomes the establishment of a new Services Strategy Group (SSG), which aims to formulate a vision and strategy on how to promote a sustainable and competitive services sector in Ireland. In addition, much of the real value from research seems to be arising from the convergence between biotechnology, ICT and nanotechnology. In the health and medical research areas, translational research, including pre-clinical and clinical research, that brings enterprise, hospitals and academia together is increasingly important in taking discoveries from bench to bedside and improving patient outcomes. These developments require a high level of co-operation among Ireland's R&D funding bodies and enterprise agencies for Ireland to develop as a hub for bringing new knowledge and ideas to market.

It is anticipated that the development of high quality researchers, as well as research, will be a key output of Ireland's public investment in R&D. The establishment of post-graduate schools that can develop the range of skills needed to ensure that excellent research can be effectively transferred to the market is important. In this regard, the NCC recommends that the HEA and Enterprise Ireland in co-operation with the Higher Education Institutions should continue to promote the inclusion of certified academic entrepreneurship and management components on higher degree programs. Finally, in terms of evaluating the SSTI, there is a need for regular assessments of progress with a clear focus on business innovation targets.

Clusters and Networks

Being part of a cluster is an important competitive strength for business. Clusters help to close the gap between business and research, thereby bringing knowledge faster to the market. Successful clusters promote intense competition along with co-operation. They also help to share risks such as in entering new markets, in training provision and in standards development. Potential exists to develop clusters on an all-island or broader level.⁸⁷ Clusters have received limited support to date from the State, yet research by NESC indicates that in successful regions internationally, coalitions between public and private bodies and enterprises play a key role in strengthening innovative capability and embedding economic activity.⁸⁸ The NCC believes that the development agencies need to act collaboratively with representative bodies and enterprises to encourage and facilitate network and cluster development.

4.2.5 Technological Infrastructure

A range of technological factors are important in developing an environment conducive to innovation. Technological infrastructure encompasses a wide variety of infrastructures that are essential to support and promote enterprise level innovation.

This includes the development of eGovernment as a driver of innovative solutions and as rationale for businesses to upgrade their eBusiness capabilities. The proportion of public services available online in Ireland is below that of the EU-15 average.⁸⁹ In relation to technological readiness, WEF surveys highlight that there has been a notable deterioration in indicators that assess the perceived prioritisation of ICT by the government (36th, down 28 places since 2001) and the government's success in promoting ICT (43rd, down 36 places since 2001). The NCC believes that there is a need to prioritise and advance the implementation of key eGovernment projects.⁹⁰ The wider uptake and exploitation of ICT in public services would not just improve the productivity of the public sector; it could enhance value for money and open up large markets for innovative ICT products and services.

Ireland's investments in both information and communications technologies are below the EU-15 average (5.2 percent versus EU-15 average of 6.4 percent of GDP), and lag leading countries by some distance, e.g., Sweden – 8.5 percent, UK – 8 percent. The sophisticated use of eBusiness in Ireland also remains relatively low.⁹¹ Greater leadership is required to accelerate e-business adoption and to develop the ICT skills of enterprises. The ICT audit scheme recently launched by the Department of Enterprise, Trade and Employment is an important first step.

Despite having an advanced electronic payment infrastructure in Ireland, Irish payments patterns favour cash and cheques. Figures from the European Central Bank suggest that Irish people write 32 cheques per head annually which is double the Euro area average. Greater use of epayments can support innovation in business models, such as online businesses and processes, and can improve the efficiency of all businesses. The NCC welcomes the Government's commitment to encouraging greater use of electronic payments as part of the second Action Plan for Information Society and looks forward to the progression of this agenda with the release of its third Action Plan in the future. A national strategy to reduce our high dependence on cash and cheques and to further encourage the use of electronic payments is vital.

While broadband take-up rates have increased significantly in Ireland in recent years,⁹² many other countries are recognising that the applications of the future will demand bandwidth far greater than is currently available and are investing in next-generation networks that can cater for the bandwidth-intensive industries of the future. To help achieve progression to next generation networks (NGNs), the Irish Government has announced its intention to establish a National Advisory Forum to provide a blueprint for the development of NGNs in Ireland. The challenge will be to encourage high levels of investment in the next generation of broadband infrastructures and services, which will require a partnership approach between the public and private sector.

4.2.6 Promoting Access to Finance and Demand for Innovative Products (including Eco-Innovation)

A range of broader market factors are also critical to developing an environment that is conducive to innovation. Enterprise must be able to raise adequate finance to fund the development of new products and services, a vibrant market must exist that demands new innovative products and services, and the regulatory environment must be conducive to the attraction, creation and protection of new intellectual property.

The general finance environment in Ireland has improved significantly in recent years. However, evidence suggests that Irish businesses continue to report difficulties in accessing early stage finance and venture capital (VC). Examining the merits of the various tools used to facilitate financing for start-ups in other EU countries could offer options for facilitating finance in Ireland. For example, according to the Small Business Forum, the further development of business angel networks would help address the gap in the market for early stage finance while historically, Ireland has also underutilised European Investment Fund supports such as partial loan guarantee schemes for SMEs.⁹³ In addition, evidence from Benchmarking Ireland's Performance on interest rate margins suggests that there is room for more competition in the business banking market. Planned reductions in the tax incentives available to property investors may encourage greater investment in innovative companies. In addition, the creation of a single EU financial services market has the potential to enhance competition in the Irish market.

Ireland has a relatively immature VC market. The environment is also more challenging, as many Irish VCs are coming to the end of their current investment cycles and international VCs are increasingly focusing on larger, more successful markets.^{94, 95} As a consequence, many enterprises experience difficulty securing sufficient capital and the specialist skills and contacts that VC funds can provide. Potential may exist to enable early stage enterprises to remain within a campus incubation environment for a longer period or to encourage them to enter one i.e. spin-ins, thus making them more 'VC ready' when they seek to raise capital as a standalone enterprise. This may require further investment in incubation space. Continued efforts are required to encourage increased participation from international VC funds in the Irish market. In particular, there may be opportunities for Enterprise Ireland to attract international VC funds to co-invest with generalist and specialist domestic funds, particularly at the second and subsequent rounds.

There may also be potential to build on InterTrade Ireland's equity investment programme initiative which assisted firms to become more investor ready. It is important that schemes are of a sufficient size to support enterprises in developing real scale.

Demand-side initiatives in the area of public procurement can also be effective in encouraging the development of innovative products and services. The State can play a key role both as a customer for innovative goods and services and as advocate for the creation of open, international markets.

- Potential exists to make greater use of public procurement to promote innovative products and services, within the context of maintaining transparency and ensuring value for money for the State. The European Commission suggests that contracting authorities can do this by making sure that they describe their needs in a broad and performance based way, which allows bidders to propose a variety of better solutions to the problem to be solved. The Commission also suggests that so-called 'pre-commercial procurement' is a yet untapped opportunity for public authorities.⁹⁶
- Promotion of the Single Market in Goods and Services is important. The entry into force of the Services Directive will be an important step towards creating a real internal market for services adding a strong stimulus to innovation. The further development of the single market can form the basis for one of the largest single markets in the world, where innovative products and services can be commercialized on a large scale. Special attention needs to be paid to the service sector. Related to this, efforts to promote the adoption of open, interoperable European and global standards and to better integrate SMEs and consumers into the standards-setting process can support innovation in small firms.

Box2: Potential New Opportunities from Eco-Innovation

The environmental goods and services (EGS) market is an area of increasing interest and opportunity for Irish enterprise.⁹⁷ Globally the EGS market was estimated to be worth €745 billion in 2004.⁹⁸ The sector encompasses established industries such as waste water treatment and newer industries at the leading edge of technological innovation, including environmental monitoring and renewable energy. As emerging countries in Eastern Europe and Asia advance and as developed economies and enterprises consider the range of carbon emissions abatement strategies available to them, the market opportunities are expected to continue to grow. Irish environmental services exports are growing strongly and Enterprise Ireland is developing its capacity to assist firms in this sector.

The Government's Energy White Paper commits Ireland to achieving a 20 percent saving in energy use by 2020, and more specifically the public sector to reducing its energy demand by 33 percent by 2020. Meeting these challenging targets has the potential to drive the development of innovative products and services. While the ESG sector is an important area of future potential and one which needs to be developed in a careful manner to exploit its potential, support for the sector should be based on cost-benefit analysis to ensure maximum efficiency.

Endnotes

1. In the long term, raising per capita incomes is ultimately dependent on increases in productivity. Given the small size of Ireland's domestic market, exporting sectors have the potential to achieve the economies of scale necessary for productivity gains.
2. Towards 2016, Ten-Year Framework Social Partnership Agreement 2006-2015, <http://www.taoiseach.gov.ie>.
3. A number of specialist international competitiveness bodies, such as the World Economic Forum (WEF) and the Institute for Management Development (IMD) undertake cross-country assessments of competitiveness. These aggregate scores are based on a vast array of data and executive opinions.
4. Private sector credit growth, while slowing, grew by 19.5 percent in the year to September 2007, despite higher Eurozone interest rates. Source: Monthly Statistics, Central Bank of Ireland, September 2007.
5. It should be noted that the bulk of job losses in manufacturing occurred between 2000 and 2003.
6. Average productivity growth was just 1.6 percent during the period 2003-2006, below the OECD average of 1.7 percent and well below the Irish average between 2000 and 2003 of 3.3 percent.
7. Based on the consumer price index data.
8. CSO figures on the number of planning permissions for new dwellings peaked in 2004, while the total size (in square metres) of planning permissions peaked in 2005. Completions figures, albeit based on estimates, point to a year-on-year slowdown in activity starting in December 2006.
9. The latest National Development Plan (NDP) envisions expenditure of approximately €100 billion in capital investment in infrastructure and social housing over the next seven years, compared to about €40 billion during the previous NDP.
10. Pre-fabricated buildings, up €30 million to €113 million; pulp and waste paper, has more than trebled its export earnings since 2000 to €51 million.
11. Annual Business Survey of Economic Impact, Forfás, 2005.
12. Annual Employment Survey, Forfás.
13. Driven by machinery/transport equipment and office/telecom equipment.
14. Europe and Global Imbalances, Philip R. Lane, IIS, Trinity College Dublin and CEPR and Gian Maria Milesi-Ferretti, International Monetary Fund and CEPR.
15. Annual Competitiveness Report, Benchmarking Ireland's Performance, NCC, 2007.
16. Prices in internationally trading sectors are primarily determined by changes in world prices and nominal exchange rates (in accordance with long run purchasing power parity and international arbitrage), while prices in non-traded sectors are also affected by domestic demand conditions. For example, expansionary fiscal policies, the costs charged by central government, local authorities and state sponsored companies for goods and services provided, increases in taxes, and structural changes in the economy including the regulation of specific sectors can influence price levels and inflation rates.
17. Unlike consumer prices indices, most countries do not produce a business price index.
18. Cities benchmarked are Bangalore, Belfast, Boston, Budapest, Copenhagen, Cork, Derry, Dublin, Galway, Limerick, London, Maastricht, Manchester and Singapore.
19. On average, labour dominated business costs (59 percent) in the case study firms, followed by property costs (11 percent), utility costs (nine percent) and transport costs (four percent). All other costs account for 17 percent of total costs and comprise the following costs: accountancy fee costs, car leasing costs, postage and courier costs, health, insurance costs, IT service costs, legal fees, travel and subsistence costs and stationery costs. Costs exclude equipment and raw materials.
20. Central Statistics Office, Labour Market Statistics and Census of Industrial Production; Unit Labour Cost Statistics, OECD.
21. Competitiveness Performance, Quarterly Bulletin 2, Central Bank of Ireland, Mark Cassidy and Derry O' Brien, 2007; European Commission statistics.
22. Quarterly Economic Commentary, ESRI, Summer 2007. Analysis excluding agriculture and health.
23. ACR Volume 1, Benchmarking Ireland's Performance, National Competitiveness Council, 2007.
24. Comparative Price Levels for Selected Consumer Services in Europe for 2005, Eurostat, 2006.
25. 2007 figures are based on latest available data to July 2007.
26. Quarterly Bulletin: Ireland's Competitive Performance, Central Bank of Ireland, April 2007; Eurostat, HICP 2007.
27. Housing and utilities prices comprise 16.5% of the CPI. Of that 16.5%, 9.5% is accounted for by mortgage interest payments and rent. Electricity, gas and other fuels account for just over 4% while maintenance and repair costs and water costs together make up the remaining 3%.
28. Quarterly Bulletin: Ireland's Competitive Performance, Central Bank of Ireland, April 2007.
29. Assuming no changes in products, process, etc.
30. When measured using the HICP.
31. The Minister for Enterprise, Trade and Employment has requested the development of a policy paper on the barriers to people continuing to work once they reached 65, and is considering allowing people to access some of their pension if they worked beyond 65. The number of people aged 65 or over in Ireland is expected to treble to 1.5 million in the next two decades.

32. If the level of overall demand grows more quickly than the economy's ability to produce goods and services, then prices generally must rise. In their 2006 reviews of the Irish economy, both the OECD and the IMF highlighted the importance of an appropriate fiscal stance in order to keep inflation in check.
33. A major review of various existing tax incentive schemes was undertaken in 2005, on foot of the announcement by the Minister for Finance, Mr Brian Cowen T.D., to this effect in Budget 2005. The review process involved internal reviews conducted by officials in the Department of Finance and the Office of the Revenue Commissioners, as well as reviews of certain schemes by external consultants. The purpose of this review was to assess the costs and benefits of a wide range of various tax incentive schemes.
34. Benchmarked locations include Limerick, Cork, Galway, Dublin, Copenhagen, Budapest, Maastricht, Boston, Manchester, Derry, Singapore, Bangalore, Belfast and London.
35. Urban Sprawl and Market Fragmentation in the Greater Dublin Area, The Society for Chartered Surveyors, 2007.
36. The new wording proposed by the Constitution Review Group in a single constitutional provision more clearly articulates the proper balance which must be struck between the rights of property owners and community interests. Ninth Progress Report: Private Property, The all-Party Oireachtas Committee on the Constitution, 2004.
37. Guidelines for Planning Authorities on Residential Density 2008.
38. In non-tradable services, a substantial productivity gap exists in utilities between Ireland and other economies. In addition, transport services have achieved limited productivity growth since 1990. While public services generally record low productivity growth rates, simple measures of overall productivity suggest that Ireland performs well relative to the public sectors of other countries. For details on Ireland's productivity performance, see the NCCs Overview of Ireland's Productivity Performance (1980 – 2005), which is available at www.competitiveness.ie.
39. Electricity Benchmarking Analysis, Forfás, 2006.
40. It is worth noting that the energy intensity of the economy as a whole has fallen by over 40% since 1990 reflecting changes to both the structure of the economy and improvements in energy efficiency achieved to date.
41. Review of the Electricity Sector in Ireland, Deloitte, 2005.
42. All figure presented in this section, unless otherwise stated, are based on measuring productivity through the value added (VA) approach. This measures revenue minus intermediate input costs, divided by the total number of hours worked in that sector/economy.
43. See the NCC's 'Statement on Productivity 2006' and Forfas's 'Perspectives on Irish Productivity Growth', 2007.
44. "Competition and Productivity", published in Perspectives on Irish Productivity, Boyle, D. and Evans, J. Forfás, 2007.
45. "Competition and Productivity", published in Perspectives on Irish Productivity, Boyle, D. and Evans, J. Forfás, 2007. An analysis of the air-travel industry in Ireland over the past two decades illustrates the effect that effective dynamic competition can have on productivity and how consumers and the economy more generally can benefit.
46. The National Consumer Agency established by Government is a welcomed initiative to defend and promote consumer rights. <http://www.nca.ie>.
47. The newly formed High-Level Group on Business Regulation will have an important role to play in reducing the regulatory costs on businesses.
48. Management Matters, McKinsey and the London School of Economics, June 2005. www.cep.lse.ac.uk/management/management.pdf.
49. Management Practices Across Firms and Nations, Bloom, N., Dorgan, S., Dowdy, J., Van Reenen, J. and Rippin, T. 2005.
50. Management Matters, McKinsey and the London School of Economics, June 2005.
51. Evidence suggests that formal training and development cuts business failure rates by half – all other things being equal and failure rates could fall from one in three in the first three years to one in ten where training was undertaken. Small Firms Training Impact Assessment, SFEDI, 1999.
52. SME Management and Development in Ireland, Expert Group on Future Skills Needs, 2005.
53. The NDP (2007-2013) has dedicated €2.8 billion towards a sub-programme for up-skilling the workforce. The sub-programme has four themes. These are to improve training for people in employment, help up-skill those affected or likely to be affected by industrial restructuring, improve and enlarge the apprenticeship system, and provide progression opportunities for school leavers.
54. EU Lisbon Agenda Growth and Jobs Strategy.
55. ICT and Productivity in Europe and the United States Where Do the Differences Come From?, Bart van Ark, Robert Inklaar and Robert H. McGuckin, CESifo, Vol. 49, 3/2003; Catching up or Getting stuck? Europe's Trouble to Exploit ICT's Productivity Potential, Bart van Ark and Robert Inklaar, Groningen Growth and Development Centre, September 2005.
56. 'Information Technology Performance and Process: Four Case Studies' published in Perspectives on Irish Productivity, Maddox and Boyle, Forfás, 2007.
57. <http://www.bettergov.ie/>
58. Towards 2016 makes provision that a minimum of 75% of all internal promotional posts in each grade will be filled through competitive merit based processes in each civil service department and office by the end of 2006 though many departments have reported a commitment to increasing this target. Towards 2016, Second Sectoral Progress Report to the Civil Service Performance Verification Group, May 2007.
59. Sales, Marketing and Innovation Capabilities of Irish Exporting SMEs, Forfás, November 2004. These types of innovation are often more formally classified as product, process, management and organisational innovation.
60. Competing in the Global Economy: the Innovation Challenge, DTI, London, December 2003.
61. Community Innovation Survey, Forfás 2007. Based on firms employing ten employees or more.

62. Firms which are innovation active are those that have carried out a 'product' or 'process' innovation between 2002 and 2004.
63. Entrepreneurship is the process of creating new enterprises. Enterprise development is the process by which start-up and existing companies grow into larger companies, some of which go on to trade internationally.
64. Early stage entrepreneurial activity among the adult population aged 18-64 years inclusive.
65. Global Entrepreneurship Monitor Report (GEM), 2006; Irish Revenue Commissioners.
66. Index of the Massachusetts Innovation Economy, Massachusetts Technology Collaborative, 2007.
67. The number of initial public offerings is an indicator of companies with the potential for high-growth. "Going public" raises significant capital to stimulate next-stage growth. There are presently around 70 Israeli companies traded on NASDAQ and around 30 traded on various European exchanges. In comparison, there are six Irish companies traded on NASDAQ and only a handful of additional technology companies listed on other main exchanges. Source: Whitebridge Capital.
68. Ahead of the Curve: Ireland's Place in the Global Economy, Report of the Enterprise Strategy Group, July 2004.
69. The medical devices sector may be a notable exception. In addition to a large increase in employment in recent years, a large proportion of firms are developing both research and marketing operations.
70. In 2004, IDA Ireland supported 36 R&D investment projects, which increased to 50 projects in 2005 and 54 in 2006. These R&D projects involved expenditures of €140, €260 and €470 million respectively.
71. The Economic Costs and Benefits of International Students. Phil Vickers and Bahram Bekhradnia. The Higher Education Policy Institute, UK.
72. International Students in Higher Education in Ireland, Current Status...Future Trends..., The International Education Board Ireland, 2006.
73. Provision of Undergraduate and Taught Postgraduate Education to Overseas Students in Ireland, HEA 2003; Internationalisation of Education Services, Report of the Interdepartmental Working Group, November 2004.
74. Central Statistics Office, Census 1971.
75. Community Innovation Survey, Forfás, 2004.
76. Forty percent of the 25-34 age group in Ireland possesses a third-level qualification. This compares very favorably with the OECD average of just over 30 percent.
77. Delivering On The Modernisation Agenda For Universities: Education, Research And Innovation, European Commission, May 2006.
78. On commencement of the Institutes of Technology Act 2006, the Higher Education Authority (HEA) now has responsibility for funding universities and institutes of technology. Work is also underway between the Department of Education and Science and the HEA with a view to agreeing a broad framework for a more co-ordinated approach to higher education.
79. For example, through the introduction of graduated fees within the undergraduate cycle, and/ or a comprehensive student loan system with targeted grants.
80. Lifelong Learning in EU Member States (Percent 25-64 year olds), 2005, Eurostat.
81. At Leaving Certificate level, participation in chemistry and physics dropped from 16 percent and 20 percent of Leaving Certificate students in 1990 to 12 percent and 16 percent respectively in 2001.
82. OECD PISA study (2003).
83. Review of Mathematics in Post-Primary Education, 2005 and 2006, National Council for Curriculum and Assessment.
84. The Changing Workplace: A Survey of Employers' Views and Experiences, NCPP.
85. <http://www.entemp.ie/publications/science/2006/sciencestrategy.pdf>.
86. FUSION is InterTradeIreland's all-island technology transfer initiative that gives companies access to the expertise and facilities of universities and colleges across the island of Ireland, allowing them to make strategic advances in innovation and capability.
87. Statistics indicate that just over 32 percent of innovative active firms in Ireland are involved in some collaboration activity when developing their innovations. While this is above the EU average of 25% Ireland lags leading performers such as Finland and Sweden.
88. Skillsnet is a useful example of government support for clusters and networks. Skillsnet was set up to mobilise and support groups of enterprises to develop strategic answers to their joint training needs by establishing networks. The Training Networks Programme is funded under the National Training Fund through the Department of Enterprise, Trade and Employment and companies and organisations involved contribute an average of 32% to the costs of training.
89. Annual Competitiveness Report, Benchmarking Ireland's Performance, NCC, 2007.
90. Forfás is conducting a review of eGovernment in Ireland in 2007. The review will identify areas where the acceleration of eGovernment plans could benefit business.
91. Forfás research for the Department of Enterprise, Trade and Employment.
92. Despite progress, broadband penetration rates in both households (13.1 percent) and firms (61 percent) in Ireland remains well below the EU-15 average (33 percent and 77 percent respectively). Source: Annual Competitiveness Report, Benchmarking Ireland's Performance, NCC, 2007.
93. Small Business is Big Business, Small Business Forum, May 2006

94. 'Informal investors' are a very important source of finance as they often provide small amounts of money, but of a critical nature, to early stage entrepreneurs. Typically this form of investment comes from the family and friends of the entrepreneur. In 2006, the rate of informal investment activity in the adult population in Ireland was 1.74%. In leading countries such as the US, for example, the level of informal investment is 5.96 percent, in Iceland it is 5.83 percent and in Norway it is 4.04 percent.
95. Irish technology companies raised €62.6m in the first half of 2007 compared to €83.7m in the same period last year. Source: Irish Venture Capital Association (IVCA) Techpulse survey, July 2007.
96. Pre-commercial procurement is defined as the use of public procurement to encourage innovation by providing a lead market for new technologies to improve the commercialisation and exploitation of research results.
97. According to the OECD definition, the environmental goods and services industry consists of activities which produce goods and services to measure, prevent, limit, minimise or correct environmental damage to water, air and soil, as well as problems related to waste, noise and eco-systems.
98. Emerging Markets in the Environmental Industries Sector, DTI, 2006.

Appendix: NCC Publications

Publication	Date
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
Annual Competitiveness Report, 2005	September 2005
The Competitiveness Challenge, 2005	November 2005
Annual Competitiveness Report 2006, Volume 1: Benchmarking Ireland's Performance	October 2006
Overview of Ireland's Productivity Performance, 1980-2005	October 2006
Statement on the Costs of Doing Business in Ireland, 2006	October 2006
Annual Competitiveness Report 2006, Volume 2: Ireland's Competitiveness Challenge	February 2007

