

Fitzpatrick Associates



EU
STRUCTURAL
FUNDS AND
IRELAND'S RTDI
TRANSITION

October 2006

TABLE OF CONTENTS

LIST OF ABBREVIATIONS USED

1. INTRODUCTION	1
2. IRELAND – ECONOMIC PERFORMANCE AND KEY FEATURES	3
2.1 DISTINCT FEATURES OF IRELAND.....	3
2.2 IRELAND’S ECONOMIC TRANSFORMATION.....	6
2.3 IRELAND’S RTDI TRANSFORMATION	10
3. EVOLUTION OF IRISH RTDI POLICY.....	12
3.1 INTRODUCTION	12
3.2 IRELAND’S RTDI POLICY PRE-EU ACCESSION.....	13
3.3 IRISH RTDI POLICY IN THE 1970S AND 1980S.....	14
3.4 IRISH RTDI POLICY IN THE 1990S	16
3.5 IRISH RTDI POLICY IN THE PRESENT DECADE.....	17
3.6 IRISH RTDI POLICY 2007-13.....	18
3.7 ROLE OF SPI TOOLS IN RTDI POLICY DEVELOPMENT	18
4. ROLE OF EU FUNDING IN IRISH RTDI.....	20
4.1 OVERVIEW OF STRUCTURAL FUNDS.....	20
4.2 RTDI AND STRUCTURAL FUNDS	24
4.3 STRUCTURAL FUND MONITORING AND EVALUATION.....	31
5. SUMMARY, CONCLUSIONS AND IMPLICATIONS	33
5.1 INTRODUCTION	33
5.2 KEY FEATURES OF THE IRISH EXPERIENCE.....	33
5.3 ROLE OF STRATEGIC POLICY INTELLIGENCE IN RTDI INVESTMENT	35
5.4 SOME IMPLICATIONS FOR NEW MEMBER STATES, ACCESSION COUNTRIES AND LESS DEVELOPED REGIONS	37
ANNEX 1: LIST OF CONSULTEES	
ANNEX 2: RTDI MEASURES BY OP AND PRIORITY IN EACH PROGRAMMING PERIOD	
ANNEX 3: SUMMARY OF SELECTED EVALUATIONS	

LIST OF ABBREVIATIONS USED

BMW	Border Midland and Western Region
CSF	Community Support Framework
EI	Enterprise Ireland
ERDF	European Regional Development Fund
ESF	European Social Fund
EU	European Union
FDI	Foreign Direct Investment
HEA	Higher Education Authority
HRD	Human Resource Development
ICSTI	Irish Council for Science, Technology and Innovation
IDA	Industrial Development Authority
IIRS	Institute for Industrial Research and Standards
NBST	National Board for Science and Technology
NESC	National Economic and Social Council
NIS	National Innovation System
NDP	National Development Plan
NSC	National Science Council
NSRF	National Strategic Reference Framework
OECD	Organisation for Economic Co-operation and Development
OP	Operational Programme
PATs	Programmes in Advanced Technology
PRTLTI	Programme for Research in Third-level institutions
PSOP	Productive Sector Operational Programme
RTDI	Research, Technology Development and Innovation
S&E	Southern and Eastern Region
SFI	Science Foundation Ireland
SPI	Strategic Policy Intelligence
STRIDE	Science and Technology for Regional Innovation and Development
SEZ	Steinbeis Europa Zentrum

1. Introduction

This Background Paper has been prepared for the EU RegStrat¹ EU-funded co-ordination project by Fitzpatrick Associates, Economic Consultants, Dublin. Steinbeis Europa Zentrum (SEZ) Baden Wurttemberg, Germany, is the RegStrat lead partner. The other partners are Forfás, Ireland; the Regional Institute for Research of Lombardy, Lombardia, Italy; the Foundation for the Development, Extremadura, Spain; Wroclaw University of Technology, Lower Silesia, Poland; and the Institute of Baltic Studies, Tartu Region, Estonia.

Commencing in January 2006, the two-year project adopts a “cross-cutting and integrating approach to harness synergies from past and present developments, and knowledge stocks” regarding Strategic Policy Intelligence (SPI) tools (see box). This approach takes account of the different governance levels, different policy and policy research fields, and the different actor communities of Europe’s (trans-) regional, national and sectoral innovation systems.

Strategic Policy Intelligence (SPI) is defined by RegStrat as “the set of activities to search, process, diffuse and protect information in order to make it available to the right person at the right time in order to take the right decisions – including such policy instruments as evaluation, foresight, technology assessment and roadmapping, benchmarking, etc.”

The purpose of this Paper is to examine the role EU Structural Funds and related policy played over the last 15-20 years in Ireland’s transition from being a very low investor in research, technology development and innovation (RTDI) to a more medium investment level (13th out of 25 for R&D as % of GDP in 2003)² and committed to achieving an EU Lisbon target of 2.5% of GNP by 2010³.

The specific objectives of the Paper are to:

- chart Ireland’s transition from a relatively low to a medium investor in RTDI;
- identify key policy and institutional aspects of this transition, including use of SPI;
- identify the role of the EU, and EU Structural Funds in particular, in this process;
- identify lessons for new Member States, Accession Countries, and developing Regions regarding Structural Fund programming for the 2007-13 period.

¹ Further details at www.Regstrat.net

² Eurostat, Structural Indicators Database

³ Department of the Taoiseach, National Reform Programme, October 2005, para. 3.2.3, and more recently *Strategy for Science, Technology and Innovation*, June 2006.

Preparation of the Paper involved a review of relevant Irish reports and other literature dealing with RTDI policy and with the three Structural Fund periods to date, examination of relevant economic and RTDI data, and consultations with a number of senior-level Irish policy makers directly involved in the interface between the Structural Funds and Irish RTD investment during the NDP periods to date (1989-93, 1994-99, 2000-06). The Consultees are listed in Annex 1.

The Paper also draws on Fitzpatrick Associates' own extensive experience in Structural Fund programming in Ireland over three Structural Fund periods, in EU-wide reviews and evaluations and more recently in Structural Fund planning and evaluation in new Member States and Accession countries.

The subject matter of the paper is a relatively complex one. It involves an element of ex-post rationalisation of Irish policy developments over a period going back 15 years and beyond. There are inevitably potentially different descriptions and interpretations of this period. The topic also straddles a number of distinct but overlapping policy areas – RTDI, enterprise development, education and training, EU regional and cohesion policy, and Structural Fund programming. The evolution of policy is also complex and the role of any individual influence can be difficult to separate from other concurrent ones. So the Paper must be read in this light.

The structure of the Paper is as follows:

- Chapter 2 sets the scene by describing distinct features of Ireland which need to be noted in relation to both economic and RTDI structure, and also summarises recent economic and RTDI trends as a backdrop to the remainder of the Paper;
- Chapter 3 describes the evolution of RTDI policy generally in Ireland, during both pre- and post-EU membership periods;
- Chapter 4 describes the role that EU funding and policy played in the evolution of this policy and of investment in RTDI;
- Chapter 5 summarises the Irish experience and highlights both positive features of this and aspects where EU funding had less impact;
- Chapter 6 presents potential lessons for others, i.e. new Member States, Accession Countries and less developed regions, as well as for the Commission.

2. Ireland – Economic Performance and Key Features

2.1 Distinct Features of Ireland

2.1.1 General Socio-economic Features

In considering the recent experience of any EU Member State or region and its implications for others, it is obviously important to note that each location has its own very distinct features. Therefore lessons or implications for elsewhere need interpretation. It is therefore appropriate to remind readers, including the partners in RegStrat, that the Irish experience and context reflects a number of distinct aspects.

Key among these are:

- the fact that Ireland has recently had a period of very rapid growth mostly focused within quite a short period of time (from the mid-1990s to the end of the 1990s). Relatively strong growth is still continuing, but at nothing like the “Celtic Tiger” levels. Ireland’s overall economic transformation is therefore relatively recent and was relatively rapid;
- Ireland is a small country in absolute terms by comparison with larger Member States, although less so in the context of a number of some new Member States. Ireland is akin in size to many regions within the larger Member States, old and new;
- Ireland is now a very open economy, and highly globalised, reflecting a combination of both its relatively small size and its emphasis on export-oriented inward investment;
- Ireland has a long standing and well known policy of attracting foreign direct investment (FDI), via low corporation profits tax rates. This has played, and continues to play, a role in the structure and performance of the Irish economy that is quite unusual at EU level and indeed internationally. This distinct policy has had quite significant implications for RTDI policy and will continue to do so into the future, implications which Ireland’s own National Innovation System perhaps still does not always fully articulate;
- Ireland has traditionally had a relatively weak regional tier of government with the national level (NUTS I) and the local authority level (NUTS III) predominant. There is potential for endless debate about the advantages and disadvantages of this within Ireland, but for EU Structural Funding and RTDI purposes it can be taken as an exogenous variable;
- as shown later in Section 4, Ireland’s main receipts of Structural Funds occurred during the 1994-99 period. In many ways, therefore, it is that period in Ireland rather than the current period which is of most direct relevance to EU Structural Fund programming elsewhere. However, significant differences arise between the 1994-99 period and the present period. One of the most important of these is that the Commission role was previously much more “hands on”, whereas a more

strategic approach is being taken during the current round and this will be enhanced further during the next round, as evident in the new Commission Guidelines⁴;

- prior to the advent of Structural Funds Ireland already had three decades (late 1950s to late 1980s) of experience in delivering development programmes through public sector structures. Whatever the weaknesses at a policy or strategic level, this meant that for purposes of Structural Funds usage Ireland had a strong pre-existing set of professional structures in place allowing sophisticated programming of EU funding at Operational Programme, Priority and Measure level. This applies to RTDI and to enterprise policy generally. This important pre-condition may be absent in some new Member States and less developed regions.

2.1.2 Features of Ireland's National Innovation System

The Irish Innovation System also has a number of key features:

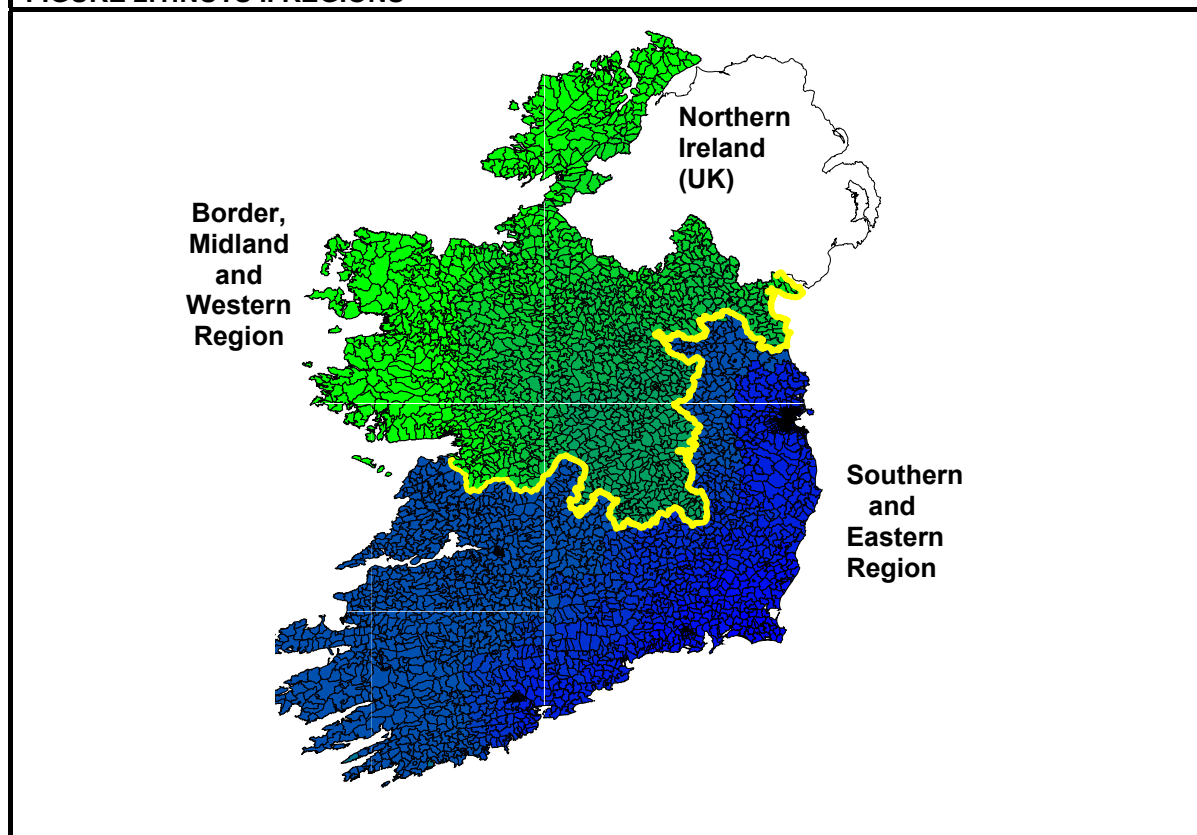
- while elements of Irish RTDI policy go back over many decades, as a whole, the system is a relatively new one. This is especially so in institutional terms. A “young” NIS has both advantages and disadvantages. It means that Ireland lacks many of the kinds of RTDI institutions that are prevalent and well established in new Member States such as national academies of sciences;
- the regional dimension of RTDI policy within Ireland has not traditionally been particularly clear or well articulated. This in part reflects a relatively centralised government system already referred to. Whether there should be a clearer regional dimension is an issue on which views in Ireland still vary, with lobbies both for and against;
- Ireland has a lack of major public RTDI infrastructure outside the third-level education system. With a few exceptions, notably in the case of agriculture, microelectronics and the marine, Ireland therefore by and large does not have national publicly-funded R&D establishments. This means that in practice a heavy emphasis is therefore placed by RTDI policy on the third-level education system and the links between it and enterprise;
- particularly in recent decades, Irish RTDI and enterprise policy have been very closely intertwined. Again, this has advantages and disadvantages. On the one hand it helps to improve linkages between policy systems which might otherwise be more separate from each other; on the other hand it means that the benefits of RTDI investment outside the enterprise arena generally, and export-oriented enterprise in particular, may not always be fully appreciated.

2.1.3 EU Cohesion Policy in Ireland

Ireland has had a quite distinct relationship with EU Cohesion Policy. While many new Member States look to Ireland as a model of what it is possible to achieve using Structural Funds, it is also important to be cautious and keep in mind the distinct features of the Irish experience. These include:

⁴ European Commission, Cohesion Policy in Support of Growth and Jobs: Community Strategic Guidelines, 2007-2013, 2005

- relative to its size and population, especially in the 1994-99 period, Ireland had access to levels of Structural Funding which are unlikely ever to be repeated. This is in part because, as a relatively “old” Member State, Ireland was a beneficiary of Structural Funds at a time when there was only a small number of other Objective 1 countries, namely Spain, Greece and Portugal;
- during the first and second rounds of EU Structural Funding (1989-93 and 1994-99) Ireland had quite a unique position in that the entire Republic of Ireland was a single Objective 1 region. Other Objective 1 countries were either not fully covered or involved a number of Objective 1 regions. It is only during the current 2000-06 period that Ireland has been divided into two NUTS II regions – Border Midland and West, and Southern and Eastern (Figure 2). This has thus occurred only after the high point of Structural Funding receipts in the 1994-99 period;
- facilitated by country-wide Objective 1 status, Ireland’s Structural Fund programming relied very heavily on pre-existing national departments (Ministries) and state agencies. Departments acted as Managing Authorities for Operational Programmes and state agencies acted as implementing bodies. In contrast to many other Member States, both old and new, Ireland generally avoided creation of new structures for Structural Fund programming⁵.

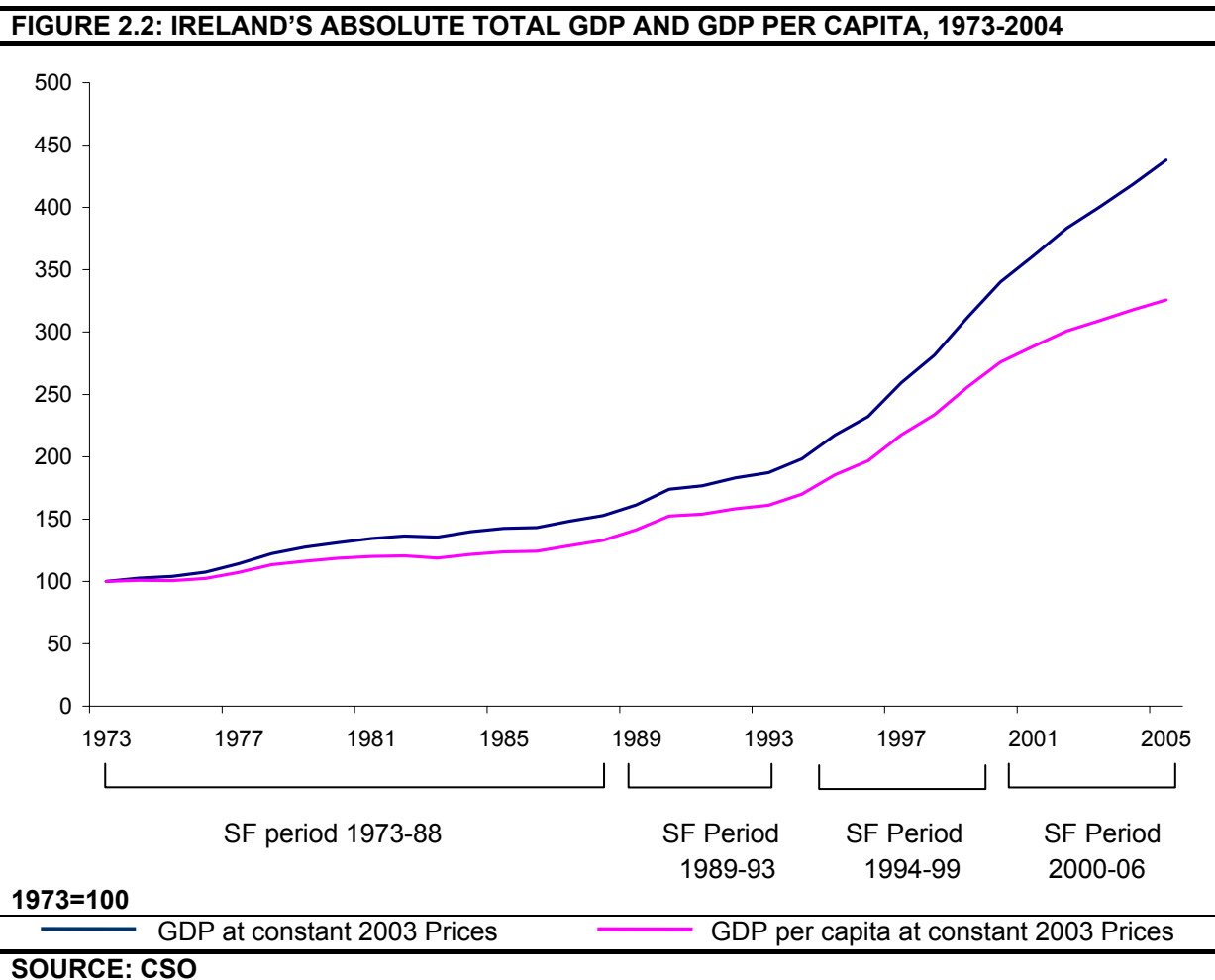
FIGURE 2.1:NUTS II REGIONS

⁵ An exception to this was in the area of local development.

2.2 Ireland’s Economic Transformation

Ireland’s rapid economic growth has been attributed to a number of factors. The OECD in their 1999 Economic Survey of Ireland found that investment in education and increased labour input has been a key component. The report also found that EU membership with associated Structural Funds and domestic policies have also been important factors. But the most important influence “has come from the success of the strategy of attracting inflows of foreign direct investment, especially from the United States.”⁶

Figure 2.2 shows the growth in Ireland’s total GDP and GDP per capita since it joined the then EEC in 1973. As shown, the most rapid growth in GDP (total and per capita) was concentrated in the late 1990s, that is in the second half of the second (1994-99) National Development Plan and Structural Fund period. This was the period of Ireland’s rapid “Celtic Tiger” growth. Previous growth had been, at best, slow and steady.



⁶ OECD, Economic Surveys Ireland, 1999

Figure 2.3 shows Ireland’s GDP per capita as a percentage of the EU average, again from 1973 to the present. For the first two decades after EU entry, Ireland’s GDP per capita did not converge on the EU average but stayed fairly steady at 60-70% of it. Between 1979 and 1989, Ireland’s GDP per capita rose from 67% to 72% of the EU average.

However, in the decade between 1989 and 1999, Ireland’s GDP as % of the EU average shot ahead, growing from 72% to 111%.

Ireland’s growth and convergence therefore coincide heavily with the periods of the three main rounds of EU funding – 1989-93, 1994-99 and 2000-06. Furthermore, the strongest growth rates, between 1994 and 1999, correspond with the largest Structural Fund receipts. Obviously, no simple relationship can be assumed here, but the coincidence is striking.

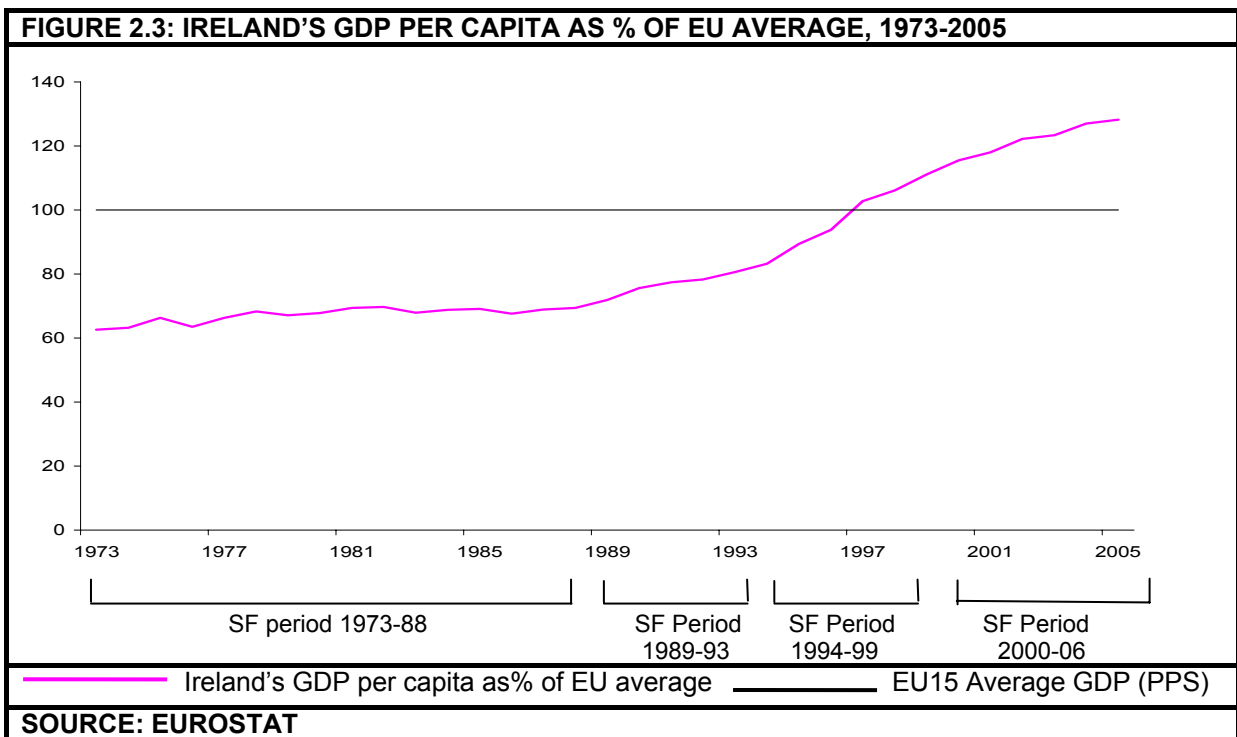
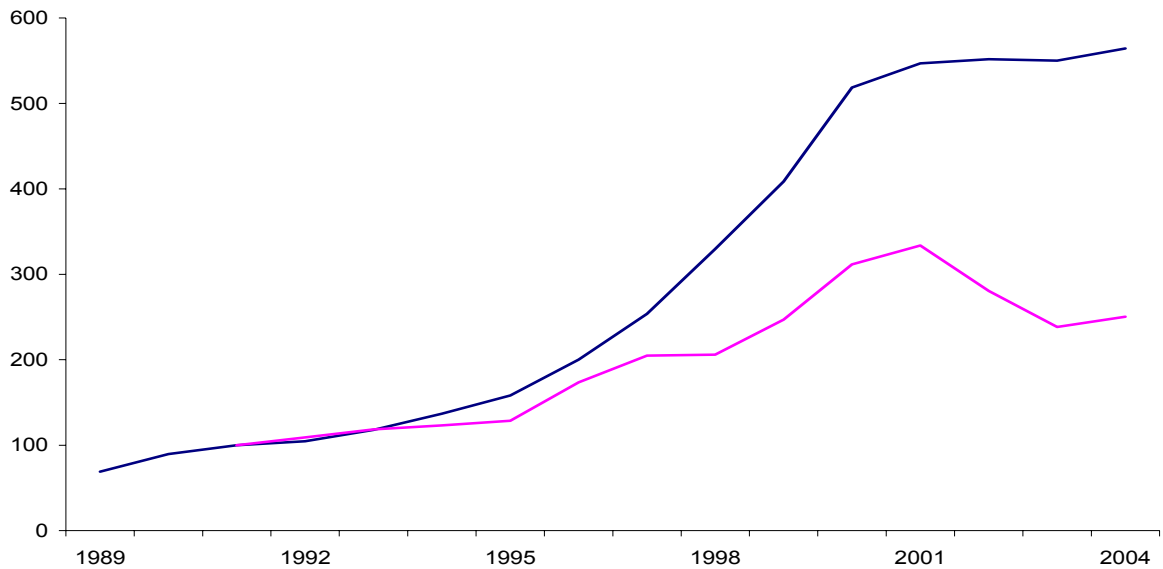


Figure 2.4 shows some underlying features of Ireland’s transformation. During the rapid growth period between 1995 and 2002 employment in the “internationally traded services” sector – i.e. new export-oriented services in areas such as finance, IT and software – grew from 20,000 to nearly 70,000, while employment in Irish-owned software firms grew by 6,827 over this period. This demonstrates the shift to relatively high technology jobs occurring during the rapid growth period.

FIGURE 2.4: FULL-TIME EMPLOYMENT IN FINANCIAL AND OTHER INTERNATIONAL SERVICES IN AGENCY ASSISTED FIRMS AND IN INDIGENOUS SOFTWARE COMPANIES, 1989-2004



Base Year: 1991=100

— FTE in financial and other financial services — Indigenous software jobs

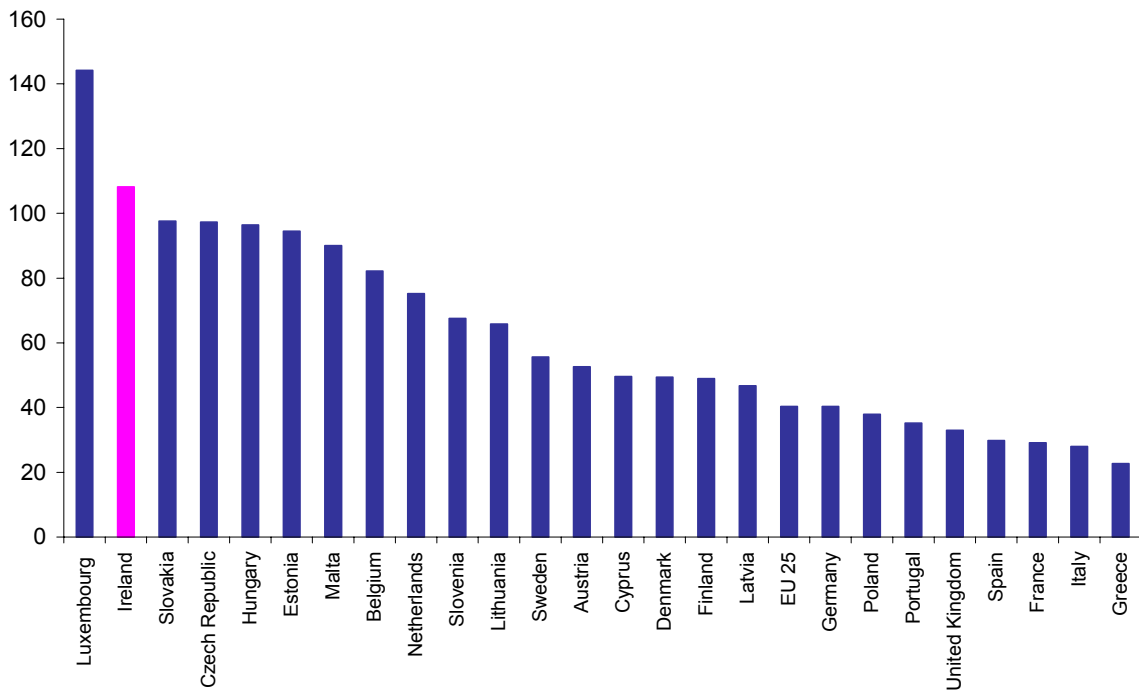
SOURCE: FORFAS ANNUAL EMPLOYMENT SURVEY 2005, CSO

Exports as a % of GDP have grown from 53% in 1990 to 105% of GDP in 2005. Ireland is now one of the most open economies in the European Union in terms of foreign trade.

Figure 2.5 shows that in 2004, the country had the second-highest export/GDP ratio among the 25 Member States. Ireland's portion of high-technology exports is also high. According to Eurostat, 29% of Ireland's exports are classified as "high-technology exports" compared to an EU15 average of 18% in 2004.⁷

⁷ EUROSTAT database

FIGURE 2.5: EXPORTS AS A % OF GDP – EU25 COUNTRIES, 2004



SOURCE: EUROSTAT

Table 2.1 summarises the economic transformation that has occurred, comparing the present with the start of the Structural Funds in the late 1980s.

TABLE 2.1: IRELAND “THEN AND NOW”

	1989	2005
Demography/Labour Market		
Population	3,509,500	4,130,700
% of immigrants in Irish Population	0.8%	1.69%
Unemployment %	15.0%	4.4%
Female labour force participation rates %	34.4%	51.4%
Economy		
GDP €mn	56,060	152,091
GDP per capita €	15,973.8	36,819.7
GDP growth previous 3 years average	4.3%	5.3%
Annual inflation %	4.1%	2.5%
Interest rates %	10.3% ¹	4.1% ²
Exports as a % of GDP	52.7% ¹	105.3% ²
Agriculture as % of GDP	10.1%	2.8% ²
RTDI		
R&D as % of GDP	0.8% ¹	1.2% ²
No of researchers per thousand employed, full time equivalent	3.7	5.8 ²
Other		
Passenger Cars per 1000 Inhabitants	237 ³	371 ⁴

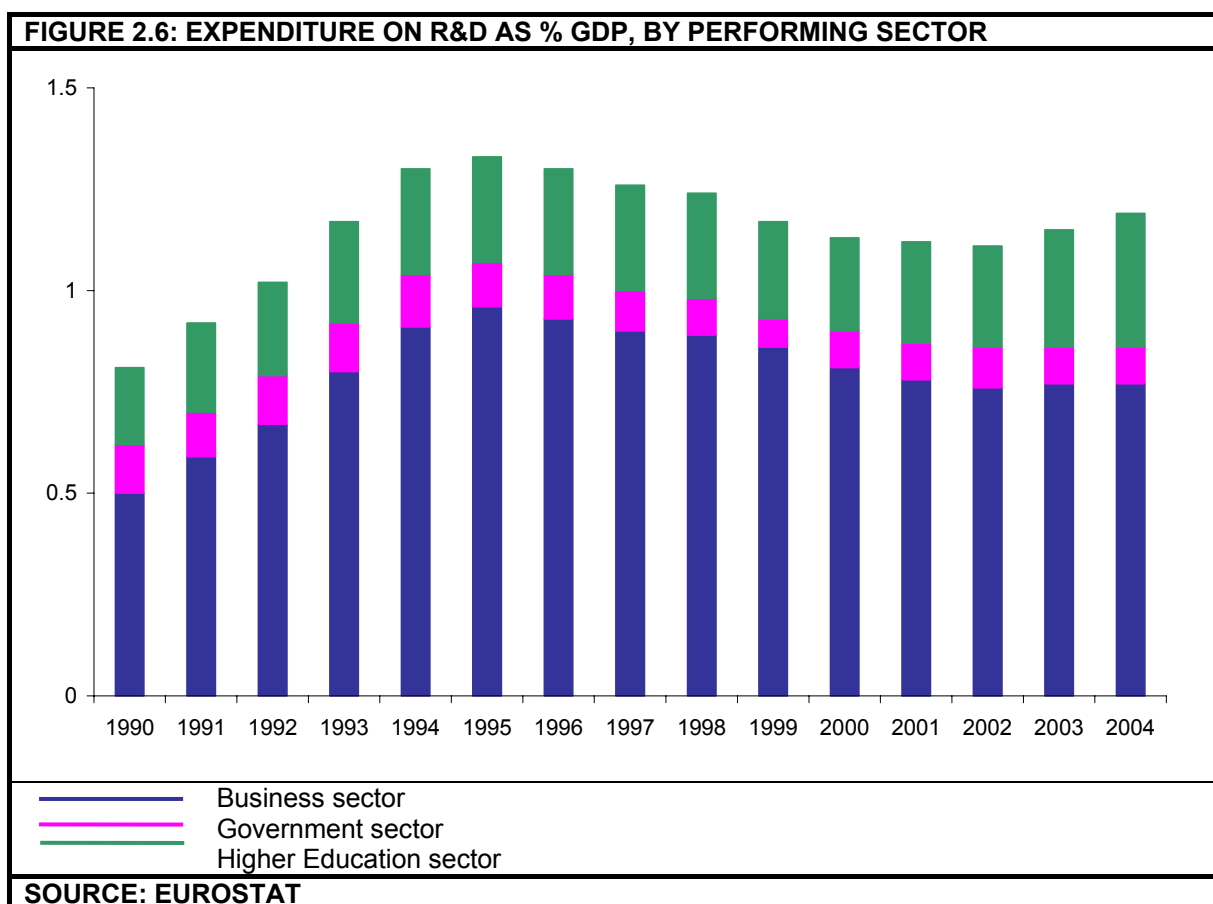
¹ 1990; ² 2004 ³ 1991; ⁴ 2002

SOURCE: CSO, EUROSTAT, OECD

2.3 Ireland's RTDI Transformation

Most Irish commentators would regard the causes of Ireland's recent rapid growth as a combination of inter-related factors, internal and external.⁸ The key role of Foreign Direct Investment (FDI), including low corporation tax, in Ireland's economic transformation has already been emphasised. Other key drivers that most commentators would cite include completion of the Single European Market, a benign global environment and better domestic economic policies. Mainstream economic commentary would cite RTDI less instinctively, and this is probably valid.

Figure 2.6 shows Ireland's expenditure on R&D as a percent of GDP between 1990 (just after the start of Structural Funds) and 2004. Total expenditure on R&D in 1990 was 0.8% of GDP. This increased to a peak of 1.35% of GDP in 1995. From 1996 to 2002, the expenditure on R&D as a % of GDP actually declined year on year to 1.1% in 2002. There has been a small increase in the last two years, 1.16% in 2003 and 1.2% in 2004.



⁸ See Enterprise Strategy Group, *Ahead of the Curve: Ireland's Place in the Global Economy*, 2003 and also ESRI, *Medium-Term Review 2005-2012*, 2005 for reasons for Ireland's economic success.

The sluggish performance of R&D as a percentage of GDP since the mid-1990s must, of course, be viewed against a backdrop of rapid economic growth, i.e. the denominator of the percentage calculation was growing rapidly. Consequently the R&D/GDP percentage calculation in Ireland's case masks the rapid absolute rise in R&D expenditure since the mid 1990s (see Fig. 5.1 later).

The business sector's expenditure on R&D has experienced the greatest fluctuations and has had the greatest impact on the total expenditure figure. In 1990, Business Expenditure on R&D was 0.5% of GDP. Expenditure peaked in 1995 (the same year as total expenditure) at 0.96% of GDP. The rate of expenditure slowed between 1995 and 2002 (0.76% of GDP), and in the last two years it has regained an upward trend – 0.77% of GDP in 2003 and 2004.

Comparing Ireland's R&D investment performance with the EU average, expenditure on R&D has been considerably lower in Ireland. The gap has closed from a 1 percentage point difference in 1991 to a 0.75 percentage point difference in 2004. However in 1995, when Irish expenditure on R&D as a % of GDP was at its highest, the gap with the EU average dropped as low as 0.5 percentage points. This gap increased again until 2002, and has only been reduced in the last two years.

Ireland's recent economic transformation cannot therefore be credited in any simplistic way to an RTDI transformation. If anything, the chain of causation has probably been at least as much in the other direction with economic growth facilitating expanded investment in RTDI.

This dovetails with our major conclusion later that probably the Structural Fund's greatest impact on RTDI was to release resources in the pre-Celtic Tiger years to "kick-start" new investment in RTDI prior to this being realistic from national resources.

3. Evolution of Irish RTDI Policy

3.1 Introduction

This section summarises the history of Irish RTDI policy over recent decades. This summary is designed to set the context for the more specific issue of the relationship between the evolution of this policy and availability of EU Structural Funds. The section broadly aims to summarise the experience of RTDI policy, as well as related enterprise development and human resources policies.

A variety of approaches could be taken when summarising RTDI policy evolution in Ireland. One could look primarily in terms of institutional developments over the period. In a previous summary we took this approach and divided the periods into an “R&D Institutional Phase” (up to the late 1970s), a “State Advisory Agency Phase” (the 1980s), and a more centralised “Central Government Phase” subsequent to that.⁹

More recently, focusing on international patterns, Helena Acheson¹⁰ cites a four-Phase approach as typical. The first was “a Policy for Science” Phase during which the main issue was the public and private contribution of scientific enterprise, i.e. how to find ways of distributing funds rationally to science in order to promote curiosity-driven research. The second Phase shifts from policy for science to “Science for Policy” in which science was seen to support the objectives of other policies. The emphasis, from the late 60s onwards, was on S&T to achieve the diverse objectives of modern welfare states. The third Phase, “Policy for Technological Innovation”, has seen a re-focus towards policy for technological innovation. The economic crisis of the late 1970s and early 1980s and increasing worldwide competition brought about a critical reappraisal of S&T and its contribution to economic performance. This led internationally to a fourth Phase, “Policy for Global Scale Issues”, where many of the world’s advanced economies have focused on issues of economic, social and environmental relevance at global level.

The approach taken here is a chronological one, cognisant of the EU funding focus. We summarise the evolution of policy in the following periods:

- the period up to accession of Ireland to the EU in the early 1970s;
- the 1970s and 1980s, when Ireland was already a member of the EU but before Structural Funding;

⁹ Fitzpatrick Associates (with Brendan Wafer and Associates), *Review of the EC R&D Framework Programme in Ireland 1994-98*, main report, a report prepared by the EC Commission, DGXII, May 1990.

¹⁰ Helena Acheson, M.Sc. in Policy Studies Thesis, September 2001, *The National System for Innovation – helped or hindered by the National Development Plan*.

- the 1990s which corresponds to the two main periods of Structural Funds (1989-93, 1994-99);
- the current decade to date, i.e. Structural Fund period 2000-06;
- the next Structural Fund period 2007-13.

These are dealt with in sequence in the sections 3.2-3.6 respectively.

3.2 Ireland's RTDI Policy Pre-EU Accession

Prior to its independence in 1921, Ireland was part of the UK government and policy system generally, and thus also from the perspective of science and technology policy. In the specifically Irish context, many date the formal historical commencement of a conscious RTDI policy to the establishment of the Royal Dublin Society in 1720. It has subsequently continuously promoted the advancement of science for economic and social development. However, it has not at any point achieved the kind of intellectual leadership status of Academies of Sciences in many central European countries. In 1901, a Department (Ministry) of Agriculture and Technical Instruction was established signifying the policy and sectoral priorities of the day.

Modern Irish S&T policy can be dated from the post-war period. From the 1940s onward a series of independent agencies were established with a more or less specific RTDI focus. These included the Institute for Industrial Research and Standards (IIRS) (1946), the Agricultural Institute (1958) and The Physical Planning Institute (1964). These bodies were all classic independent state agencies. While they reported to the relevant Government Department and Minister, these had limited influence on day-to-day activities. Organisations had their own boards and the use of annual budgetary allocations was heavily at their discretion. S&T policies and programmes were in practice largely determined by the scientists themselves, based on their perceptions of Irish needs, on their own interests and capabilities and, during the latter part of the pre-accession period, the need to generate additional funds.

In the enterprise policy field, the state agency model was also followed with establishment of the Export Board and of the Industrial Development Authority (IDA).

In terms of enterprise policy, the late 1950s was a major historical watershed with the ending of traditional protectionism focused on national self-sufficiency, and an opening up of policy towards attracting inward investment to Ireland as a location for manufacturing and service activity for the export market. This policy has continued broadly intact right up through EU accession to the present day.

In terms of education and training policy the 1960s was also a period of major change. It involved the introduction in particular of “free” second-level education for all citizens – cited by many as a major antecedent of the Celtic Tiger – as well as the establishment of third-level Institutes of Technology.

The 1960s also saw the awakening of interest in national RTDI policy (then generally referred to as “science policy”)¹¹. The OECD which, alongside the EU, has been the major external institutional influence in Ireland in this regard published a major report on science and Irish economic development in 1966. This contributed inter alia to the establishment of the aforementioned Institutes of Technology and also of an advisory National Science Council (NSC) in 1967.

3.3 Irish RTDI Policy in the 1970s and 1980s

For the first two decades after EU entry in the early 1970s, the EU Structural Funds did not operate in their present programmatic form, and did not have any explicit focus on RTDI. EU funding for R&D was of course available through the EU R&D Framework Programme. Initially, however, these programmes were largely in areas of little immediate relevance to Ireland (fusion, fission, and the environment). An exception was agriculture, where the Framework Programmes’ focus was similar to the then Irish R&D effort.

Otherwise during these two decades the drivers of RTDI policies were largely domestic. A major milestone was the establishment of the National Board for Science and Technology (NBST) in 1978 as a new dedicated agency for promoting and funding R&D and innovation. The NBST had relatively little non-pay funding for supporting research. However, many RTDI schemes operating since have their origins in the NBST’s policy development role at that time.

The agency also experienced institutional resistance from both the mainstream enterprise development policy community and the established RTDI structures, and was subsequently merged with the IIRS into EOLAS, itself subsequently re-merged in the 1990s with parts of the enterprise agency system to become Enterprise Ireland.

In practical terms an important enterprise policy initiative during this period was introduction of Product and Process Grants available from the then IDA for individual enterprises. As the title implied, the emphasis was not on primary R&D but on introduction and application of product and process technologies in firms.

¹¹ This summary relies on the Science Policy Research Centre, *Suggestions on Policies for Science to the National Board for Science and Technology*, June 1978.

In the 1970s and 1980s there were also a number of major developments in relation to enterprise policy. Among the most significant was publication in 1980 of the “Telesis” report¹² which suggested increased promotion of indigenous Irish-owned enterprise, particularly larger indigenous enterprise, alongside FDI. While Telesis made some references to the need for R&D and innovation in this context, the emphasis was quite limited.

Looking back, an important feature of the 1970s and 1980s was that Irish enterprise policy and RTDI policy tended to co-exist but to operate on separate tracks, reflected in the coexistence of the NBST and IIRS and the Industrial Development Authority in the 1980s. Policy integration was not helped by the fact that the RTDI policy community tended to be a major source of critique of the policy reliance on inward investment, while proponents of the latter were arguably oversensitive to any apparent questioning of this emphasis. An early report for the National Science Council (NBST’s predecessor) published in 1973 set the tone, containing fairly strong criticism of the then approach and the reliance on inward investment.¹³

Whatever the merits or otherwise of what this report was saying, it almost inevitably led to quite negative and lasting reaction from the enterprise policy authorities, and probably set back rather than progressed efforts to achieve greater coherence between the two.

In the Irish economy of the 1970s and 80s, with high unemployment and emigration, it was inevitable that agencies able to offer immediate “jobs on the ground” would win any political arguments with agencies offering a possibly more sophisticated, but also more speculative, analysis of Ireland’s needs. And, looking back, inward investment has proved successful to a level that even its most ardent supporters would hardly have predicted.

The experience of the 1970s and 1980s in Ireland is a case study in the need for application of strategic policy analysis and policy intelligence tools to be undertaken co-operatively among stakeholders, and of the importance of a shared analysis among key stakeholders in the NIS in any county or region.

¹² Telesis Consultancy Group, *A Review of Industrial Policy*, National Economic and Social Council, Report No. 65, February 1982.

¹³ Charles Cooper and Noel Whelan, *Science, Technology and Industry in Ireland*, Report to the National Science Council, January 1973.

3.4 Irish RTDI Policy in the 1990s

The 1990s were the height of Structural Funds receipts by Ireland, covering the two programming periods of 1989-93 and 1994-99.

The decade was also one of major RTDI policy development, with a “chain reaction” of successive milestones leading one to another. A key initial such milestone was the work and subsequent (1995) report of the Science, Technology and Innovation Advisory Committee (STIAC)¹⁴, and a subsequent White Paper¹⁵ on science and technology published in 1996. These two documents mark a key point in the gradual mainstreaming of RTDI into wider economic and enterprise policy. They also led to subsequent further key developments including Ireland’s Foresight exercise, which in turn led to establishment of Science Foundation Ireland as the major funder of strategic R&D.

The 1990s was also a period of major institutional change, with much, arguably too much, re-configuration of both enterprise development and RTDI agencies. A number of the old independent R&D structures were wound down, leading to a situation in which Ireland now has relatively little public R&D infrastructure outside the third-level sector. The level of preoccupation with institutional change possibly also delayed implementation of the RTDI policy developments that were taking place.

The details of institutional changes over the period need not be described in detail here. “Fast forwarding” to the present, the institutional outcome is that the main state bodies now involved are essentially either funding channels or advisory rather than operational RTDI institutions. They are:

- IDA Ireland as the inward investment promotion agency;
- Enterprise Ireland as the agency for promotion of development of indigenous enterprises including RTDI in them;
- HEA as the channel for state funding, including funding of academic R&D in universities and Institutes of Technology;¹⁶
- Science Foundation Ireland as the agency funding strategic research;
- Forfás as the enterprise and RTDI advisory body.

Another major development during the period was a reassertion of policy control back to the lead departments, principally the Department of Enterprise, Trade and Employment and the Department of

¹⁴ Science Technology and Innovation Advisory Council, *A Strategic View of Science Technology and Innovation in Ireland*, Main Report, 1995.

¹⁵ Department of Enterprise, Trade and Employment, White Paper on Science, Technology and Innovation, 1996

¹⁶ The HEA is about to formally take over funding of the Institutes of Technology.

Education and Science. This reassertion reflected a view that independent agencies were in danger of becoming too powerful, and were failing to recognise the policy primacy of the Departmental (Ministry) level. A challenge that remains, however, is whether in Ireland's public service structures – where civil servants are typically generalist managers and administrators, while the specialists are in the executive agencies – the policy development balance is now both correct and realistic.

3.5 Irish RTDI Policy in the Present Decade

At a policy level, the major feature of the present decade is the extent to which RTDI policy is now finally an accepted aspect of wider enterprise and national policy. The recent report of the Enterprise Strategy Group¹⁷, for example, deals extensively with RTDI policy. This contrasts with similar reports prepared 10 or 15 years earlier which often contained little or nothing on RTDI. The Government's recent launch of the new Strategy for Science, Technology and Innovation is a further milestone and consolidation in this regard.

Similarly, at the wider national cross-sectoral level, the recent report of the National Economic and Social Council¹⁸ deals more extensively with RTDI and innovation. This report is the latest in the series of reports that form the basis of multi-annual national partnership agreements which cover a wide range of pay and other aspects of the national socio-economic policy in Ireland. For example the counterpart NESCC report published 20 years earlier in 1986 has a mainly more macroeconomic focus, containing only a small number of pages on industrial policy and with no reference to RTDI.¹⁹

A factor in this policy shift towards RTDI is not just increased policy conviction about the importance of RTDI itself, but also wider contextual changes. This includes the ceding to EU level of powers traditionally held nationally, particularly in relation to monetary policy, and the role of EU competition rules in reducing the scope for government tax and financial incentives. RTDI (and training) remain as the key tools still at the discretion of national authorities as developmental instruments, and as such are especially significant for Ireland as a country with a traditionally interventionist enterprise policy approach.

The 2000-06 period still, however, sees a lack of coherence at operational level. This has been commented upon by many including the Enterprise Strategy Group, the OECD, and the Inter-

¹⁷ Enterprise Strategy Group, *Ahead of the Curve: Ireland's Place in the Global Economy*, Forfás, July 2004.

¹⁸ National Economic and Social Council, *NESCC Strategy 2006: People, Productivity and Purpose*, Report No. 114, December 2005.

¹⁹ National Economic and Social Council, *A Strategy for Development 1986-1990*, NESCC Report No. 83, Nov 1986.

Departmental Group on Science, Technology and Innovation²⁰. The new Strategy for Science Technology and Innovation makes specific proposals in this regard.

3.6 Irish RTDI Policy 2007-13

In the new round of Structural Funds, Ireland's place will of course be very different from previously. There will be some Structural Funding available, but at a much reduced level. ERDF monies will be utilised through two Regional Operational Programmes, which are likely to retain a focus on RTDI. However, the role of the Structural Funds will become very small relative to investment under the new Exchequer-funded National Development Plan 2007-13.

Ireland is already committed to achieving the EU Lisbon Objective targets by 2013, so a strong policy influence on RTDI from the EU is still evident. At national level, the challenge of converting the Irish NIS from a second to a third generation system will continue²¹.

3.7 Role of SPI Tools in RTDI Policy Development

Section 4 will deal with the specific role of EU-inspired evaluation in Irish RTDI policy development. Here we comment on the use of wider SPI tools in the evolution of Irish RTDI policy and practice. Observations in this regard are:

- the most long-standing type of SPI tool used in Ireland has been the establishment of formal committees and working groups of a representative, expert or mixed, nature. This tradition dates back over decades, and many key developments in RTDI, enterprise and HRD policy can be associated with such structures. Key examples include the sectoral reports prepared as part of preparation for EU accession (the Committee on Industrial Progress)²², the Culliton Report on Enterprise Policy in 1992²³ and the follow-up Moriarty report²⁴ on its implementation, and more recently the report of the Enterprise Strategy Group as well as STIAC already referred to;
- there is also a tradition of commissioning major external "expert" reviews of policy. As cited earlier, the OECD has played a significant role in this regard going back to the mid-1960s from an RTDI and education perspective. Other examples include the previously mentioned Tesis report published in 1980;

²⁰ Inter-Departmental Group, *Building Ireland's Knowledge Economy*, 2005.

²¹ OECD, *Governance of Innovation Systems, Volume 2: Case Studies in Innovation Policy*, 2005

²² Committee on Industrial Progress, *General Report*, Dublin, the Stationery Office, Dublin 1973.

²³ Culliton Report, *A Time for Change: Industrial Policy for the 1990s*, Report of the Industrial Policy Review Group, Government Publications, Dublin, 1992.

²⁴ Moriarty Task Force on Implementation of the Culliton Report, *Employment Through Enterprise*, The Stationery Office, May 1993.

- there has also been a number of programme-level reviews or evaluations commissioned outside of EU funding requirements. In the RTDI field these were commissioned by the implementing agencies or by Forfás and its predecessors, which contained a specific dedicated RTDI policy evaluation function. In terms of policy impact, these rather than EU-related evaluations probably had the main impact. However, they tended to contribute not so much to strategic policy decision-making, but far more to practical refinement or adjustment of programmes;
- the main instance of usage of a formal STI tool in Ireland to date has been the Technology Foresight process and report published in 1999²⁵. This identified two main foci for the national RTDI effort and led to establishment of Science Foundation Ireland.

²⁵ The Irish Council for Science, Technology and Innovation (ICSTI), *Technology Foresight Ireland*, April 1999.

4. Role of EU Funding in Irish RTDI

4.1 Overview of Structural Funds

4.1.1 Background

As described earlier, there have been three rounds of EU Structural Funds to date and Ireland has benefited from all three. The first round covered the five-year period 1989-93, while the two subsequent rounds (1994-99 and 2000-06) each ran for seven years.

At EU level, four separate funds were used to support the objectives of cohesion, each promoting different areas of development:

- the European Regional Development Fund (ERDF);
- the European Social Fund (ESF);
- the European Agricultural Guidance and Guarantee Fund (EAGGF); and
- the Financial Instrument for Fisheries Guidance (FIFG).

In addition the Cohesion Fund co-financed transport and environmental projects.

The structure for channelling EU funds has evolved over time. The first major step in the introduction of the Structural Funds was the articulation of Europe's cohesion policy in the Single European Act (1986). Cohesion policy was originally designed to offset the burden of the single market for less-favoured regions. A significant part of that policy involved a complete overhaul of the operation of solidarity funds (subsequently referred to as Structural Funds) in February 1988. The significant increase in EU Structural Funds and the priority to be given to less-developed regions, such as Ireland, was recognition by the Commission of the threat that the Single European Market could pose for many economic activities in those regions.

In the Treaty of the European Union (1992), cohesion was once again designated as one of the main objectives of the Union, alongside economic and monetary Union and the single market. The Treaty also established the Cohesion Fund for transport and environmental projects in the least favoured regions. In December 1993, the European Council allocated one-third of the Community budget (€200bn) to cohesion for the 1994-99 round.

For the 2000-06 period, a major focus has been preparing the Union for enlargement. This enlargement meant extending Structural Funds to 10 new Member States with per capita incomes that were less than one-third of the Community average. It was decided that Structural Funds should be concentrated on those areas and regions. As Ireland's status had changed from being one of the poorest countries of the original 15 members in 1994 (one of the four cohesion countries) to being

one of the wealthier Member States in 2000, Structural Funds were reduced significantly for this programming period.

The other major EU policy reform at that time was the adoption of the Lisbon Strategy in March 2000. This was designed “to make the Union the most competitive and dynamic knowledge-based economy in the world by 2010.” This strategy was relaunched following its Mid-Term Review in March 2005. The new more focused strategy, “Strategy for Growth and Jobs”, emphasises the importance of investment in RTDI, employment and job creation.

4.1.2 Role of European Commission

An important evolution on the side of the Commission in regard to Structural Funds is the change towards a more strategic role. This is in marked contrast to the position taken on RTDI and other aspects of Structural Fund support to Ireland during the 1989-93 and the 1994-99 periods, a time when Ireland already had a relatively sophisticated implementing agency system. This earlier more hands-on role was more akin to the experience of the new Member States on Phare than on Structural Funds, i.e. it involved a high level of day-to-day interaction and also substantive policy guidance. This had formal manifestation in active Commission involvement in Monitoring Committees at both Community Support Framework (now NSRF) and Operational Programme level.

While this very proactive Commission role was not always welcome in Ireland at the time, it had positive features. It introduced a level of acceptance of more open dialogue about programming, of questioning of implementing Departments and agencies about their priorities and their progress, of performance indicators to monitor progress and the systematic monitoring of this progress. Much of this practice has since been absorbed into mainstream national investment activity in Ireland. While far from perfect, the validity of this kind of more systematic activity is now largely unquestioned.

There is now at least a question mark as to whether the Commission’s increasingly “strategic” role in Structural Funds, accompanied by much greater reliance on auditing, accounting and administrative requirements only, is desirable for the new Member States and Accession Countries. There is a case for a more intense role for the Commission there than in the more experienced Member States. Otherwise, new Member States and Accession Countries may find themselves experiencing all the “downsides” of Structural Funds administration in terms of heavy bureaucratic requirements, while not experiencing the upsides of positive Commission involvement and interest in the underlying substance of investment programmes and associated developmental issues.

4.1.3 Ireland's Operational Programmes 1989-2006

Structural Fund	1989-93	%	1994-99	%	2000-06	%
ERDF	1,995	43.5%	2,552.0	36.9%	1,863	49.8%
ESF	1,731	37.7%	1,953.0	28.2%	1,057	28.3%
EAGGF	863	18.8%	1,070.0	15.5%	182	4.9%
FIFG	0	0	45.0	0.7%	71	1.9%
Cohesion Fund	0	0	1,301.0	18.8%	567	15.2%
Total	4,589	100%	6,921	100%	3,740	100%
% of Total NDP	38.4%		39.6%		7.2%	

The 2000-06 figures are at current market prices.

SOURCES: IRISH CSF, 1989-93, 1994-99 AND 2000-06

Table 4.1 shows the budgeted Structural Fund amounts for Ireland for the three Structural Fund periods (in constant 1994 prices). Under the 1989-93 round, Ireland received a total of €4.5bn. This increased to almost €7bn in the 1994-99 round, including the Community Initiatives and the Cohesion Fund. In the current period, Ireland is scheduled to receive less than €4bn. The 1994-99 period was thus very much the “high-point” of Ireland’s receipt of Structural Funds.

In terms of funding sources, the ERDF accounted for 40-50% of Structural Funds in the 1989-93 and 2000-06 periods. It was lower in the main 1994-99 period, reflecting a relatively large role also for ESF and the Cohesion Fund. In all periods the ESF share was relatively high by EU standards, especially in 1989-93. This reflected a relatively “human capital” orientation in Irish priorities, as opposed to physical infrastructure.

This pattern can also be seen in Table 4.2, which shows the share of different OPs in total NDP investment (i.e. Structural Funds plus national co-financing) by period. While differing configurations of OPs between the periods hamper comparisons somewhat, it can be seen that in the 1989-93 period industry (inc. RTDI) received about 30% of funds, human resources 33% and agriculture 16%, leaving about 30% for the infrastructural Programmes. In 1994-99 the split was industry (inc. RTDI) 24%, human resources 18%, agriculture and rural development 17%, leaving about 40% for infrastructure. In the current NDP the split is industry inc. RTDI (productive sector inc. agriculture) 12%, human resources 27%, regional development 14%, and infrastructure 48%.

This approach was probably a good choice at the time, but probably continued too long, leaving Ireland with major infrastructural deficits still to be addressed post Structural Funds.

TABLE 4.2: EXPENDITURE BY OP AS PERCENTAGE OF TOTAL NDP, 1989-93, 1994-99 AND 2000-06					
2000-06	%	1994-99	%	1989-93	%*
Productive Sector	12.1	Industrial Development	21.5	Industry	30.1
		Tourism	3.4	Tourism	3.3
		Fisheries	0.9	Fisheries	0.2
		Agriculture, Rural Development and Forestry	8.5	Agriculture and Rural Development (including forestry)	15.6
<i>Sub-total</i>	<i>12.1</i>		<i>34.3</i>		<i>49.3</i>
Economic and Social Infrastructure	47.4	Economic Infrastructure	18.6	Energy	5.3
		Transport	15.2	Transport	15.7
		Environmental Services	3.8	Sanitary and other local services	3.5
<i>Sub-total</i>	<i>47.4</i>		<i>37.6</i>		<i>24.5</i>
Employment and Human Resources Development	26.6	Human Resource Development	18.2	Human Resources	22.1
<i>Sub-total</i>	<i>26.6</i>		<i>18.2</i>		<i>22.1</i>
Regional and Local	13.6	Local, Urban and Rural Development	7.4	Communication	4.3
<i>Sub-total</i>	<i>13.6</i>		<i>7.4</i>		<i>4.3</i>
PEACE II	0.3	PEACE I	2.4		
<i>Sub-total</i>	<i>0.3</i>		<i>2.4</i>		<i>0</i>
Total	100		100		100
Note: * Percentages are calculated on the basis of total NDP expenditure.					
SOURCE: NDP DOCUMENTS, 1989, 1994 AND 2000					

The Operational Programmes for each programming period are listed in Table 4.2. In the first two periods, the Operational Programmes were sectorally-based, broadly covering industry, economic infrastructure, transport, human resources, agriculture and tourism. In the current 2000-06 period, the OPs have been consolidated into just five programmes – Productive Sector, Economic and Social Infrastructure, Employment and Human Resources, and two Regional OPs.

As noted earlier, during the first two programming periods from 1989 to 1999, the whole of Ireland was a full Objective 1 region. However, the rapid convergence with the EU average GDP in the late 1990s meant that the whole country would have been relegated to “transitional” for the new programming period (2000-06). The Commission agreed to the division of the country into two regions at the NUTS 2 level. The Border, Midland and Western Region maintained full Objective 1 status and the Southern and Eastern Region was designated a “transitional” Objective 1 region.

4.2 RTDI and Structural Funds

4.2.1 Overview

As already stated, both the 1989-93 and the 1994-99 OPs were sector-based. R&D expenditure was dispersed between different measures, priorities and OPs. Under 2000-06 structure, all RTDI initiatives are included in one RTDI Priority in the Productive Sector OP. Annex 2 shows the RTDI measures, priorities and Operational Programmes for each for the programming periods.

The remainder of this section shows what RTDI measures were funded during each of the three programming periods. In accordance with common practice, we are using figures related to research, technological development and innovation. This does not include ESF co-financing of 3rd level education infrastructure in the 2000-06 Employment and Human resource Development OP, which arguably might be defined as RTDI expenditure.

4.2.2 What Was Funded: 1989-93

When the first **Community Support Framework (1989-93)** was introduced, the Irish economy was going through a time of severe economic constraint and very little national funds were available for Science and Technology. The advent of EU Structural Funds enabled the Office of Science and Technology to put in place a 'RTD' Development Plan, which was the Science and Technology Sub-programme (Priority) of the first Operational Programme for Industrial Development.

This Sub-programme had five measures; Programme in Advanced Technology; HE Industry Linkages and Innovation; Technical Services to Industry – Services; Technical Services to Industry – Infrastructure; and Regional Infrastructure Development.

The objective of the Sub-programme was to help Irish industry improve its technological capability in product development, innovation, quality and pricing, to enable it to compete more effectively on both domestic and overseas markets. Specific objectives of the OP included:

- development of new technology for industrial applications;
- identification of emerging technologies that have applications for Irish industry;
- strengthening of applied research and development in third-level education institutions, and transfer of technology to industry;
- increased employment of technological services available to Irish industry from EOLAS;
- strengthening of the technological infrastructure available to Irish industry in third level initiatives and in EOLAS;
- supporting industry lead R&D of strategic importance to participating companies.

The total CSF funding for the Science and technology Development Programme 1989-1993 was €249.5mn (the third largest of the then Sub-programmes). Table 4.3 outlines the expenditure under each of the measures. The largest of the programmes was the Programmes in Advanced Technology (PATs) with €81.8mn (32% of the CSF expenditure under the sub-programme). The second largest was the Regional Infrastructure Development measure with expenditure of €63.7mn (25% expenditure). The contribution of the EU was a very significant part of the overall funding profile for Irish STI activities during the 1989-93 period.

TABLE 4.3: S&T MEASURES EXPENDITURE, 1989-93 CSF

Sub-Programme	Measure	CSF (€mn)	Total SF (€mn)	Govt. (€mn)	Private (€mn)
Industrial Development OP					
Science and Technology for Industrial Development	Programmes in Advanced Technologies (PATs)	81.8	51.7	17.2	12.8
	Higher Education Industry Linkages and Innovation	43.4	19.6	6.5	17.3
	Technology Services to Industry (services)	44.9	18.2	6.1	20.5
	Technology services to industry (infrastructure)	15.8	7.9	7.9	0.0
	Regional Infrastructure	63.7	45.3	15.1	3.2
<i>Sub- total</i>		249.5	142.7	52.8	53.9
Agriculture and Rural Development OP					
<i>Development of Human Resources and Technology Base</i>		6.2	3.7	2.5	0
<i>Sub-Total</i>		6.2	3.7	2.5	0
Total		255.7	146.4	55.3	53.9
Note: The figures shown are the original projections from the Operational Programme documents.					
SOURCE: PROGRAMMES FOR INDUSTRIAL DEVELOPMENT, AND AGRICULTURE AND RURAL DEVELOPMENT, 1989-93, DEPARTMENT OF AGRICULTURE AND FOOD					

In July 1992, an extra measure (Measure 6 for the Industry R&D Initiative) was launched on a pilot basis (partly as a means of absorbing R&D funding that was not spent on other measures). This was intended for R&D projects in industry only. €20mn was allocated for 67 projects. The companies contributed 50% of the cost of each project and the remaining 50% was provided by the EU.

The programme for Agriculture and Rural Development had a programme for the development of human resources and a technology base in order to promote the need to acquire new skills. The

development of human resources and application of modern technology were seen as key to improve existing standards and to increase quality.

A dedicated Community Initiative, STRIDE (Science and Technology for Regional Innovation and Development) was also introduced in 1990 to improve the research, technology and innovation capacities of the regions whose development was lagging behind (Objective 1 regions). This Community Initiative was designed to improve economic and social cohesion in the RTDI area, by supporting research, innovation and technological capacity. The Programme was targeted at four natural resource based areas of Marine, Environment, Forestry and Food.

The key effects of this funding were three-fold:

- firstly, they enabled policy aspirations developed by the NBST and others to be operationalised;
- secondly, they facilitated expenditure on RTDI infrastructure;
- thirdly, they involved expenditure on new areas not previously funded, e.g. key strategic technologies under the PATs.

4.2.3 What Was Funded: 1994-99

Under the **Community Support Framework 1994-99**, R&D expenditure was spread across four Operational Programmes – the Industrial Development OP, the OP for Agriculture, Rural Development and Forestry, the Environmental Services OP, and the Fisheries OP.

The Operational Programme for Industrial Development focused on the development of R&D activities within indigenous companies. The Human Resource measure of the OP was co-financed by the European Regional Development Fund (€256.6mn) and the European Social Fund (€12.1mn).

The Industry Initiative was a continuation of the Industry R&D Initiative that was introduced on a pilot basis, late in the previous programming period. It represented over 43% of the projected budget and was seen as the main policy instrument to stimulate in-company R&D. Targets set included an increase in Business expenditure on R&D as a percent of GDP from 0.65% in 1993 to 0.82 in 1999 and an increase in gross expenditure on R&D as percent of GDP from 1.0% in 1993 to 1.3% in 1999. In 1999 business expenditure on R&D was 0.86% of GDP and therefore exceeded the target set, while gross expenditure on R&D was 1.18% of GDP, therefore it did not meet its target.

Under the OP for Agriculture, Rural Development and Forestry, the Research Measure of the sub-programme for Structural Improvement and Rural Development had two sub-measures. The aim of the first, Research in Sustainable Agriculture and Rural Development, was to develop the technical expertise necessary for the adjustment of the agricultural production systems in response to CAP reform and the GATT Agreement. The second, a Research Stimulus Fund, was designed to bring

about a more systematic and co-ordinated approach to the institutions and bodies responsible for research in the area of agriculture and rural development.

The Environmental Monitoring, Research and Development sub-programme of the Environmental Services OP sought to address the environmental data and knowledge deficits and to provide incentives to the productive sector to adopt a more environmentally friendly approach. There were two measures under the sub-programme, Environmentally Sustainable Resource Management and Cleaner Production.

TABLE 4.4: S&T MEASURES EXPENDITURE, 1994-99 NDP

Sub-Programme	Measure	NDP (€mn)	CSF ¹ (€mn)	Total SF (€mn)	Govt. (€mn)	Private (€mn)
Industrial Development OP						
R&D	Industry R&D initiative	218.2	218.2	109.1		109.1
	Industry/Third Level Co-operation Services	237.0	169.3	127.0	42.3	67.7
	Human Resource Development	19.1	16.1	12.1	7.0	0.0
	Research Support	27.3	27.3	20.5	6.8	0.0
Food Industry	Research and Development	97.4	91.1	58.2	12.7	26.5
<i>Sub-total</i>		<i>599.0</i>	<i>522.0</i>	<i>326.9</i>	<i>68.9</i>	<i>203.3</i>
OP for Agriculture, Rural Development and Forestry OP						
Structural Improvement and Rural Development	Research	47.0	38.9	29.1	9.7	8.1
<i>Sub-total</i>		<i>47.0</i>	<i>38.9</i>	<i>29.1</i>	<i>9.7</i>	<i>8.1</i>
Environmental Services OP						
Environmental Monitoring/R&D	Environmentally Sustainable Resource Management	3.8	1.9	1.9	0	1.9
	Cleaner Production	2.4	1.2	1.2	0	1.2
<i>Sub-total</i>		<i>6.3</i>	<i>3.1</i>	<i>3.1</i>	<i>0</i>	<i>3.1</i>
Fisheries OP						
Research	Marine Research 1	10.3	10.3	7.7	2.6	0
<i>Sub-total</i>		<i>10.3</i>	<i>10.3</i>	<i>7.7</i>	<i>2.6</i>	<i>0</i>
Total		662.6	574.3	366.8	81.5	214.4

Note: The figures shown are the original projections in the Operational Programmes.

¹ This column shows the co-financed part of the total NDP budget for each Measure.

SOURCE: OP FOR INDUSTRIAL DEVELOPMENT, AGRICULTURE, RURAL DEVELOPMENT AND FORESTRY, ENVIRONMENTAL SERVICES AND FISHERIES 1994-99

The overall goal of the Marine Research measure of the Fisheries OP was to enhance the performance of the marine sector in Ireland through research and technology transfer activities and to improve Ireland's RTD capacity in order to maximise the potential benefits of its natural marine resources.

The main impact of Structural Funds in this period were:

- their role in supporting in-company R&D, and at a scale unlikely to have occurred otherwise;
- supporting R&D in natural resources other than agriculture, i.e. especially the marine.

4.2.4 What Was Funded 2000-06

For the current **Community Support Framework 2000-06**, most is provided under the RTDI Priority of the Productive Sector OP. There is also a Regional Innovation Strategies measure under the Regional OPs, which funds incubation centres for applied research that has commercial application. The centres are established in third-level institutes.

TABLE 4.5: S&T MEASURES EXPENDITURE, 2000-06 NDP

Sub-Programme	Measure	NDP (€mn)	CSF (€mn)	Total SF (€mn)	Govt. (€mn)	Private (€mn)
Productive Sector OP						
RTDI	Education RTDI	810.4	104.3	60.6	749.8	0.0
	Industry	2,431.3	763.8	230.1	1330.0	871.3
	Agriculture	61.9	0.0	0.0	61.9	0.0
	Food	76.7	0.0	0.0	76.7	0.0
	Marine	52.6	0.0	0.0	52.6	0.0
	Forestry	17.3	0.0	0.0	17.3	0.0
	Environment	45.1	0.0	0.0	32.4	12.7
	<i>Sub-total</i>	<i>3,495.2</i>	<i>868.1</i>	<i>290.7</i>	<i>2,320.6</i>	<i>884.0</i>
BMW Regional OP						
Local Enterprise	Regional Innovation Strategies	18.3	18.3	8.8	9.5	0.0
	<i>Sub-total</i>	<i>18.3</i>	<i>18.3</i>	<i>8.8</i>	<i>9.5</i>	<i>0</i>
S&E Regional OP						
Local Enterprise	Regional Innovation Strategies	27.7	27.7	13.2	14.5	0.0
	<i>Sub-total</i>	<i>27.7</i>	<i>27.7</i>	<i>13.2</i>	<i>14.5</i>	<i>0.0</i>
Total		3,541.2	914.0	312.7	2,344.6	884.0
Note: The figures shown are the original projections in the Operational Programmes.						
SOURCE: PRODUCTIVE SECTOR OPERATIONAL PROGRAMME 2000-06						

The RTDI Priority under the Productive Sector OP (2000-06) represents a new approach to R&D funding. In previous funding periods, there was an R&D priority in each of the sectoral OPs. With the new structure, all R&D expenditure falls into one RTDI priority, which is sub-divided into sectoral measures. It covers the education, industry, agriculture, food, marine, forestry and environment sectors. The majority of expenditure is under the industry measure (70%). The Education RTDI measure provides €810mn, or 23% of expenditure under the priority. These are the only two measures that are co-financed.

The objective is to encourage indigenous Irish industry and foreign multinationals to switch their Irish-based activities from basic manufacturing to more advanced activities further up the value chain. Indigenous enterprises need to shift their activities from low value added, low productivity sectors towards sectors characterised by high levels of innovation, quality, productivity and value added. It is also important to develop an environment where it is attractive for multi-nationals to carry out higher-level functions such as R&D in Ireland. For the first time, Government provided a significant level of non-co-financed funding to support strategic basic research under the Productive Sector.

In this round, as Table 4.5 shows, EU Structural Funds are heavily concentrated – in just two measures.

The impact of Structural Funds in this period is inevitably less, but it includes:

- a continued focus on in-company R&D in enterprise;
- support for aspects of research in the third level sector.

Table 4.6 shows the S&T expenditure under the CSF, the total CSF expenditure and the S&T expenditure as a percent of total CSF expenditure for each round of funding. The percentage of total CSF funding spent on Science and Technology has increased from 3% of the 1989-93 CSF to 13% in the 2000-06 CSF.

TABLE 4.6: S&T EXPENDITURE UNDER THE CSF AS A % OF TOTAL CSF¹ EXPENDITURE			
	1989-93	1994-99	2000-06
Total S&T Expenditure (€mn)	255.7	574.3	914.0
Total CSF Expenditure (€mn)	8,339.0	10,383.0	7,002.0
S&T Expenditure as% of total CSF expenditure (%)	3.1	5.5	13.0
Note: CSF included EU co-financed national expenditure, it excludes all non-co-financed national expenditure.			
SOURCE: COMMUNITY SUPPORT FRAMEWORK 1994-99 AND 2000-06 AND THE IRISH REGIONS OFFICE			

4.3 Structural Fund Monitoring and Evaluation

4.3.1 Monitoring

One of the major impacts of the Structural Funds in Ireland in terms of national investment programming generally, including in RTDI, has been in the area of monitoring. The concept of Monitoring Committees, with a wide representation and relatively open discussion about programme progress, was a new one.

Related to this was introduction of formal agreed performance indicators, including result and impact indicators, which were then systematically and regularly reported. There has been a good deal of learning in this regard along the way, in particular perhaps on the need for fewer but higher quality and more relevant performance indicators, rather than overly large numbers of these which cannot be reported on or interpreted.

Other important lessons are the difficulty of defining relevant and useful indicators, and the danger of routine collection and reporting of indicators without interpretation.

Significantly, this broad monitoring structure is to be maintained within Ireland's new nationally-funded National Development Plan 2007-13.

4.3.2 Evaluation

The Structural Funds in Ireland are frequently credited with having made a major contribution to introducing an "evaluation culture". They have undoubtedly helped in this regard; however, this impact can be exaggerated, particularly so in the case of RTDI. There was already, through agencies such as the National Board for Science and Technology and subsequently EOLAS, Forbairt, Forfás and Enterprise Ireland, a considerable tradition of programme evaluation pre Structural Funds²⁶.

The types of evaluation introduced directly as a result of the Structural Funds were two-fold. Firstly, an internal evaluation unit (Industry Evaluation Unit – IEU) operated in the Department of Enterprise Trade and Employment during the period 1994-1999 with responsibility for carrying out ad-hoc evaluations under the Industry Operational Programme. Its brief therefore included RTDI and it undertook a number of evaluations in this regard.

These evaluations were generally akin to those already being undertaken by implementing bodies themselves, i.e. they were generally at scheme or measure level, and had a primary focus on operational aspects rather than on more fundamental issues of efficiency, effectiveness, impact and

²⁶ Fitzpatrick Associates' first evaluation of an RTDI intervention, a review of the then NBST Industrial Liaison Officer Scheme, was undertaken in 1985.

underlying rationale. A review of the work of this Unit, carried out by the overall NDP/CSF Evaluation Unit in October 1998, concluded generally that “the focus of IEU evaluations tends to be on the detail of the design and delivery of interventions. While this is a strength of the Unit’s work, producing many useful recommendations, we feel that there could be more emphasis in the reports on the key evaluation questions outlined in Chapter 2 (i.e. efficiency, effectiveness, impact and rationale)”²⁷.

The Structural Funds also gave rise to the formal requirement for ex ante and mid-term evaluations. In Ireland the mid-term evaluations have been the main focus in this regard, and have generally been undertaken by external evaluators. These evaluations occurred at both OP and NDP/CSF level. Their nature was, however, generally rather broad, and in particular RTDI was generally included in broader reviews. The focus also tended to be generally on checking and reassurance that broad objectives were being met and plans followed, and the nature of these exercises generally did not really facilitate the emergence of major new insights of either a strategic or a detailed nature.

However, these reviews were generally reasonably supportive of investment in RTDI and frequently argued for a shift in investment prioritisation towards it. Some economic reservations have continued in relation to in-company as opposed to public sector “public good” R&D, and whether the former reflects genuine market failure.

Annex 3 summarises the findings of a number of the more strategic (i.e. not intervention-specific) evaluations across the three Structural Fund Periods.

Ireland, and this is a wider issue than RTDI, generally tended to be weaker in relation to both ex ante and ex post evaluation. Unfortunately these are the evaluations most akin to SPI, i.e. where arguably the scope for more strategic analysis of overall aims, objectives and priorities is greater²⁸.

An important wider legacy of the EU evaluation methodologies in both RTDI and other spheres is widespread use and acceptance of the logical causal flow of investment programmes from “inputs” to “outputs”, “results” and “impacts”, and the consequent opportunities for both monitoring and evaluation at each of these stages.²⁹

²⁷ CSF Evaluation Unit, *Review of Ongoing Evaluation Function in the Community Support Framework for Ireland, 1994-99*, October 1998.

²⁸ ESRI, *Mid Term Review 1994-99* (published in 1996), ESRI, *Mid-Term Evaluation of the National Development Plan*, NDP/CSF Evaluation Unit, October 2003, ESRI *Review of Investment Priorities*, 1999.

²⁹ For a recent re-statement see European Commission Directorate General, Regional Policy, *The New Programming Period 2007-2013: Methodological Working Papers, Draft Working Paper on Ex Ante Evaluation*, October 2005.

5. Summary, Conclusions and Implications

5.1 Introduction

This chapter draws conclusions from the descriptions of the Irish experience in the previous sections, and their implications for new member states, accession countries and less developed regions.

5.2 Key Features of the Irish Experience

5.2.1 *Impacts of Structural Funds*

Summarising the description of RTDI in the previous chapters, the Irish experience is as follows:

- **1989-93 period:** during this period the principal impact of the Structural Funds was a “kick-start” one, enabling existing policy intentions regarding RTDI to be operationalised via the availability of funding, and on a multi-annual basis. Without the funding, it is unlikely that emerging national RTDI goals could have been operationalised to the same extent or as quickly, judging by the limited levels of funding already available in the relevant Ministries and competition for the resources. This funding particularly involved the ERDF both through the mainstream Operational Programmes and through the STRIDE Community Initiative. In practice, the Structural Funds allowed various S&T infrastructure to be put in place;
- **1994-99 period:** during the 1994-99 Structural Funding round (the main round in financial terms), the important funding role continued. Improving national economic circumstances, especially after the mid-term, meant that the funding was somewhat less critical than in the previous period, with the Celtic Tiger now producing greater resources for investment in RTDI. However, the availability and effective guarantee of seven-year co-financed expenditure allowed medium-term planning in a way that would not have happened otherwise. In addition, the Structural Funds in this period brought a new focus on supporting R&D activity in enterprise, including a new industry R&D Measure which was initially 100% co-financed by the EU;
- **2000-06 period:** during the current period, EU Structural Funding is much more limited. It is heavily focused on in-company R&D and on basic research in the third-level education sector. However, the overall role of EU funding and its influence has declined. Indeed, arising from concerns about growing levels of associated administrative burden, the main national RTDI initiative during this period, Science Foundation Ireland, is not EU co-financed.

5.2.2 Overall Strategic Impact

In terms of overall impact on the evolution of Irish RTDI policy and investment, the EU Structural Funds alone clearly cannot be credited with putting RTDI on the national policy agenda in Ireland. This was already happening gradually before the arrival of Structural Funds. However, the Structural Funds played a very important role in two respects:

- (a) enabling policy aspirations to be put into effect via the availability of much larger funding, especially in the early pre-Celtic Tiger 1990s, in particular funding that was ring-fenced;
- (b) influencing decisions in regard to certain priorities of RTDI funding, especially R&D in enterprise.

The positive role of the Structural Funds thus involves co-existence of two mutually reinforcing drivers, namely an already increasing national policy pre-disposition to investment in RTDI, and EU reinforcement of this coupled critically with availability of EU funding to allow RTDI aspirations to be implemented.

This is an important finding for other countries and regions. It means that “it takes two to tango”. EU Structural Funds can be an important enabler, allowing key strategic investment to be made. But alone they are not a panacea in either RTDI or other investment areas. They require a disposition to make such investment, existence of coherent policies and programmes that can be supported, and existence of wider institutional and other pre-requisite conditions for success.

5.2.3 Programming Influence

The Structural Funds also had important implications at programming level during the funding rounds. Furthermore, as evident in both non-co-financed RTDI measures in the current 2000-06 Irish NDP and in the decision to have a new 2007-13 NDP, this legacy seems to be a lasting one.

Dimensions of this programming are:

- multi-annual programming involving near (although not entirely) guaranteed funding;
- systematic monitoring, including the use of quantitative indicators, including result and impact indicators;
- use of competitive tendering procedures, rather than simply giving grants on the basis of eligibility or on a first come, first served or ad hoc basis;
- increased openness and transparency, both at project decision-making level via the published criteria and selection procedures, and also at the level of programmes as a whole through, for example, Monitoring Committees with wide-ranging membership from inside and outside the public administration.

5.2.4 Outstanding Issues in Ireland

Areas where Structural Funds have had limited impact in regard to Ireland have been:

- (a) Irish investment in RTDI, including EU co-financed investment, arguably fails to follow through logically on its underlying rationales, and how these may differ across different types of schemes, i.e. whether it is to act as a magnet for mobile inward investment, to produce high-quality graduates, to produce spin-off enterprises or other. Yet the precise rationale should be a primary influence on the subsequent design and implementation of schemes in practice;
- (b) encouragement of proper policy integration. The approach of supporting individual agencies and particularly activities or components of activities separately and in parallel has facilitated continuation of separate independent schemes. While Structural Funds have facilitated more basic level co-operation, they have not particularly encouraged genuine integration either at policy or at operational level;
- (c) Ireland has had a strong focus, arguably an overly-strong one, on the third-level institutions. It has been less effective at encouraging both R&D in enterprise and technology transfer between third-level institutions and enterprise. Efforts in this regard are of course ongoing;
- (d) the now very close alignment between RTDI and enterprise policy – itself a good development – has one danger. This is inadequate attention to other RTDI areas which are important economically and socially, but don't have such potentially direct or overt economic spin-off, e.g. energy, environment, health, transport.

5.3 Role of Strategic Policy Intelligence in RTDI Investment

5.3.1 Irish Experience

The Irish record and experience here has been limited and mixed. On the positive side:

- there is evidence of considerable use of policy analysis of various degrees of formality at key stages. A major example of this was the STIAC report published in 1995 which had involved extensive use of committees, working groups and back-up research to establish and validate the case for increased investment in RTDI, and which in turn gave rise to the Technology Foresight exercise;
- Ireland's national Technology Foresight exercise which involved the application of full, formal foresight techniques and resulted in identification of key investment priorities that were subsequently reflected in the establishment of a Foresight Fund and of Science Foundation Ireland.

A new “technology assessment” process to identify investment priorities in nanotechnology is currently under way, and due to report in late 2006³⁰.

On the less positive side, the impact of evaluation during the period, both EU inspired and other, was limited. While perhaps subjective, this is a view shared by most of the consultees spoken to as part of our work for this Paper. Evaluation is seen as having made useful contributions at the level of detailed programme operation, but less so in terms of overall strategic policy-making. Possible reasons for this are:

- (a) the genuinely difficult nature of evaluating RTDI investment, particularly in regard to socio-economic impact;
- (b) the nature of the Terms of Reference of many Structural Fund-driven programmatic evaluations which tended to emphasise operational issues rather than issues of policy or rationale;
- (c) the fact that many of the EU required evaluations (ex ante, mid-term) were of a very broad review-type nature, with RTDI one of numerous issues being examined simultaneously;
- (d) a tendency to focus evaluations on individual programmes rather than on “NIS-wide” impact of multiple interventions with similar objectives;
- (e) institutional issues including resistance to evaluation, evaluation of one public institution by another, and lack of adequate follow-up mechanisms.

5.3.2 Implications of Irish Experience

Irish experience to date therefore suggests that considerable challenges remain for the evaluation community, both commissioners and evaluators, in terms of developing RTDI evaluation processes and techniques which are effective from a policy development and SPI perspective. This includes a need for techniques which effectively straddle the scientific-type peer review on the one hand and the more economic impact-focused evaluations on the other.

It necessitates definition of benefits and impact beyond output, profits, jobs and new products and processes³¹. It necessitates evaluation occurring at times when it can have a meaningful impact on future policy directions, e.g. ex ante evaluation for example often occurs too late to affect investment choices, and it necessitates evaluations achieving a balance between internal and external control, and of avoiding overly negative reaction to critical evaluation.

³⁰ <http://www.forfas.ie/events/consultation.html>.

³¹ “Behavioural additionality” is a candidate in this respect.

5.4 Some Implications for New Member States, Accession Countries and Less Developed Regions

5.4.1 Lessons for Other Countries and Regions

Need for Coherent RTDI Policy:

The role that RTDI can play in the development of new Member States, Accession Countries or less developed regions will vary from location to location, depending on the local context. It is therefore important that the relevant authorities have their own distinct policy approach to the issue. There could be a temptation to “trawl through” the EU Structural Fund Regulations, identify everything that is potentially eligible for co-financing, and treat this as a strategy.

However a strategy – RTDI or other – is more than this. It necessitates understanding of the local situation, identifying local strengths and weaknesses, setting out a strategy for how these are to be addressed, and designing a set of interventions which reflect these needs and priorities.

In particular, there is a danger of simply assuming that investment in RTDI is “a good thing” without thinking through the rationale for the precise type of RTDI expenditure being proposed, and how investment in this is meant to achieve the wider national or regional socio-economic objectives;

Programming Issues:

In terms of practical programming, an important consideration is the need for “readiness”, i.e. to have policies, plans and programmes which are ready for implementation. Otherwise, early years of the new 2007-13 programming period could be spent designing these and expenditure will not really start until years 3 or 4.

Associated with this is a need for caution about programming which is overly front-loaded or indeed which involves a flat spread of annual expenditure over the full programming period. Either of the above are likely to be unrealistic in practice, and more realistic lead-times need to be allowed.

The Role of Public RTDI Infrastructure:

Many new Member States have significant inherited RTDI infrastructure. The historical Irish experience in this regard is twofold:

- (a) that there should not be a rush to close down this infrastructure if it is potentially reformable. Otherwise, in the future there might be a need to begin to try to reconstitute some of it;
- (b) on the other hand, any temptation to use Structural Funds to simply meet the ongoing operating running costs of such infrastructure, “resprayed” as a programme or strategy, must also be

avoided. If these institutions need reform in terms of governance, strategies, etc. this challenge should be addressed.

Importance of Technology Transfer:

An aspect of the Irish experience to date is inadequate attention to explicit interventions for technology transfer. This is an especially important issue where, as in Ireland, high expectations are being placed on the third-level education sector, a sector that has other aims and responsibilities.

In Ireland these gaps are now being addressed, but clearly this is 15 years after the commencement of Structural Funds. The planned use and dissemination of the results of applied R&D must be seen as an integral part of any programme, not simply as an optional add-on.

Performance Indicators:

These are a very valuable tool for performance monitoring, and for assisting evaluation. Irish experience points to a number of potential pitfalls, however, especially if indicator systems are being developed without prior experience.

First, you can't monitor everything so there is a need to make choices. Second, indicators need interpretation; they seldom provide a clear neutral answer in themselves. Third, they are better for monitoring than evaluation and don't alone constitute evaluation. Finally, the difficulty of defining small numbers of good indicators, especially in a complex area like RTDI, is easily underestimated. It is prudent to draw on appropriate experience.

Regional Dimension:

There is considerable emphasis on the regional as well as the national and Community-wide dimension of RTDI policy. However, there is a danger in this context that the word "region" is frequently used in different ways or to mean different things.

The Irish experience suggests that there are specific issues about this concept in the context of relatively small Member States which do not have strong traditional regional structures, a description that fits many new Member States. This situation contrasts with large and traditionally strongly federal Member States such as Germany or Spain. In the latter, regional issues are more akin to national issues in smaller Member States.

In smaller Member States the benefits of RTDI investment cannot really be regarded as geographically ring-fenced at regional level. Third-level institutions (such as Irish universities and

Institutes of Technology) draw their student population from all over the country, while firms in small regions will draw their R&D or technology transfer sources from national and indeed international sources. RTDI expenditure must therefore not be artificially ring-fenced within Operational Programmes for relatively small regions.

Human Resource Development:

There is also a temptation to assume that it is the ERDF which is the only Structural Fund contributor to RTDI.

However, the human resource aspect of RTDI is clearly crucial. Researchers are clearly absolutely central to research, as are entrepreneurs to the use of its results. And an important aspect of RTDI benefits in third-level institutions is of course its contribution to education and training. Structural Fund programmers should therefore consciously plan for the use of ESF as well as ERDF funds in an RTDI context.

Strategic Policy Intelligence:

The need for clear national policy and strategies can be addressed by the use of strategic policy intelligence tools such as technology foresight, technology assessment and road mapping. These are emphasised in the Community Strategic Guidelines and in the Guideline 3.4 regarding administrative capacity.

It is therefore quite appropriate and desirable that national and regional authorities include actions in this regard in their EU co-financed RTDI programmes for the 2007-13 period.

Twelve-Point Guide for Good EU Co-Financed RTDI

1. have clear objectives and a clear rationale for how the intervention will meet these;
2. be specific and focused, and not overly broad;
3. ensure that the programme can commence quickly and can absorb the budgeted funds;
4. ensure that the programme is relatively easily audited and that the adequate records can be maintained;
5. ensure that potential recipients are well informed about criteria, procedures, etc. (in the case of people's time there will need to be information and timesheets and specialist experience of Structural Funds available);
6. have competitive tendering for both public and private recipients, and avoid co-financing core budgets of RTDI institutions it creates;
7. don't have too many performance indicators;
8. have a good implementing body on the ground which understands the objectives, criteria, methods and so on;
9. ensure that all activities are eligible and appropriate;
10. ensure that Commission publicity and other regulatory requirements can be complied with;
11. avoid overly small projects;
12. plan for a good Mid-term Review when 50% of the money is spent (although the Regulations don't require it).

5.4.2 And Some Lessons for the Commission....

At Member State and regional level, EU policies and priorities are frequently taken as a given, a kind of "independent variable". However, lessons of experience can also provide food for thought for the Commission as it moves forward to the new 2007-13 Structural Fund period.

Some arising from the Irish RTDI experience are:

- (a) **don't encourage Programme front-loading:** this is usually unrealistic and can lead to bad decisions. Give spending bodies, especially in new Member States, Accession Countries and less developed regions, time to prepare and ramp up their programmes gradually. And in many regions there may already be an overhang of Phare, Transition and 2004-06 Structural Fund ("N+2") monies in the early years;
- (b) **encourage integrated planning at national and regional level:** while the Commission is clearly in principle in favour of this, the co-existence of the separate Structural Funds often has the

reverse effect in practice. Beyond simply allowing for a (limited) degree of co-financing between Programmes in the Regulations, the Commission needs to look at its own procedures and practices to see whether these act in practice as a disincentive to co-operation between, for example, ESF co-financed and ERDF co-financed measures in the RTDI area;

- (c) **be cautious about the overly strategic approach (in new Member States, Accession Countries and Less Developed Regions):** the Commission correctly and understandably wishes to take a more strategic position in the 2007-13 period, with a more “hands-off” role than heretofore. However, older Objective 1 countries such as Ireland benefited from more a hands-on Commission role, including in relation to RTDI, during earlier rounds. There should be consideration of the level of involvement the Commission takes in the new Member States as opposed to older ones for the coming period, and especially in the early years. Otherwise, the expectations being placed on the newer Member States and Accession Countries in terms of policy design, development and implementation may be overly heavy;
- (d) **administrative burden:** a very common complaint in Ireland now is the increasingly heavy administrative requirements involved in receipt of EU monies, to the point where these now constitute a disincentive to organisations to be recipients. It also means that many of the kinds of organisations with which the Commission would like to be involved, e.g. SMEs and newer more innovative public bodies, find the Commission requirements very onerous. While of course recognising the need for full openness and accountability, there is a case for the Commission to examine whether it is getting the balance right in this regard, or whether it is now so cautious, and transferring so much risk to the recipient countries, regions and organisations, that this is becoming counter-productive in terms of some of its own objectives.

Annex 1: List of Consultees

Dr Brendan Wafer, Circa Group Europe

Mr Michael Fitzgibbon, former Head of S&T Evaluation, Forfás

Dr Jim Higgins, Department of Finance

Mr David Hegarty, former Head of NDP/CSF Evaluation Unit, Department of Finance

Dr Don Thornhill, former Chair, Higher Education Authority, current Chair of National Competitiveness Council

Ms Agnes Aylward, former Principal Officer, Office for Science and Technology, Department of Enterprise, Trade and Employment

Mr Bill Hogan, Evaltec and formerly of S&T Evaluation Unit, Forfás

Mr Dermot O'Doherty, Intertradelreland, formerly of Forfás

Dr Martin Lyes, Manager, Science and Innovation Division, Enterprise Ireland

Mr Michael Leahy, Head of Policy, Planning Division, Enterprise Ireland

Dr Owen McBreen, formerly Head of Technology Transfer of IIRS/EOLAS/Enterprise Ireland

Mr Geoffrey O'Sullivan, Section Manager, International Co-operation Division, Marine Institute

Dr Tom Higgins, formerly of Circa Group Europe

Ms Helena Acheson, Manager, Science, Technology and Innovation Policy and STI Awareness Programmes, Forfás

Annex 2: RTDI Measures by OP and Priority in each Programming Period

Period	Operational Programme	Priority/Sub-Programme	Measure
1989-93	Industrial Development	Science and Technology for Industrial Development	Programmes in Advanced Technology HE Industry Linkages and Innovations Tech. services to industry – Services Tech services to industry – Infrastructure Regional Infrastructure Development
	Agriculture and Rural Development	Development of Human Resources and the Technology base	
1994-99	Industrial Development	Research and Development	Industry R&D Initiative Industry – 3 rd Level Co-operation services Human resource Development Research Support
	Agriculture, Rural Development and Forestry	Structural Improvement and Rural Development	Research
	Environmental Services	Research and Development	Environmentally Sustainable Resource Management (ESRM) Cleaner Production
	Fisheries	Research	Research Vessel Capacity National Marine Research Laboratories Fisheries/Aquaculture R&D Marine Food Processing National Marine Survey Marine Technology Development Evaluation of STRIDE OP
2000-06	Productive Sector	Research, Technological Development and Innovation	Higher Education Industry Agriculture Food Industry Marine Forestry Environment
	Regional OPs	Local Enterprise	Regional Innovation Strategies

SOURCE: NATIONAL DEVELOPMENT PLAN 1989-93, 1994-99 AND 2000-06

Annex 3: Summary of Selected Evaluations

1989-93:

An Evaluation of the Science and Technology (S&T) sub-programme 1989-93 was carried out by Deloitte and Touche in 1993³². This evaluation found that:

- the S&T sub-programme had a significant impact on Ireland's Science and Technology capacity and performance, and without the programme, Ireland's Gross Expenditure on R&D (as % of GDP) would be even further below that of most other EU Member States;
- S&T activities, specifically the industry orientated R&D Initiatives, can contribute to the process of strengthening the link between S&T investment and economic growth;
- the primary objective of the sub-programme, "to help Irish industry to improve its technological capability", was partially realised, but not maximised;
- there was a lack of industrial input into the development of strategies and objectives of the sub-programme;
- actual expenditure at the time of the evaluation (from 1989 until the first quarter of 1993) was 65% of the latest target set and 56% of the original target;
- the investment was good value for money; and
- the sub-programme made a positive contribution to the development of indigenous industry.

A thematic evaluation of the impacts of CSFs on Research and Technology Development (RTD) in Greece, Ireland and Portugal³³ found that:

- the tangible impacts of the CSFs on Research and RTD were considerable and have resulted in significantly enhanced public infrastructure for RTD, better resourced programmes, new and more effective policies, improvements in the quality and availability of human resources and a more dynamic institutional environment for RTD;
- a substantial enhancement of public sector RTD capacity had been achieved;
- many new policy initiatives and programmes had been introduced, most of which were working quite well;
- the demand for programmes, mainly from public sector agencies, was high;
- the RTD systems in all three countries were evolving strongly towards university based systems under the stimulus of CSFs;

³² Deloitte and Touche, An Evaluation of Science and Technology Sub-Programme 1989-1993, 1993.

³³ The Circa Group, thematic Evaluation of the Impact of CSFs for Research and Technology in Greece, Ireland and Portugal, 1993

- the capacity for participation in the Framework Programme was improving ;
- there was evidence of choices being made, of selectivity and concentration by national authorities in the application of funds;
- successful projects in Ireland included Techstart and Technology Management, the technology auditing programme, the industrial liaison programmes at universities and RTCs and the R&D grants for companies; and
- problem areas included: industrial participation; technology transfer; operational costs; achieving self-financing targets management and evaluation problems; overemphasis on the supply side; concentration on RTD around capital cities; and human resource shortages.

1994-1999:

A Meta Evaluation of R&D Policy and Interventions was prepared by the Industrial Evaluation Unit and Forfás in March 1999.³⁴ The evaluation found that:

- the targets set in the R&D sub-programme for BERD and GERD were exceeded early on in the life of the 1994-99 CSF, but these targets were not relevant and more ambitious targets should have been set;
- the main areas where achievement had been poor at that stage were: the capability of industry to be internationally competitive, particularly the indigenous sector; support for human resource development in science and technology through school curricula; third-level activity and life-long learning for the workforce and increased interaction and collaboration between third level and industry through activities, research and the diffusion of knowledge;
- a number of weak areas were in the process of being addressed the establishment of a national planning system for STI; prioritisation of state investment in STI and increased awareness of the importance of STI investment; and
- other areas that needed to be addressed included: the capability of industry to be internationally competitive, particularly much of the indigenous sector; support for human resource development in science and technology through school curricula; third-level activity and lifelong learning for the workforce and increased interaction and collaboration between the third-level sector and industry through training activities, research, and the diffusion of knowledge

The Mid-Term Evaluation of the CSF 1994-99 by the ESRI³⁵ found that for R&D measures of the Industrial Development OP:

³⁴ Industrial Evaluation Unit and Forfás, Meta Evaluation of R&D Policy and Interventions Modelling the Future – An Evaluator’s Perspective, 1999

³⁵ Economic and Social Research Institute, EU Structural Funds in Ireland: A Mid-term Evaluation of the CSF1994-99, 1997

- demand was running ahead of budgeted funds for the Industry Initiative;
- the 1994-99 CSF played an enormously important role in contributing to R&D;
- the official commitment to R&D had a positive effect on business expenditure on in the area; and
- the best mechanism for allocating R&D funding and the optimal evolution of the public research bodies must remain the subject of discussion and experimentation.

2000-2006:

According to the Ex Ante Evaluation of the National Development Plan, 2000-2006³⁶, a major increase in expenditure was planned in the area of Research, Technological Development and Innovation for the 2000-06 period. Expenditure in the area was set to nearly treble the estimated 1999 expenditure levels. One of the key aims of the investment should be to correct deficiencies of the old system: deadweight investment; targeting; displacement effects; and cost-effectiveness.

The question as to whether there is a market failure to justify government investment in R&D is raised. While government investment in pure or basic research carried out in academic institutions is of a public good nature, the benefits of in-company research accrue to the company itself, and are therefore less justifiable for government investment.

The ESRI published a Report, National Investment Priorities for the Period 2000-2006 in 1999.³⁷ The Report found that the principal risks to continuing sustainable growth in Ireland relate to supply side constraints, with respect to both infrastructure and certain categories of labour. Therefore, the Report recommended that investment for the 2000-2006 period should target those areas of Ireland's social and economic infrastructure that have the potential to curb the pace of expansion.

Based on their analysis, the ESRI prioritised four broad investment areas; the highest priority for public investment was investment in public physical infrastructure; the second priority area identified was education and training; third investment in R&D; and the fourth area was private sector physical investment.

This Report also raised the "public value" question and concludes that the challenge for policy makers is to devise policies that target true public good activities within the broad investment category of R&D.

³⁶ CSF Evaluation Unit, Ex Ante Evaluation of the National Development Plan, 2000-2006, 1999

³⁷ The Economic and Social Research Institute, National Investment Priorities for the Period 2000-2006, 1999

This report found that Ireland has a low level of R&D investment, by international standards. The gap in funding is particularly apparent in the higher education and public sectors. Based on the evidence regarding the social returns to R&D expenditure and the relatively low level of public funding of R&D compared to international experience, there was a strong case for significantly increasing the level of public investment in R&D. It was recommended that expenditure be maintained at least at the 1999 ratio of GDP, with a significant increase in “public good” research, compared to the overall total.

In order to ensure that funds were used in the most efficient way possible and that deadweight was minimised, a new structure was recommended for R&D investment:

- all R&D measures should be brought together under a single programme or sub-programme;
- there should be a reduced number of measures, in order to maximise competition for public funding;
- a comprehensive set of national indicators should be developed and applied to measure the outputs and impacts of such spending;
- an explicit set of eligibility criteria should be applied as part of the process of assessing which areas of R&D should be supported with public money;
- activities and programmes should have clear and specific objectives and be subject to monitoring and evaluation in terms of their impacts and achievements;
- the body responsible for allocating funds should be given responsibility for funding all sectors, including agriculture and industry; and
- R&D expenditure should be focused on selected target areas within the overall R&D budget.

The Report also said that Ireland’s particularly high number of foreign multinationals was an important aspect of Ireland’s R&D investment policy. As many foreign investors typically conduct the bulk of their R&D in the home country, rather than the host country, Ireland’s industrial policy strategy should provide incentives for multinational firms based in Ireland to locate some of their technology production here. This should also have a positive impact on indigenous industry, given the high level of human capital mobility.

The Mid-Term Evaluation of the Productive Sector OP³⁸ found that under the RTDI Priority:

- expenditure was slow, 38% of the original OP forecast and 70% of the latest OP forecast at the end of 2002;
- physical progress was also slow under the RTDI Priority at the mid-term stage; and

³⁸ Indecon International Economic Consultants, Mid-Term Evaluation of the Productive Sector OP, 2003

- the impact of the Priority was mixed across different measures.

The Mid-Term Evaluation of the National Development Plan and the Community Support Framework 2000-06³⁹ drew the following conclusions in relation to R&D measures:

- in general there was a significant amount of under-spending at measure-level, but that there had been some acceleration in the overall rate of progress on an annual basis;
- physical progress was relatively positive with clear success in some areas and persistent difficulties in others;
- It was expected that targets would be achieved under most measures, except for the Technological Sector, innovation management, collaboration in an international context and Marine research sub-measures.

³⁹ Economic and Social Research Institute, Mid-term Evaluation of the National Development Plan and Community Support Framework 2000-2006, 2003