18. HUMAN RESOURCES

18.1 Context

It has been argued that the expansion in educational participation, at both second and third level has been one of the main factors underlying Ireland's rapid economic growth during the 1990s (Fitz Gerald, 2000). As noted in Chapter 2 of this report, human capital is of particular importance to growth and competitiveness. The rapid development of Irish society over the past four decades entailed a process of occupational upgrading to meet the skill needs of a rapidly modernising economy and, as a consequence, educational credentials have come to assume major importance in determining the economic prospects of individuals (O'Connell, 2000).

Forecasts of future skill needs indicate that high skilled occupations will continue to expand over the medium to long-term and emphasise the need for continued investment in human capital, and the continuation of high demand for higher education graduates (Sexton, Hughes, McCormick and Finn, 2001; and Sexton, Hughes, Casey, Finn, and Morgenroth, 2004). In a context of ongoing rapid changes in the technology and organisation of production and service delivery, education and skills have come to assume central importance both for macroeconomic performance as well as for the labour market prospects of individuals. Increasing productivity and enhancing productivity in the future will require additional investment in research and development and in the expansion of tertiary education, at undergraduate as well as post-graduate levels.

18.2 Strategic Goals in Human Resource Development

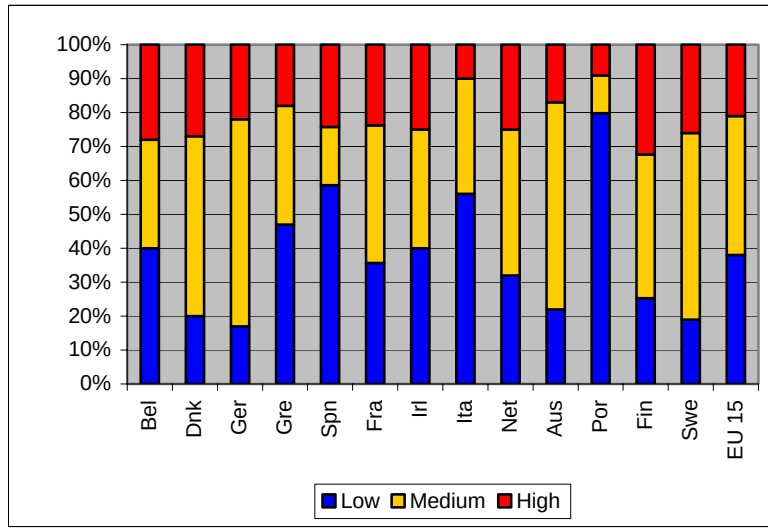
In pursuit of the two objectives of economic development and social progress, the Irish education and training system is confronted with two major challenges: (1) to produce a highly educated population and labour force by the standards of other advanced countries; and (2) to ensure that the educational system serves all members of society in promoting equality of opportunity in initial education and in access to continuing vocational education and training.

Irish educational outcomes are now broadly in line with the average among OECD countries, but they lag behind the best performers. If Ireland is to achieve its objectives of further economic development and social progress it will need to increase investment at all levels to match those of best practice countries.

In terms of educational attainment, the adult population is polarised: Figure 18.1 shows educational attainment of the

population aged 25-64 years, thus including the main age groups from which the workforce is drawn. Ireland compares favourably with other EU countries in the proportion of the working age population with higher levels of educational attainment: 25 per cent of the population in this age group in Ireland have third level qualifications, compared to an EU average of 21 per cent. However, Ireland also has a larger proportion at low levels of education: 40 per cent of the population aged 25-64 years in Ireland have lower secondary education, or less, compared to an EU average of 38 per cent, and to only 17 per cent in Germany, 19 per cent in Sweden, 20 per cent in Denmark, and 25 per cent in Finland. In this respect Ireland falls short of the leading countries with which it must compete.

Figure 18.1: Educational Attainment of the Population Aged 25-64 years, 2002



Source: Department of Education and Science, *Annual Report, 2003*.
Data presented in Appendix Table A6.1.
Low attainment = Lower Secondary education or less.
Medium attainment = Completion of Upper Secondary education.
High attainment = Third level education.

Closely related to the objective of increasing the supply of highly skilled labour is the need to reduce the share of those with low skills. The number of people leaving the initial education system without upper secondary education is about the OECD average but well above best practice examples (OECD, 2006). This requires actions to reduce early school leaving and raise rates of completion at upper secondary level. It also requires a substantial increase in the provision of continuing vocational education and training to those who have already entered the labour force. However, Ireland is below average in terms of the extent of participation by employees in continuing education and training (OECD, 2006). It is also well established that participation in continuing education and training is strongly related to educational attainment, with the result that those

with lower education are much less likely to participate in training to upgrade their skills than those with higher levels of education (O'Connell, 2005). Therefore, raising the educational attainment rate will also raise the participation rate in training.

Given the demographic changes discussed in Chapter 4 of this report, Ireland faces a long-run decline in the number of new entrants to the labour force. This means that, in contrast to the situation in the 1990s, increasing the skill profile of the workforce must rely heavily on upskilling those already in the labour force. This means that in addition to investing in initial education, it is increasingly necessary, on both efficiency and equity grounds to invest in lifelong learning of those already in the labour force (Task Force on Life-Long Learning, 2002).

While the proportion of the working-age population with third level qualifications is Ireland is higher than the European average, this sector is crucial to increasing productivity and maintaining competitiveness. Increased investment in the third-level sector is needed to provide for growing enrolments, to enhance standards, to expand post-graduate education, and, as outlined in recent announcements, to develop linkages between learning, research and the enterprise sector (see Chapter 19).

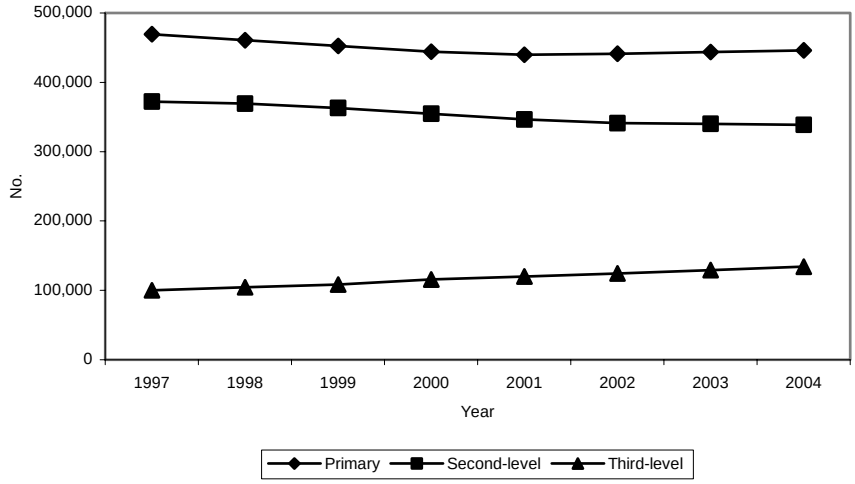
18.3 Current Activity

EDUCATION

There has been a decline in full-time enrolments in the primary and second-level sectors of 5 per cent and 9 per cent respectively over the period 1996/7 to 2003/4 (Figure 18.2). Primary enrolments reached their lowest levels in 2001 but have increased somewhat in subsequent years. At the same time, full-time enrolments in third-level education have increased by over a third over their 1997 levels. It should also be noted that there has been an increase in part-time enrolments within third-level institutions (from 25,000 in 1997/8 to 34,000 in 2003/4).

The number of children under the age of 9 years is projected to increase by over 15 per cent between 2005 and 2015 while the numbers aged 10 to 19 years of age are projected to increase by 5 per cent (see Chapter 4 and Fitz Gerald *et al.,* 2005). Therefore, the primary school-aged population is expected to increase significantly (by 18-29 per cent) while the second-level school-age population is expected to decline until 2011 and increase thereafter (CSO, 2004). Even without any changes in participation rates within second level education, resource requirements are consequently expected to increase substantially in the primary sector with somewhat more modest additional requirements at second-level over the lifetime of the National Development Plan.

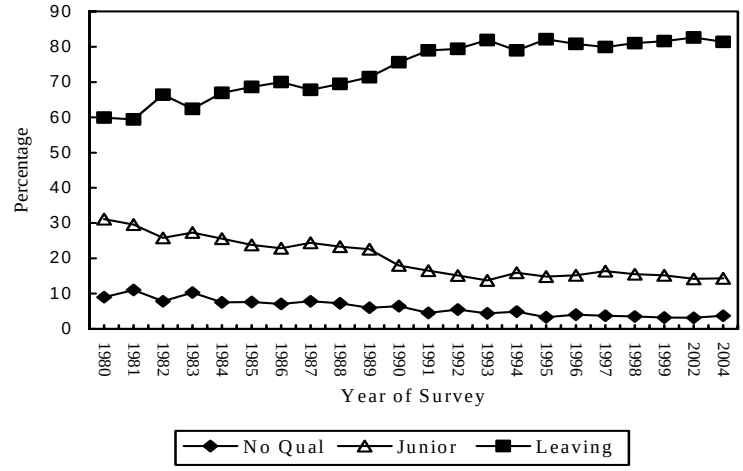
Figure 18.2: Enrolments in Full-time Education by Sector 1997-2004 (aided institutions only)



Source: Department of Education and Science, *Statistical Reports*, various years.

Reductions in both the number of primary and second-level pupils have reflected demographic trends rather than changes in participation rates. After a marked increase in retention to Leaving Certificate level during the 1980s and early 1990s, rates of Leaving Certificate completion have plateaued since the mid-1990s, with just under a fifth of young people leaving school without senior cycle qualifications[78] (Figure 18.3).

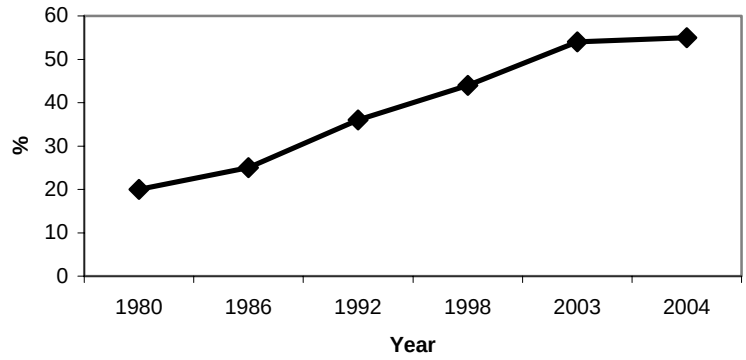
Figure 18.3: Qualification Level of School Leavers 1980-2004



Source: Gorby *et al.*, 2006.

[78] Even allowing for participation in post-school apprenticeships, 17 per cent of young men and 15 per cent of young women are not on routes leading to senior cycle qualifications, a higher proportion than in several other European countries (see Appendix 4).

Figure 18.4: Admission Rates to Higher Education, 1980-2004



Source: O'Connell *et al.*, 2006, Table 5.1.

Rates of admission to higher education have increased dramatically from 36 per cent in 1992 to 55 per cent in 2004 (Figure 18.4). Indeed there is nothing to suggest that declining population numbers in the higher teenage years has led to any decline in the numbers attending third level education. The absolute number of full-time students increased by almost 12 per cent between 1999/00 and 2002/03 and that of part-time students by 10 per cent. It should be recognised that part-time students are an important component of higher education, representing about 21 per cent of all students in higher education. While young people from professional, employer and managerial backgrounds continue to be over-represented in higher education, the expansion in enrolments has facilitated some improvement in third-level participation among young people from working-class backgrounds (O'Connell *et al.*, 2006).

Enrolment at tertiary level has almost tripled form 37,000 in 1979/80 to 134,000 in 2003/4. Notwithstanding the scale of expansion of the sector the demand for graduates continues to be strong. Graduate employment prospects have remained buoyant as evidenced by the *Annual First Destinations Surveys* published by the HEA and private returns to higher education continue to be strong (OECD, 2005a).

Table 18.1: Number of Students Enrolled in Third Level Courses in Institutions (aided by the Department of Education)

	1999/00	2002/03	% change
Full-time	115,696	129,283	11.7
Part-time	31,469	34,680	10.2
Total	147,165	163,963	11.4

Source: www.hea.ie

As well as changes in demographic patterns and rates of educational participation, recent years have seen increasing diversity within the educational system. There has been some movement from a culturally homogenous society to a more culturally diverse

one, with increasing numbers of people with non-Irish nationality living in Ireland. Diversity is also evident in terms of the 'ability' mix of students within schools. There has been a decline in the number of pupils attending special schools since the 1990s with a greater policy emphasis on inclusion. However, little is known about the consequences of increasing diversity at the school level in terms of resource requirements and day-to-day teaching and learning.

Table 18.2: Public Expenditure on Education, Ireland and Selected Countries, 2002

	Ireland	Finland	Netherlands	UK	OECD
Per Capita Expenditure in US Dollars					
Primary	4,180	5,087	5,558	5,150	5,313
Secondary	5,725	7,120	6,823	6,505	7,002
Tertiary	9,809	11,768	13,101	11,882	10,655
Total Public Expenditure, All Levels, as % of GDP	4.4%	6.4%	5.1%	5.3%	5.4%

Source: OECD (2005a), *Education at a Glance*: OECD Indicators, 2005.
Note: Using Purchasing Power Priorities for GDP.

Table 18.2 shows comparative data on public expenditure on education for Ireland, selected other countries, and the OECD average. On a per capita basis, and expressed in US dollars and adjusted for purchasing power parities, Irish expenditures in 2002 fell short of expenditures elsewhere, and the gap was particularly large in respect of primary and secondary expenditure. The ratio of educational expenditure to GDP was also lower than the OECD average, and lower than any other country reported in Table 18.2. Indeed, by this measure, Ireland ranks 25th out of 28 OECD countries in the share of GDP devoted to public educational expenditure. If the ratio is adjusted for the GNP/GDP gap in Ireland, then this would bring Ireland closer to the OECD average, but Irish spending remains lower than in other advanced societies.

Expenditure on higher education in Ireland in 2002 was closer to the average OECD expenditure per capita, although, well below the leading countries. Higher education has expanded dramatically in recent years: enrolment at tertiary level has almost tripled from 37,000 in 1979/80 to 134,000 in 2003/4.

Graduates from third level earn a substantial premium over those with lower qualifications (OECD, 2005a). There is some evidence to suggest that the return to third level, compared to no qualifications may have declined somewhat (from about 100 per cent in 1994 to about 80 per cent in 2000), but these returns nevertheless remain significant (Barrett, Fitz Gerald and Nolan (2002) and the discussion in Chapter 2). The evidence also suggests that investment in human capital over the 1990s increased the supply of skilled labour sufficiently to dampen high-skilled wage

inflation (Bergin and Kearney, 2004). The investment thus contributed both to competitiveness as well as to reduced earnings dispersion, and thus to equality and social inclusion objectives.

If Ireland is to achieve further economic growth, enhanced productivity and competitiveness, and social progress, it will need to match its leading competitor countries in terms of both investment in as well as outcomes from, tertiary education. As such the recent increases in expenditure announced in the 2006 Budget, as well as initiatives to support institutional reform at third level are to be welcomed. The available evidence thus points to a strong economic case for investment in higher education

CONTINUING EDUCATION AND TRAINING

In discussing continuing vocational education and training (CET) it is useful to distinguish between training for those in employment versus training to assist the unemployed.

CET for Employed Persons

O'Connell (2005) shows that expenditure on education and training of employed persons by public providers and bodies amounted to about €173 million and supported the training of about 260,000 workers in 2003. About €124 million of this was accounted for by apprenticeship training of about 27,000 young entrants to designated trades. This would suggest that outside of apprenticeship programmes, which should, in any event, be classified as Initial Vocational Education and Training (IVET), State funding to support the training of persons in employment – in the region of about €49 million in 2003 – is on a very modest scale. In addition, there was public expenditure of about €41 million on part-time enrolments at third-level institutions. While no direct correlation exists between part-time enrolments and labour market status, approximately 90 per cent of part-time students are also in employment.

Total expenditure by employers on training costs is estimated to have been in the region of €1 billion in 2003. This figure includes both the direct costs of training, including tuition fees, and the wage costs of employees while engaged in training. Of about €45 million paid in private fee expenditure, some of this amount is already included in the €1 billion expenditure from employers, where employers pay for, or subsidise, part-time study at third-level institutions.

Public Expenditure on Assisting Unemployed Individuals

State expenditure on training to assist unemployed individuals secure work accounted for about €270 million in 2003. Some proportion of these programmes may, of course, also be regarded as contributing to the productive capacity of the economy as well as the employability of their participants. Programmes targeted at the unemployed encompass a far wider range of measures than is

captured by the training data above. NESF (2006) shows that about €1 billion is spent per annum on the active labour market interventions, employment and social inclusion mainly aimed at helping people into work. Nonetheless, State investment in CVET is modest, particularly so in respect of training of employed workers. Table 18.3 shows comparative data on participation in non-formal learning, which mainly encompasses learning outside of the mainstream educational system.

Table 18.3: Participation Rate in Non-formal Learning by Employed and Unemployed in Last 12 Months, 25-64 Year Age Group, 2003, Selected Countries

	Employed	Unemployed
	%	%
Greece	6	7
Hungary	6	5
Italy	7	2
Portugal	11	9
Spain	12	16
Netherlands	13	9
Poland	15	4
Germany	16	12
Czech Republic	17	6
Ireland	17	12
EU-25	21	14
France	25	20
Cyprus	25	13
Belgium	26	13
Slovakia	29	7
Austria	30	25
United Kingdom	42	26
Finland	50	25
Denmark	53	41
Sweden	53	24

Source: Ireland: Derived from CSO *Quarterly National Household Survey, 2003* Q2, Module on Life-long Learning, micro data. All other countries: Fox (2003).

In Ireland about 17 per cent of the employed participated in non-formal training in the previous twelve months., compared with an average of 21 per cent across the EU-25, and well below Denmark, Sweden and Finland, where over 50 per cent of employees participated. In most countries, participation in non-formal training is higher among the employed than the unemployed. In Ireland, 12 per cent of the unemployed indicated that they had participated in non-formal training, compared to 14 per cent across the EU-25 as a whole, and, again, well behind the leading countries, that included Denmark, Finland Sweden and the United Kingdom.

18.4 Investment Priorities

In general our recommendations on investment in human capital are guided by the widely acknowledged importance of such investment and by the evidence that such investment, where appropriate, pays dividends to both individuals and to the economy. Investment priorities for the post-2006 period should be consistent with the needs of a rapidly growing economy seeking to increase productivity as well as to promote equity and social inclusion. In general the priorities for human resources investment relate to:

- Meeting the skill needs of the economy.
- Achieving equity of access to education.
- Reduction of early school leaving.
- To support the development of a knowledge and innovation based economy, production of a strong stream of well-educated graduates from higher education and development of a strong research capacity, linked to the needs of enterprise and public policy.
- Promoting lifelong learning for both the employed and unemployed.

These priorities are consistent with the Lisbon Agenda and with the priorities of the National Reform Programme (Department of Enterprise, Trade and Employment) and the high level objectives in education identified by the Department of Education and Science. In summary the strategic objectives by level are as follows:

EARLY-CHILDHOOD EDUCATION

- Most studies indicate that early childhood education brings enduring benefits in terms of better school outcomes and enhanced social skills in later life. However, Ireland is below average and lags well behind the leading countries in the proportion of 3-5 year olds in pre-primary education (OECD, 2004; Goodman and Sianesi, 2005).

PRIMARY EDUCATION

- Investment in physical infrastructure is needed to raise standards.
- Investment in programmes to counter social disadvantage and poor educational achievement is needed to prevent school failure and dropout which has a high social return (see Morgenroth, 1999).

SECONDARY EDUCATION

- Currently just under one-fifth of young people leave school without having completed the upper secondary cycle, as discussed below. This is an unacceptable wastage of human resources and it should become a core objective of the

second-level system that every student should complete either a Leaving Certificate or its equivalent (NESF, 2006).

HIGHER EDUCATION

- Investment in higher education is essential to support the development of an economy based on learning and innovation. The two priorities in higher education are (1) to maintain a strong stream of well educated graduates to fill technical and managerial positions in the labour market; and (2) to support the growth of research in higher education institutes, with strong linkages to the private sector. These priorities are reflected in the commitment of greater resources to higher education and in developing the research infrastructure and in providing ongoing support for research.
- An additional complementary priority, and one that is a core component of national objectives is to widen access to higher education. This includes not only those from disadvantaged socio-economic backgrounds, but also mature students and students with disabilities. Some progress has been achieved in respect of the former two in recent years, but there has been much less progress in improving access for students with disabilities.

CONTINUING EDUCATION AND TRAINING

- Ireland falls well below the leading countries in investment in the ongoing training of employed workers. This, combined with the decline in the new entrants to the labour force, suggests the need for increased investment in continuing education and training. There is a strong argument for targeting public investment in continuing education and training towards the lower skilled, because they are less likely to participate on the basis of their own resources, and upgrading the skills of the low skilled has the potential to meet skill shortages. Training of individuals with greater endowments of human capital is more likely to be funded by their employers, particularly where the returns to such training, both to employers and employees, may be more apparent.

With low unemployment, many of those who experience difficulties in finding employment, particularly the long-term unemployed, suffer a range of diverse difficulties. Programmes to assist their reintegration to the labour market need to be intensive, client centred, and effective (NESF, 2006).

At both primary and secondary levels, a major priority remains the needs of those children who are currently being failed by the system. Their difficulties are multi-faceted and while the outcome is educational failure and/or dropout, the answers to the problem are

not to be found within the educational system alone. It will be important to integrate measures to address educational disadvantage with other measures to counter poverty and social exclusion (see Chapter 9). Within the education system, there is also a strong rationale for the expansion of pre-school and early childhood education for disadvantaged groups (see Chapter 22). At second-level, a key objective should be the 20 per cent of school leavers who leave without having completed the Leaving Certificate. In both sectors, also, it will become essential to devote more resources to meeting the needs of pupils with physical and learning disabilities.

A newly emerging priority, deriving from the success of the Celtic Tiger and the associated immigration of new workers and their families, is the increase in national, ethnic, cultural and religious diversity in Irish schools. Such diversity is directly related to economic success, and is to be welcomed in its own right, but it does require additional resources to ensure that the 'New Irish' children are successfully integrated into Irish society, into the educational system, and, eventually, the labour market.

In higher education, the key strategic objectives are meeting the skill needs of the economy and widening participation in higher education to groups that have heretofore been under-represented. Participation rates have increased strongly in recent years, and while Ireland is about average in terms of participation rates in higher education, it falls behind some of the leading, high-skills high-productivity countries that we may wish to emulate. While it should be acknowledged that substantial numbers of young Irish people go abroad to take up higher educational opportunities, mainly in the UK, little is known about the return migration patterns of such students. However, to the extent that they remain abroad they represent a loss of talent to the Irish economy and society.

Investment at third level needs to promote the continued production of a strong steam of well-educated graduates to take up positions in science, technology, management, the caring professions, and in the formation and implementation of public policy. Investment is also needed to support the expansion of post-graduate education to underpin increased research activity in key strategic areas – the expansion of the so-called "Fourth Level" of education and research. Increased investment also needs to be accompanied by institutional reforms to enhance both teaching and research in order to maximise the effectiveness of the sector and its responsiveness to economic and social needs.

Accepting that substantial additional investments are required in the tertiary sector to serve national efficiency and equity goals, the question then becomes one of where those resources are to come from. Further investment in higher education should be framed in a context where it is well established that the private returns to higher education are high. This provides a strong argument for some sharing of the burden of the cost of higher education through the re-introduction of fees. A recent OECD report (2006) argues that the re-introduction of fees would also have additional benefits in

terms of efficiency and responsiveness of institutions to their stakeholders.

EDUCATION

Capital Expenditure

Primary and second-level infrastructure development focuses on new build and refurbishment. Given demographic trends and the need to upgrade existing facilities, investment in infrastructure at both primary and second-levels will be required. The framework for investment decisions should incorporate the following criteria:

- Infrastructural development should be responsive to the regional and local demographic trends and should be linked with land-use planning under the National Spatial Strategy and the Regional Planning Guidelines;
- Developers of new residential developments should be required to provide serviced sites and possibly school buildings as part of integrated residential development schemes;
- Standardisation of design, design and build contracts, and bundling of projects will help in maximising value for money.

Current Expenditure

Evidence from other countries has indicated that the provision of high quality early childhood education targeted at disadvantaged groups has positive consequences for young people's retention within the educational system as well as their longer-term life-chances. Investment in early childhood education has been assessed to be cost-effective; each dollar spent on one intervention in the US (the High/Scope Perry Program) yielded savings in public expenditure of $12.9 per participant, due to higher employment rates, lower welfare dependency and lower crime rates among programme participants (Belfield, *et al.*, 2006). Currently, participation in pre-school education in Ireland is low by European standards and the Early Start Programme (targeted at children from disadvantaged backgrounds) covers just 3 per cent of the cohort entering junior infant classes in primary schools. The new *Delivering Equality of Opportunity in Schools Programme* (DEIS) allows for support for early childhood education in the schools serving the most disadvantaged communities. However, there is a strong rationale for the expansion of pre-school provision for disadvantaged groups beyond current and proposed levels, given its likely contribution to lower rates of educational underperformance and early school leaving. Such provision should be subject to on-going monitoring and evaluation to ensure it achieves these objectives. This monitoring should take account of the quality framework being developed by the Centre for Early Childhood Development and Education and the curriculum framework for early childhood

education developed by the National Council for Curriculum and Assessment.

Expenditure per student on primary and second-level education in Ireland remains below the OECD average (OECD, 2005a). Due to demographic trends, even maintaining the status quo in provision will require additional resources, especially at primary level, over the time frame of the Plan. However, there is a case for additional targeted expenditure on certain key areas over and above that required by increasing numbers of pupils. Targeting additional resources on schools serving disadvantaged communities has been a feature of educational policy since the 1990s. Such an approach has a strong rationale given that examination performance is lower, and rates of early school leaving higher, in schools with a sizeable concentration of students from disadvantaged backgrounds (Smyth, 1999; McCoy *et al.*, 2006). Furthermore, there is a persistent significant gap between designated disadvantaged and non-disadvantaged schools in the reading scores of their pupils (Eivers *et al.*, 2005). The new DEIS initiative proposes to change the nature of resource allocation to schools serving disadvantaged communities. The intention to integrate previously fragmented initiatives under one umbrella is to be welcomed.

To date educational interventions for disadvantaged students have varied in the criteria used to target schools and/or students and have fallen under the jurisdiction of a range of agencies. The increase in the allocation to designated schools is likely to help to bridge the gap between the resources of schools serving disadvantaged communities and those of other schools. However, not all young people from disadvantaged backgrounds attend designated disadvantaged schools. The *Giving Children an Even Break* initiative had established the principle of providing more gradated support for schools catering for different levels of disadvantage. However, second-level students not attending designated disadvantaged schools do not receive any extra assistance at present. It is recommended that, in addition to the additional funding targeted on schools serving the greatest concentration of disadvantage through the DEIS initiative, funding should be provided for schools with somewhat lower levels of disadvantage on a gradated basis; this would be analogous to the approach taken by *Giving Children an Even Break* at primary level.

The DEIS initiative proposes to secure maximum class sizes of 20 in the junior classes of the 180 primary schools with the highest concentration of disadvantage, while maintaining existing maximum class sizes for schools previously involved in the schemes for designated disadvantaged primary schools. This maximum represents an increase over that adopted for the *Breaking the Cycle* scheme (15) and is higher than the threshold specified as securing benefits in international studies. While the further reduction in maximum class sizes for the senior classes (to 24 in the schools serving the most disadvantaged communities) is to be welcomed, international research has indicated that the benefits of smaller class sizes accrue to children who are allocated to classes with fewer than

17 pupils over a sustained period of time.[79] It is recommended that additional funding be allocated in order to bring the maximum class size for junior years to 15 in order to maximise the learning of children at this crucial stage of their engagement with the school system.

The targeting of expenditure at schools serving disadvantaged communities and the reduction in class sizes are only likely to be successful in so far as they are underpinned by measures to improve student educational progress and retention more generally, a perspective that is taken on board in the DEIS policy document (Department of Education and Science, 2005c). Measures to promote literacy and numeracy are a key priority, given how fundamental these basic skills are to later educational attainment and even adult life-chances. Such measures should take account of international best practice and schools should take advantage of any reduction in class sizes to focus on the development of appropriate pedagogical practices. These literacy/numeracy measures should be underpinned by learning support provision for those students who experience particular difficulties. The adequacy of the level of learning support and resource teaching, in the light of recent changes in the basis for teacher allocation to schools, should be monitored on an on-going basis.

There would appear to be considerable potential to achieve a further reduction in the prevalence of early school leaving, which is especially important given the significance of Leaving Certificate qualifications for early labour market transitions and later adult life-chances (see Gorby *et al.*, 2006). Despite a range of interventions to tackle educational disadvantage, rates of early school leaving have plateaued since the mid-1990s. Given that upper secondary completion levels are higher in a number of other European countries (principally, the Nordic countries and those with a 'dual system' of apprenticeship and education combined), it would seem feasible to increase senior cycle completion in the Irish context. Early school leaving has been found to reflect a cumulative process of educational underperformance, poor attendance and disengagement from school. High quality early childhood education along with literacy/numeracy measures within primary school (and beyond) should help to increase student retention. It is crucial, however, that such provision be supported by a positive school climate. Early school leaving is found to be higher where students have a negative experience of school and little sense of ownership over school life. School development planning should facilitate the development of more positive relations between teachers and students and higher teacher expectations within the school along with promoting measures to increase student and parental involvement (NESF, 2005). It is, therefore, recommended that an additional €3.5 million per annum be allocated for school

[79] Finn *et al.* (2001) indicated a gain in reading achievement of almost six months for children assigned to classes with 13-17 pupils, compared with those in classes of 22-26 pupils, for a period of three years.

development planning specifically to address issues of student engagement and retention. Student engagement could also be facilitated by allowing greater student choice over curriculum components, a variety of assessment methods, more active teaching methods and a better balance of knowledge and skills, as envisaged by the NCCA (2005) proposals for reform of the senior cycle curriculum.

The development of Post Leaving Certificate (PLCs) programmes has been one of the success stories of the Irish education system in recent decades. PLCs provide vocational training for a substantial proportion of young people who do not progress from second-level to higher education, and has become an increasingly important provider of second-chance education for mature students. It also plays a vital role in delivering relevant skills to the labour market. On this basis, State funding for this sector should be maintained. It is, however, the case that most PLC provision is delivered within second-level organisational structures and the teaching workload is comparable to that on traditional second-level courses. The McIver Report (2003) indicated the need for organisational and staffing changes in order to promote planning, flexibility and programme development within the PLC sector. Consideration should, therefore, be given to reforming organisational arrangements to ensure that PLCs have the organisational independence and flexibility appropriate to fulfilling their mission.

Higher Education

Recent years have seen significant increases in participation in higher education, and the most recent evidence suggests that the increased participation levels have been associated with a reduction of some of the most glaring socio-economic inequalities in access. A key priority in higher education is retention. Attrition rates in certain fields, particularly science, engineering and computing are known to be high, with the result that investment in these key areas may be wasted. It is possible that dropout from higher education may be related to socio-economic background, but there is as yet, a shortage of evidence on this point. High dropout rates also raise concerns about educational preparedness for higher education. More research is urgently needed on this.

There is a commitment to a very substantial increase in funding for higher education, particularly to expand the number of those engaged in advanced postgraduate ("fourth level") education to support a greatly enhanced research effort in higher education. This will require building capacity to provide high quality postgraduate programmes. Whether this is the most cost effective approach to generating a highly skilled scientific elite needs to be carefully examined in relation to each area of study: for some areas it may be more appropriate to provide support for Irish students to study at leading international research centres, and then, of course encourage them to return. A vibrant postgraduate education and research system also needs the infusion of new talent from abroad,

so attracting foreign students to undertake postgraduate studies at emerging centres of excellence in Ireland should also be an important element of this sector for tertiary education. Funding criteria should also cover the important relationship between Ph.D. programmes and research and the rest of the higher education sector.

It is well established that the third-level sector is in need of substantial further resources (OECD, 2005a; HEA, 2004), and this has been recognised in the increased provision in the latest Budget. It is also well established that the private returns to higher education are positive and high. This suggests that students should, and would, make a contribution to their tertiary education and, as argued above, there is a strong case for a review of free fees. Resource needs in the sector are such that fee income should be additional to, rather than substitute for, public investment. While this suggestion may not be particularly feasible at this point in time, it may be possible to review the issue over the long term. Introducing a charge for participation in tertiary education would also require some reforms to the current system of grant-aiding students from lower income backgrounds. The OECD review suggests that a loan system has substantial merits and, as such, would be worth further investigation.

It would also be important not to lose sight of the importance of the need to upgrade the quality of education at primary and secondary levels, as discussed above. Access to higher education rests on the experience of the primary and secondary sectors: high standards at earlier levels provide a good basis for learning at tertiary level, and maximising the proportion of the cohort that completes upper secondary education can improve equality of access to higher education.

TRAINING

Training of the Unemployed

Unemployment rates in Ireland have remained below 5 per cent for the past five years or more. In this respect the current situation differs markedly from that in the 1990s, when the unemployment problem was dominated by long-term unemployment. Labour market polices, informed by the European Employment Strategy, emphasise the importance of measures to prevent the drift to long-term unemployment. This strategy requires targeting of effective measures with strong linkages to the labour market to those at risk of becoming long-term unemployed.

At the same time there is a need to provide measures to enhance the employability of those who, for whatever reason, remain long-term unemployed. This is now a comparatively small group. At the end of 2005 the number long-term unemployed was 27,600, representing 1.3 per cent of the labour force. This represents a very substantial decline in long-term unemployment (which was about 9 per cent in the mid-1990s) although in the current tight labour

market, the long-term unemployed are likely to suffer particularly severe labour market disadvantage, requiring particularly strenuous interventions.

A recent NESF report calls for a radical reform of the range of training, education and employment measures to ensure that spending is responsive to current labour market conditions rather than those pertaining in the early 1990s. This could be employed as a framework to guide future investment on behalf of the unemployed. Measures to assist two groups in particular should be prioritised: early school leavers experiencing difficulties in accessing employment and the long-term unemployed. In relation to both priority target groups, the decline in numbers should allow more intensive interventions. The effectiveness of measures to assist new entrants to unemployment would be greatly enhanced if the means of identifying those most at risk of drifting into long-term unemployment could be identified early. A recent study suggests that investing in some form of profiling system to identify 'hard to place' clients could enhance effectiveness, reduce unemployment durations and generate savings in unemployment related social welfare payments (Layte and O'Connell, 2005).

Continuing Vocational Education and Training of Those at Work (CVET)

We have noted above that the lion's share of investment in vocational education and training is borne by employers and that the State contribution to CVET is modest. The returns to CVET are mostly private: training is believed to enhance productivity and organisational performance, and in turn leads to higher corporate profitability and employee earnings. As such, it is appropriate that the private sector accept the principal responsibility for investment in training.

However, there are market failures in the provision of CVET, resulting in under-investment in CVET. This under-investment particularly concerns low-skilled workers, older workers, and those working in small and medium-sized enterprises. A strong case can be made for State intervention to counteract market failures and to provide support for particular targeted groups where investment in CVET would otherwise be sub-optimal.

Recent proposals in this field, from a range of sources, including the report of the Enterprise Strategy Group, the Irish Congress of Trade Unions, and FÁS, are in broad agreement on the need to provide training opportunities to allow low-skilled young people to upgrade their educational attainment. Some such proposals have included study leave supported by the State at minimum wage levels, perhaps with an employer top-up, a proposal that merits serious consideration. The potential for such initiatives is enhanced by the development of the *National Framework of Qualifications*.

In this context, consideration should also be given to equivalising the situation applying to fees for part-time versus full-time third-level students. This would entail either charging fees for full-time students, or extending free fees to part-time students at

higher education (or a fee rebate on completion of a course) for those taking occupationally relevant part-time courses, for the first time, in further or higher education. NESF (2006) argue that such a proposal would be consistent with the idea of a one-step-up approach to helping workers attain higher qualifications, and it would also have an equitable dimension in benefiting those with lower levels of qualification. On balance, however, charging fees to all students, irrespective of whether they are full- or part-time, appears more appropriate in the light of the private returns to higher education.

More generally, both types of intervention to boost qualification levels of those with lower levels of educational attainment, would be consistent with the Lisbon Agenda and would help to meet Ireland's commitments under the *European Employment Strategy*, an issue that has been raised repeatedly in the *Employment Guidelines* in the related *Recommendations from the European Commission* in recent years.

Inward migration has been a significant component of labour force growth in recent years. Given growth forecasts this is likely to continue. Immigration from the new accession States is expected to continue to be an important component of inward migration. There is evidence to suggest that many immigrants are working below their levels of qualification (Barrett *et al.*, 2006). Provision of language training could assist in the integration of new immigrants as well as facilitate their employment in occupations commensurate with their qualifications. This would ensure that available human capital would be more fully utilised, essential in an economy suffering labour and skill shortages, and could also contribute to social inclusion objectives.

Table 18.4: Summary of Investment Priorities in Human Capital

Sector	Recommendation
Primary	
Capital Infrastructure	Increase, with value for money
Early childhood education	Increase
Disadvantaged Schools	Increase + target
Literacy and Numeracy	Increase + target
Integration of diverse ethnic groups	Increase
Second-Level	
Capital Infrastructure	Increase, with value for money
Disadvantaged Schools	Increase + target
Literacy and Numeracy	Increase + target
Integration of diverse ethnic groups	Increase
School Development and Planning	Increase
Post Leaving Cert Programmes	
Funding	Maintain
Structures	Reform
Third Level	
Infrastructure	Increase
Current	Increase
	Improve retention
	Maximise 3rd- 4th level linkages
Continuing Education and Training	
Unemployed	Maintain, but target to high risk groups
Employed	Increase
	Target low-skilled

Table 18.4 above provides a summary of recommendations relating to investments in human capital. More detailed recommendations, as well as the underlying rationale will be found in Table 18.5 below, and in the text.

Table 18.5: Investment Priorities in Human Capital

	Current NDP 2004 € million	2007-13 Average € million	Comment
Education			
Early childhood	2.0	45.3	1/3 of €136 proposed by NESF report.
Disadvantaged Schools	24.7	155.0	Incorporates existing expenditure under current NDP + DEIS initiative + ESRI recommendation for graduated support at 2nd level + reduction in class sizes in targeted schools.
Literacy & Numeracy	3.6	10.0	Increase.
Integration of Diverse Ethnic Groups	1.5	8.0	Extend to all school and all non-English speaking children.
School Development Planning		3.5	Improve school organisation to achieve retention goals.
School Guidance	30.0	40.0	Guidance is important for progression.
Modern Languages	3.0	3.0	Maintain.
3rd Level Access	36.0	72.0	Increase to achieve access agenda.
LLL Back to Education	95.0	45.0	This is part of wider PLC etc provision, difficulty meeting throughput targets in NDP, so budget not fully spent. Structures need reform.
Third level	347.0	300.0	Vocationally oriented courses - market incentives already positive.
Strategic Innovation Fund		50.0	Enhance capacity of 3rd level sector & increase post-graduate output for '4th level'.
ET System Development	40.0	40.0	Maintain (Qualifications framework, training of trainers etc.).
Equality	3.8	3.8	Maintain and allow for equality proofing of NDP measures.
Capital Infrastructure – 1st Level	277.0	315.0	Increase to meet demographic needs.
Capital Infrastructure – 2nd Level	229.0	229.0	Maintain to meet demographic and needs and quality enhancement.
Capital Infrastructure – 3rd Level	70.1	150.0	Increase, demography + investment in postgraduate at '4th level'.
Continuing Education/Training Unemployed			
Early School Leavers	95.0	100.0	Maintain, target effective programmes.
Activation & training unemployed	667.4	600.0	Unemployment is low, so reduce, but target effective programmes at those most in need.
Sectoral Entry Training	50.6	50.6	Maintain, but target effective programmes (includes early school leavers).
Employed			
Apprenticeship	207.5	207.5	Maintain but avoid training too many in construction industry.
Ongoing sectoral training	21.8	15.0	This is mainly in contracting sectors.
In-company training	43.5	30.0	Hard to spend in current NDP - divert funding to 'One Step Up' (see below).
Disabilities	60.5	70.0	Needed to respond to policy developments
Adult Literacy & Lifelong Learn	20.0	20.0	Important area but needs strategic plan & integration with other initiatives.
Social Economy	42.0	20.0	
One Step Up training		75.0	ESG Proposal for training of low skilled workers.
	2,411.0	2,697.7	

18.5 Supporting Measures

There are a number of supporting measures that would enhance the impact of existing investment in human capital.

RECOGNITION OF PLC QUALIFICATIONS IN PROGRESSION TO HIGHER EDUCATION

At present qualifications earned in Post Leaving Certificate courses are not evenly recognised and accepted for progression throughout the higher education system. This represents an unjustifiable barrier to skills enhancement and progression and is at odds with the principles underlying the development of the National Framework of Qualifications. All third-level institutions not already doing so should be encouraged to develop systems to recognise such qualifications.

RECOGNITION OF SKILLS OF IMMIGRANTS

Anecdotal evidence from diverse sources suggests that immigrants to Ireland experience difficulties in having their educational credentials recognised by Irish employers and educational institutions. The available empirical evidence does suggest that many immigrants work below their levels of qualification (Barrett, et al., 2006). To the extent that this occurs it has the potential to waste available human resources and may contribute to social exclusion. Further research is needed to examine the extent of the problem and to ascertain how systems can be developed to facilitate the recognition of educational qualifications and skills by educational institutions and employers.

DEVELOPMENT OF INFORMATION DATABASE ON CONTINUING EDUCATION AND TRAINING

Key decision makers in CET, including policymakers, employers and employees all face significant information deficits with respect to a series of key questions:

- What, if any, CVET is needed? Individuals are often not well informed about what training they need. Employers may also have difficulty and this is a particular problem for small enterprises.
- What CVET is available, what is the cost and quality? Individuals also encounter difficulties in assessing which training providers are best and best value. Employers face the same information deficit, and the problem is particularly severe for small enterprises – large enterprises may be better placed to survey the training market.
- What are the returns to investment in CVET? Individuals typically have, at best a rough sense that CVET may be useful and lead to better career prospects, but without any precision. Employers also encounter severe difficulties in assessing the returns to training. Many employers rely on subjective evaluations by trainees on the quality of training

received, but this does not generate useful information on the impact of investment in training on corporate performance – productivity, market share, quality or profitability. States also have difficulty in establishing in a rigorous manner returns to investment in training.

- An effective and appropriate State intervention would help solve these information gaps confronting all key actors in the field. This would entail provision and dissemination of information for employers and employees on levels of skills and competences by sector and occupation, as well as on the cost and quality of training provision. It could also entail investment in research to rigorously assess the returns to training for employers and employees.

19. RESEARCH AND DEVELOPMENT

19.1 Benchmarking Ireland's R&D Performance

Compared to other expenditure items within the current NDP, public spending on R&D is relatively small, accounting for around 3.0 per cent of NDP spending. As was shown in Chapter 2, in economic development terms R&D investments, and their commercial counterpart, innovation, play a central role in the process of wealth creation. At EU level this has been recognised in the EU Lisbon Agenda and in Ireland expenditure has increased rapidly in recent years to address historic under-investment. In considering R&D, however, it is important to recognise that R&D investments are not homogenous, and that different types of investment – undertaken by different types of organisations – have very different economic outcomes. A recent study by Guellec and Van Pottlesberghe (2004), for example which includes Ireland and fifteen other OECD countries emphasises the importance of business, foreign and public R&D for productivity growth. Importantly from an Irish perspective Guellec and Van Pottlesberghe (2004) find the largest productivity effects from foreign R&D followed by public R&D, which includes R&D by public bodies and universities, and then business R&D.[80] They conclude that: "The social return on business R&D is therefore much greater than the 'normal social return'…The long-term impact of R&D seems to be higher when it is performed by the public sector than by the business sector, probably because the former concentrates more on basic research, which is known to generate a higher social return" (p. 366).[81]

Guellec and Van Pottlesberghe's study focuses on the strength of the macroeconomic linkages between types of R&D and productivity. Different types of R&D influence innovation and productivity through very different mechanisms, however. Public support for Higher Education Expenditure on R&D (HERD) or Gross Expenditure on R&D (GERD), for example, will generate positive direct expenditure effects, but will also have much more important dynamic effects by generating exploitable knowledge. This exploitation might operate through direct channels such as

[80] They estimated a Multi-Factor Productivity (MFP) elasticity of 0.45, 0.17 and 0.13 for foreign, public and business R&D respectively.

[81] Other studies have, however, suggested more modest productivity gains from R&D and differential patterns of effects between public and private sector R&D investments (e.g. OECD, 2003).

spin-outs, license agreements, consultancy by universities etc., or indirect through enhancing the skills of research students or through knowledge spillovers. For any given level of R&D spending, the productivity effect of public investments in higher education R&D will, therefore, depend on the effectiveness of universities' technology transfer activities and recipient firms' ability to absorb and exploit new technologies. Locality may also be important, here, as recent research studies have emphasised the greater effect on innovation when firms are closest to R&D performing universities – a type of clustering effect.[82]

Similarly, public support for Business Expenditure on R&D (BERD) may encourage private sector investments by addressing market failures associated with incomplete information or lack of suitable finance for innovation. Direct, private benefits – i.e. to the R&D performing company – will depend on the degree of additionality in the support provided, firm's innovation capability and its ability to exploit any innovation introduced. Indirect, public or social benefits arise when the R&D or innovation generate either 'rent spillovers' or 'pure knowledge spillovers'. Rent spillovers occur through supply chain links, where quality improvements by a supplier are not fully translated into higher prices for the buyer(s). Productivity gains are then recorded in a different firm or industry than the one that generated the productivity gains in the first place (Beugelsdijck and Cornet, (2001, p. 3). Pure knowledge spillovers, on the other hand, occur when a firm "…investing in research or technology development will end up facilitating other agents" innovation efforts…" (Breschi and Lissoni, 2001, p. 975).[83] In each case, however, the ability to realise spillovers will depend on donor firms' ability and willingness to share knowledge, the degree of 'connectivity' between firms, and recipient firms' absorptive capacity.

This discussion is important, in the context of the aspiration that "….by 2010 Ireland will be internationally renowned for the excellence of its research and be at the forefront in generating and using new knowledge for economic and social progress, within an innovation driven culture…" (Forfás, 2004, p. 2). In particular, it emphasises the importance of substantial and consistent investments in higher education or Government R&D in order to generate a stock of commercialisable new knowledge, as well as a flow of trained researchers. Second, it emphasises the need for Irish firms to have a high level of absorptive capacity to enable them to take advantage of the new knowledge being developed in Irish universities, and to absorb and use knowledge developed elsewhere. This absorptive capacity is strongly related to firms' own R&D investments, with numerous studies suggesting the importance of

[82] See Anselin, Varga and Acs (1997); Zucker, Darby and Brewer (1998) and Fischer and Varga (2003).

[83] This facilitation may occur either unintentionally, as it happens when inventions are imitated, or intentionally, or as it may happen when scientists divulge the results of their research.

in-house R&D as a key element of absorptive capacity.[84] Third, it points to the importance of effective knowledge transfer both between universities and firms and between firms themselves. This will involve university knowledge transfer activities as well as reflecting the extent of both supply-chain and network activity between firms and other organisations.

So, where does Ireland stand relative to its international competitors in terms of public R&D investments, absorptive capacity etc.? In 2002, for example, Ireland's level of investment in HERD (as a proportion of GNP) was 0.31 per cent, broadly in line with that in Spain (0.31 per cent) and Greece (0.29 per cent).[85] By 2010 the aspiration outlined earlier might necessitate levels of HERD spending similar to those in Canada (currently 0.73 per cent of GDP), Finland (0.67 per cent), Denmark (0.60 per cent) and Sweden (0.83 per cent), which requires more than doubling levels of HERD investment over an eight-year period.[86] Progress to date has been impressive with the most recently available figures (for 2004) suggesting that HERD increased in real terms by 44 per cent between 2002 and 2004, reaching 0.4 per cent of GNP, and a consequent move up the OECD league table (26 countries) from 19th place in 2002 to 16th place in 2004[87] (see Table 19.1). Over the same period the number of researchers in the Higher Education sector (HE) in Ireland increased from 2,695 in 2002 to 4,152 in 2004 (Forfás, 2005c, p.3).

As Figure 19.1 indicates levels of HERD spending in Ireland, as of 2004 at least, remained marginally below the EU-25 average and significantly below that in benchmark countries such as Denmark and Finland where HERD spending has also risen markedly since 2000. Despite these increases elsewhere, levels of HERD in Ireland have actually caught-up some ground on these benchmarks. From 2000 to 2004, Irish HERD increased from 71 to 93 per cent of that in the EU-25, from 60.0 to 66.6 per cent of that in Denmark and from 44.2 to 59.7 per cent of that in Finland.

Interestingly, levels of HERD expenditure in Ireland also lag behind those in Northern Ireland and some other UK regions. In 2003, for example, the latest year for which regional figures for the UK are available, around half of UK regions, including notably Scotland at 0.7 per cent, had higher levels of HERD investment than Ireland (see Figure 19.2).

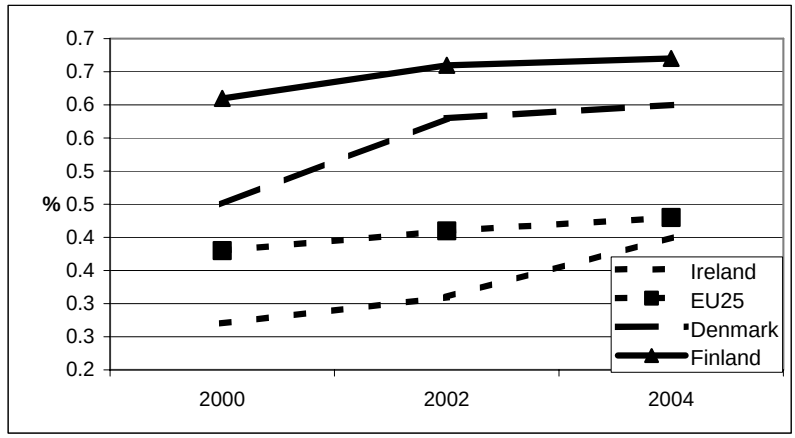
[84] See for example, Cassiman and Veugelers (2002), Zahra and George (2002) and Schmidt (2005).

[85] *Source*: Forfás, 2005c; Appendix 5, Table A5.1, p.34.

[86] Even then, however, viewed from the perspective of knowledge stocks, sustained investment at this level would be necessary if HERD is to contribute the same impetus to innovation in Ireland as in these international competitors where levels of HERD spending have been at similar levels for some years.

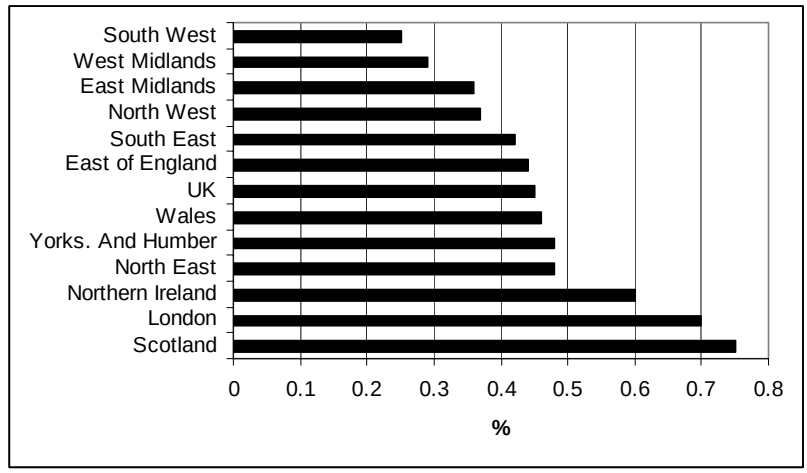
[87] *Source*: Forfás, 2005c, Appendix 5, Table A5.1, p.34.

Figure 19.1: Higher Education R&D as a Percentage of GDP or GNP: Ireland and International Benchmarks



Source: Forfás, 2005c.

Figure 19.2: HERD as a Percentage of Regional Value Added, 2003



Sources: GB regions – Research and experimental development (R&D) statistics, 2003, Economic Trends 621 August 2005, Office for National Statistics 28. Northern Ireland, NI R&D Statistics 2005, DETI.

Increases in HERD in Ireland since 2002 have been driven primarily by increases in direct Government support, primarily through, SFI, PRTLI and Enterprise Ireland, and indirect public investment (through the HEA).[88] Overall, HERD spending rose by 44 per cent from 2002 to 2004, with increases in direct Government support of 48 per cent and indirect support of 58 per cent. Notably, Irish firms' support for HERD remained static over

[88] This process of increasing direct support for HERD has continued with SFI, for example, increasing its support for HERD from €72 million in 2004 to around €121 million in 2005 (*Sources*: Forfás, 2005, p.11 and Forfás, 2005a, p.6).

the 2002 to 2004 period having previously fallen by around a quarter from a 1998 high (Forfás, 2005c).

This reflects the wider level of investment in BERD, which as of 2003, was marginally lower as a proportion of GNP in Ireland than in 1999 (see Figure 19.3). At this time levels of Irish BERD were also significantly lower than the EU average and around half those in benchmark countries such as Finland and Denmark where levels of BERD have increased significantly since 1999. This means that over the 1999 to 2003 period levels of BERD in Ireland actually fell from 91.2 to 86.6 per cent of the EU level, 72.5 to 55.4 per cent of the Danish level and from 46.8 to 40.2 of the Finnish level. The levels of absorptive capacity for new technology in Irish firms are likely to be significantly lower than in either Danish or Finnish businesses and, more worryingly, are likely to be falling increasingly behind.

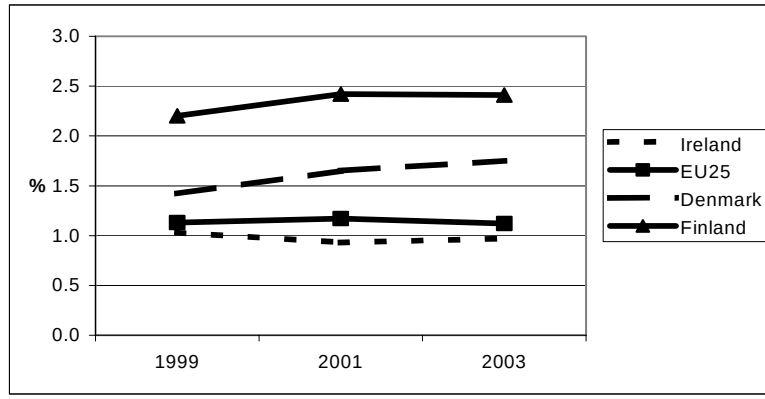
Table 19.1: R&D and Technology Indicators: Ireland and Selected Comparators

	Higher Education R&D % of GDP/GNP	Business R&D % of GDP/GNP	Technology Balance of Payments % of GDP
Ireland	0.40	0.97	-10.46
OECD	0.40	1.45	na
EU	0.43	1.12	na
Finland	0.67	2.41	0.16
Norway	0.48	0.96	0.09
Sweden	0.83	3.32	na
Denmark	0.60	1.75	0.35
UK	0.40	1.26	0.72
France	0.42	1.36	0.11
Germany	0.43	1.73	-0.05
Japan	0.43	2.32	0.19
Korea	0.27	2.01	-0.40

Notes and *Sources:* HERD and BERD figures from Forfás (2005c) and Forfás (2005b). Technology BOP as a percentage of GDP in 2003 (Denmark 1999).

Source: OECD *Science, Technology and Industry Scoreboard,* 2005.

Figure 19.3: Business R&D as a Percentage of GDP or GNP: Ireland and International Benchmarks



As well as being relatively low by international standards, BERD expenditure in Ireland has a somewhat skewed distribution with an unusually strong concentration in the high-tech sectors and foreign-owned firms. In terms of sectoral concentration, for example, 72.6 per cent of R&D spending in 2003 was concentrated in software/computer related activities, electrical and electronic engineering and pharmaceuticals compared to 42.8 per cent in EU-25 (Forfás, 2005b, p. 13). R&D activity is also very concentrated in foreign-owned firms (72.1 per cent or 252 firms) with 27.9 per cent of BERD in 873 Irish–owned businesses. This means that average R&D expenditure per Irish R&D performer was around €340,000 compared to an average of €3.1 million per foreign-owned business. Two implications follow. First, absorptive capacity in firms in Ireland is likely to be concentrated in the high-tech sectors where R&D is greatest. Second, the absorptive capacity of foreign-owned firms is on average likely to be much greater than that of Irish-owned firms.

The profile of R&D and technological activity in Ireland also stands out from other developed OECD economies in two other respects: low levels of intra-mural R&D spending by Government and its dependency on external research activity.[89] In 2004, for example, intra-mural R&D spending by Government in Ireland amounted to €138.4 million, equivalent to 0.11 per cent of GNP compared to the EU average of 0.25 per cent and an OECD average also of 0.25 per cent. This suggests, first, that historically Irish Government departments are under-spending on intra-mural R&D compared to their equivalents elsewhere to the potential detriment of effective evidence based policymaking. Second, it also means that public sector R&D in Ireland is more strongly concentrated in the higher education sector than that in many comparator economies. In terms of external dependency, Table 19.1 provides figures for the Technology Balance of Payments (TBOP) for different countries, which reflects the balance of inward and outward knowledge transfer through patents, licensing etc. Countries such as Finland and Denmark with historically higher levels of business and university R&D both have small positive TBOPs, while Ireland has a significant TBOP deficit (i.e. net inward transfer) equivalent to 10.5 per cent of GDP. While these figures have to be regarded with some caution, the message is clear: over the last decade Irish growth has relied to a massive extent on inwards technology transfer and to a lesser extent on Irish-owned technology.

The aspiration expressed by the Inter-Departmental Committee on Science Technology and Innovation (Forfás, 2004) is clearly to move away from this 'innovation by invitation' strategy and towards a 'Nordic' development model based more strongly on indigenously developed technology. Important steps towards this goal have been taken through the current NDP such as Science Foundation Ireland

[89] For a more detailed account of these comparisons see Fitz Gerald *et al.* (2003), Appendix 7.

(SFI), Programme for Research in Third Level Institutions (PRTLI) etc. In the next section we review the evidence to date on the effectiveness of these measures and identify priorities for future development. In large part, our views reflect those of the Inter-Departmental Committee on Science Technology and Innovation (Forfás, 2004), emphasising the need for a continuation of significant investment in HERD, increased support for BERD to address issues of absorptive capacity and institutional support for the Higher Education Institutes (HEIs) to develop their commercialisation activities.

19.2 Assessing Policy Effectiveness

Any assessment of policy effectiveness in terms of public R&D investments is complicated by the uncertain and highly skewed returns from different R&D projects but also because of the relatively long time scales, which attach to R&D investments, particularly those in basic research activity. In the context of Ireland, the situation is complicated further by the rapid development of public sector support institutions for higher education R&D, in particular, since 2000. New research councils, new funding streams through the Higher Education Authority (HEA) as well as Science Foundation Ireland (SFI), have all been established over this period.

While these institutional developments are positive, reflecting the developing maturity of the Irish research system, their newness means that any evaluation inevitably reflects operational outputs rather than economic outcomes. The recent International Review Panel assessment of SFI, for example (Forfás, 2005a) has much to say about research quality and bibliometric indicators but inevitably very little about the added value to the Irish economy of SFI investments. Similarly, evaluations to date have tended to be piecemeal rather than systemic in nature. The evaluations of PRTLI and SFI, for example, both acknowledge the importance of potential synergies or co-ordination between the initiatives but the assessments were undertaken separately. Operationally, this is clearly an easier approach but may fail to identify overlaps or conflicts between individual measures. In the innovation systems tradition a better approach going forward may, therefore, be a more systemic approach to evaluation, which considers the whole range of support for HERD in Ireland. For the moment, however, we can only draw on the evaluative material to date relating to supports for HERD, Business R&D (BERD), GERD and knowledge transfer activity.

SUPPORT FOR HERD

Support for HERD is driven largely by the public sector and therefore has substantial budgetary implications. Targets suggested in Forfás (2004) are that national investment in HERD and Government R&D should increase to around 0.8 per cent of GNP by 2010, which would amount to around €1.1 billion (Forfás, 2004).

As Government R&D is unlikely to increase significantly over this period relative to GDP, the majority of the increase will come through an expansion of public investments in HERD either through increases in the HEA block grant or 'direct' funding initiatives through the NDP. In 2004, 41 per cent of Government support for HERD was supported by 'direct' Government support through the NDP (primarily SFI and PRTLI) with a further 41 per cent supported by indirect support, primarily through the HEA block grant (Forfás, 2005c). Assuming a continuation of Government R&D at the current level of 0.15 per cent of GDP (Forfás, 2004, p. 25), and a maintenance of the division of Government support for HERD remained similar this would suggest NDP expenditure on HERD support of around €400 million per annum towards the end of the planning period. An additional investment of a broadly similar size would then need to be provided through the HEA as part of the block grant.

In terms of the 2000-06 NDP, the main direct supports for HERD in Ireland were:

- ***Science Foundation Ireland*** which began work in 2001 following a foresight exercise with a focus on establishing world class research capability in niche areas of ICT and bio-technology. Over the period of the NDP, 2000-06, around €650 million was committed to supporting SFI, and as of 2005: SFI had established 163 research groups led by Principal Investigators (PIs), of whom 34 were new to Ireland, and centres employ over 1,150 research staff (around a fifth of the entire research staff in Irish HEIs) and around 450 Ph.Ds. Six Centres for Science Engineering and Technology (CESTs) in core thematic areas.
- The ***Programme for Research in Third-Level Institutions*** (PRTLI), operated by the Higher Education Authority, was established in 1998 with Exchequer support and contributions from Atlantic Philanthropies to support high quality basic research in third-level institutions. The overall financial commitment over the period of the current NDP was around €698 million. Headline figures as reported by International Assessment Committee in 2004 included €135 million of new capital and €260 million for new research buildings along with 34 new academic appointments (14 professorial) as well as over 1,500 new postdoctoral or postgraduate research appointments. Other outputs include a range of new courses as well as extension of collaboration between institutions and internationally.
- Two new research councils were also established in 2000/01: ***The Irish Research Council for Science, Engineering and Technology*** (IRCSET) and the ***Irish Research Council for Humanities and Social Science***s (IRCHSS) to support postgraduate and post-doctoral research as well as providing some project based research

funding. Both research councils have annual budgets of around €10 million.

Although it is early days to be making judgements about any of these initiatives, recent evaluations have been positive about scheme outputs, and suggested the need for continuing funding in order to achieve sustained gains. An International Review Panel conducted in 2005, for example, examined the work of SFI and concluded: "impressive progress towards developing a strong research capability in biotechnology and ICT the existence of SFI funding is having a positive catalytic effect on the performance of research in its two fields". The review team argued that "SFI investments are continued and made an established part of the innovation system" (Forfás, 2005a, p. 21). Earlier an International Review Committee also concluded that "…investment in PRTLI is fully justified and should be continued the important goals of PRTLI will only be achieved if funding on a significant scale is sustained over an extended period for at least another ten years" (HEA, 2004, pp. 46-47).

A key output of both the SFI and PRTLI initiatives, supported by the research councils has been the increase in postgraduate and postdoctoral research training in Irish HEIs. Progress to date in this area has been impressive as both the review of SFI and PRTLI suggest. Continued development of skilled researchers in Irish universities, and their retention within the Irish National System of Innovation (NSI), will be necessary if national targets on both HERD and BERD are to be met. Research trained staff also play a key role in increasing the absorptive capacity of firms and provide a strong inter-personal link between firms and universities.[90] This type of personal linkage has repeatedly been shown to be an important element of knowledge transfer activity.

Notwithstanding some administrative and operational criticisms on each scheme, there are positive arguments for continued NDP support for both SFI and PRTLI.

Three clear areas for development are suggested by the evaluations, however.

It is vital to ensure that these investments in R&D activity are of maximum benefit to the Irish economy. Links to advanced postgraduate level (4th level) skills and human resource development are already relatively well developed in both measures, and provide a key rationale for continued investment in this area. Less well developed and under-resourced are measures to promote commercialisation and the exploitation of research results. Proposals to address this are discussed in more detail below.[91]

[90] In this respect it worth noting that recent research has shown a low level of interaction between businesses in Ireland and HEIs (see Jordan and O'Leary, 2005).

[91] The need for some emphasis on improved commercialisation of outputs is reinforced by evidence from the BERD survey, which suggested that the proportion of firms active in higher education collaboration has decreased from 30 per cent in 1999 to 24 per cent in 2003 (Forfás, 2005b, page 6).

It is necessary going forward to ensure the coherence and complementarity of NDP supported measures as they mature, particularly if budgets are going to be expanded. This would addresses a point made in the PRTLI evaluation, that it is difficult to understand how PRTLI integrates with the wider innovation system (HEA, 2004, p. 46).[92] There is a similar weakness of understanding of how the innovation systems of Ireland and Northern Ireland work together. Of particular importance here are the potential for identifying and exploiting synergies between policy measures, and ensuring an appropriate expenditure balance between the focused and more strategic 'world-class' research ambition of SFI and the more broadly based 'international-standard' objectives of PRTLI.

There is a need to develop a clear rationale for the prioritisation of sectoral R&D investments. Tradable services, for example, are likely to generate most new economic activity in years to come but are only weakly supported by current R&D investments under the NDP while some sectors with more limited prospects have benefited from ear-marked financial allocations.

SUPPORT FOR BUSINESS R&D

A more difficult policy challenge than that associated with higher education R&D is the need to increase through, both broadening and deepening, the level of business R&D spending in Ireland. The Inter-Departmental Group on Science, Technology and Innovation (IDGSTI) emphasises the refocusing of public support for industry on R&D, suggesting an increase in the proportion of development budgets allocated to R&D support from around 3 per cent of State-aid to match the 30-40 per cent in leading EU competitors (Forfás, 2004, p.24). The magnitude of this increase is necessary due to the scale of the expansion required in business R&D, and to the currently low level of support provided by the Irish agencies for R&D. More specifically, the IDGSTI advocate an increase in business R&D to 1.7 per cent of GNP (around €2.5 billion per annum) by 2010, up from (€1.01 billion in 2003).

In the context of essentially static levels of BERD relative to GNP over recent years (see Figure 19.3) and the programme of support, which has been in place since 2000 this target is hugely ambitious. Support for BERD in the NDP 2000-06 was provided through a range of demand-led measures operated by Enterprise Ireland. The key activities were:

- The ***Competitive RTDI Scheme,*** which provides support for R&D projects as part of an integrated package of assistance through the Business Development Model, an approach often cited as reflecting international leading practice. Interim evaluation of this measure suggested generally positive outcomes both in terms of increasing

[92] An important start has been made in this area with the establishment of the interdepartmental committee for SSTI and the Cabinet sub-committee.

firms' R&D investments and introducing new firms to undertaking R&D (see, for example, Indecon, 2003). The indicative budget over the 2000/06 NDP for the RTDI scheme was €180 million.

- ***Measures to Promote Collaboration in R&D*** have also proved relatively successful, although the mid-term review notes progress in developing national collaborations to be stronger than that of international collaborations. Collaboration measures had an indicative budget of €255 million over the 2000/06 NDP.
- Other measures, also operated by Enterprise Ireland were intended to support the development of ***Innovative Management*** (€45.5 million) and ***R&D capability*** (€91 million).

Overall, these measures provide a fairly comprehensive support for business R&D focusing both on the need to develop individual firms' R&D capability and build research collaborations. Moreover, the original rationale for each of these measures still holds good, with the continued need to build the volume of R&D activity, strengthen firms R&D capability and develop denser patterns of association between firms and between firms and research organisations. The measures currently in place also have the key advantage of being well understood by firms. This suggests an approach based on continuity rather than change, and a development and expansion of current measures under the new NDP.

SUPPORT FOR PUBLIC R&D

Other measures within the current NDP focused on targeted support for R&D in the food, marine, forestry, agricultural and environmental sectors. While recognising the importance of these sectors within the Irish economy and their continued potential to generate export earnings, there seems little specific economic justification for their prioritisation, particularly in the context of the goal of moving Ireland rapidly towards a knowledge economy. Having said this, there is a clear need to invest in intra-mural Government R&D in Ireland to support evidence-based policymaking, and to ensure that the benefits of investment in R&D in these sectors in the NDP 2000-2006 are fully captured by Irish firms. There is also a need to ensure that more basic research conducted in these sectors is of international quality. These goals suggest the potential value of a reconfiguration of investment priorities in these sectors with:

- Support being provided for R&D, which supports policy development and implementation in these areas.
- Focus on knowledge transfer and adoption to capitalise on research investments under the current NDP.

- Opening up of competitive mainstream funding sources (e.g. PRTLI, SFI) to allow independent research institutes to compete for research funding alongside the HEIs.

Strategic arguments for a specifically targeted programme of R&D focused on environmental technologies, sustainability and energy self-sufficiency are much stronger. In particular, Ireland's current dependence on internationally traded energy is high by international standards, and research, which can support moves towards energy self-sufficiency, is strategically important. More generally, such research may contribute to Ireland's ability to meet current and future international commitments on greenhouse gases etc., and help to ensure the sustainability of commercial development. To achieve these objectives, research in this area will need to be complemented by effective technology transfer and adoption measures to ensure take-up and implementation of research results.

In addition to these sectoral priorities there is also a clear need to remedy under-investment in R&D in Ireland to support other elements of public service such as health. Benchmarking expenditure levels in this area is difficult, but figures from the HRB suggest that funding for health research in Ireland is one-sixth of that in the UK as a proportion of the heath budget (0.25 in Ireland compared to 1.6 per cent of NHS spending). The need to invest in this area has recently been recognised by the decision to support the Health Research Board's Investment Programme in Research for Health and Wealth. Further investment here is necessary, however, to support health care provision in Ireland, to attract and retain highly qualified staff and to complement other public investments in R&D particularly in aspects of biotechnology.

19.3 Investment Priorities

Our recommendations for investment priorities reflect three main influences. First, the aspirations of the Enterprise Strategy Group (ESG) and Interdepartmental Committee on R&D, which themselves reflect the wider aspirations of the EU Lisbon Agenda. Building on investments to date, these essentially aim to achieve a step change in the level of R&D investment in Ireland over the period of the NDP 2007-2013, and the measures we are suggesting are designed to support this aspiration. In particular, we envisage substantial increases in public investment in both higher education R&D and support measures for private sector R&D activity and the continuation of funding for public R&D to support policy development and implementation. Following the recommendations of the ESG we are also recommending a continuation of most of the current funding mechanisms for R&D and innovation implemented under the NDP 2000-05 (Enterprise Strategy Group, 2004, pp 65-76).

Second, our recommendations reflect the current strengths and weaknesses of the Irish innovation system outlined earlier, as well as the evaluation and profile of investments in the NDP 2000-05.

These points are important, as recent studies have emphasised the importance of systemic and institutional competencies in creating competitive advantage (e.g. Cooke and Leydesdorff, 2006). For example, research by Rodriguez-Pose (1999) and Fernandez *et al.* (1996) suggests that in an economy dominated by small and medium-sized firms with an intermediate technological and industrial base the returns may be greater from more applied research, which is more easily absorbed by local firms. A similar point is made by Oughton *et al.* (2002), who consider what they call the 'regional innovation paradox', which they define as "…the apparent contradiction between the comparatively greater need to spend on innovation in lagging regions and their relatively lower capacity to absorb public funds earmarked for the promotion of innovation…" (p. 98). Other related points are made by Edquist (2004) who argues for the importance of 'coherence' in defining organisational roles within a systemic approach. ESG (2004) argues that in Ireland a lack of 'cohesion or strategic focus' is reducing the effectiveness of current innovation support (p. 66).

Third, recent reports on SFI, PRTLI as well as the ESG (2004) report emphasise the need to increase the effectiveness of the commercialisation activity in Ireland's universities. This has the potential both to increase the value added derived from public funding of university research activity but also to help to embed mobile firms in Ireland by increasing the strength of their relationships to local knowledge providers. With some notable exceptions, this is one element of the Irish innovation system, which is under-developed compared to that in other European economies. Our recommendations here, therefore, draw on leading practice from elsewhere; focusing on the UK experience of the Higher Education Investment Fund (HEIF).

Within the RTDI priority we identify seven sub-priorities:

- Focused International Research – to continue to develop and expand world-class research capability in sectors of strategic importance to economic development in Ireland.
- Broadly-based International Research – to continue to upgrade the research capability of Irish HEIs across the range of subject areas and disciplines.
- Research to Support Public Policy – to contribute to effective, evidence based policymaking across a range of key policy areas.
- ***Commercialisation*** – to develop and extend current commercialisation activities within the higher education sector.
- ***Business R&D*** – to increase the number of R&D performing companies, and increase R&D intensity among existing R&D performers.
- ***Collaboration*** – to increase the strength of national, North-South and international networks and collaboration in R&D and innovation.

- ***Coherent Development*** – to ensure greater consistency and synergy between the role of different actors within the Irish innovation system.

Objectives 1 to 6 are dealt with in this section, having expenditure implications for the NDP, which are summarised in Table 19.2. Objective 7 is discussed in the supporting measures section below as it relates to institutional structures and building organisational competencies, which has less clear budgetary implications.

Under the ***Focused International Research*** sub-priority we recommend continued and expanded funding for SFI. This reflects the consensus view of the ESG and the International Review Group who recently considered the performance of SFI. Continuation of this funding is important to consolidate the value of investment to date and continue to enhance Ireland's position as a centre for world-class research (Table 19.2). Alongside the expansion of funding there is a need to ensure the commercial relevance of SFI investments and that SFI's funding priorities change in a direction, which is consistent with national development priorities, and the remit of other R&D support organisations and particularly the research councils. To support the budgetary expansion we therefore suggest that:

- as in EU Framework grants, groups funded by SFI should be required to develop an exploitation plan by the mid-term of any award as a condition of funding;[93]
- where appropriate, SFI funding be accessible to publicly funded research groups where it is applicable;
- SFI's investment priorities should be set by an external foresight group with a system-wide perspective, perhaps under the auspices of Technology Ireland (see below);
- consideration be given to how SFI's agenda might strengthen North-South co-operation.

Our recommendations for supporting more ***broadly based research of international standard*** also emphasise continuity of measure while recognising the need for an expansion of public support. This reflects the recommendations of the ESG (p. 65) as well as more recent evaluative comments on the value of the PRTLI (HEA, 2004). As the PRTLI evaluation emphasises, continuation of funding in this area is necessary to achieve the step-change in the R&D capability of higher education institutes in Ireland envisaged in 'Ahead of the Curve' (Table 19.2). As with the expansion of SFI resources, however, there is a need to maximise the economic potential and relevance of R&D while recognising the wider cultural and educational benefits of curiosity driven research.

[93] We recognise that in some cases SFI research is fundamental in nature and, therefore, may not have any immediate or short-term commercial application. Even where research is 'basic', however, we believe it is appropriate to ask research teams to consider potential exploitation routes even if this is longer term.

We therefore suggest that alongside increased budgets for PRTLI and the research councils that:

- projects be required to develop explicit exploitation plans and that these should be part of funding requirements;
- where appropriate research funding should be available both to HEIs and other publicly funded research groups.
- that priorities for PRTLI and Research Council funding should be considered by an external foresight group. In each case we also see the potential for increased North-South co-operation.

In addition to boosting the level of HERD in Ireland, the measures in this priority also play a key role in generating high-level skills in Ireland. This is a matter of substantial concern especially given recent studies, which have emphasised potential skill shortages in the future. McDowell and Ruane (2004), for example, suggest that from 2004-2014 labour demand in Ireland for those with third-level qualifications will be around 30,000 higher than will be met by domestic supply and that this gap will need to be filled by in-migration.[94] Barrett *et al.* (2005) echo a similar point, emphasising that 54 per cent of migrants to Ireland have third level qualifications compared to 27 per cent of the native population but that currently migrants are under-utilised in the Irish economy, and would add 3.5-3.7 per cent to GDP if employed at an appropriate level. More specifically in terms of research skills the Expert Group on Future Skills Needs (EGFSN) publication *A Model to Predict the Supply and Demand for Researchers and Research Personnel*, (2004) points to a net shortage of 609 Ph.D graduates and 2,947 non-Ph.D graduates in Ireland over the 2004-2010 period. Two factors are important here: first, the capability of the research councils and PRTLI to expand the training capacity of the Irish University System and second the importance of attracting and retaining high quality research trained scientists from elsewhere. As the EGFSN (2004) argues: "it seems highly appropriate to develop a migration framework to facilitate at the in-migration of high-skilled labour from countries outside the EU" (p. 115). To help meet future skill demands we recommend a substantial expansion of the role of the research councils over the NDP period and suggest that assessments of future skills be carried out at the All-Ireland level.

In terms of ***research to support public policy*** we recommend the continuation of current support for targeted programmes in the agriculture, marine and forestry areas albeit at a level slightly below that in the 2000-2005 NDP. In addition, we would wish to see research teams in these areas able to compete for research funding from the growing resources of the mainstream funding sources (i.e. SFI, PRTLI) and, if appropriate, the research councils. This approach, while a clear break with the past, will provide continued support for the development of evidence-based policy, help to ensure the international quality of research in these areas, and

[94] This point is also made by Sexton *et al.* (2004)

provide the scope for the attraction of increased R&D funding for strong areas of research activity.

Our recommendations in this area also include provision for an expanded programme of research emphasising environmental sustainability and measures, which can support energy self-sufficiency (Table 19.2). This will continue and develop research supported under the NDP 2000-05. We envisage this as a strongly applied priority supporting action research projects, which have a demonstrable contribution to sustainable development or energy self-sufficiency. This will support medium-term macro-economic policy objectives as well as helping to reduce Ireland's international exposure on energy.

Specific support is also provided here to develop the research programme of the HRB. The aim is to support the HRB in putting in place a research base, which can contribute to improvements in the quality and effectiveness of health service provision in Ireland and also expand Ireland's health research capacity. As was highlighted in Chapter 21 health policy related research is required in a number of areas. Key issues here reflect demographic changes such as ageing as well as the need to maximise the efficiency of health service provision through effective intervention and resource management.

In terms of ***Commercialisation***, our recommendations build on previous investments in R&D activity in the NDP 2000-06 and leading practice elsewhere. The need for developments in this area has recently been stressed by both the SFI and PRTLI review bodies as well as the ESG. The latter in particular recommend the establishment of "…a ***Competitive Innovation Fund*** (CIF) for higher education institutions to encourage them to further exploit technology and deliver innovative services to enterprise. A proportion of this fund should be ring-fenced to support the institutes of technology…" (p. 76). In this area policy in England has developed rapidly, and current proposals there relate to Round 3 of the Higher Education Innovation Fund (HEIF3). This might provide a model for a development in Ireland. HEIF3 support comprises two elements: a formula funding element based on the characteristics, research intensity and scale of the HEI itself (75 per cent), and a competitive element for collaborative bids (25 per cent of the budget). This mix has proved positive, providing continuing 'core funding' for universities' commercialisation activities as well as stimulating creative collaborative bids, often based on leading international practice in commercialisation. Current levels of support for HEIF3 in the UK amount to around 3 per cent of HERD spend and a broadly similar level of expenditure is being recommended here. This would support the development of current proposals from Department of Enterprise, Trade and Employment for a competitive fund to support the function of the technology transfer offices in the HEIs. In addition to this competitive programme for HEIs we envisage smaller competitive and targeted programmes (Innovation Funds) for commercialisation initiatives designed to build on the R&D activity

undertaken under the food, marine technology, agriculture, forestry, energy and health sector programmes (Table 19.2).

Our recommendations on support for **Business R&D** and **Collaboration** follow the general principles for best practice in support of business R&D suggested in EU (2003). This advocates the use of a relatively small number of flexible policy instruments, which are readily understood by firms and are supported by Government on a long-term basis to reduce potential uncertainty. As indicated earlier our feeling is that the current suite of support instruments operated by Enterprise Ireland is with some refinement appropriate for this purpose. We, therefore, recommend the continuation of the main support measures developed and embedded under the current NDP. Budgets for these schemes will have to increase substantially, however, to support the levels of BERD recommended in the report of the Inter-Departmental Working Group (Forfás, 2005b).

We also support the recent adoption by Enterprise Ireland of a suggestion by the ESG for a specific measure intended to develop innovation networks in Ireland. This type of initiative is important as it can help with both technological and non-technological innovation and may therefore be appropriate both to manufacturing innovation as well as that in services. We recommend support for this measure, which we feel should be competitive in nature and have a clear emphasis on the joint commercialisation of research results. We have set support for this measure at the level suggested by the ESG and would be keen to encourage some North-South co-funding of this measure (Table 19.2).

In terms of support for Business R&D and Collaboration a major concern relates to the ability of the agencies as they are currently staffed to deliver effectively much expanded programmes of R&D support. In essence this reflects the changing mission of these agencies as they move from providing mainstream business support towards a role as technology support agencies, with a corporate focus on supporting R&D and innovation. Casual empiricism suggests, for example, that TEKES the Finnish Technology Agency has a much larger proportion of staff with higher-level science qualifications than either the grant administering elements of Enterprise Ireland or IDA Ireland. A higher proportion of staff with advanced skills may allow more rapid evaluation of proposed projects as well as the earlier identification of potential research synergies or applications between proposed project or firm expertise. Therefore, alongside the expansion of resources to support BERD a rigorous benchmarking examination of the qualifications of agency staff in Ireland compared to those in leading practice countries (e.g. Finland, Denmark) should be carried out to ensure the efficient allocation of resources.

Finally, as was pointed out in the *Mid-Term Evaluation* of the current NDP (see Fitz Gerald *et al.* 2003), progress with regard to the R&D measures was very uneven across the two NUTS 2

regions, with disappointing progress in the BMW region. This may be due to the spatial distribution of HEIs, a lower absorptive capacity of firms in less developed regions or poor links between HEIs and firms in those regions.[95] Therefore, in order to support the NSS more attention needs to be paid to the regional dimension of R&D policy.

In the analysis of regional development (see Chapter 6) we showed that while the proportion of the population with third-level qualifications has increased substantially in all regions, those regions that had a higher proportion to start with have done better. In other words in relation to advanced skills there is a process of divergence which reduces the relative capacity to innovate or absorb innovations in the weaker regions. The cause of this is likely to be a circular process where graduates have the best employment opportunities in the more developed and particularly urban areas so that they are attracted to these areas following graduation. This reduces the total number of graduates in other regions, which may deter new high skills investment in these regions, thereby reinforcing advantage of the more developed regions. This type of cumulative causation process, which has been highlighted in the literature on growth and economic geography, is difficult to break (see Chapter 2).

In the light of poor progress in the current NDP and the underlying weakness with regard to human capital and innovation capacity of the less urbanised regions more modest goals need to be set for these. In this respect the role and capacity of the Institutes of Technology, which serve most of the smaller gateways, needs to be reassessed. These should play a central role in building both absorptive capacity in firms and carrying out research of their own. The latter will require a strengthening of the research capacity of the ITs through stronger links with the universities.

19.4 Supporting Developments

The investments in supporting R&D and innovation envisaged for the new NDP represent a significant public expenditure commitment. There is, therefore, a need to develop an effective system of policy development and evaluation to ensure that resources are allocated effectively and their benefits in terms of wealth creation maximised. This is complicated in practice because of the number of agencies, departments and organisations involved in supporting R&D and innovation as well as potential conflicts and overlaps between institutional agendas.

[95] The Gateways study (Fitzpatrick Associates, 2005c) showed that 57.5 per cent of full-time researchers in the HEIs were working in the Greater Dublin Region and a further 37.1 per cent were working in the main gateways Cork, Limerick and Galway. Thus, other areas account for just 5.4 per cent of full-time researchers.

Table 19.2: RTDI Priority – Summary of Recommendations

Sub-Priority	Measures	Recommendation	Expenditure 2006 € million	Average Recommended Expenditure 2007-2013 € million
Focused International Research	SFI	Increase	147	180
Broadly-based International Research	HEA programmes (incl. PRTLI)	Increase	117	160
	IRCSET	Increase	31	30
	IRCHSS	Increase		15
Research to support policy	Agriculture RTDI	Reduce	9	6
	Food RTDI	Reduce	14	10
	Marine RTDI	Reduce	4	3
	Forestry RTDI	Reduce	4	3
	Environmental/Energy RTDI	Increase and Re-orient	16	23
	Health RTDI (HRB)	New	0	20
Commercialisation	Competitive Innovation Fund (HEIs)	New	0	15
	Agricultural Innovation Fund	New	0	1
	Food Innovation Fund	New	0	1
	Marine Sector Innovation Fund	New	0	1
	Forestry Innovation Fund	New	0	1
	Environmental Innovation Fund	New	0	2
	Health Innovation Fund	New	0	1
Business R&D	Competitive RTDI	Increase substantially		182
	R&D Capability	Increase substantially	254 for all three measures	50
	Innovation Management	Increase substantially		33
Collaboration	National and International Collaboration	Increase substantially	21	65
	Innovation Networks	New		20
Total			617	822

Note: The 2006 allocation is based on the figures for the NDP and is not directly comparable with the MACIF used in Chapter 5.

Government intervention in this area has traditionally been justified in terms of market failure, which leads to sub-optimal levels of private R&D investment. More recent thinking, however, has emphasised the partial nature and inadequacy of such criteria for intervention, stressing instead the role of the Government in addressing 'system failures'. OECD have summarised the situation as follows, arguing that Governments should "…address systemic failures that block the functioning of innovation systems, hinder the flow of knowledge and technology and, consequently, reduce the overall efficiency of R&D efforts. Such systemic failures can emerge from mismatches between the different components of an innovation system, such as conflicting incentives for market and non-market institutions (*e.g.* enterprises and the public research

sector), or from institutional rigidities based on narrow specialisation, asymmetric information and communication gaps, and lack of networking or mobility of personnel".[96] This reflects issues of policy coherence and institutional capabilities, which the ESG group argued was reducing the effectiveness of current policy initiatives in Ireland (pp. 64-65).

This points to the need for some form of overarching body which can adopt a strategic approach to the development of the Irish innovation system, and which has sufficient power to alter expenditure priorities and agency remits. This is hinted at in the suggestion by the ESG for 'Technology Ireland' and welcome progress has been made in this direction with the establishment of the inter-departmental group for SSCI. Issues remain in this area, however, and we recommend that alongside the expenditure increases suggested earlier some benchmarking activity is undertaken comparing NSI governance in Ireland to international best practice.

At a more local level the capabilities of specific organisations will also need to change. Concerns about the delivery capability of the industrial development agencies as their agendas move increasingly towards supporting R&D have been mentioned earlier. Similar concerns may also be registered about the HEIs as they are asked to further expand and develop rapidly their research and commercialisation activities. In both cases considerable institutional investment and restructuring is likely to be necessary involving both staff re-training and recruitment and we recommend that consideration is given to both issues in future strategic planning exercises.

[96] *Source*: OECD (1999), p. 10.

20. PRODUCTIVE SECTOR

Strong growth over the recent past has been generated through the excellent performance of firms in many sectors. However, there is substantial heterogeneity across sectors with some growing extremely rapidly while others are not performing well. In general it must be the aim of policy to best utilise the resources of the country and this means that resources that are locked-up in declining sectors should be released for use in growing sectors, which inevitably carries some restructuring costs. Especially in the case of human resources workers will only be able to make the transition from a lagging to a growing sector if they have the required skills. Thus the investment in training and education outlined in the human resources chapter above has an important role to play. Experience from other countries shows that supporting lagging industries slows down the transition towards better economic performance. Thus rather than supporting lagging sectors, support should be given to restructuring measures.

An important development in the changing structure of the economy is the growth of services. Basic manufacturing, not just in traditional sectors but also in high-tech sectors is coming under increasing pressure due to a lack of cost competitiveness. Movement of economic activity towards un-traded and especially internationally traded services has to date compensated for any negative impacts from this development. For the future, economic growth will see a greater emphasis on growth in traded services, though high-tech manufacturing will still remain very important to the future prosperity fo the country. This shift in emphasis, with a greater role for the services sector, needs to be reflected in general industrial policy and in human resource development. A further notable development has been the strong growth of construction which, as was outlined above, is having a negative impact on other sectors, which when the building boom eventually comes to an end will face significant adjustment costs.

The rationale for public intervention in the provision of infrastructure, education and training and R&D is established through the public good qualities that characterise these investments. When it comes to the various activities that are aimed at supporting the productive sector we adopt a different approach. Thus, need or importance in itself does not justify public investment. Rather, the case for public intervention has to be made

on the basis of market failure; otherwise a case could be made for public intervention in all productive sector activities.

Structural difficulties in an industry do not mean that there is market failure, as these structural problems may simply be due to changes in the competitiveness of that industry arising from international market conditions. Indeed well functioning markets may expose structural weaknesses more readily. With the growth of the economy over the last decade and a half, wage rates have increased in response to increasing demand for labour. In this respect it is useful to keep in mind the steady change in the internationally tradable side of the economy towards the services sectors and the high-tech manufacturing sector and away from the traditional manufacturing and primary sectors. As a consequence of the overall economic success of the country, some sectors have become uncompetitive. Devoting public resources to supporting such sectors would be inefficient as public funds have to be raised through taxes, thereby raising the overall tax burden. Rather than devoting public funds to supporting declining sectors they should be re-directed to investment areas with good growth prospects.

If a market failure cannot be identified in any aspect of the productive sector there is no justification for public intervention. The nature of that market failure should determine the nature of the intervention and the length of time over which the intervention needs to be in place and the interventions can be classified into public good, corrective pricing, or targeted interventions. This distinction is important since, for example, a targeted intervention should only be in place for a limited period. Thus, for example a targeted intervention may be required to stimulate a particular activity, which is currently not taking place because private agents lack sufficient information. Once the intervention overcomes this information deficit it will no longer be required.

This approach necessarily limits the role of public intervention in the productive sector and therefore the range of activities reviewed here. In an era of full employment and rapid growth, substantial public sector involvement in the productive sector appears inappropriate. Rather, the role for Government is to create the right environment within which the productive sector will flourish and resources are allocated efficiently. The proposed investment in the key growth drivers, such as infrastructure, human resources and research and development, proposed in this study will be vital in improving the operating environment for the productive sector. These investments by and large will yield a higher return, as they are there for the wider economy rather than a few selected sectors. Nevertheless, there are some important areas where continued public investment is warranted.

Overall, the sectoral coverage of the supports to the productive sector under the current NDP is interesting. The sectors specifically covered are agriculture, forestry and fishing, food, tourism and the film industry. In quite a number of these sectors the prospects are not bright and, as a result, further investment may not always produce a reasonable return on public funds. Perhaps a more

appropriate approach in the next NDP would see the prioritisation of sectors with good future growth prospects.

ENTERPRISE STRATEGY GROUP REPORT

The most important report on the development of the Irish productive sector is the Enterprise Strategy Group Report – *Ahead of the Curve* (2004). This report highlighted a number of challenges, which need to be met if living standards are to continue improving. These challenges include:

- globalisation,
- increasing cost base,
- declining corporate tax advantage,
- average performance of indigenous enterprises,
- EU enlargement,
- demographic change,
- changes in EU policy (State aid).
- environmental issues.

Furthermore, major changes including the shift towards services and the growing importance of knowledge as a driver for economic growth will shape the future economic development in Ireland.

The report identified internationally traded services, such as education and software development, as having high potential. Furthermore, new areas franchise management, intellectual property management, and eClinical trials could also prove useful niches.

Importantly, the report highlighted that Ireland's strengths currently lie in the areas of production and operation. This reflects the heavy orientation towards manufacturing FDI in the past, where R&D and other strategic capabilities were centred in the HQs of the organisations. However, as continued FDI is uncertain, and indigenous firms have underperformed, possibly due to low degree of outward orientation, it will be necessary to develop the other important areas of business development such as developing international marketing and sales expertise, and world-class product and services development.

Product and market development will need to become a stronger focus, since in a globalised world competition is increasing, requiring more attention to market development. With the move towards a high wage economy, Ireland will only be successful if high-value products and services are developed.

This will inevitably require the appropriate skills mix to be put in place. In this respect it is not only the education system that will be important but also the State agencies that support business development which will need to facilitate the broadening of expertise. In particular the report recommends that:

- Establish within Enterprise Ireland special sections to promote marketing and product development.
- Increase applied R&D funding.
- Enterprise networks.

Cost competitiveness will also be important. In this respect the report identified low production costs, and a high level of infrastructure, innovation and entrepreneurship and management capabilities as essential conditions for business. It argues that cost competitiveness can be supported through increased competition, regulation and proper workplace incentives. Furthermore, the report recommends that the attractive taxation regime be retained and Government be agile and effective.

20.1 Agriculture Forestry and Fishing

The primary sectors of agriculture, forestry and fishing have traditionally been important to the economy. Overall however, primary production has steadily lost importance. This trend follows the well-known pattern of economic development of countries that starts with a heavy emphasis on primary production, that subsequently declines in importance as other sectors grow which typically produce higher value added.

While agriculture, forestry and fishing account for less than 6 per cent of total employment and about 4 per cent of GDP their role in the more remote parts of Ireland remains important in relative terms. Developments in these sectors, therefore, play a significant role in rural development and some intervention may be justified on those grounds.

In general it is difficult to conduct a review of the various schemes without simultaneously considering the whole common agricultural policy, which dominates the developments in agriculture and forestry, which is beyond the scope of this report. Consequently, a very narrow range of measures, that were part of the current NDP are considered here. A similar point applies to the fishing industry, which is dominated by the Common Fisheries Policy.

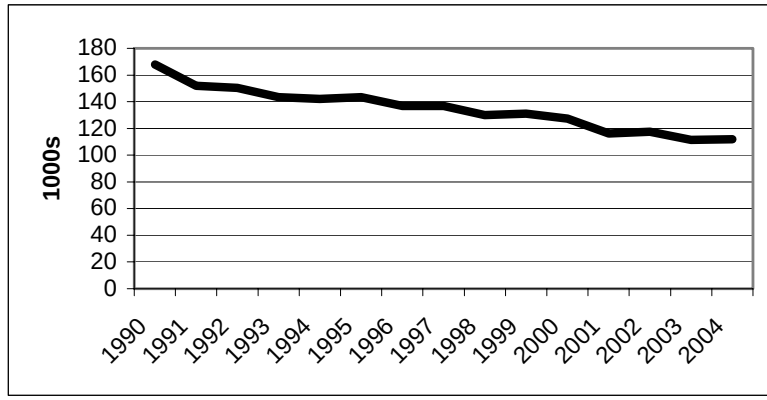
20.2 Agriculture

In the case of agriculture in particular the sector has attracted substantial subsidisation over many decades. Much of this subsidisation was aimed directly at supporting production rather than dealing with any structural problems within the sector. The indirect objective of much of public policy has been to support farm incomes, with the effects on output being of secondary importance. However, the recent reform of the Common Agricultural Policy, through the decoupling of subsidies from production and the introduction of the single farm payment, is likely to have a significant impact on the sector. This change in policy has made explicit the link between public support and income. To the extent that the bulk of public support for the sector has an income support objective it does not belong in the National Development Plan, rather being part of the role of the State in providing income support and is, therefore, not considered here (because it is not aimed at making a permanent difference to productive capacity).

International competition is becoming increasingly important not only outside of the EU where EU produced agricultural outputs have competed largely with the help of export subsidies, but also within the EU since trade negotiations have resulted in increased access to the EU for overseas producers. As increasing competition comes from countries that are less developed than Ireland, with the consequent cost advantages particularly with respect to labour and land, Irish agriculture is becoming less competitive especially as the CAP regime has resulted in slow structural change in the industry.

Consequently, the outlook for agriculture is relatively poor, and the sector's share in national output will continue to decline. Full-time farmer numbers have steadily declined and are projected to continue on this path. For example, the Agri Vision report (Agri Vision, 2004) projects, that viable farm numbers will decline by 22 per cent between 2002 and 2015. The decline in full-time farmer numbers should result in significant structural change, which is necessary if the sector is to have a satisfactory future. However, as many farmers continue to farm on a part-time basis this structural change remains elusive. Agricultural employment continues to decline correspondingly, as is shown in Figure 20.1, which shows that agricultural employment has declined by one-third since 1990. Over the period 1990 to 2003 agricultural output barely grew with an average annual growth rat of 0.1 per cent.

Figure 20.1: Employment in Agriculture (ILO Basis)



Source: CSO *QNHS* various issues.

CURRENT ACTIVITY

A range of measures targeted at the agricultural sector have been part of the current NDP covering a wide range of issues.[97]

[97] The CAP Rural Development Measures were not in the Operational Programmes. Here we specifically do not consider the Common Agricultural Policy interventions. The CAP can by in large not be considered an investment e.g. Disadvantaged Areas. While the early retirement scheme may yield some benefits in restructuring the sector it is largely a redistributive scheme.

General Structural Improvements

The General Structural Improvements comprised six sub-measures:

- Installation Aid for Young Farmers.
- Farm Waste Management.
- Improvement in Dairy Hygiene Standards.
- Improved Animal Welfare Standards.
- Animal Carcass Disposal.
- Development of Grain Storage Facilities On-Farm.

A number of these measures, such as Installation Aid and Farm Waste Management, have been in place in some form or another for some time, however, it is nevertheless useful to consider the objectives and rationale of the measures.

The *Installation Aid* sub-measure provides a one-off subsidy to young farmers who take over a farm. The eligibility criteria set a maximum age, minimum qualifications, and minimum farm size. As such it appears to support structural change in the industry by helping farmers with higher qualifications to improve competitiveness. However, it is not clear to what extent the measure is successful in providing an incentive for young people to enter the agricultural sector who would not have done so anyway, and to what extent it acts as an incentive to develop the required qualifications.[98] In other words, the measure is likely to have high deadweight and is, in effect, largely redistributive in nature.

Agricultural waste, mainly animal manures, represents the largest arising of waste in Ireland. The EPA's *National Waste Database 2004* indicates that a total of 60.2 million tonnes of such waste arose that year, compared with 25.1 million tonnes on non-agricultural waste. Organic agricultural waste has value as fertiliser, and is mainly disposed of by spreading on the land,[99] with a proportion subject to pre-treatment. Developments such as the Nitrates Directive and increasing concerns about impacts of agriculture on water quality, however, have highlighted the problematic aspects of land-spreading of untreated waste. In this context there have been calls to promote pre-treatment of the waste, via the use of anaerobic digestion.[100]

The *farm waste measure* provides grants to farmers to build farm waste storage, silage storage, livestock housing and the purchase of mobile equipment for the disposal of farmyard manure. Thus, it addresses important aspects of livestock production that could have

[98] There may well be an economic return but it does not accrue to the wider economy, but is captured by the young farmer who in any event may have taken over the farm. It is unlikely that important life decisions are influenced in any substantive way by a payment of just under €10,000.

[99] The 2004 *National Waste Database* records that a 2005 ruling by the European Court of Justice indicated that agriculture manure spread on land may be considered not to be waste, if certain criteria are met.

[100] See Curtis, J., *Anaerobic Digestion: Benefits for Waste Management, Agriculture, Energy, and the Environment*, Discussion paper by the Strategic Policy Unit of the EPA, January 2005, for a concise treatment of the issue.

a significant environmental impact. The implementation of the Nitrates Directive, which among other things places restrictions on the timing of slurry application and the required land area for the disposal of the waste of a given number of livestock, has a direct impact on the requirement for on-farm storage of farm waste.

The facilities provided through this measure are necessary to protect the environment and demand for them is further increased by the Nitrates Directive. This however, is not sufficient justification for the continuation of this measure. Farm waste storage infrastructure and spreading equipment are required for the proper operation of a livestock enterprise in the same way as waste facilities are necessary for example in the chemicals industry. In the latter the provision of such facilities is left to the private sector and enforced through regulation. Agricultural waste arises from the production activities of farmers, and as such the Polluter Pays Principle should apply.[101] Its disposal should be the responsibility of its producers, with regulation to ensure environmental impacts are within acceptable parameters. Thus in principle there is no justification for public subvention of treatment and disposal of this waste.

Apart from allowing farmers to adhere to proper environmental standards, which clearly have a benefit for the wider public, these facilities have a significant private return as they allow higher productivity through better livestock management, thereby suggesting that deadweight is likely to be high.[102] Furthermore, this measure has been in place in some form for decades. It is therefore difficult to see where the demand for this measure should come from. This point is underlined by poor progress in the measure under the current NDP.[103]

Both the *Improvement in Dairy Hygiene Standards* and *Improved Animal Welfare Standards* sub-measures address concerns that could also be addressed through effective regulation and are therefore poor value for money. However, the *Animal Carcass Disposal* is warranted since following the emergence of BSE in cattle the cost of disposal of fallen animals has increased substantially. In order to safeguard public health it is important to ensure the safe disposal of fallen animals.

Given the discussion so far it is particularly difficult to rationalise the inclusion of the *Development of Grain Storage Facilities* sub-measure as the benefit of these facilities is completely captured by the farmer and indeed this measure is aimed at a relatively commercial sub-sector.

[101] It is important to note that most other commercial sectors have to pay the economic cost arising out of waste created, it is, therefore, difficult to see why agriculture should be exempted.

[102] The return arises out of reduced poaching damage to grassland, and ease of management, which is particularly important to part-time farmers.

[103] The foot and mouth outbreak is blamed for the poor uptake, but given that this can only have impacted for less than 12 months, FMD is unlikely to be responsible for the poor overall take-up.

Alternative Enterprises

Diversification must be an important goal of the industry as it appears uncompetitive under the current structure and policy regime. However, in many cases there is a high return from the investment, which suggests that subsidies could have high deadweight Under this measure, however, a number of well established sub-sectors such as potato growing is being aided. Thus, the targeting appears to be poor. In general, one would expect private finance to be available to carry out investment in more profitable segments of the market.

The organic sector development sub-measure appears to have the potential to address a genuine market failure in the sense that the conversion from 'conventional' to organic farming is likely to be associated with initial loss in income. However, farmers must have completed the transition to organic before qualifying for aid under the development of the organic sector measure. For this reason, we note that there is a significant element of deadweight attached to these schemes, as the eligible recipients are likely to be in a position to undertake the required investment without this targeted intervention. This measure may, therefore, benefit by a change in the eligibility criteria such that farmers that are in the process of converting to organic farming become eligible.

Services for Agricultural Development

Finally this measure provides an important service as it supports the restructuring of the industry and increases the human capital of farmers. However, this is current expenditure, which does not fit well within an NDP. The second sub-measure, which provides a subsidy for the farm relief service constitutes a direct subsidy to a commercial operation with no obvious market failure., and therefore is hard to justify.

RECOMMENDATION

Much of the current activity is hard to justify on economic grounds and appears more aimed at redistribution than at addressing any identified market failure. On that basis there is little justification to continue the majority of the measures. It might, however, be useful to re-orientate some of the activity towards meaningful environmental improvement that would have genuine public good qualities and cannot be achieved through regulation.

20.3 Forestry

Development of the forestry sector has been constrained through the heavy subsidisation of the agricultural sector over many decades (see Barrett and Trace, 1999). While some research shows that the long-run return to farmers from forestry exceeds that of other enterprises on the poorer soils or against the less profitable cattle and suckler enterprise, the reform of the CAP may erode this advantage resulting in a reduction of the total area that will be

afforested (Bacon *et al.,* 2004). This may have a significant negative long-run impact as it may render further processing plant unprofitable.

Overall, employment in forestry has declined by almost one-third since 1990, which is similar to the decline suffered in the agricultural sector. However, unlike the agricultural sector there has been reasonable output growth of 3.2 per cent per annum since 1990. Thus, labour productivity in the sector has increased by 6 per cent per annum.

CURRENT ACTIVITY

Generous grants are available for the planting of forestry and forestation targets were set in the *1996 Strategic Plan – Growing for the Future*. These targets have not been met, which undermines the viability of a competitive processing sector. Furthermore, the species mix which had been envisaged has not materialised (see Bacon *et al.*, 2004). Concerns have been raised that forestry management has been poor resulting in lower long-term returns, which might further discourage forestation.

Through the afforestation grants the sector is receiving a very substantial level of support. Indeed, the *Review and Appraisal of Ireland's Forestry Development Strategy Report* (Bacon, 2004) estimates that in order to generate €100 grower income requires a support payment of €121.6.

Activity under the current NDP was confined to three sub-measures. The first of which was aimed at improving the quality of forests could be justified as it deals with an externality that may otherwise not be addressed. Given the concern about the poor management of forests this sub-measure is further justified as quality improvement can only be achieved through better management.

The second measure provided support for the purchase of harvesting machinery, which was aimed at growing harvesting capacity in order to increase output from the sector. This sub-measure cannot be justified on economic grounds as the returns to this investment are captured entirely by the woodland owner, implying 100 per cent deadweight in the absence of any market failure. It is therefore important to note that the measure has been suspended.

Finally, the forestry roads sub-measure is aimed at improving access for forest plantation development, maintenance and fire protection. As with the harvesting machinery sub-measure it is difficult to justify this measure as the benefits are almost entirely captured by the woodland owners. While these roads may be necessary to maximise the return on the investment in forests, it is the forestry owner who reaps the benefits from the investment. Failure to thin and maintain crops due to low or even negative returns to this activity is not market failure since the long-run benefits to the woodland owner are significant. The only externality would arise if these forest roads were open to the public for

recreation e.g. walking, cycling etc. Thus, if any support through this measure is to be maintained a condition of granting resources should be access rights to the public.

RECOMMENDATION

The forestry industry makes a wider contribution to rural development. It currently attracts substantial subsidies, which however, have not been sufficient to achieve planting targets. The subsidisation regime should be kept as transparent as possible to allow potential planters to properly evaluate the long-run income streams from forestry. This provides a further rationale to limit public interventions through the NDP to those, which actually address market failures.

Most of the current activity under the NDP has been targeted at investment areas with high deadweight and no or very little market failure rationale. These sub-measures should be scrapped and instead the focus should be on improving the quality of woodland. This, apart from supporting the improvement of the species mix so that the industry better meets the demand for timber, would also have a significant positive impact on the amenity value of forestry and thereby support the development of tourism.

20.4 Fishing and Aquaculture

As with tourism it is difficult to define the marine industry using the conventional industrial classifications since it incorporate diverse activities such as fishing, aquaculture, marine transport, energy exploration and tourism. Consequently, investments under the current NDP are found in a number of Operations Programmes (OPs). For example, the sports angling component is found under the tourism product development measures while marine transport fits most usefully into transport infrastructure. This is also reflected in this report so that R&D, Infrastructure and Human Resources issues are covered in other chapters.

Notwithstanding the difficulties in measuring the contribution of the sector it is possible to quantify sub-sectors such as fishing and aquaculture, which are the target sub-sectors of the NDP interventions, which have not been covered elsewhere. It is therefore useful to briefly review the performance of these two sub-sectors. While aggregate numbers are readily available these mask the geographic distribution of the sector, which of course is largely confined to coastal areas (there is some inland fisheries activity). In particular, the activity of the fishing and aquaculture sectors is concentrated in more remote coastal communities so that the sector makes a significant contribution to rural development.

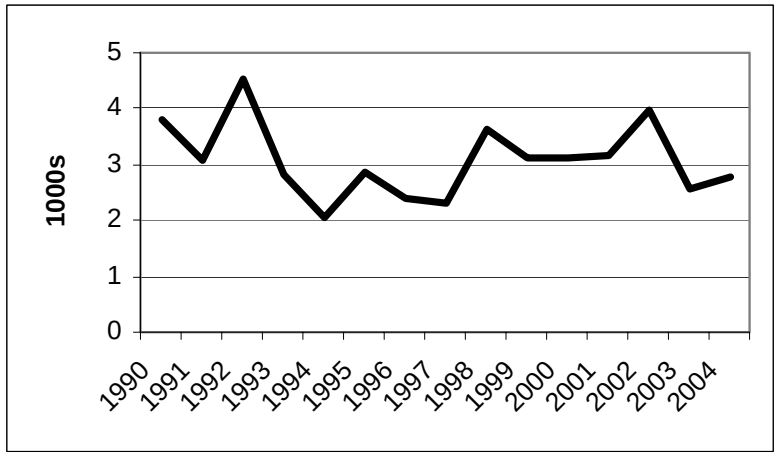
Overall, employment in the fishing industry is quite variable but there appears to be a long-run downward trend (see Figure 20.2). However, output has increased by an average of 5.6 per cent per annum between 1990 and 2003, which while lower than the average growth for the whole economy is nevertheless respectable. Given the two trends it comes as no surprise that productivity has grown

substantially by just over 12 per cent per annum during that period. It is likely that this productivity growth is largely due to changes in the fishing fleet, where vessel numbers have declined but there has been a significant increase in average size (see Table 20.1).

Fish processing employment has increased by 28 per cent over the period 1991 to 2001 to reach 2,802. However, output did not increase more rapidly than employment so that productivity did not change over that period. Nevertheless, the fact that industrial inputs into fish processing have increased substantially, it appears that the industry is changing towards heavier processing.

The tonnage produced by aquaculture has more than doubled between 1994 and 2002 with a particularly strong increase of tonnage being recorded for shellfish production. However, the average prices received for the output of the sector has decreased so that the real value of output only increased by 50 per cent or 6 per cent per annum which is in line with the performance of the fishing sector at large.

Figure 20.2: Employment in the Fishing Industry (ILO Basis)



Source: CSO *QNHS* various issues.

Table 20. 1: Fishing Fleet

	1991	2002
Number of boats	1,436	1,376
Total tonnage of fishing fleet (tonnes)	52,993	77,888
Average vessel size (tonnes)	36.9	56.6

Source: CSO Fisheries Statistics.

The most important policy framework for the fishing sector is the Common Fisheries Policy (CFP). The key feature of the CFP is that it restricts catches for a wide range of key species, which have suffered substantial declines in overall stock size and which are under threat from over-fishing. Given dwindling stocks of key species and the consequent quotas, which have by in large been reduced over time, the overall potential for the industry to develop are limited to increasing catches of non-quota species, which

however may not find significant appeal in the market place. The aquaculture sector is not constrained by quotas but rather by environmental considerations which limit the number of suitable sites, both from a visual impact point of view and terms of the impact on wild species. Thus, the development of the aquaculture sector without regarding the potential environmental impact risks damaging the tourism sector which particularly in rural areas relies heavily on the attributes of the natural environment including the key angling species such as salmon and sea trout.

CURRENT ACTIVITY

A range of different measures and sub-measures targeted at the fishing and aquaculture have been implemented as part of the current NDP.

The *Seafood Processing* measure is aimed at growing and sustaining the seafood processing sector by promoting increased value added at an early stage of production, ensuring optimal utilisation of raw material supplies and developing companies with the strength to become internationally competitive. The *Seafood Marketing* programme is aimed at enabling the industry to take advantage of the buoyant market for seafood products, through market research and the improvement of the marketing capabilities of seafood processors. In line with the recommendations on tourism marketing it can be argued that this measure is justified if targeted at the SMEs in the sector. While SME's are important in the sector there are important differences between this sector and the tourism sector in that in this case companies will need to market their own product rather than market the attributes of Ireland as a tourist destination. Thus, the benefits of marketing are captured by firms directly. The processing measure is only justified if finance for the sector was for some reason unavailable. This is unlikely to be the case if a proper business case can be made. Thus deadweight is likely to be high.

The aim of the *Sea Fisheries Development* priority is to modernise the fleet of vessels while at the same time encourage vessel decommissioning. These aims are clearly conflicting since on the one hand, vessels numbers are to be reduced in order to adjust the fishing effort downwards while on the other hand, a measure is in place that aims to renew and modernise the fleet to among other aims increase operational efficiency. While the adjustment to fishing effort is justified since this contributes to the environmental goal of stock preservation, simultaneously increasing the operational efficiency of the remaining fleet is likely to undo any benefits gained from the other measure. The *Renewal and Modernisation* measure, in common with other measures aimed directly at the private sector, may be subject to substantial deadweight. Overall, this priority does not make a significant contribution to national economic development.

The Fisheries Harbours/Gaeltacht-Island Harbours measure, which was supported under the regional Operational Programmes as part of the local infrastructure priority was split into three sub-measures.

First, the *Fisheries Harbour Improvement* sub-measure aimed to provide support for the development of fisheries port infrastructure and ancillary facilities such as ice plants, auction halls and landing facilities. As these facilities are eminently excludable they are not pure public goods and as such public support is difficult to justify on classic economic grounds. However, since many of these harbours are located in remote peripheral regions and thus make a contribution to rural development, there is some value to continuing some public funding. However, the industry should be asked to make a contribution towards the provision of the infrastructure and ancillary facilities.

The *Gaeltacht/Island Harbours* sub-measure can be justified on rural development grounds since it increases access to the remote Gaeltacht areas and the islands of the western seaboard. In most cases the local communities are unlikely to be able to finance this work, which benefits not just locals but also improves access for visitors, which will help in the development of tourism. However, where the level of utilisation of these resources is high contributions to the improvement and maintenance work on those facilities should be sought.

The *Aquaculture* sub-measure provides grants for private sector investment in aquaculture. While it covers collective facilities, it is not easy to see what market failure the *Aquaculture* measure addresses, especially as this measure appears to be expensive and there are clear private sector returns so that these are likely to suffer from deadweight.

RECOMMENDATIONS

The prospects for the fishing sector are limited as stocks of the key species are limited and quotas apply. While non-quota species may offer an opportunity for expansion, these stocks are also limited and indeed these species may not find a ready demand in the market place. As with almost all commercial activities, public subsidisation is difficult to justify except with reference to rural development and some limited market failures.

The measure that passes not only the economic rationale of market failure but also supports rural development is the Gaeltacht/Island harbours development. The adjustment of fisheries effort is also justified, but as another sub-measure is in place that appears to counteract the objectives of this measure one has to question further investment. The modernisation of the fishing fleet and the development of aquaculture measures lack economic rationale. Finally, there may be a limited role for support for marketing provided it is aimed at the SME sector.

Table 20.2: Financial Recommendations

Measure	Recommendation	2006 (€ million)	2007-2013 Average (€ million)
Services for Agricultural & Rural Development	Same	10.4	10.4
General Structural Improvement	Reduce	63.8	30.0
Alternative Enterprises	Reduce	9.5	6.0
Forestry	Reduce	13.0	5
Fishery Harbours, Gaeltacht and Islands	Same	12.4	12.4
Fishery Harbour Infrastructure	Reduce	21.4	10.0
Aquaculture Development	Reduce	13.5	6.0
Fisheries Supporting Measure	Reduce	2.9	2
Renewal & Modernisation of the Fishing Fleet	Reduce	1.6	0
Adjustment of Fishing Effort	Same	19.0	19.0
Total		**186.012**	**106.3**

Note: The 2006 allocation is based on the figures for the NDP and is not directly comparable with the MACIF used in Chapter 5.

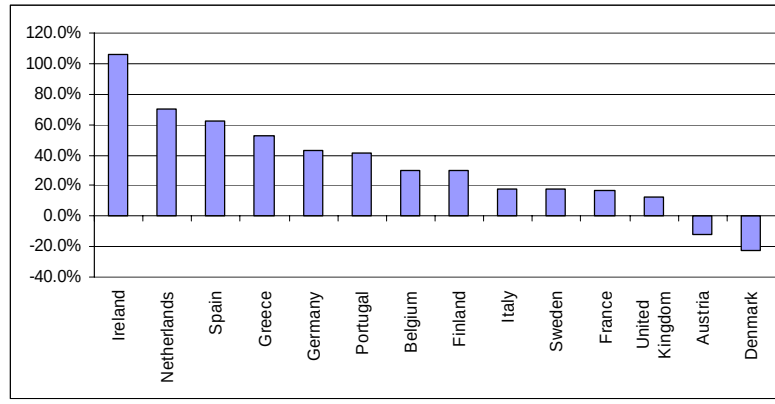
20.5 Tourism

Tourism is a major internationally traded service. As such it contributes to the export performance of the economy. An important aspect of the nature of the tourism sector is that it can provide an important stimulus to the economy of the more remote rural parts of the country where the range of alternative economic activities is more limited compared to urban centres. Thus, tourism can play an important role in regional development. In Ireland, where tourists are likely to visit for the overall experience of the countryside, people and heritage, developing the industry in a sustainable manner is important.

The nature of the industry makes precise quantification of the contribution of this sector difficult since some of the activity of the sector could be classified into other sectors and since there are significant input-output linkages to other sectors. Notwithstanding these difficulties it is possible to sketch out some important trends in the industry.

Employment in hotels and restaurants has increased by 13,200 between 1998 and 2005, which equates to an annual average growth rate of just under 2 per cent. Compared to the national employment growth of over 4 per cent across all sectors over the same period this performance is quite modest. Of course this comparison does not shed light on the output of the sector, which given the measurement issues indicated above might, best be measured in terms of numbers of visitors from abroad and their expenditure in Ireland. As Figure 20.3 shows, Ireland expanded bed capacity by 100 per cent in a decade and a half, which far exceeded the expansion in all other EU countries. Over the same period visitor numbers increased by 114 per cent, suggesting that over that period occupancy rates must have been increasing. Of course, the time period chosen in this comparison is relatively long. Consequently, it is also useful to consider developments in the recent past.

Figure 20.3: Change in Bed Capacity Between 1990 and 2004



Source: Own calculation using data from the Eurostat *New Cronos* database.

According to CSO data visitor numbers have increased on average by 2.5 per cent per year over the period 1998 to 2004 while tourism expenditure has increased by 2.1 per cent per annum in real terms over the same period.[104] These statistics suggest that the tourism sector is not going through a particularly dynamic period, which is a marked contrast to the performance of the sector internationally. For example, in all of Europe tourist arrivals grew by almost 4 per cent per annum between 1995 and 2004. This signals heavy competition and falling market share for the Irish tourism sector. A further indicator of the modest performance of the tourism sector comes form the balance of payment statistics, which identify tourism exports. They have grown by just 2.9 per cent per annum between 1998 and 2004, which compares badly to an annual growth rate of 40.0 per cent for business services.

Overall, then the recent performance of the sector has been relatively poor when compared to many other sectors. Falling market share is likely to have many reasons. These include lack of cost competitiveness, opening-up of more exotic destinations and poor product development relative to key competitors. While some of these factors are at least to a large extent out of the control of the sector, many of the relevant issues relate to failings within the industry.

The exceptional performance of the Irish economy has resulted in high non-traded inflation which impacts heavily on the tourism industry since many of these internationally un-traded services make up a significant component of tourist consumption.[105]

[104] This figure refers to total expenditure by overseas visitors and is derived using data from the CSO Database Direct service. The price deflator used is the harmonised CPI.

[105] They are un-traded in the sense that they have to be consumed within Ireland.

TOURISM POLICY REVIEW GROUP REPORT

In 2003 a major review and strategy of the tourism sector was published (Tourism Policy Review Group, 2003). It highlighted that tourism had been one of the most important and successful indigenous sectors of the economy. It also noted that growth in the industry had slowed over recent years. The industry is particularly important since it is broadly based and contributing to the activity in many sectors.

In general the prospects for the sector worldwide are expected to be very positive with substantial growth in tourism arrivals predicted. What the report did not point to is the fact that growth in Europe is expected to fall short of that of other regions, a view that is supported by recent research (see Papatheodorou and Song, 2005).

The assessment of the sector concluded that the industry is strong but at a turning point, in the sense that it faces a major competitiveness challenge. The report pointed to falling margins and unused capacity, which could affect future investment. It highlighted the urgent need for investment in transport infrastructure and greater investment in human resource development.

The report accepted the reduced role of public finance in the industry and asserted that a successful tourism industry will be self-reliant in future. This will require a new strategy to be followed, which has the following key components:

- Clear vision of where the industry wants to go.
- An understanding of the forces impacting on the industry.
- Establishment of challenging targets.
- Enhanced capability to innovate.
- Implementation framework.

CURRENT ACTIVITY

Under the current NDP a number of measures have been implemented that address issues in the tourism sector. These are scattered in a number of Operational Programmes depending on the target areas. As some of these are addressed elsewhere this section concentrates on the remaining measures. These are *Tourism Product Development and Tourism Marketing.*

The *Tourism Product Development* measure is part of the Regional Operational Programmes and has a number of aims including the development of major tourist attractions, special pursuit interests, tourism, environmental management, angling and marine tourism. The initial slow progress of this measure has been addressed, but this itself does not provide sound evidence that there will be a high return to the investment.

The second measure relates to tourism marketing, which was funded under the Productive Sector OP. In general the marketing programme was aimed at addressing a market failure in that it was specifically aimed at SMEs where there is a likelihood, due to their

small size, that firms are not able to market their products internationally. Thus, there is justification for continued funding of the measure. With regard to tourism, the fragmented nature of the sector still argues for public intervention in marketing.

One new area of investment, which is proposed by the Department of Arts, Sports and Tourism, is the development of a large convention centre. It is argued that this will have significant impact as it would attract large numbers of visitors who currently do not come to Ireland as the major conventions are held in other countries with better facilities. This could help existing suppliers of accommodation increase their bed-occupancy rates.

RECOMMENDATIONS

Tourism Product Development

As was highlighted above, the performance of the sector is relatively modest and in this respect one could reasonably argue that product development is needed in order to achieve greater competitiveness and growth. However, one could also argue that if the prospects of the sector are poor, spending scarce public resources on developing products, the demand for which is going to be low, is not warranted. In general it is not clear why the State should support the product development in any sector directly. The market failure that might justify such involvement centres on the preponderance of many small and medium-sized enterprises in the sector, which on their own may not be able to develop the tourism product. It is this lack of co-ordination between small enterprises that should be the focus of public intervention. Rather than making available resources for the development of a particular product, the enterprises in particular areas should be incentivised to develop their shared tourism product on a collaborative basis. This will result in a significantly higher return from any public investment, which in any case should be matched by resources from the main beneficiaries minimising deadweight.

It should be noted here that in Chapter 23 we recommend substantial investment in sports and art infrastructure, which apart from serving the domestic market will also have an important spillover effect for tourism. In order to maximise the benefits of that investment, the facilities provided or improved through this investment should be incorporated into product development strategies.

Tourism Marketing

It is recognised that the industry already spends substantial resources on marketing their product. Nevertheless, since the marketing measure addresses a market failure it can be justified. However, efforts need to be made to reduce this market failure which arises by encouraging the SME's in the industry to organise themselves better. In order to encourage this and minimise deadweight, matching funds for the marketing measure should be

sought from the SME segment of the industry, which would have the added benefit of increasing the overall budget available for marketing. It is recognised that given the substantial and positive North-South co-operation on marketing such changes may not be straightforward, but since the proposal is not to cut the total funds available for marketing but rather change the sources of where the funding comes from these changes should be possible without breaking binding agreements with the Northern partners.

Convention Centre

The development of the convention centre in Dublin may have a high return. However, this needs to be assessed through a thorough cost-benefit analysis. As capacity constraints in the construction sector are likely to exist going forward and with continuing high demand for infrastructure and housing, not just from the public sector but also from the private sector, this development should not receive high priority. However, once the major infrastructural projects are coming to an end this project may prove attractive. Consequently, some preliminary planning should be carried out so that this facility will be well integrated with the new transport infrastructures in Dublin.

Table 20.3: Financial Recommendation

Measure	Recommendation	2006 (€ million)	2007-2013 Average (€ million)
Tourism Marketing	Reduce	40	30
Tourism	Reduce	5	2
Tourism and Recreational Angling	Reduce	1	0
Total		46	32

20.6 Enterprise/ Industry Development

While the success of the Irish economy over the last fifteen years owed much to Foreign Direct Investment (FDI), the indigenous sector also plays an important role in the Irish economy. Attracting internationally mobile investment across the world to Ireland is likely to become more difficult for a number of reasons. First, with globalisation and continuing reductions in trade barriers, market access is becoming less important as a determinant for FDI. This implies that international competition for FDI is increasing. Second, as the Irish economy has grown substantially over the last decade and a half, cost competitiveness, particularly with regard to wage levels, has diminished. Finally, as FDI predominates in some sectors, these sectors are particularly dependent on developments such as tax laws and macroeconomic fundamentals in competing countries, which are outside the control of the Irish Government. Given these developments, industrial strategy should aim at developing a more diverse portfolio of enterprises, by developing indigenous enterprises, while still seeking to attract quality multinational employers.

A variety of other supports have been provided either for specific sectors (food sector, film industry), types of enterprises (micro-enterprises) or geographic areas (Gaeltacht). Again the rationale for such interventions must be that they address specific market failures.

CURRENT ACTIVITY

As part of the supports for indigenous industry marketing is a key priority in the current NDP. The rationale for this is based on the high proportion of SMEs among indigenous businesses, which may not have developed adequate marketing expertise. This is likely to be a particular problem in more peripheral regions where market access is already more difficult due to their location. In addition to the general marketing measure and the sector specific measures on tourism and the seafood sectors, there is a specific focus on the food sector, for which the same rationale ought to apply implying that the focus must be on SME's since larger enterprises should have the resources and capabilities to carry out their own marketing.

Apart from marketing the priority also supports the development of SME's by improving their in-company strategic planning capabilities by facilitating a review of operations and the adoption of efficiency enhancing work practices. Furthermore, financial support for enterprises through equity participation and Seed and Venture Capital Funds has been provided to aid business development and facilitate expansion. In the case of indigenous industries the venture capital measure performed well. Since highly risky projects may exhibit positive externalities there are some arguments for enhancing this sub-measure. Regional Networks, which are aimed at building the capacity of firms, were supported. Networking encourages knowledge transfer between businesses and diffusion of best practice increasing competitiveness and growth. Finally, Dedicated Support Services at a sectoral level such as the Crafts Council was aimed at increasing specific skills.

The stimulation of entrepreneurship through support for the micro-enterprises is practiced in many countries. The rationale is that all firms start small and, particularly in rural and peripheral parts of the country, the number of firm start-ups is low thus limiting the potential economic growth. The *Micro-enterprise* measure aims to support micro-enterprises through selective financial interventions. This will support employment, albeit at a very small level, and could help in diversifying the enterprise structure of the regions. As business start-ups require some entrepreneurial skills the measure also aims to develop these skills through targeted training programmes and mentoring. Overall, the micro-enterprise measures were performing well both in financial and physical terms. However, the overall impact of this measure is likely to be small. Finally, specific sub-measures targeted at indigenous industry in Gaeltacht areas through financial support and the provision of land and buildings have been in place. Support for land and buildings

produces a very low return and was eliminated elsewhere. Support under this measure should be ended whereas the financial grants should be maintained.

Apart from getting support under the current NDP, the *Film Industry* sector was also funded through the tax system. Thus, the sector has received substantial funding. Having provided incentives for the "infant" industry, total public provision should be less generous moving forward. As the stimulus has been given to the industry to get it started it is time to phase it out. Further support for the industry should be part of broad support for cultural activities. The industry should then compete against other cultural activities to attract future funding. If, as is indicated by the Department of Arts, Sports and Tourism, the film industry requires indefinite capital support and incentivisation, support for this industry should be seriously questioned, since this industry will absorb resources that could be used by other industries that will not need ongoing support, resulting in substantially higher returns. The key issue is not whether an industry achieves a net return but how this return compares to other industries. This approach, providing a more competitive environment for support, is in character with the recommendations we have made for other measures in this and other chapters.

While prospects for the attraction of significant FDI may have diminished somewhat over recent years, this source of investment continues to play an important role. FDI was supported under the current NDP through Capital Grants, Employment Grants, Equity Participation, and R&D capability grants. The focus of the *Capital Grants* is aimed particularly at regional development especially in Objective 1 regions, by funding further expansion of existing firms and attracting new ones. *Employment Grants* are particularly relevant for internationally traded services firms which require considerably less capital investment than manufacturing firms. As with the indigenous sector the State can also participate in equity terms in multinational businesses, which is particularly useful in emerging sectors where investment is risky but may have particularly high returns in the long run. Finally, in keeping with the general aim of increasing research and development effort, *R&D Capability Grants* have been available in order to encourage existing multinational enterprises to upgrade the operations carried out in Ireland. This appears to be an important measure since basic manufacturing is unlikely to have a long-term future in Ireland as the cost structure for such activities disimproves. Thus, these activities need to be replaced with higher level strategic activities.

Most sub-measures under FDI did not perform well during the years 2000 to 2002. An exception is the sub-measure on capital grants. There may be several reasons for this. Concerning R&D, it can be shown that foreign-owned companies do most of their research in the home country. Second, the Irish national innovation system may be too limited, so that the companies do not avail of grants. Therefore, it could be better to reduce the research grants under FDI and raise the funds for other grants or to support

networks on R&D between foreign owned and indigenous industries. It is questionable whether employment grants are useful when the economy is close to full employment.

RECOMMENDATION

The recommendations for funding under the next NDP are shown in Table 20.4. The development of enterprises, both foreign and indigenous is vital for the success of the Irish economy. Addressing market failures and putting in place strategic measures will continue to be of high priority. However, as the potential for deadweight is particularly high in private sector activities caution needs to be exercised and sufficient controls built into schemes. In relation to grants to multinational enterprises, safeguards related to employment creation and plant survival have been applied for some time, which is likely to ensure reasonable value for money. Similarly, equity and venture capital schemes, if targeted correctly, are likely to address financing problems in emerging sectors, while allowing the State to profit from the success of any project. In general targeting is important. In the indigenous sector support should be focused particularly on SMEs.

Table 20.4: Enterprise/Industry Development

Measure	Recommendation	2006 (€ million)	2007-2013 Average (€ million)
Seafood Processing	Reduce	2.0	1
Food Agricultural Products	Reduce	9.0	5
Film Industry	Reduce	15.5	0
Seafood Marketing	Merge – reduce	1.9	0
Food Sector Marketing	Merge – reduce	5.0	0
Industry Marketing	Merge - reduce	11.0	0
Marketing	New	0	10 + industry contribution
Micro-enterprise	Merge	33.4	0
Gaeltacht Areas	Merge	27.7	0
Indigenous Industry	Merge	55.6	0
Industry Development	New (unchanged funding)	0	120
Foreign Direct Investment	Same	98.5	98.5
Indigenous Industry/Foreign Direct Investment		0	0
Total		259.6	234.5

21. HEALTH

As in all developed countries, healthcare is an important area of Government intervention and the public sector is the major healthcare provider in Ireland. Government policy as set out in the 2001 health strategy entitled *Quality and Fairness: A Health System for You* emphasises the wider concept of health that covers the State of physical, mental and social well-being and not just the absence of illness or disability. The aim of policy is to promote health gain through alleviation of illnesses and disability and other measures that improve the quality of life. Furthermore, covering other related aspects, the strategy aims to promote social gain, including the quality of life of carers, dependents, the elderly and children.

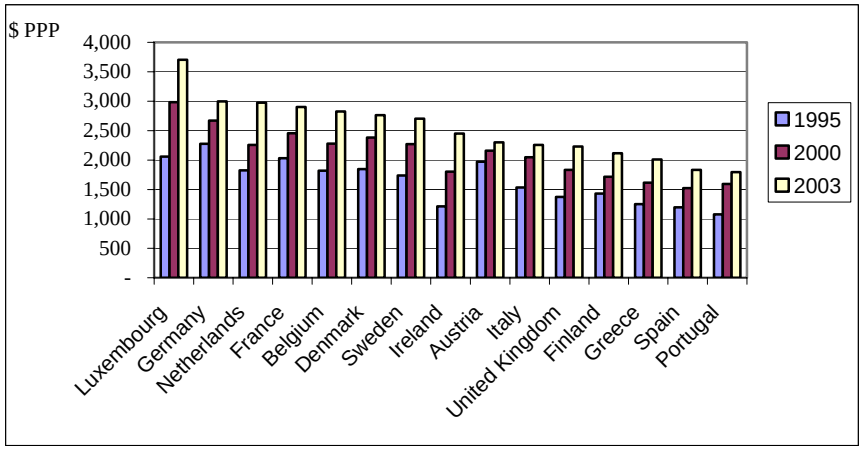
The health system has been subjected to substantial reforms over recent years. Healthcare provision was the responsibility of the eight regional health boards starting in 1970, with the Department of Health having been responsible for the development and execution of health policy. Since 2005 the Health Boards have been abolished and replaced by the Health Services Executive (HSE), which is charged with managing the health service as a single entity, while policy remains the responsibility of the Department of Health and Children. The bulk of capital spending in the area is the responsibility of the HSE.[106]

A substantial proportion of expenditure in the health area is current expenditure, which in the strict sense does not constitute an investment. However, as an important output of the health system is intended to be the improvement of health, one could nevertheless make the case that even the current expenditure has investment qualities.

Healthcare expenditure in all developed countries is increasing rapidly. This is clear from Figure 21.1, which also provides a comparison of health expenditures across EU countries. While per capita expenditure in Ireland for 2003 is close to the OECD average, a number of countries have substantially higher expenditure. Nevertheless, Ireland has achieved the fastest growth rate of health expenditure of the EU countries and, if the trend is continued, will be close to the top per capita expenditure (excluding Luxembourg) in 2007. It should also be noted that almost 80 per cent of the total expenditure is public expenditure which is slightly above the EU average.

[106] The Health Services Executive controls approximately 96 per cent of public capital expenditure on healthcare.

Figure 21.1: Total Health Expenditure Per Capita Expressed in $ PPP



Source: OECD *Health Data 2005.*

However, expenditure does not necessarily translate into positive health status indicators and good healthcare outcomes. Nolan and Nolan (2004) show that in a comparison for these indicators with other developed OECD countries, Ireland did not perform well. For example, in terms of health status indicators, life expectancy, birth weight and infant mortality, Ireland ranked just 14th out of 22 countries. In terms of factors influencing these health status indicators, such as road traffic accidents, alcohol and tobacco consumption, sulphur-dioxide emissions and immunisation rates, Ireland ranks joint last with Japan. Of course this does not necessarily imply that the health services do not manage to perform well in terms of causes of mortality. However, in this respect Ireland also ranks very poorly. Thus, while Ireland has outperformed most other developed countries in terms of per capita GDP, there remains much ground to be made up in terms of improvements in health status, equity and efficiency (Wiley, 2005).

21.1 Overview of Progress and Lessons

Despite the high proportion of current expenditure in the healthcare area substantial capital investment has also been put in place over the last decade. In this respect the current NDP has made a substantial contribution. The three broad areas that the NDP has contributed to are:

1. Acute Hospitals

This measure was primarily aimed at expanding and improving acute hospital facilities in keeping with health needs. Thus, the investment was aimed at reducing waiting lists and supporting national strategies on cancer and cardiovascular treatment. A second target of this measure, that was not outlined in the original programme complement but has appeared in the recent progress report, is the provision of facilities to support the new nursing degree.

2. Non-acute Continuing Care

The non-acute care measure aims to provide facilities for a range of different groups, including the disabled, elderly, the mentally ill, at risk children, and the wider community. Given the diversity of target groups it is useful to briefly outline the range of facilities that were to be provided under this measure. For example, the measure provides funding for the provision of new Community Nursing Units (CNUs), extensions to Community Hospitals, new Day Care Centres and new social centres. This is to provide the additional range of supports required to maintain older people within the community, refurbish/upgrade the existing building stock and provide sufficient specialised services to meet current demands and assist in meeting the projected future growth in demand. Investment in acute psychiatric units in general hospitals was to help eliminate the need for any further acute admissions to old psychiatric hospitals. Furthermore, residential facilities designed to cater for child and adolescent psychiatric in-patients were to be constructed. The main emphasis in relation to childcare and protection was on high support units for out-of-control non-offending children and the upgrading of residential units for homeless children and others who are disadvantaged. Finally, the measure supported the extension, refurbishment and construction of health centres and community care headquarters.

3. Information and Communications Technology (ICT)

Under this measure a range of projects to develop intranet facilities and resource management systems, are supported. Other facilities supported under this measure are integrated IT systems that link various departments within hospitals.

Table 21.1 shows the financial progress of the three measures up to the middle of 2005. In total almost €2.4 billion had been spent to that point. While both the acute hospitals and ICT measures were ahead of target in terms of spending, the non-acute continuing care measure suffered poor financial progress. The pattern of financial progress is also reflected in the physical progress. Indeed the target number of new acute beds was already met in 2002. However, progress on facilities for the disabled appears to have been slow. Similarly, physical progress on health centres and community care headquarters has been slow.

Table 21.1: Financial Progress

Expenditure 2000-2005 € million	% of Forecast %
1,633.40	126.9
538.27	50.4
203.12	114.5
2,369.79	**93.6**

Source: ESIOP progress report to end June 2005.

21.2 Assessing Acute Hospital Bed Needs

In framing recommendations on investment needs for healthcare it is important to consider future bed needs. This is particularly important since, as was shown above, Ireland has experienced substantial population growth, which is projected to continue. Ideally, future needs projections should form the basis of all recommendations. The focus here is on estimating projections for acute hospital bed capacity; the production of projections for all aspects of the health service is beyond the scope of this study. The report on *Acute Hospital Bed Capacity* published by the Department of Health and Children in 2002 recommended an increase in the hospital bed stock of around 3,000 beds. A range of factors, including changes in population and hospital service utilisation patterns, provide grounds for now revisiting the question of how many hospital beds will be required by the Irish health service up to 2013. At the outset, however, it is, important to note the limitations of the work undertaken on this issue as part of this study. The work is policy neutral so no assumptions are made regarding changes in the way the health system is currently operated. Specifically, it should be noted that the data that drive the results refer to the period 1995-2004, prior to the establishment of the Health Services Executive and the associated changes in management and administration within the Irish system. Questions relating to changes in the geographical distribution of hospital service provision and/or changes in the provision of long-term care or service delivery outside of the acute area have not been addressed for the projections presented here.

No assumptions were made regarding changes to the way the primary/community care system operates or the public/private mix etc. As this study is focused on capacity within acute public hospitals in Ireland, the analysis to date does not address the current or potential future relationship between the public and private sectors in regard to the provision of acute hospital services. While information is available on capacity within the private hospital sector, there is no standardised database available on the utilisation of services within private hospitals. The utilisation data for the public hospital system does include data on the utilisation by private patients in this sector.

The projections are based on a review of the utilisation of beds in acute public hospitals by gender, age and site of care. The data on hospital service use is provided by the Hospital In-patient Enquiry System (HIPE). The HIPE Scheme is a computer-based health information system designed to collect clinical and administrative data on discharges and deaths from acute hospitals in Ireland (HIPE, 2002). Data for the ten year period 1995-2004 have been analysed for this study. Over this period, data on approximately 95 per cent of all discharges from all acute public hospitals have been collected, with the 1995 estimate of total discharges of 608,151 increasing to 984,230 in 2004.

Clearly, demographic projections for the period are key to the estimation of acute hospital bed requirements. In this respect, the

Medium-Term Review (high-growth) population projections formed the basis for the analysis conducted here. The overview of changes in utilisation patterns for acute hospital services show some important developments over the past ten years. Specifically, important variations are observed for the age distribution, day/in-patient status and surgical/non-surgical status. The overall growth in the volume of discharges treated on a day basis rather than on an in-patient basis is particularly significant.

Table 21.2 shows the number of acute hospital beds available for the period 1995-2004 as reported by the Department of Health and Children. According to these estimates, there has been an increase of 1,011 acute hospital beds over this period, representing an 8 per cent rise in the total acute bed stock. The table also shows that occupancy levels have been increasing since 1995 to the point where in 2004 occupancy was estimated at 84 per cent nationally (based on 100 per cent coverage of discharges).

A review of the literature suggests that the approach adopted by researchers at the Manitoba Centre for Health Policy on projecting hospital bed needs for Manitoba could be usefully applied to the Irish context (Stewart and Tate, *et al.*, 2002; Tate, 2005; Finlayson, 2005). For this study, two models for projecting hospital use up to 2020 were estimated. The first model, called "Current Use Projection", projected future use on the basis of current patterns of use. With this model, data on the current utilisation of acute care beds were used to project the utilisation forward to 2020 based on available projections regarding the age and sex composition of the population. The second model, "Trend Analysis", was based on analysis of trends in hospital use of the most recent 10-year period. This model involved the identification of trends in hospital use for specified age and sex groupings, which were subjected to statistical regression analysis to enable the extrapolation of trends to 2020. Over the period of the current study, the Canadian researchers who estimated acute bed capacity requirements for Manitoba up to 2020 worked with the ESRI team to estimate acute hospital bed capacity requirements up to 2013 for Ireland.[107] In addition to the Current Use and Trend Models, an additional 6-year Trend Model was estimated.

For the estimation of acute hospital bed capacity requirements for Ireland up to 2013, the Current Use model assumed that future utilisation of acute hospital beds would be similar to that prevailing from 2002 through 2004 and that only the population distribution would change. The 10-year Trend Analysis model considered the trends in hospital use over the period 1995-2004 and assumed that

[107] A detailed description of this collaborative study will be presented in Tate, R., G. Finlayson, L. MacWilliam, M.M. Wiley "Projections for Acute Hospitals Beds in Ireland, 2007-2020", ESRI Working Paper, 2006, forthcoming. This paper will also present more detailed projections for acute hospital bed capacity requirements to 2020 by category for gender, age, in-patient (surgical and non-surgical) and day.

Table 21.2: Acute Hospital Beds, Bed Days and Occupancy 1995-2004

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
DoH&C estimate of total acute beds available	12,496	12,520	12,470	12,421	12,437	12,607	12,808	13,076	13,207	13,507
Change in number of beds compared to previous year		24	-50	-49	16	170	201	268	131	300
Available beds adjusted for hospitals in HIPE	12,790	12,821	12,830	12,784	12,787	13,000	13,188	13,454	13,565	13,883
Available bed days for HIPE hospital beds	4,671,548	4,682,870	4,686,158	4,669,356	4,670,452	4,748,250	4,816,917	4,914,074	4,954,616	5,070,766
Bed days reported to HIPE (95% coverage)	3,359,198	3,347,478	3,410,662	3,420,553	3,559,155	3,645,781	3,794,162	3,819,671	3,871,912	4,022,751
Occupancy based on returns to HIPE (%)	72	71	73	73	76	77	79	78	78	79
Bed days reported to HIPE adjusted up to 100%	3,535,998	3,523,661	3,590,171	3,600,582	3,746,479	3,837,664	3,993,855	4,020,706	4,075,697	4,234,475
Occupancy based on HIPE returns adjusted up to 100%	76	75	77	77	80	81	83	82	82	84

Source: Own calculations.

Table 21.3: Projections for Acute Hospital Beds and Capital Expenditure Requirements, 2007-2013

100 Per Cent occupancy	2006	2007	2008	2009	2010	2011	2012	2013	Cumulative Total
Current Use Model Total	13,591	11,552	11,778	12,010	12,259	12,524	12,806	13,100	
Implied Change compared to previous year			226	232	249	265	282	294	1,548
Trend Analysis Model: 10 Year Trend	13,591	11,916	12,287	12,685	13,124	13,605	14,133	14,704	
Implied Change compared to previous year			371	398	439	481	528	571	2,788
Trend Analysis Model: 6 Year Trend	13,591	11,389	11,636	11,903	12,205	12,541	12,914.9	13,325	
Implied Change compared to previous year			247	266.9	301.6	335.6	374.4	409.9	1,935
85 Per Cent occupancy									
Current Use Model Total	13,591	13,591	13,857	14,130	14,422	14,734	15,066	15,412	
Implied Change compared to previous year			266	273	293	312	332	346	1,821
Trend Analysis Model: 10 Year Trend	13,591	14,019	14,455	14,924	15,440	16,006	16,627	17,299	
Implied Change compared to previous year			436	468	516	566	621	672	3,280
Trend Analysis Model: 6 Year Trend	13,591	13,399	13,690	14,004	14,359	14,754	15,194	15,676	
Implied Change compared to previous year			291	314	355	395	440	482	2,277

these trends would continue into the future. Acute hospital bed projections for this model were based on the trends observed combined with changes in the population distribution. The 6-year Trend Analysis model, which was specific to Ireland, was estimated because of a change in the practice of reporting obstetrics over the period of the data used to estimate this model.[108]

Summary estimates are presented in Table 21.3 according to the assumption of 100 per cent occupancy and 85 per cent occupancy. It should be noted that current occupancy rates are below 100 per cent, which explains the difference between the current 2006

[108] Specifically, the reporting of obstetrics to the Hospital In-patient Enquiry only became compulsory in 1999 – prior to that time, reporting for these discharges was on an ad hoc basis. Because of this change, the 10-year trend analysis model was found to be severely compromised for females in the age groups 15-24, 25-34 and 35-44 years. The 6-year trend analysis model was estimated to address this problem; the findings of this model are therefore only applicable to females aged between 15-44 years.

available beds and the projected 2007 beds requirement under the 100 per cent occupancy assumption. While it is unrealistic and perhaps even undesirable to expect 100 per cent occupancy, this assumption forms a benchmark against which the implications of other occupancy rate assumptions can be judged.

This analysis shows that over the period 2007-2013, assuming 100 per cent occupancy, 1,548 additional acute hospital beds would be required according to the 'Current Use' model, 2,788 additional beds would be required according to the 10-year Trend Model and 1,935 additional beds would be required according to the 6-year Trend Model. Assuming 85 per cent occupancy over the period 2007-2013, an additional 1,821 acute hospital beds are projected to be required according to the Current Use model, an additional 3,280 beds would be required on the basis of the 10-year Trend Model while the 6-year Trend Model estimated the need for an additional 2,277 beds. The projections for the 6-year trend model are clearly closer to the current use model while those derived from the 10-year trend model are much higher. The 6-year trend model has the benefit of more complete data but the disadvantage of a shorter time period over which to estimate the bed capacity projections.

In order to estimate the financial implications of these projections, approximate costs per bed were supplied by the Department of Health and Children. The DoH&C estimate that, at 2006 prices (including VAT and excluding site purchase costs), the cost of building 'new' acute beds on a green field site approximates €500,000 per bed; building additional beds for an existing hospital may cost closer to €250,000 per bed. Here an even split between Greenfield and extension beds is assumed. The actual cost will vary depending on the type of support facilities required to service the additional beds. The DoH&C cost estimates do not differentiate bed type (day, in-patient surgical, in-patient non-surgical). The estimation of the revenue requirements arising from any expansion in the number of acute hospital beds is outside the scope of this project. Prior to any commitment to capital investment in this area, the revenue implications will have to be thoroughly addressed as they will be considerable.

The capital investment required to provide the additional beds is summarised in Table 21.4. The table clearly shows the implications of varying the assumptions and model on funding requirements. Depending on model and occupancy assumption the average annual funding requirement is between €97 million and €205 million. The 6-year trend and the current use models produce quite similar numbers. As was noted above, the 6-year trend model has benefited from a more comprehensive data set and is therefore preferred. Comparing the funding requirements for the same model under the two different occupancy assumptions reveals the benefits of achieving higher occupancy rates. For the 6-year trend model the difference between the average cost for the 100 per cent and 85 per cent occupancy rates are over €20 million.

Table 21.4: Implied Investment Required (€ million)

100 Per Cent occupancy	2008	2009	2010	2011	2012	2013	Average	Cumulative Total
Current Use Model Total	84.8	87.0	93.4	99.4	105.8	110.3	96.8	580.5
Trend Analysis Model: 10-Year Trend	139.1	149.3	164.6	180.4	198.0	214.1	174.3	1,045.5
Trend Analysis Model: 6-Year Trend	92.6	100.1	113.1	125.9	140.4	153.7	121.0	725.8
85 Per Cent occupancy								
Current Use Model Total	99.7	102.4	109.9	116.9	124.4	129.7	113.8	682.9
Trend Analysis Model: 10-Year Trend	163.7	175.6	193.7	212.2	232.9	251.9	205.0	1,230.0
Trend Analysis Model: 6-Year Trend	109.0	117.8	133.1	148.1	165.2	180.8	142.3	853.9

Overall, the model yields very useful results. However, as was noted above a fuller analysis should be carried out in the future.[109] The potential impact on acute hospital bed capacity projections would need to be assessed for a range of issues including:

- policy changes both in the hospital and community care systems;
- the public/private mix within the public hospital system having specific regard to proposals announced in July 2005 to free up 1,000 beds in public hospitals with the development of new private hospitals on the campuses of public hospitals. The implications of planned developments of additional hospitals by the private sector should also be addressed here;
- the geographical distribution of acute hospital services;
- alternative scenarios assuming differing levels of occupancy;
- international best practice in relation to acute hospital service provision.

RECOMMENDATIONS

Health expenditure (current and capital) has been growing at an exceptional pace in recent years. Starting at a relatively low level, Irish public expenditure on health per capita is now amongst the highest in the EU. As in other investment areas, the investment needs are highly dependent on the underlying system. Thus, if efficiencies are achieved then the investment needs are lower. That said, the analysis presented here suggests that the current volume of investment appears to be appropriate given the underlying structure.

[109] It should be noted here that, at the time of writing, the Health Services Executive have established a steering group and a project team and issued a call for tender to undertake a Review of Acute Bed Capacity requirements for Ireland to 2020.

Substantial investment has already gone into the Nursing Degree Programme. Given this high level of expenditure in this area, further investment should be limited.

If one considers the 6-year trend as the most appropriate projection then an average investment of just under €150 million per year will be needed in order to provide the additional beds required. Apart from this investment, upgrading and replacement of non-bed facilities will be necessary. While the precise needs for this are difficult to measure (see our comments below), it seems appropriate that investment of the same magnitude to the additional acute beds will be required.

The non-acute/continuing care measure is of considerable importance from a social inclusion and equality point of view. It can also contribute to reducing pressure on acute hospital beds by ensuring that appropriate secondary care is available for people who no longer need care in acute beds. As was shown in Chapter 9, the number of individuals with a disability has increased. Demographic change also means that by 2013 there will be almost 160,000 more people aged 65 years and over compared to 2006, which will result in an increase in facilities for the elderly.

The *Report of the Expert Group on Mental Health* (2006) calls for substantial extra funding for a new Mental Health Policy. In particular it recommends a programme of capital and non-capital investment in mental health services that is to be implemented in parallel with the reorganisation of mental health services. Progress on this measure was slow under the current NDP, which means that there is even more need to invest going forward.

The ICT measure is important since it facilitates process innovation and should increase productivity. *The National Health Information Strategy* highlights the urgent need to put in place information technology (IT) systems as these are a vital component of a modern health system. Such IT systems include a national integrated personnel and financial management system, systems to manage medical records, laboratory results, disease specific registers (e.g. the cancer register), databases of research, services planning, e-Government and public information. Such systems clearly contribute towards improving the levels of service within the sector and should result in significant productivity improvements.

While significant progress has been achieved in the ICT measure there appears to be a need for continued funding. However, once the investment is in place the level of funding will need to be scaled back. Furthermore, the best system is of little use if the staff operating it do not have the required skills. It is, therefore, important to ensure that staff receive the appropriate training or staff with the required skills are recruited. It will also be necessary to put in place the necessary monitoring of progress on projects.

Table 21.5: Financial Recommendations

Measure	Recommendation	2006 (€ million)	2007-2013 Average (€ million)
Acute Hospitals (incl. Nursing Degree)	Same	283.9	283.9
Non-acute	Increase	240.7	300.0
ICT and Research	Increase	65.0	90.0
Total		**589.6**	**673.9**

Note: The 2006 allocation is based on the figures for the NDP and is not directly comparable with the MACIF used in Chapter 5. The table also excludes expenditure for agencies funded by the Department of Health and Children and expenditure through the Dormant Accounts scheme, which amounted to €47 million.

ACCOMPANYING MEASURES

In making recommendations on acute hospital bed needs the impact of demographic change was taken into account. This analysis, however, was conducted under certain assumptions the impact of which need to be considered in more detail. For example, the analysis focused entirely on beds in acute public hospitals. As private provision is likely to increase due to the tax incentives that are available, total supply may be increasing faster and to a level that is higher than required. Assumptions about utilisation rates and technical change in the sector also need to be considered in more detail. The needs in the acute sector were considered in isolation of the wider sector, particularly primary provision and long-term continuing care provision. Clearly developments in these two sectors may result in reduced demand for acute beds. Finally, the spatial aspects of acute bed demand were not considered. In this respect trends in the regional population need to be considered in finalising policy in this area.

Consequently, a more comprehensive rational decision-making process for the configuration of capital spending in the sector (e.g. achieving the appropriate balance between the acute and non-acute sectors and between residential and community supports) requires a more extended analysis than could be provided as part of this report. Since expanded physical capacity needs to be accompanied by increased operating expenditure, the current expenditure implications of any recommendation need to be factored into the decision model. This is of course dependent on the mix of specialist services. Physical investment must be accompanied by guaranteed current expenditure streams to run the physical facilities.

The key analysis of this chapter considered acute hospital bed needs. It did not consider the resources required to upgrade/refurbish current hospital facilities, or the non-bed investment requirements (equipment). Currently, substantial resources appear to be spent on capital investment other than new beds, including the purchase of new or replacement equipment and maintenance. It is difficult to assess the real need in these areas due to a lack of information. We estimate that this could be in the region of 50 per cent of capital spending in the acute hospitals area. Given the size of the expenditure, this must also be subject to a

rational decision process, which should reflect an assessment of need, so that this investment can be properly planned for.

In our recommendations on acute bed needs we made the assumption that 50 per cent of these would be provided on Greenfield sites, which would be more expensive. Clearly this assumption might not hold up in practice and it will be necessary to assess the degree to which investment needs might include a number of new facilities, either because space for expansion of existing facilities is limited or because the new facilities cannot be integrated properly with the existing facilities.

Experience has shown that delivery of large new facilities in the public health services is relatively slow. In part this reflects institutional factors, but might also reflect shortcomings in other areas. In order to speed up the provision of any new facilities utilising standardised designs should be explored which reduces the time taken to design new facilities and will also reduce costs of such designs. This approach has already been started with respect to schools.

The analysis conducted here did not consider the geographical distribution of acute hospital services. The current geographical distribution of facilities is to a large extent a legacy of the past. While changes might be expensive and subject to considerable debate, the geographical distribution of key facilities should be reconsidered according to changes in the regional distribution of the population and Government policy, especially the NSS. In this respect it appears reasonable to expect the key facilities to be located primarily in the gateways and the hubs identified in the NSS. Otherwise, a spatial mismatch between service availability and the location of the population will reduce efficiencies.

22. CHILDCARE

22.1 Introduction

In Ireland, childcare is often thought of as provision for pre-school children (i.e. those who have not yet entered infant classes in primary school) or for school-age children outside of school hours or during school holidays. State support for the provision of childcare in this sense is relatively new in Ireland, having begun to emerge only in the 1990s. However, childcare is now increasingly thought of as an element within a broader "early childhood care and education" (ECCE) paradigm (NESF, 2005). In this paradigm, the main focus is on the developmental needs of the child, which are thought to evolve through three stages in early childhood, with a fourth post-ECCE stage arising in later childhood:

- Individualised infant care (usually by parents) is preferred as the dominant (though not necessarily sole) form of care in the first year of the child's life;
- High quality centre-based care becomes more important from ages 1 to 2 years;
- From ages 3 to 5 years, the focus broadens to include an educational as well as a care dimension – this is where early childhood *education* comes in.
- From age 6 years onwards, primary schooling takes over the education function and the care requirement shifts to care outside of school hours and during school holidays.

There is a consensus that none of these elements is adequately provided in Ireland, although improvements are taking place in some (for overviews, see OECD, 2004; NESF 2005; see also below). The traditional practice of providing infant classes for 4 and 5 year-olds in primary schools means that provision for this age group (stage 3 above) is the most widely developed and is funded largely by the state.[110] However, there is a concern that because this service is provided within the primary school system and is delivered by primary school teachers, the type of education it entails is overly geared to instruction and cognitive learning and has pupil-teacher ratios that are too high to yield appropriate developmental benefit for 4 and 5 year olds (OECD, 2004). Furthermore, it provides no service for 3-year olds or half of 4-year olds and so misses a large part of the relevant population. Consequently, early childhood education services are in need of development as are the other elements of the ECCE system in Ireland. Additional care

[110] About 50 per cent of 4 year olds and virtually all 5 year olds attend infant classes in national primary schools (NESF, 2005).

demands for this group also exist outside of the school day and during school holidays.

RATIONALE FOR STATE SUPPORT

Four main types of justification are given for State support for ECCE:

- Gender equality.
- Child development.
- Social inclusion.
- Support for birth rates.

While market forces will encourage women with high earnings potential to enter paid employment during their child-rearing years, women with lesser earnings potential will not have the same incentives and will therefore be more likely to give up careers and lack independent incomes. Consequently, public interventions towards childcare that are aimed towards those with lower incomes and linked to employment status are justified to help avoid the gender inequality inherent in this outcome.

Children's social and educational development is enhanced by participation in early childhood education in the pre-school years (i.e. at ages 3 or 4 and 5 years) and the lifetime return on investment in such education is high, particularly in the case of disadvantaged children (NESF, 2005). This type of education has high returns but as with other types of education, demand would be sub-optimal without public intervention. This relates primarily to stage 3 referred to above, as for infants in the first year of life child development is best aided by extended parental leave. For 1 and 2 year olds, there is no clear evidence that paid childcare has developmental benefits (except in the case of disadvantaged families) and so the rationale for State support for childcare at these ages rests on grounds other than child development.

Research has shown that support for childcare and development from the first year of life onwards aimed at disadvantaged families helps children overcome the developmental handicaps often associated with poverty and it can enable parents to develop skills through participation in education and training courses or to enhance their incomes through paid employment.

Governments in many developed countries have become concerned about a decline in birth rates to very low levels and the consequences this might have for future social and economic development. As was shown above, this issue is less pressing in Ireland, since birth rates, though much lower than in the past, are at the upper edge of the range for developed countries and when combined with modest inward migration are sufficient to ensure modest population growth for the foreseeable future. Nevertheless, State support for childcare aimed at raising the birth rates might also be thought to have some application for Ireland. However, research results indicate that State support for families with children is not an effective means of influencing birth rates. Rather, the findings suggest that a high level of labour demand, especially with

regard to *women's* employment, is the strongest influence in support of higher birth rates (D'Addio and d'Ercole, 2005). Thus the birth rates argument on its own is not a strong justification for State support for childcare.

While public childcare supports are largely aimed at childcare outside of the home, the perspective of *mothers in the home,* which has been important in influencing policy in Ireland, must also be considered. This perspective rejects the view that State subvention for childcare should be aimed solely at parents in the labour force and argues instead that mothers (or fathers) who wish to stay at home to look after their children themselves are equally deserving of recognition and support from the State. It therefore promotes the view that the State should subvent childcare in a manner that is neutral on the choice facing parents between paying for childcare while working outside the home versus staying at home to provide care themselves.

This stance has important policy implications. As it requires that State support be spread over a wider population of families than would be the case if it were focused on paid childcare alone, it either implies lower spending per child or substantially higher levels of funding requirements. A neutral stance between supporting paid childcare and parent provided childcare is also likely to imply that some of the aims of 'early childhood care and education' (ECCE) outlined above might not be achieved in full. The difficulty of reconciling these cost implications with the desire to be neutral on the basis of paid versus self-provided or unpaid childcare has been at the centre of much of the debate about childcare provision in Ireland over recent years.

22.2 Assessing Progress

Up to 2006, the main forms of State support for childcare were as follows:

1. Capital and current subsidies to childcare providers made available under the Equal Opportunities Childcare Programme (EOCP), 2000-2006. This was the first major programme of public spending aimed at the childcare sector. It was designed to increase the supply and improve the quality of centre-based childcare places and thus responded to the gender equality, labour supply and child development perspectives on childcare. It also included some targeting on the less well-off and thereby aimed to serve the social inclusion rationale.

2. Increases in Child Benefit introduced over recent years, which were justified both on anti-poverty grounds and as a general support for childrearing, were thought of as incorporating an element of subsidy towards the cost of paid childcare. However, Child Benefit increases, insofar as they included a subsidy for childcare, were provided on the basis of the neutrality principle referred to earlier and so were made universally available to all parents, whether or not they made use of *paid* childcare.

3. The traditional provision of infant classes for 4 and 5 year olds in primary schools continued as before. No recent developments in structures or provision of facilities have occurred in this sector to address its limitations as a form of early childhood education referred to earlier.

Of these three supports the first, the EOCP 2000-2006, was the most important new development. It entailed total expenditure of €499.3 million, inclusive of administration, which, based on approvals to end-June 2005, is now expected to deliver 38,000 new childcare places by the end of 2007.[111] Although the EOCP was formulated under the National Development Plan and thus in principle was focused on capital development (both physical and human), in practice a large proportion of the expenditure was directed towards current costs. As Table 22.1 shows, 38.5 per cent of the expenditure was accounted for by supports for staffing costs. The supports for staffing under the EOCP are currently supporting over 2,300 childcare staff. 'Quality improvement' accounted for a further 18 per cent, and while a proportion of that was directed towards human capital (in the form of training for childcare workers), a substantial proportion was accounted for by administration and regulatory costs, especially those incurred in connection with main institutional innovation introduced to develop childcare, namely the County Childcare Committees. Thus, up to half the expenditure under the EOCP 2000-2006 was for current rather than capital purposes. This is not entirely surprising, since childcare is a labour intensive service in which support for capital costs, no matter how generous, is capable of having only a limited impact on overall costs. However, this feature of the EOCP is important to keep in mind in looking forward to the next National Development Plan, as it reminds us that public support for childcare is as much a question of current expenditure as capital expenditure.

Table 22.1: Expenditure Under the Equal Opportunities Childcare Programme 2000-2006

Measure	€ Million	%
Capital grants	204.5	41.0
Support for staffing costs	193.5	38.5
Quality improvement	83.3	16.5
Programme Administration	18.0	4.0
Total	499.3	100.0

Source: Department of Health and Children.

Of the new places established under the EOCP, 57 per cent are sessional/part-time and 43 per cent are full-time.[112] This compares with the original target breakdown of 67 per cent sessional/part-time and 33 per cent full time. The survey of 2004 grant

[111]The forecast number of new places based on approvals to end of June 2005 is 38,543 (BMW and S&E Monitoring Committee Reports Autumn 2005).

[112] A full-time place is one that provides more than 3.5 hours per day. In reality most of the full-time places provide well over the 3.5-hour minimum.

beneficiaries (ADM, 2005) found that 36 per cent of facilities were operating for 40 hours a week or more. Community providers were less likely to provide full-day services than private providers. Average operating hours per week were 30.7 in the community sector compared to 37.3 in the private sector.

The pattern of opening times has implications for the extent to which parents' participation in employment is facilitated. Overall, 71 per cent of community facilities and 55 per cent of private facilities closed for some period in the summer, with an average closure period (among those who close) of 5.5 weeks. County Childcare Committees are charged with ensuring that provision matches local demands and therefore these patterns may reflect needs. However, the lower coverage of opening times in the community sector versus the private sector (and in rural compared to urban provision) would have to be justified, as there is no a priori reason for expecting different demands from these sets of consumers. In 2004 a requirement that funded services operate for a minimum of 45 weeks was introduced.

QUALITY IMPROVEMENT

Under the quality improvement element of the programme training was provided for childcare workers. Between June 2004 and June 2005, 410 accredited courses were delivered. This ongoing investment in training of childcare personnel is crucial from a child development perspective. Funding was also usefully invested in researching best practice and developing policy recommendations, for example, in the Model Framework on Education and Training and the School Age Childcare Report.

TARGETING/SOCIAL INCLUSION

The Department reports that 60 per cent of successful applicants under the EOCP up to the end of 2004 were from the community and voluntary sector, for which 100 per cent capital grants were available. Targeting on the voluntary and community sector was intended to serve a social inclusion purpose, since that sector operates primarily in disadvantaged areas. Just 32 per cent of facilities provided under the scheme were located in such areas. However, the location of facilities in disadvantaged areas is not a precise targeting mechanism as many poor families live outside disadvantaged areas and services located within disadvantaged areas may be used by families from either within or without the area who are not themselves disadvantaged. Systematic information on the income profile of parents availing of services or on the level of parental contributions to childcare costs is not available. In 2004 only a minority of providers (8.9 per cent) reported that disadvantaged children are given priority access to childcare places, although this may understate the focus on disadvantage since many community-based services are wholly oriented to the socially and economically marginalised. The number of services caring for children of lone parents rose between 2002 and 2004 and

represented approximately 19 per cent of all children attending (according to *Census 2002*, 12 per cent of children under 15 years live in lone parent families). There has also been an increase in the number of services who care for children from the Travelling Community and from ethnic minorities.

A small proportion of community providers charge no fee (6 per cent). Of those providers that charge fees, one-third operate a sliding fee based on parental income (ADM, 2005). There is no central regulation in the setting of fee levels. The Department have noted that funders are now required to collect information on parental income. The Childcare Directorate's plan to require all community sector applicants to put a tiered system of charges in place might improve social inclusion targeting.

While it is recognised that social inclusion objectives are well incorporated into project selection criteria, further improvements in reporting are needed to establish that social inclusion targets are met at the *individual* level. This means measuring the extent to which disadvantaged children are getting access to places and ensuring that subsidies are targeted towards disadvantaged parents for example by adjusting fees according to parental income.

WAITING LISTS

In 2004 half of the grant-aided facilities had waiting lists for childcare places required immediately (ADM, 2005) and 78 per cent had waiting lists for places required in the future. The total number of children on waiting lists was 14,338. While these figures are an imperfect measure of demand they do suggest a significant level of under-supply.[113] The largest waiting list was for the 3-5 year age group. However, greatest demand relative to current provision was for babies under 1 year. In this category there were more children on the waiting lists than actually attending services.

ORGANISATIONAL ISSUES

Over the period of the current NDP significant progress has been made in establishing structures to develop and co-ordinate childcare policy at the local and national level and to manage the EOCP. The County/City Childcare Committees have proved an effective means of encouraging co-operation between the range of childcare providers in local areas and in establishing childcare needs. The recent re-organisation of childcare at the central Government level is to be welcomed as this should lead to an improvement in policy development and delivery and will hopefully reduce the problem of negotiating with multiple funders, which is frequently reported in the community sector (Southside Partnership, 2005).

[113] As noted in the ADM report, a facility has to exist before there is a waiting list so demand in areas with no facilities is not measured, and some children may be on more than one list. We have no current information on waiting lists in unsupported facilities but the Childcare Census suggested lists were just as high in the private sector as the community sector.

LESSONS LEARNED

The key lessons learned from developments in childcare provision to date are:

- State support in this area is primarily a matter for current rather than capital expenditure, but capital expenditure can make a useful contribution, as evidenced by the effectiveness of the EOCP in creating new childcare places.
- The effectiveness of provision to date in serving its social inclusion rationale is unclear since the relevant information is not available. Information in this area needs to be improved and social inclusion targeting reviewed in that light.
- There is unmet demand for existing services, over and above any latent demand that might be uncovered as services develop or become more affordable.
- Only modest progress has been made in addressing the need to improve and expand the provision of early childhood education for 3-5 year olds. While early education was not an objective of the EOCP it has been incorporated into targets for the NCIP.

22.3 Priorities for the Next Plan

Childcare continues to be a high priority for society and the economy, and many difficult questions arise as to the desired level and purpose of future state support in this area. However, most of the issues involved (such as staff training and retention, subsidies towards current costs, targeting of those subsidies on the socially disadvantaged) relate to *current* rather than capital expenditure and, therefore, do not need be resolved in connection with capital expenditure under the next National Development Plan. For capital expenditure purposes, the main question that arises is the likely overall level of future demand for centre-based childcare places, while a further question relates to the need to provide facilities for the future development of early childhood education. We assume here that further issues, such as the availability of after-school care, will be resolved without major capital expenditure on the basis that existing facilities (such as school premises) will be used for this purpose, although expenditure will be needed to improve facilities. If issues related to the use of school premises cannot be resolved, the level of investment would increase substantially and would result in two sets of premises being under-utilised – school buildings outside of school hours and after-school premises during school hours.

The main uncertainty concerning future demand for childcare arises less from the size of the child cohort than from changing patterns of labour force participation among mothers and changing preferences regarding types of childcare. The latter in turn will be strongly influenced by the cost, quality, suitability and availability of

different types of childcare and thus will in part be a consequence as much as a cause of State investment in this area.

According to data from the CSO *Quarterly National Household Survey* in 2002 (Table 22.2), non-parental childcare was used by 42.5 per cent of families with children of pre-school age and by 25.3 per cent of families with children of primary school age. However, most of this care was non-centre-based. In the case of families with pre-school children who used non-parental childcare, only 27 per cent used centre-based care (crèche or Montessori school), while 43 per cent relied on relatives, the majority of whom were unpaid, and 29 per cent relied on individual childminders. Thus, the proportion of all families with pre-school children using centre-based care was only about 10 per cent in 2002.

Table 22.2: Types of Childcare Among Families with Pre-School and Primary School Children, September-November 2002

	Pre-school Number of Families (000s)	%	Primary Number of Families (000s)	%
Unpaid relative	22.8	31.2	31.1	46.1
Paid relative	8.8	12.0	9.5	14.1
Paid carer	21.5	29.4	21.5	31.9
Crèche/Montessori	19.8	27.1	4.1	6.1
Other	5.4	7.4	2.9	4.3
Total	73.1	100.0	67.5	100
% of families with children in childcare		42.5		25.3

Source: Central Statistics Office, *QNHS* 4th Quarter 2002 Childcare Module.
Note: 'Other' includes after-school facilities, homework clubs, and activity camps.

As indicated earlier, however, this pattern of usage reflected a level of pent-up demand for centre-based childcare places. Just under 20 per cent of respondents with pre-school children indicated that they would prefer alternative childcare arrangements and centre-based care was by far the most commonly cited option[114]. Amongst those with school age children around 12.5 per cent would welcome alternative childcare arrangements, and among these after-school care was the most popular alternative (24 per cent), followed by paid carers (22 per cent) (CSO, July 2003).

We now set out an illustrative indication of the level of demand for centre-based care that might be expected to emerge by 2012. Since future demand for centre-based childcare will be shaped by many factors which are themselves difficult to predict (including, for example, the cost of childcare relative to after-tax earnings, and preferences for centre-based over other forms of paid childcare), firm predictions on this issue cannot be made. The purpose of the calculations presented here, rather, is to estimate orders of magnitude that would enable us to assess whether the projected

[114] Just under half of the group said they would prefer crèche/Montessori compared to 20 per cent who mentioned a paid carer and 10 per cent who would prefer to mind their children themselves.

number of places to be created under the NCIP (50,000) is likely in broad terms to represent under or over-provision.

The projection of demand for centre-based care is arrived at by applying a series of assumptions to a demographic forecast of the size of the child cohort in 2012 as set out in Table 22.3. Column A in this table sets out the demographic forecast by single year of age. Column B presents the assumed percentage of each one-year age-group requiring childcare. For children under the age of one year we assume that the provision of six months paid maternity leave will mean minimal demand for care for those aged under six months, while for those aged 6-12 months, we assume that 40 per cent will require childcare. This is based on research showing that just under 40 per cent of Irish mothers were back in employment one year after the birth (Russell *et al.,* 2006). We apply the 40 per cent rate to half the cohort and add 5 per cent for non-employment related care, thus giving 25 per cent of the whole cohort.

For children aged 1 to 3 years we assume that 65 per cent will require some form of childcare. This assumption is based on current participation rates of 58 per cent among mothers with children under 5 years (CSO, *QNHS* q2 2005), which we assume will increase to 60 per cent .We add a further 5 per cent who may require non-employment related care.

Around half of 4 year olds are in primary school, therefore, the estimate of the proportion requiring care is reduced to 53 per cent. This figure is arrived at by applying the 65 per cent rate to half the cohort and the 40 per cent rate estimated for primary school children (see below) to the other half of the cohort.

For school age children we estimate that 40 per cent will require childcare. We assume an employment rate of 60 per cent among mothers of children in this age bracket based on the *QNHS* figures for the last quarter of 2005 for mothers whose youngest child is aged between 5 and 15 years (*QNHS* q4 2005). We assume one-third will work part-time and that none of this group will require childcare.[115] On the basis of these calculations we estimate that in 2012, 367,000 children will require some form of childcare.

The next question is what proportion of these will require *centre-based* care, a question that cannot be answered with any certainty. Here we assume that the combined effect of the greater availability of places and decreasing number of non-employed relatives available to provide informal childcare *will cause the proportion of all childcare that is provided in formal childcare centres to double by 2012 compared to that recorded in the QNHS in 2004*. This assumption also reflects the preference for switching to centre-based provision amongst a proportion of those using informal care noted earlier. *On this basis, we estimate a total demand for 137,000 centre-based places by 2012*. If the forecast number of places based on latest approval

[115] The part-time rate among female workers in q4 2005 stood at 32 per cent. The assumption that no part-timer require childcare is likely to under-estimate demand, however, this is counter-balanced by the likelihood that the part-time employment rate is in fact higher than average amongst this group of women.

figures are created (38,000) by the end of 2007 and we add this figure to the 57,000 places counted in the 2000 Childcare Census (see Table 22.4) *this would suggest that an additional 42,000 new places would be required between 2007 and 2012 to reach the 137,000 figure projected here.*

Table 22.3: Projected Number of Centre-based Childcare Places Required in 2012

Age	A Projected Number in Cohort (2012)[a]	B Assumption re % of cohort requiring childcare [b]	C Projected Number Requiring Childcare (B*A)	D Assumption re % of Care that is Centre-Based[c]	Projected Number of Centre-based Places Required (D*C)
		%		%	
< 1 year	70,000	25	17,500	54	9,450
1	69,000	65	44,850	54	24,219
2	69,000	65	44,850	54	24,219
3	69,000	65	44,50	54	24,219
4	68,000	53	35,00	54	19,278
5	68,000	40	27,200	20	5,440
6	67,000	40	26,800	20	5,360
7	67,000	40	26,800	20	5,360
8	65,000	40	26,000	20	5,200
9	65,000	40	26,000	20	5,200
10	58,000	40	23,200	20	4,640
11	59,000	40	23,600	20	4,720
Total			367,350		137,305

[a] ESRI Demographic Model.

[b] Details of the assumptions underlying these estimates are outlined in the text.

c For school-age children centre-based care includes after-school care on school premises. These proportions are double those in the CSO childcare module which showed 27 per cent of those using childcare for pre-school children used centre-based options and 10 per cent of those using childcare for primary-school children.

As Table 22.4 shows, the biggest projected increase is for after-school services, which reflects the current low level provision for this age group. As mentioned above, ideally this provision should make use of existing school premises with necessary modifications. Therefore, the capital investment for after-school care should be directed at improving existing infrastructure and will not be as costly as provision for pre-school care. The working group on school age childcare makes recommendations on the appropriate physical environment for after-school care, which should be incorporated into planned expenditure (NCCC, 2005).

Table 22.4: Current and Indicative Figures for Centre-Based Care by Age Group

	Centre-Based Care 2000 Childcare Census	Places in Facilities Funded Under the EOCP Up to Dec 2004[1]	Projected Centre Based Care 2012
Under 1 years	2,337	1,581	9,450
1 to 2 years	12,515	5,836	48,438
3-6 years	37,619	21,431[2]	54,297
7 to 11 years	4,332[3]	6,552[4]	25,210
Total	56,803	35,400	137305

[1] Survey of Beneficiaries 2004. These are not necessarily additional places.
[2] 2004 figure refers to 3-5 year olds.
[3] 2000 figures include 12 year olds.
[4] 2004 figures refer to 6-14 year olds.

Account should also be taken of the need to expand and improve the provision of early education services for 3-4 year old children, an issue not taken into consideration in Table 22.3. Universal provision as recommended by the NWCI and NESF would increase demand to 98,000 places in 2012 for 3-4 year olds rather than the 43,000 estimated here. The capital implications of this need are unclear, since some of it relates to children who are already accommodated in primary schools and thus would have little requirement for further capital facilities.

Quality of care is a key issue for the future and many of the social inclusion benefits of early participation are conditional upon the quality of care received. Therefore, a high priority must be given to staff training and retention, and to best practice in provision of care and facilities. Reliance on Community Employment (CE) participants as core childcare staff in many community/ voluntary sector facilities is highly problematic in this respect and can result in the most disadvantaged children being cared for by the least qualified workers. The problems with this staffing model have been strongly underlined in a number of recent reports (see Southside Partnership, 2005; OECD, 2002; Childcare Census Report, 2000).[116] The *de facto* funding for staffing through CE should be replaced with funding for professional staff, and CE trainees should only be used to supplement core staff.

The Childcare Directorate's proposals to develop training and networking opportunities for childminders are also important for improving quality. Increasing quality will raise the costs of childcare, which needs to be factored into future spending and subsidies.

[116] The Childcare Census in 2000 reports that 38 per cent of staff in community sector were either CE or JI schemes, and 17 per cent of staff in privately run centres (DJELR/ADM). More recently the Southside Partnership reported that 52 per cent of childcare staff in the community/voluntary sector were on Community Employment schemes (Southside Partnership, 2005, Figure 10). Not all of these facilities are funded under the EOCP.

NATIONAL CHILDCARE STRATEGY, 2006-2010

In December 2005, the Government announced a new *National Childcare Strategy* to cover the period 2006-2010. The total cost of the plan was projected at over €2.6 billion over the period, of which 86 per cent (€2.276 billion) was accounted for by current expenditure (see Table 22.5). All elements of the programme, however, have implications for what is needed in regard to capital facilities.

The main elements of the programme are as follows:

- An extension of paid maternity leave up to an eventual level of 26 weeks from March 2007, with provision for up to 16 weeks of unpaid leave. This will reduce demand for infant places in centre-based care, but may still leave substantial demand for such places for infants aged from 6 months to 1 year.
- An Early Childcare Supplement of €1,000 per year is to be paid to parents of all children aged up to 6 years. This is the largest expenditure element in the strategy, amounting to €1,677 million over the period. The key feature to note here is that this measure observes the neutrality principle referred to earlier, and thus is provided to parents of all 0-6 year olds rather than just to those who use paid childcare. Therefore, it is only partly intended to provide support towards the costs of paid childcare and, for the total amount of expenditure involved, will have only limited impact as a subsidy in that area.
- A childcare training scheme designed to train 17,000 childcare workers up to 2010. This should improve quality and help ease staff shortages in paid childcare services.
- A National Childcare Investment Programme (NCIP), costing a total of €575 million up to 2010. This is the successor to the EOCP 2000-2006, though with greater provision for involvement by private providers as well as the community and voluntary sector. It is designed to add a further 50,000 childcare places, bringing the total provided under public investment to 91,000. As with the EOCP, a large proportion (38 per cent) of NCIP spending is allocated to current costs. The capital element of the programme, at €358 million over the period, is modest relative to the cost of the overall programme (of which it represents 13.5 per cent), although it is larger than the capital element of the EOCP (which was €203 million).
- A childminding tax relief. A minder who cares for up to three children in her or his own home may earn up to €10,000 from this activity free of income tax. This provides a support to informal childminding, which will have some effect in reducing the demand for centre-based care.

Table 22.5. National Childcare Strategy 2006-2010: Expenditure Measures

Measure	Ongoing Increase over 2005 Base (€ m)					
	2006	2007	2008	2009	2010	Total
1. Extended maternity leave	35	78	85	85	85	368
2. Early Childcare Supplement	265	353	353	353	353	1,677
3. Childcare training	2	2	3	3	4	14
4. National Childcare Investment Programme (NCIP)						
Current	2	4	67	70	75	217
Capital	10	20	102	110	116	358
Total	12	24	169	180	191	575
Total current	304	437	508	511	517	2,276
Total capital	10	20	102	110	116	358
Total	314	456	610	621	633	2,634
Additional item: Childminding Tax Relief	3	4	4	4	4	19

Source: Budget 2006.

22.4 Recommend-ations

For the next NDP the key issue to be considered here is item 4 above, the NCIP, and particularly the €358 million in capital expenditure envisaged under the NCIP. While it is difficult to predict the likely level of demand for centre-based childcare, and the projections we provide here are based on very limited information, the 50,000 additional places which the NCIP is designed to provide would seem to be a reasonable level of provision for new State-supported childcare places.

Our projections could not take account of the number of unsupported places created (or lost) between 2000 and 2006. Further compilation of information from the City and County Childcare Committees on unsupported places is necessary for a better assessment of the level of provision needed at the national level, and the figures presented here should be reviewed in the light of such information. This information will be vital for the effective spatial targeting. In this respect the objectives of the NSS with its focus on the gateways and hubs must be taken into account. This means that investments needed to support the gateways should be accorded a higher priority.

For the period 2010-2013, the focus would need to be broadened to take account of the need to improve and expand early childhood education. Investment in early education targeted at the disadvantaged is included in the education section but is predominantly current expenditure. Additional infrastructure support would be needed to adapt existing school buildings where possible and provide non-school based places. Larger questions about the level and nature of currents supports for childcare are equally important but are not a matter to be resolved in the context of the NDP.

CURRENT EXPENDITURE

The National Childcare Investment Programme includes provision for an average annual investment of €54 million in current expenditure over the period 2007 to 2010. While the focus on the

NDP will be on capital rather than current support, here we indicate priority areas for those aspects of current support that have been included in the current NDP. These are:

- Subsidies for current costs to make up for a shortfall in running costs from tapered fees based on parental income.[117] Current experience suggests that it would be extremely difficult for many voluntary/community providers to become self sufficient while meeting the social inclusion aims and providing care to the highest professional standard, given the fact that this is a labour intensive sector where staffing costs are a high percentage of overall costs.
- Costs of replacing community employment workers with trained staff as *core* staff members. In 2005 the costs of CE funding for childcare workers was €24.6 million. The costs of substituting other trained workers would be higher.
- Quality improvement/training. The NCIP for 2007-2010 does not currently specify the level of investment in this area but given the focus on child development this should be a priority.

The exact level of current support needed in this area should be estimated in forthcoming expenditure review.

Table 22.6: Recommended Expenditure

Childcare	EOCP Sub-Measures	Total EOCP 2000-2006	EOCP Annual Average	Recomm-endation	2007-2013 Annual Average Recommend	NCIP[a] 2007-2010 Annual Average
Capital	Capital Grants	204.5	29.2	Increase	86.7	86.7
Current	Staffing Costs	193.5	27.6	Increase		
	Quality Improvement & programme administration	101.3	14.5			
	Total current	294.8	42.1	Increase	(117.0)b	54.0
Total		499.3	71.3		203.0	140.7

a Committed in Budget 2006 (NCIP National Childcare Investment Programme).

b The increased emphasis on quality, early education, staff training and retention and the likely need for continued staffing subsidies to meet social inclusion objectives all suggest that the ratio of current supports (excluding programme administration costs) to capital supports should be maintained (ratio 1: 1.35). The exact level of current support should be estimated in forthcoming expenditure review.

[117] Ideally these should be available to both community providers and private providers who provide for disadvantaged children. This would lead to childcare provision that is less segregated by children's socio-economic background.

23. SPORTS AND ARTS

A high skilled economy needs to provide the facilities that high skilled individuals require. These facilities are important determinants of the quality of life. While this is particularly important in order to retain and attract mobile high-skills workers it is also important for the wider population. It is in these terms that public support for cultural and recreational infrastructure should be evaluated.

A view of sport as a dimension of cultural and recreational life that should be supported by public spending is quite new in Ireland, having emerged only in the late 1990s. The previous NDP did not include significant provision for sport. Yet public spending in the area has grown since the previous NDP was initiated and in 2005 amounted to almost €185 million, of which just over half (€94 million) was for capital purposes.

The types of sport that receive public subsidy in Ireland can be divided into two broad categories:

1. *Active* sports, which centre on recreational or competitive physical activity and where voluntary/community effort plays a major part (as in Gaelic games, soccer, rugby, golf, swimming, athletics, aerobics, walking and hiking, aquatic sports, etc.).

2. *Betting* sports, which consist mainly of horse and greyhound racing, where the main forms of public participation are spectating and gambling and where core activities are mainly commercial in character. The commercial focus of these sports would justify treating them under the heading of industrial or trade policy, and their links with farming and rural life (especially in the case of horse racing) would suggest that they be treated under agricultural or rural development policy. For the present, however, they are dealt with under a sports heading by the Department of Arts, Sport and Tourism, and so are classed under that heading here.

To provide a basis for evaluating public capital expenditure for the two categories, it is necessary first to consider the rationale for public spending on each.

23.1 Rationale for Public Spending on Active Sports

Active sports contribute to a number of socially valuable outcomes:

1. They encourage physical activity in the population and thereby make a major contribution to public health, both physical and mental (Fahey *et al.* 2004, 2005.)

2. They are the context in which a large number of voluntary and community clubs have emerged (approximately 2,200 in the GAA alone) and these clubs are the main arenas in which voluntary activity takes place in Ireland. A recent estimate has suggested that for every four adult people who regularly play active sports, there are three adults who volunteer (Delaney and Fahey, 2005). These sports are thus major generators of community activity and social engagement (or what is now sometimes labelled 'social capital') among both young people and adults.

3. Public support and following for teams or individuals competing in local, national and international events are an important dimension of social life and a major basis for the formation and expression of collective identity in modern societies.

4. Active sport generates a significant level of economic activity, which has been valued by a number of estimates as lying in the range of 1-2 per cent of GDP (Delaney and Fahey, 2005).

The social importance of these outcomes does not in itself dictate a particular level of public support. Calculation of the issues involved is difficult, since many of the outputs (such as improved public health) and inputs (such as volunteering) are difficult to measure. In view of the steady increase in population, the rapid development of new housing, the generally underdeveloped state of facilities for physical recreation in many parts of Ireland, there is a *prima facie* case for public support.

On the other hand, there is evidence that inadequacies in sports facilities are not experienced by the public as an impediment to participation in sport (Fahey *et al.,* 2004). There may be particular activities (such as swimming) where a latent demand would be stimulated and met by provision of suitable facilities and where a 'merit good' case can be made to justify State support. But it cannot be assumed that this case applies equally across all sports or regions of the country. Furthermore, there are sectors (such as primary schools) where sports facilities clearly are inadequate (Fahey *et al.,* 2005) but which receive only marginal support from existing spending on sport. In sum, therefore, the level and targeting of public spending in this area needs to be well-planned. As the Department of Arts, Sports and Tourism (n.d., p. 6) has stated, it needs to link clearly with other areas of sport and social policy, and to be based on "…sound information and knowledge about relevant issues such as existing facilities, demographic trends, facility demand and usage levels."

23.2 Rationale for Public Spending on Betting Sports

While horse and greyhound racing industries produce benefits for the rural economy, the positive social outcomes arising from betting sports are fewer and more uncertain than those arising from active sports, and have more to do with a commercial logic than a sporting logic. Betting sports entail no significant physical activity or public health benefit and the voluntary/community dimension is absent. The spectating element is very strong. According to data reported by Horse Racing Ireland and Bord na gCon, there were 1.4 million attendances at horse racing and 1.3 million attendances at greyhound racing in 2004 (in both instances representing a large increase in attendance levels in recent years). While these attendances might have a positive social component, the precise social benefits are hard to define or measure. The level of economic activity generated by horse and greyhound racing is substantial,[118] but the existence of market failure that would justify State support for these industries has not been demonstrated.[119]

The centrality of gambling to these sports is a defining feature. Spectating and attendance at race meetings are strongly connected with gambling, gambling is a large component of the economic activity they generate, and the level of gambling on these sports has risen sharply in recent years. Betting on horse racing is estimated to have more than doubled between 1997 and 2003 (Indecon, 2004) and on-course betting on greyhound racing increased by 321 per cent between 1995 and 2005 (Bord na gCon, 2004). Total off-course betting for 2004 is estimated at €2.3 billion (data provided by Department of Arts, Sports and Tourism), while on-course betting for horse and greyhound racing combined amounted to €362 million (Horse Racing Ireland, 2004, Bord na gCon, 2004). Total betting for 2004 is thus €2.66 billion, which is roughly the equivalent of €1,900 per household.[120] While public policy might consider it desirable for economic reasons or for the benefit of the rural economy to expand the horse and greyhound racing industries, it is less evident that gambling on sport is a social good that public expenditure should be used to promote.

In view of the above, the rationale for such a level of public expenditure in support of betting sports is at best mixed and its focus on gambling gives it a questionable social value.

[118] Indecon's (2004, p. 68) employment estimates are 5,000 direct and 2,700 indirect jobs in horse racing, and 4,200 jobs in on-course and off-course betting, with many of the latter jobs casual or part-time in nature.

[119] Economic valuations of the economic costs and benefits of the Irish stallion tax incentive have been carried out (for a review, see Indecon, 2004) but similar valuations of State supports for horse and greyhound racing as referred to below have not been conducted.

[120] Comprehensive data on winnings paid out and bettings retained are not available. Indecon (2004, p. 65) estimates that total net on-course betting expenditure (i.e betting retained by bookmakers and the Tote) was between €12-24 million in 2003, which would represent about 5-10 per cent of on-course betting.

23.3 Assessing Progress

The main public spending programmes on sport that come under the responsibility of the Department of Arts, Sport and Tourism are set out in Table 23.1. Included in this table is an indication of the expenditure that the Department has planed for the period 2006-2009, with an approximate breakdown between current and capital expenditure. The first three programmes in the table are concerned with active sports, and the fourth is concerned with betting sports. The fifth programme consists of spending administered through the Irish Sports Council and is concerned with active sports. It is included in the table for completeness. It entails no capital expenditure and is not considered further here.

SPORTS CAPITAL PROGRAMME

This programme provides grant support for sports capital projects to voluntary and community sports clubs, national governing bodies of sport, local authorities, colleges, and primary or second-level schools that submit joint applications with sports clubs. For local facilities, the maximum grant is 70 per cent of the total cost (80 per cent in the case of disadvantaged areas) and for regional or national facilities the level of grant depends on the scale of the facility. Funding is allocated on the basis of applications received. Applications are scored according to a set of criteria designed to reflect the objectives of the programme and ensure a balanced spread of grants by county and sport.

In the period 1997 to 2005 a total of €395 million has been allocated to 4,923 projects under this programme. Expenditure is expected to continue at about €60 million per year.

This programme is broadly justified on the basis of the rationale for public support for active sports outlined earlier. However, a Capital Expenditure Review of the programme for the period 1999-2002 pointed to the need for a strategic approach to planning for sports facilities and a sound information base on existing facilities, facility demand and usage levels (Department of Arts, Sports and Tourism, n.d.). This need has not yet been fulfilled. In 2005, it was decided to conduct a national audit of sports facilities in order to assist with strategic planning but work on this is still in its early stages. The planning basis for this programme is, therefore, inadequate and as it progresses the risk of sub-optimal targeting or excess levels of spending increases. In so far as possible, further spending on the programme should increasingly be linked to need as identified by the audit of sports facilities and in the context of a strategic plan for such facilities.

MAJOR CAPITAL PROJECTS

This programme involves two major once-off projects – Sports Campus Ireland and the redevelopment of Lansdowne Road stadium – that are important elements of Government sports policy. Sports Campus Ireland is expected to enable important spin-off benefits for Ireland to be produced from its potential as an

international training centre in the run-up to the London Olympics in 2012. Public capital expenditure on the two projects combined will amount to €310 million over the next two to three years. *Both projects should proceed as planned.*

SWIMMING POOL PROGRAMME

This is a programme of grant support for building or re-furbishing local authority swimming pools. The programme was closed to new applicants in July 2000, by which time 56 applications had been received. Of these, 18 projects have been completed, 14 are in construction or about to begin construction, and the remainder are being processed.

The rationale for this programme is similar to that for the Sports Capital Programme above, though with the added consideration that swimming is a form of physical activity that can be targeted on population categories that have been identified as priorities from a physical activity point of view (such as older people, inactive women, children). The programme should proceed as at present. Any future development of the programme should be contingent of the finalisation of a strategic plan for sports facilities as referred to in the Sports Capital Programme above.

HORSE RACING IRELAND AND BORD NA GCON

Horse Racing Ireland (HRI) and Bord na gCon (BnagC) are State bodies with responsibility for controlling and developing the horse and greyhound racing industries. HRI and BnagC are funded in part by the Exchequer and in part by income from a range of levies and activities. Exchequer funding is provided through the Horse and Greyhound Racing Fund, which was established by the Horse and Greyhound Racing Act, 2001. In 2004, the Government committed €350 million to the Fund, which is sufficient to sustain financial support to HRI and BnagC at present levels up to 2008.

Annual revenue to the Horse and Greyhound Racing Fund is provided in part by an excise duty on off-course betting. When the Fund was established in 2001, the rate of excise duty was 5 per cent and was sufficient to meet the funding requirement in full. The excise duty was reduced to 2 per cent from 1 May 2002. This led to a shortfall in revenue, which was made up from direct Exchequer sources (in 2005, the betting excise yielded €46.1 million revenue for the Fund and the balance made up directly from the Exchequer was €22.45 million, a ratio of 67:33). The excise duty has been further reduced to 1 per cent in Budget 2006, so that the share of revenue drawn from direct Exchequer sources will be larger in the future.

The level of financial support provided to horse and greyhound racing from this Fund is large, at €68.4 million in 2005. This is approximately one-third of total expenditure on sport administered by the Department of Arts, Sport and Tourism. This funding is allocated on an 80:20 basis between HRI and BnagC (€54.7 million to HRI and €13.7 million to BnagC in 2005). In 2004, income from this source accounted for 66 per cent of total income of the HRI.

The purposes to which expenditure by HRI and BnagC is devoted are varied and are directed more towards current than capital activities. In 2005, 14 per cent of HRI income from the Horse and Greyhound Racing Fund (€7.8 million) was directed towards capital expenditure, while the corresponding proportion for BnagC was 41 per cent (€5.7 million).

Table 23.1: Public Expenditure Programmes on Sport

Programme	Funding Source	Purpose	Expenditure 2005 € million		Capital Expenditure Plans 2006-2009 (Four Years)
			Capital	Current	
1. Sports Capital Programme	National Lottery	Grant support to sports bodies for capital projects	56.8		€60 million per year, subject to annual review
2. Major Sports Capital Projects	National Lottery/ Exchequer	(a) Sports Campus Ireland		1.3	(a) Total €119 million by completion in 2009
		(b) Lansdowne Road stadium re-development	9.5		(b) €191 million grant support (total cost €365 million); completion by 2008
3. Swimming Pool Programme	Exchequer	Grants to local authorities to develop/ refurbish public swimming pools	14		€25 million per year, subject to annual review [assume €80 million over period]
4. Horse and Greyhound Racing Fund	Excise on off-course betting/ Exchequer	Current and capital funding to (a) Horse Racing Ireland and (b) Bord na gCon to support horse and greyhound racing	(a) 7.8 (b) 5.7	(a) 46.8 (b) 8	(a) €200 million capital development programme 2004-2009, of which €110 million from HRI, of which amount from Horse and Greyhound Racing Fund is unspecified [assume €35 million over period]
5. Irish Sports Council	Exchequer	Current support for recreational and competitive sport		34.4	
Total 2005			93.9	90.5	
Total 2006-2009					€665 million
Assumed capital expenditure 2010-2013					€235 million
Total capital expenditure 2006-2013					**€900 million**

On a unit basis, the public subsidy entailed by this level of funding is particularly large in connection with horse racing: it is the equivalent of almost €40 for every person attending a race meeting in 2005 and is €179,000 per meeting. Based on Indecon's (2004) estimates of employment in horse racing, it is an annual subsidy of about €7,000 per job in the sector. This subsidy is over and above the support given to the horse breeding industry by virtue of the tax reliefs in regard to stallion fees. The subsidy per person attending a greyhound race meeting is smaller at just over €10.

As indicated earlier, the rationale for public subsidy to horse and greyhound racing, whether for current or capital purposes, is mixed

and is questionable is some respects. The large *size* of the subsidy, particularly in regard to horse racing, gives rise to more questions about the justification for the programme. Since the Government has made commitments under the programme out to 2008, these commitments should be honoured. *However, it is difficult to see a rationale for an extension of the programme at a similar level beyond 2008 particularly in view of the large share of funding for the programme between now and 2008 that will have to be drawn from general Exchequer sources.* The benefits and rationale for the programme should be stringently evaluated so as to determine what level of public funding is merited beyond 2008 and also to review the forms and levels of public revenues that might be drawn from horse and greyhound racing.

23.4 Priorities for Next Plan

As already described, capital expenditure on sport for which the Department of Arts, Sport and Tourism has reasonably firm plans amounts to €665 million up to 2009, of which almost half is accounted for by two major projects – Sports Campus Ireland and the Lansdowne Road stadium. Both of these are major priorities for sports policy and both are scheduled to be completed by 2009. It is unlikely that other major projects requiring similar levels of public support would follow these. Capital expenditure on sport apart from these two major projects might be expected to continue at levels similar to those at present. However, the planning and information base for this expenditure is underdeveloped and measures that have already been proposed to improve that base (such as the national audit of sports facilities and the development of a national strategy for sports facilities) should be implemented. The precise volume and targeting of future spending cannot properly be determined until that planning base is in place.

The scenario we assume here is that, following completion by 2009 of the two major capital projects already mentioned, the volume of public capital expenditure on sport for the period 2010-2013 will be well below that for the period 2006-2009 but will remain substantial. Here we assume that public capital expenditure on sport for the period 2010-2013 will amount to €235 million in total, which is less than half the size of the programme for 2006-2010.

23.5 Recommend-ations on Sports Facilities

Plans already in place that cover the period up to 2009 combined with likely levels of activity beyond 2009 give an overall estimate of the total public capital expenditure on sports facilities over the period 2006-2013 of €0.9 billion, with a front-loading of expenditure on the first half of that period (€665 million). Averaged over the eight years of the programme, this is more-or-less the same level of capital expenditure on sport as in 2005.

Our recommendations are as follows:

(a) overall expenditure of this magnitude over the period 2006-2013 is justified;

(b) in view of current construction industry constraints, it would be preferable if the front-loading of expenditure on to the first half of the period were reduced and the timing of expenditure adjusted to produce a more even spread over the whole period;
(c) the planning basis for determining precise levels and targeting of expenditure should be improved. Two relevant instruments have already been proposed by the Department of Arts, Sports and Tourism – a national audit of sports facilities and the development of a strategic plan for sports facilities. These should be implemented and, aside from the Lansdowne Road and Sports Campus Ireland projects, future spending under other aspects of the Sports Capital Programme and the Swimming Pool Programme should be slowed until they have been completed and are available to guide that spending;
(d) commitments already made to support the horse and greyhound racing industries up to 2008 should be honoured, but support for these industries beyond that date should be based on a rigorous cost-benefit evaluation, taking account both of actual expenditure under the Horse and Greyhound Racing Fund and the tax treatment of on-course and off-course betting that is entailed in the current system.

23.6 Cultural Facilities

ASSESSING THE PROGRESS OF PREVIOUS INVESTMENT

Public investment in good roads and clean water addresses constraints on the economy and the nation's health. But cultural infrastructure also plays an important role in determining the standard of living in a modern society (ESRI, 1999). Therefore, it is desirable to ensure that cultural life should flourish and that the cultural life is inclusive and avoids imbalance between 'customers' and 'suppliers' of the arts.

Public funds raised from taxation have many competing uses and so it is important to determine the rationale for investment in any particular area. Public investment in the arts is usually justified on the grounds that it has 'public good' characteristics and that there would be under-investment if it were left to the private sector; public investment is also justified if it is redistributional by helping low-income groups or other excluded groups (O'Hagan, 1998). It is worth elaborating in more detail the nature and extent of the public goods or 'external benefits' of arts facilities, which would result in under-supply, if the supply of arts facilities were left to the market.[121]

[121] It is important to note that while philanthropy is an important source of funding for the arts in North America and to a lesser extent some other EU countries, this is a considerably more limited source of funding in Ireland. This means that the need for public intervention is stronger in Ireland than in many other developed countries.

These three broad justifications, and their sub-heads, are spelt out briefly as:

1. Public Benefits

These include the economic spillover effects, through the encouragement to tourism and attracting foreign business, and the development of national identity, social cohesion/continuity and national prestige; development of social criticism, the 'mirror of society', and promotion of experimental and innovative work.

2. Information Failures

"Too few" people choose to patronise the arts so that unaided the arts are not viable. This may sound paternalistic, in that it presupposes that consumers are unable to evaluate the benefits of arts correctly. The counter-argument says that if people have not been exposed to the arts as part of their education then they have not had the opportunity to appreciate them and develop their tastes – if they had the opportunity they would then be able to make choices on the basis of 'better' information and would engage in more culture.

3. Distribution Issues

The so-called high arts tend to be patronised by the well-off. Policies to promote equal access and participation by those who are effectively excluded from enjoyment, including policies to help people with disabilities and to help provide a regional spread are thus called for.

23.7 Lessons of Research on Arts Policy

The intended spending of the Regional OPs of the current NDP on Culture Recreation and Sports amounted to €36.3 million in the BMW region and €4.1 million in the South and East region. This relatively low level of investment in arts and culture suggests that they did not rank highly against the major economic opportunities of the NDP. However, funding for arts and culture activities was also provided outside the NDP. The issue of funding for the arts in general is a constant source of debate. In the allocation of funds in the NDP, the arts have to compete with other demands, most of which are making claims to the effect that their activities are 'intrinsically good'. Provided that the broad principles outlined above are kept in mind, funding of the arts can stand up relatively well.

SUBSIDY PER 'CUSTOMER EVENT'

Given that public resources have many uses one should consider the usefulness of a particular investment in terms of its opportunity cost. In that sense resources devoted to funding the subsidy per 'customer event' are 'tax-payers' resources foregone. However, these may be well worth foregoing, if the wider societal experiences

of identity, diversity, continuity and understanding are the result, namely, the public benefits outlined above. The subsidy gives an idea of how much is being paid for these.

It is difficult to estimate the precise subsidy per 'customer event' as it is difficult to disaggregate the data correctly. An approximate figure can be estimated for a subset of the arts, namely, the performing arts (Fitzpatrick Associates, 2004). Here there were 3 million attendances in 2003 and €33 million came from the public sector, giving a subsidy per attendance of €11. Half of this is estimated to be returned to the Exchequer in various forms of taxation, making the net subsidy approximately €5.5 per attendance. However, there may be some tax reliefs to be added to the €5.5 that have not been considered here.

As O'Hagan points out, in so far as there are public benefits, then some, all or more than this can be justified, depending on the value of the public benefits, if one could calculate them. Furthermore, some of the expenditure could also have been targeted at accessibility and at what can be termed broad educational gaols.

The manner in which public support is given to the arts is an important issue and determines who benefits. The issue can be best illustrated by the analogy with public support in the form of housing subsidies. It is not a foregone conclusion that the ultimate beneficiary is the recipient of the subsidy, if the subsidy finds itself being 'passed on', as in this analogy to landlords. Recent revelations of the depressed level of incomes in some arts professions in Ireland may reflect just such a reality (Arts Council, 2005a). If there is insufficient demand from 'customers' compared to a rising number of suppliers due to the manner in which subsidies are disbursed, artists' remuneration is likely to become depressed. To overcome this, emphasis needs to be placed on developing a more arts oriented paying public.

The question of comparative levels of State arts' expenditure between countries including Ireland has been addressed in a report by the International Arts Bureau (2000). However, the measurement of State expenditure has to deal with two broad problems. The first is the difference in definitions of 'art' and art disciplines defined in the analysis.[122] The second is the difficulty of estimating the less visible 'expenditure' via tax reliefs for artists (the artists' exemption) and for donors and availability or otherwise of VAT deductions (the last aspect appears not to have been dealt with in the study). Results must therefore be viewed as broadly indicative. The report found that in 1997 central Government spending on arts through the Department of Arts, Heritage, Gaeltacht and the Islands and the Department of the Environment was £40.2 million. Local

[122] The definition of arts for the study of comparative State support were: community arts, dance, drama, festivals/other mixed artforms/venues, film production literature support, music, opera, visual arts/public art/ photography, museums and galleries. Excluded was expenditure on libraries, built heritage, mainstream arts education or professional training, and public service broadcasting. Capital expenditure of domestic origin is identified.

Government spending was £3.8 million bringing the total to £44 million.

Indirect public support through tax relief was estimated at £24.4 million.

The report considered that per head public support was near the bottom for EU countries. As a share of GDP, spending on the arts in Ireland was 0.07 per cent, rising to 0.09 per cent when museums were included. This was less than a fifth of the share in Finland and Germany, for example, and about half the share in England. Funding has increased since 1997. Figures for 2003-4 prepared by the Canada Council for the Arts (2005) compares Arts Council Budgets per head. Ireland's budget comes out at three-quarters of that for England, which shows that the position has improved.

Whatever the levels of public funding, capital and current, the major consideration is that there be value for money, balanced attention to the interests of the arts 'customers' and 'suppliers', and efficiency. Arrangement for multi-annual funding is another aspect of efficiency, enabling music organisations to plan ahead with sourcing.

23.8 Investment Priorities for the Next Plan

MAJOR NATIONAL INSTITUTIONS

Several major cultural institutions are considered to be in need of investment to maintain or bring them to the standards expected today. These include the National Museum, the National Library, the Irish Museum of Modern Art, the Chester Beatty Library. The cost is estimated at €340 million over the seven years. Additionally, the Abbey Theatre's estimated €155 million. There is an argument that there is some excess classical performing capacity in Dublin, in the Helix, the funding of which ultimately came from the public purse. This could weaken the case for capacity expansion in Dublin, though it mainly serves to illustrate the difficulties of outreach and management that need to be addressed. Other proposals include:

SPECIAL PROGRAMMES

- The 1916 Centenary Programme is estimated at €16 million.
- The local arts communities' ACCESS Scheme, at €20 million overall, assists the development of integrated arts centres, theatres, museums and galleries as well as arts studios and other creative and performance spaces. With particular emphasis on community-based projects, the scheme is expected to bring about a greater participation in the arts.
- Wexford Opera produces local and wider spillover effects, operates in a competitive market and its building programme is expected to cost €26 million, assuming a contribution of €4 million from private sources.

EFFICIENCY MEASURES

- To exploit economies of scale, the investment of information technology for centralised advance information, marketing and box office within performing arts venues, would be worth supporting. Including the set-up costs, the sum would not be large.
- Other capital projects, such as enhancing stocks (books, digitisation, archives etc.) are costed at between €100 and €140 million. Digitisation will provide national access and world access to the collections of the national collecting institutions.
- There is a further investment that fits the justification for public funding, as a targeted scheme to address misinformation or an externality, such as a management-training subsidy. This is a cultural curriculum support service that addresses the uneven arts provision in schools and the issue of inclusiveness. A scheme has been costed for music education and a four-year programme has been piloted for a year in Donegal. Applying the initial four years of the pilot curriculum support nationally would cost €25 million to be spread over seven years (€3.57 million per year). Further discussion follows here.

INFORMATION LEARNING

Investment in the curriculum support element of the start-up costs of Music Network's proposed *National System of Local Music Education Services* fits the criteria for the NDP (Music Network, 2003). The aim of the full project is to enable Ireland to have the musical, cultural and community life more akin to that of countries with similar incomes that devote more resources to the arts, such as the Scandinavian countries. The project consists of a ten-year programme to develop music education services to address the uneven provision in general education and also in vocal and instrumental tuition. (Other art forms may also have similar proposals.)

The programme works through present administrative and physical structures, but it redefines roles and co-ordinates effort, to address the fact that the most is not being made of current resources. Thus it could be seen as efficiency oriented. The start-up year involves an amount of upskilling of teachers who, for example, have often had to teach several subjects despite not being specialists and having little by way of support. The project would be a systematic approach to including all schools and removing the hit-and-miss experience as to whether or not one's school has a vibrant artistic life.

A priority for the NDP would be that element of the proposal relating to support services for primary and second-level schools. This could deal with the problem of exclusion from appreciating those art forms that are demanding particularly at the early stages, as

discussed above. The start-up expenses of the curriculum support for a pilot scheme have been estimated by Donegal VEC to be €0.111 million, €0.167 million, €0.222 million and €0.278 million in the four years. The benefits of the project, which have been seen in similar schemes, include the help they provide in the development of many skills, and the enrichment they provide to the curriculum with cultural links to other subjects, to the wider community and to lifelong learning.

EXCLUSION

Investment is required in start-up costs of programmes to help persons still excluded. Examples would be the setting up of schemes for OAPs or, indeed, for persons without private transport. The possibilities should be investigated for the introduction of integrated ticketing, or transport schemes, that local groups such as residents' associations, churches and other bodies could be offered as special deals. The improvement or otherwise in genuine accessibility needs to be assessed. The problems that people with a disability have with transport appear not to have been addressed. Investments oriented to learning and exclusion in general have the advantage of regional spread.

Table 23.2: Recommendations on Arts and Culture

Measure	Recommendation	2006 (€ million)	2007-2013 Average (€ million)
Culture, Recreation and Sports		5.0	
Culture: National Facilities	There is a problem of regional concentration.		
Special Programmes:			5
1916 Centenary	Total = €36 million		
Local arts communities ACCESS Scheme			
Efficiency measures:			15
Central marketing/scheduling; Stock enhancement (including digitization)			
Education:	Four year programme costing €25 million over four years.		3.57
Support and up-skill arts/music teachers (*National System of Local Music Education Services* is being piloted in Donegal).	There is a serious need for schemes that would help to upgrade and even out the quality of the existing arts/music slot in the school curriculum.		
Exclusion:	There are no costings. Use €1 million per year		1
Total Culture			**99.57**

24. SUMMARY AND CONCLUSIONS

24.1 Context

Since 2000, when the current NDP started, a number of important changes have occurred in Ireland. Overall economic growth slowed in the early years of the plan but has recovered so that Ireland continues to outperform most OECD countries. Along with fast growth a change in the sectoral composition of the economy is becoming increasingly evident with services becoming more important. At the same time with increased globalisation the level of international competition in product markets has increased significantly, not least because of the strong performance of emerging economies. While Ireland has continued to attract FDI, competition for such investment has also increased internationally. In this respect the loss of competitiveness has had a significant impact. Continued net immigration, while expanding the labour force, has resulted in significantly higher demand for housing.

24.2 Macroeconomic Implications

The third National Development Plan is currently reaching completion. On the basis of all of the research undertaken to date it is clear that these Plans have made an essential contribution to the transformation of the Irish economy and society over the last fifteen years. Without successive NDPs the economy would have choked from lack of infrastructure, unemployment would still have been a serious social issue and the environment would be under much more serious pressure than is currently the case. The experience of the last three successful NDPs holds some important lessons for the future.

While the overall strategy pursued under successive National Development Plans has been appropriate, with the benefit of hindsight some areas where improvements could have been made can be identified. In the second NDP the level of investment, especially in transport infrastructure, was not sufficiently adventurous. In the current NDP the level of investment in physical infrastructure was, if anything, ramped up too rapidly with significant inflationary consequences. While the stance of fiscal policy under the first two NDPs was supportive of their objectives, under the current NDP fiscal policy has aggravated the inflationary consequences of the investment expenditure. In addition, the supporting measures (e.g. pricing of access to infrastructure) recommended in Fitz Gerald *et al.* (1999) and (2003), which were aimed at obtaining best use out of the new infrastructure, have generally not been implemented. This has reduced the albeit high

rate of return below what might otherwise have been obtained. Finally, in programmes where there has been a major increase in levels of public investment in a short space of time there have in a number of cases been problems with project management.

For the next NDP the strategy remains rather similar to that identified in the *Mid-Term Evaluation* of the current NDP. There is a need to complete the investment in the major primary roads as soon as possible. To provide for sustainable economic development over the coming decades there is a need to invest effectively in public transport serving major urban areas, especially Dublin. Investment in R&D and human capital also remains an important priority. With the achievement of compliance with the EU urban waste water directive there can be some slowdown in investment in that area in the next NDP. Generally, with the economy operating at close to capacity direct supports for the business sector ranging from manufacturing to tourism and agriculture should be phased out.

As identified in Chapter 11, if the NDP is to address the infrastructural needs of the economy effectively a series of supporting measures will be required. Many of these measures were identified in previous reports (Fitz Gerald *et al.* 1999 and 2003) but have not yet been fully implemented. The success of the next NDP will necessitate closer attention being paid to such measures if the best results are to be obtained from the huge planned investment programme.

The analysis in Chapter 5 largely replicates the results from previous such studies suggesting a high rate of return to successful investment in infrastructure, human capital and research and development. Ireland still has a substantial infrastructural deficit to be made up as a result of historically low levels of investment in previous decades and the very high rate of growth experienced over the past decade.

The analysis in that chapter indicates that the planned investment in the next NDP, through relaxing the infrastructural constraint, would allow the economy to grow more rapidly in the next decade. Over the course of the decade after completion of the next NDP the capacity level of GNP would be raised by at least two percentage points and possibly even three percentage points above the level it would be without such investment. The analysis in this chapter also suggests that the rate of return to the State on the investment would be quite high, fully justifying the very substantial commitment of resources.

If the necessary infrastructure could be bought ready-made from a supermarket then the optimal strategy would be to undertake the necessary investment very rapidly. However, the bulk of the infrastructure has to be produced domestically, in particular by the building sector. This means that the more rapid the deployment of new infrastructure the greater the share of national resources that have to be bid away from other sectors of the economy to produce the infrastructure. In Chapter 5 we analyse how large an investment programme the economy is capable of delivering without serious inflationary consequences.

While there is a high rate of return to efficient investment the results presented in Chapter 5 also suggest that the economy will have difficulty delivering the much needed investment at a reasonable cost. While the funding may theoretically be there to close the infrastructure gap rapidly, the economy does not have the ability to produce all the necessary infrastructure over the period to 2013 without squeezing out other important economic activity. This means that any attempt to close the gap too rapidly will seriously raise the cost of the investment, reducing the potential rate of return.

There are two possible responses to this constraint:

Given the likely long-term importance of the proposed infrastructure the best approach would be to use the tax system specifically to reduce private sector demand for the output of the building sector. This would allow the public sector to buy the necessary infrastructure at reasonable cost without putting undue pressure on the tradable sector of the economy. (It might also reduce the risk of a bubble in the housing market.) Even if the building and construction demand were not targeted specifically, a tight fiscal policy would also reduce existing demand pressures in the economy though reducing Government expenditure or increasing general taxation.

The alternative approach, which is assumed in this report, would see the start up of some major projects being postponed by a year or two. This would delay the benefits that would undoubtedly accrue from those investment projects that are delayed. The counterpart to this delay would be significantly lower costs for the economy in delivering the investment. The profile of investment recommended in Chapter 5 in our view provides the best compromise between the urgency of the need for the infrastructure and the importance of maintaining the competitiveness of the economy in the medium term. While a "second best" result, the objective of this delayed phasing of investment over the period 2007-2013 would be that it would ensure that the share of the economy accounted for by the building sector would not increase and would preferably show a gradual reduction towards its long-run sustainable level. The downside of such an approach would be that the economy would not have the benefit of the valuable infrastructure as early as it would under the first of these approaches.

As the first of these approaches (tightening fiscal policy) may not prove generally acceptable, the approach adopted in this report is to recommend an NDP for the 2007 to 2013 period which, while still very ambitious, would be significantly below that envisaged in the Multi-annual Capital Investment Framework (MACIF) published as part of *Budget 2006*. This analysis argues for a slower ramping up of the investment, with more of it taking place after 2010 when there is a higher probability of the economy having slowed down. It also argues for the Government saving the money not spent due to a postponement by running a surplus, so that it would be available post-2010 to finance the higher investment programme even if the public finances had been hit by an economic slowdown.

In terms of prioritisation the analysis suggests that there will be fewer constraints in delivering on the necessary investment in human capital than there will be in the case for investment requiring building and construction. For the infrastructural investment it will be very important to undertake the necessary cost-benefit studies to allow the prioritisation of different projects. This will be especially important in the case of the transport investment to ensure that very large projects are correctly sequenced to produce the maximum return to the economy and to minimise the direct and the indirect costs of delivery.

As shown in Table 24.1, this report recommends a major increase in investment on transport. This should allow the completion of the programme of upgrading the primary road system over the course of the next NDP. It should also allow an ambitious programme of investment in public transport, which should provide for sustainable economic growth beyond the end of the next decade. However, as envisaged by the Minister for Finance, all transport projects should undergo a rigorous cost-benefit analysis, preferably overseen by the Department of Finance. This report recommends a 10 per cent cut in expenditure on social housing, not because such housing does not bring significant social benefits, but rather because the economy does not have the capacity to deliver a higher level of investment without more severe inflationary consequences.

Table 24.1: "Recommended" NDP PCP Expenditure, € millions

		2007-2013, Annual Average at 2006 Prices
	2006	**Recommended**
Transport	2,555	3,374
Housing	1,245	1,133
Public Administration	1,029	1,125
Health	645	721
Education	684	858
Enterprise sector	601	521
Agriculture	214	174
Environment	590	497
Total	**7,563**	**8,403**

For investment in health infrastructure there is provision for a volume increase for the next NDP. The recommendations in this report would also imply a significant increase in investment in education infrastructure.

In the case of investment in the enterprise sector, including agriculture, it is recommended that expenditure should be cut back over the course of the next NDP. The role of the State is to provide the appropriate context for the business sector to operate, not to provide direct financing. Investment by the business sector should be determined by that sector based on its likely commercial profitability. The same rules should be applied to the energy and telecommunications sectors as to the rest of the business sector – no direct support by the taxpayer. With the economy continuing to run

at capacity over most of the current NDP, the arguments previously advanced for providing direct support for commercial activity are further strengthened.

This report also recommends a significant reduction in investment in environmental infrastructure. This recommended reduction takes account of the fact that the requirements of the EU Urban Waste Water Directive are now nearly achieved. In addition, the cost-benefit analysis to support a continuing high level of investment is not as yet available.

24.3 Horizontal Principles

The NDP will have a number of objectives. Apart from putting in place the investment necessary to maintain national competitiveness within a sustainable budgetary framework, it also has important goals in implementing the National Spatial Strategy (NSS); alleviating poverty and social inclusion; enhancing the All Island perspective; contributing to the Lisbon Strategy; and enhancing environmental sustainability. The five horizontal principles are important in that they contribute to the quality of life within Ireland.

NATIONAL SPATIAL STRATEGY

The last ESRI investment priorities study (Fitz Gerald *et al.,* 1999) highlighted the need for a spatial development strategy in order to target investment appropriately. With the publication of the NSS this important policy gap was filled. However, since the NSS was published after the current NDP the two policy documents were not fully consistent. The *Mid-Term Evaluation* found that while the NDP contributed positively to achieving more balanced regional development, links to the NSS were poor. In particular, the project selection criteria did not reflect the NSS, and there were problems with regard to evaluation as NUTS 3 level data were not available.

It is essential that the next NDP explicitly is targeted at implementing the NSS. The key objective of the NSS, to build critical mass in the gateways and hubs, remains as important as in 2002 as the urban structure in Ireland continues to be weak. With much of the growth in developed economies being urban driven, and with increasing global competition, this poor urban structure could be a serious impediment to the future success of the economy. Of course, the effects of urban sprawl, such as the increase in long distance commuting, also impacts on the quality of life.

Achieving the goals of the NSS requires two actions. First, strong planning needs to be implemented at the national, regional and local levels. This must work to increase densities, while not restricting the supply of development land which would also facilitate some of the major public transport projects planned. Second, project selection throughout the NDP must reflect the NSS priorities. This relates to all programmes and measures and not just to the infrastructure programmes. Thus, for example, the availability of childcare will play an important part in making gateways and hubs attractive to families.

We also recommend a number of specific measures aimed at supporting the NSS, along with urban and rural development:

- A special integrated infrastructure measure to support the NSS should be introduced.
- Urban and village regeneration will play an important role in enhancing the quality of life and improving the built environment in villages and towns. Heritage should continue to be protected.
- Rural development measures need to focus on non-agricultural employment.
- Equity and finance based supports to firms should be covered in one measure rather than three measures.

EQUALITY AND SOCIAL INCLUSION

While the next National Anti-Poverty strategy (NAP), which is being prepared in parallel to the NDP, will be a central strategy of the Government to deal with social cohesion over the medium term, given the wide remit of the next NDP and the longer period over which it will be in operation, this must also reflect the NAP goals.

The *Mid-Term Evaluation* of the current NDP found that existing measures appear to be useful but in some cases should be targeted better. Consequently, we recommend that these be maintained. Apart from better targeting, we also recommend that the equality measure should be broadened, covering not just gender equality, which remains important, but also other equality issues such as disability and race. The last decade has seen a turnaround in the migration patterns with significant immigration into Ireland. Consequently, a sizeable immigrant community has built up and it will be important to ensure that this community be properly integrated into the wider society. Consequently, we recommend that a measure to aid the integration of immigrants should be introduced.

ENVIRONMENT

Given the huge scope of economic activity covered by the NDP it will have a wide-ranging impact on the environment. The channels through which it will impact on different environmental media (water, air etc.) are many.

The underlying purposes of investment in water infrastructure are on the one hand, the provision of clean and safe water and, on the other hand, the protection of public safety and water quality in water bodies. Economic and demographic growth, the implications of the Spatial Strategy, the need to meet national and EU standards, and the exploitation of the benefits of water-related leisure activities (including passive enjoyment on the part of tourists), are drivers of the 'where', 'how' and 'how much' investment is advised.

The next plan will be framed in the context of the Water Framework Directive and it must take account of the likely growth in population over the coming fifteen years.

While not a major factor in expenditure under the NDP, the problem of minimising the generation of solid waste and of disposing of it in an environmentally satisfactory manner has featured in the current NDP and should be a feature of the next NDP.

Another measure under the NDP directly affecting the environment is the investment in promoting energy efficiency. These measures are designed to encourage more efficient use of scarce energy resources and also to minimise the resulting emissions of harmful gases, especially greenhouse gases.

If and when a comprehensive study is carried out on the proposed public transport network for Dublin, the environmental effects will also be examined. The proposal to implement appropriate road pricing in the long term would have important environmental benefits as well as producing much more efficient use of costly transport infrastructure.

The direct effects of a number of key measures in the NDP on emissions of greenhouse gases will be beneficial. However, by facilitating more rapid growth in the economy, resulting in the level of GNP being almost 2 per cent higher than would otherwise be the case in 2020 (Chapter 5), the NDP will have an offsetting indirect effect of increasing emissions of greenhouse gases.

If the investment is to produce a reasonable economic return to society it will be important that the physical planning process changes to promote much denser development around the new public infrastructure network. This, in turn, will produce an environment that is more sustainable in terms of lifestyle.

NORTH-SOUTH

Given the island location and small relative scale of the Irish economy it is essential that strong links be forged between the Irish Republic and Northern Ireland. Such links also support the positive political developments following the Good Friday Agreement.

In considering the priorities for the next NDP it is important to consider what infrastructural investment in Northern Ireland would support development south of the border and how the current Investment Strategy for Northern Ireland (ISNI) reflects these needs. The converse of this is consideration of what investment under the NDP in the Republic could support economic and social development north of the border.

Strong infrastructure links already exist in the area of transport and energy. With regard to the latter further emphasis should be placed on developing an all Ireland electricity market and to ensure sufficient interconnection between the existing two independent systems. This will have benefits both North and South. Substantial progress has been made on major North-South transport routes in the South and the focus now has to turn to the Northern links. Such links are particularly important for Donegal and the gateway of Letterkenny. Other areas where increased co-operation is likely to yield a strong return are in education and R&D and possibly health.

LISBON

The next NDP will build on what has been achieved so far in order to consolidate and improve competitiveness and thereby contribute to the achievement of the Lisbon Strategy. By enhancing the productive capacity of the economy, and especially by addressing key constraints, the next NDP can increase sustainable economic and employment growth. Despite the relative slowdown in economic activity, constraints in the availability of infrastructure and capacity constraints in the building and construction sector, have led to inflationary pressure and damaged the overall competitive position.

The central focus of this study is to address infrastructure bottlenecks and it recommends substantial further investment in infrastructure, particularly in the areas of transport, water services and housing. Investments in other areas such as waste, energy and telecommunications will largely be put in place through the own resources of the service providers, be they State-owned companies or private enterprises.

The recommendations on R&D are to increase resources devoted to this area. Building on investments to date, the aim of our recommendations is to achieve a step change in the level of R&D investment in Ireland over the period of the NDP 2007-2013. Our recommendations envisage substantial increases in public investment in both higher education R&D and support measures for private sector R&D activity. This increased investment in R&D will facilitate innovation and contribute to a strong European industrial base.

24.4 Accompanying Measures

The provision of public investment goods should be met in the most efficient and cost effective way. This requires consideration of the usage of these infrastructures and of related access charges. Determining the optimal level of provision needs to be undertaken in the context of an explicit pricing policy framework. Pricing policy also helps to optimise the use of the substantial endowment of existing public infrastructure. There are other accompanying measures, which also need to be put in place along with investments. The list of desirable accompanying policy components includes:

- Correct pricing.
- Timely delivery.
- Integration with land-use planning.
- Regulation.
- Resource allocation and management.
- Project Selection Criteria, efficient management.

These issues are covered in detail in Chapter 11.

24.5 Microeconomic Priorities

TRANSPORT

Transport remains the highest priority for infrastructural investment. This reflects the strong increase in the demand for transport, which despite significant progress in expanding the transport capacity, has resulted in increasing congestion. The evidence suggests that the return to transport investment, and particularly roads, remains high. It is however important to note that in the absence of proper pricing the market will not result in an efficient level of demand, which would result in calls for a continued high level of investment into the foreseeable future, in excess of the socially optimal level.

Specifically we recommend that the priority accorded in *Transport 21* to the completion of the National Primary route system to standards adequate for predicted traffic volumes is correct.

We propose a reprioritisation of the proposals contained in *Transport 21* in relation to the National Secondary roads, which would better accord with the NSS.

In the context of a review of road classification, we recommend that consideration be given to transfer the responsibility for the busier non-national routes, to the Department of Transport and the NRA.

Fixed line rail projects need to be thoroughly evaluated, considering the potential of all public transport modes. Provided projects pass these evaluations a high priority is accorded to them. In this respect it is important to note that the international evidence suggests that for inter-urban routes rail investment tends to have a lower return than roads investment. Given the relatively low population potentially served by the Western Rail Corridor this project should be scrutinised particularly strongly.

The proposals under *Transport 21* contain significant suburban fixed rail projects. These have a better chance of passing a thorough evaluation than some of the mainline rail projects, since they would serve a larger population. However, the network wide effects of the proposed investment have not been considered and such a study is urgently required.

With regard to public transport in Dublin we recommend that the relevant assets of the Dublin transport network should be transferred to a single holding company. This should include both the rail network and the bus network. That single company would then be able to co-ordinate all services, including ticketing, without having to engage in negotiations with many independent entities.

Port and airport infrastructure should continue to be funded on a commercial basis.

HOUSING

Housing remains an important component of the NDP. The recommendations which follow reflect the unprecedented level of expenditure on housing, giving cause for concern over the dependence of the economy on the housing market. There is also concern about the value for money obtained by the expenditure incurred:

- *Tenure Mix:* A better balance of tenures should be achieved through schemes using the private rented sector, such as the *Rental Accommodation Scheme*. The net result would be a lower level of capital spending for new build, acquisitions and housing maintenance. Consequently, it is recommended that the average annual spend on local authority housing should be reduced in the next NDP compared with the 2006 level.
- *Special Housing Needs:* The spend on social rented accommodation by the voluntary housing sector should be maintained, given its focus on providing rented accommodation for key groups with special housing needs, such as the elderly, the disabled and the homeless.
- *Tenant Purchase Scheme:* The value of housing units sold under the tenant purchase scheme should reflect more closely the market value of the local authority dwellings being purchased outright. If market value is not an option there should be a clawback provision over the first ten years.
- A priority should be to ensure that the Rental Accommodation Scheme (RAS) becomes fully operational as soon as possible.
- *Fair Rents Policy:* A fair rents policy across all social housing tenures, as stated in the Housing Policy Framework and addressing the issue of indexation of rents as part of this package needs to be implemented.
- *Rationalisation of Schemes:* The range of existing schemes and supports and their eligibility criteria need to be restructured in order to deliver a more streamlined set of housing policy interventions with clear objectives, targets and output levels.
- There may be a case for considering whether the Mortgage Interest Supplement Scheme, administered by the Department of Social and Family Affairs, should be included as an instrument of housing policy with all other housing interventions administered by the DoEHLG.
- *Affordable Housing:* A new simpler and streamlined affordable housing scheme for those seeking access to affordable housing for home ownership or renting should be implemented as planned. We recommend a reduced level of spending in the next NDP for non-Exchequer loan finance.
- *Part V:* The housing supply provisions under Part V should be reviewed in order to ensure that they are working efficiently and effectively and that they are not holding up the delivery of housing supply.
- *Public Private Partnerships:* More use of public private partnerships should be made in urban areas for regenerating local authority housing estates and improving the quality of the existing local authority and social housing stock. This would allow a reduction in the overall capital provision for

schemes aimed at improving the quality of the housing stock, most of which is spent on regeneration programmes.

- *Homelessness:* The recommendations from the Government's review of the implementation of its homelessness strategies need to be implemented. Schemes that provide accommodation for groups with special needs are important for tacking social exclusion and it is recommended that the level of expenditure remains unchanged.

WATER

Water and waste water services are largely publicly provided, although a significant proportion of the population has provided a private supply for themselves. It is important to consider the implications of global warming for water abstraction capacity. The projected economic and population growth also needs to be accommodated by investment going forward. In this respect it is important to note that compliance with the EU directive is at this point very high which means that additional investment needs are limited. Furthermore, as investment needs will largely be met through development levies the need for public funds is also reduced. Of course, the provision of infrastructure in the absence of efficient markets risks over-investment. Thus, in the absence of water charges for households, excess demand for water will continue, thus resulting in the need for capacity expansion.
The specific recommendations on water and waste water are:

- *Waste Water*: Compliance with UWWTD stands at over 90 per cent at end-2005, having risen from 25 per cent in 2000 (Fitzpatrick Associates, 2005a). Given this high compliance rate only limited funding will be needed to achieve full compliance.
- *Water Supply*: By end 2005 some 0.666 million population (44 per cent) out of the target of 1.5 million population had been served, leaving a considerable gap. However, the level of public funding needed is moderated by the fact that substantial resources for development related infrastructure are collected as development contributions.[123]
- *Management and Rehabilitation of Infrastructure*: This activity has yielded high returns in the past and provided that this is still the case, the activity is being rightly stepped up.
- *Infrastructural Support for Expanded Economic Activity*: Growth in population and economic activity call for this to continue. However, economies should be gained from adhering to the NSS by concentrating expansion at gateways and hubs.

[123] According to data from the Department of the Environment, Heritage and Local Government development contributions amounted to €546 million in 2005, which constitutes a significant increase over 1996 (€46 million) and 2000 (€110 million) (see http://www.environ.ie/DOEI/DOEIPol.nsf/wvNavView/Overview?OpenDocument&L#l4).

Realistic payment on the part of all water service users would reduce requirements considerably.

- *Coast Protection and Management*: No evaluation has come to hand on this measure, but as increased erosion is possible with the effects of global warming some investment is likely to be warranted.
- *Rural Water Investment*: Some further investment is required to fill the gap in achieving the last NDP's target.

WASTE

As there is now a much-reduced role for central Government funding of waste management services our recommendations here are limited. There is a momentum building up in the sector in terms of increased diversion of waste from landfill and the delivery of new infrastructure, and this should continue without the need for direct Government intervention.

The aim should be to facilitate the emergence of a commercialised, economically efficient and environmentally responsible waste management sector, not necessarily totally privatised, but exposed to competitive pressures. With environmental externalities internalised (via EPA regulations and enforcement, the landfill levy, and possibly an incineration levy), there should in theory be no need for further public subvention of recycling, composting or related activities.

As a significant proportion of waste is unaccounted for increased resources should be made available for enforcement.

ENERGY

All of the investment in energy infrastructure should be delivered on a commercial basis without any requirement for finance by the taxpayer. The general principle should be that consumers of energy should pay the full economic cost (including negative environmental externalities) of energy. Ireland does not have a comparative advantage in energy. To subsidise energy consumption in any way would lead to an inefficient use of resources. To subsidise consumption in any way would then encourage business to expand into areas where the cost of producing in Ireland is higher than elsewhere, moving the economy away from the sectors where Ireland's long-term competitive advantage lies.

TELECOMMUNICATIONS

The bulk of activity in the communications sector is resourced entirely on a commercial basis. Within the current NDP there is one exception to this in the form of the E-commerce and Communications measure. The aim of this measure is to address gaps in infrastructure to maximise the use of existing shared infrastructure and to drive demand for new services and activities in the sector.

A policy area that has attracted some attention is support for broadband. Broadband constitutes a technology that allows both businesses and individuals to change the way they operate. Overall roll-out of broadband has been slow resulting in relatively low broadband penetration. In an international comparison Ireland ranks second last among EU-15 countries with just Greece having lower availability (Forfás, 2005).

The nature of the technology suggests that the primary gains from broadband are captured by firms and individuals directly so that any externalities are limited. On that basis public intervention would not be warranted. However, the State has an important role as regulator of the sector, especially where there are monopoly elements to the provision of infrastructure.

The spatial distribution of the population in Ireland is such that provision of broadband infrastructure by the private sector in some areas may be slow, and indeed without public intervention some areas may never receive provision. In this case there is a potential market failure which needs to be assessed thoroughly. The fact that a particular area does not have broadband access is in itself not sufficient to warrant intervention if there is no local demand for that service. This point is important since if no demand exists, the resources expended on broadband infrastructure will have been wasted, at least in the short term.

HUMAN RESOURCES

It has been argued that the expansion in educational participation at both second and third level has been one of the main factors underlying Ireland's rapid economic growth during the 1990s (Fitz Gerald, 2000). Forecasts of future skill needs indicate that high skilled occupations will continue to expand over the medium to long term and emphasise the need for continued investment in human capital, and the continuation of high demand for higher education graduates (Sexton, Hughes, McCormick and Finn, 2001; and Sexton, Hughes, Casey, Finn, and Morgenroth, 2004). In a context of ongoing rapid changes in the technology and organisation of production and service delivery, education and skills have come to assume central importance both for macroeconomic performance as well as for the labour market prospects of individuals. Enhancing productivity in the future will require additional investment in research and development and in the expansion of tertiary education, at undergraduate as well as post-graduate levels.

Most studies indicate that early childhood education brings enduring benefits in terms of better school outcomes and enhanced social skills in later life. However, Ireland is below average and lags well behind the leading countries in the proportion of 3-5 year olds in pre-primary education (OECD, 2004, Goodman and Sianesi, 2005).

With regard to primary education investment in physical infrastructure is needed to raise standards. Investment in

programmes to counter social disadvantage and poor educational achievement has a high social return.

Currently just under one-fifth of young people leave school without having completed the upper secondary cycle, as discussed below. This is an unacceptable wastage of human resources and it should become a core objective of the second-level system that every student should complete either a Leaving Certificate or it's equivalent (NESC, 2006).

Investment in higher education is essential to support the development of an economy based on learning and innovation. The two priorities in higher education are (1) to maintain a strong stream of well-educated graduates to fill technical and managerial positions in the labour market and; (2) to support the growth of research in higher education institutes, with strong linkages to the private sector. These priorities are reflected in the commitment of greater resources to higher education and in developing the research infrastructure and in providing ongoing support for research.

An additional complementary priority is to widen access to higher education. This includes not only those from disadvantaged socio-economic backgrounds, but also mature students and students with disabilities. Some progress has been achieved in respect of the former two in recent years, but there has been much less progress in improving access for students with disabilities.

Ireland falls well below the leading countries in investment in the ongoing training of employed workers. This, combined with the prospective decline in new entrants to the labour force, suggests the need for increased investment in continuing education and training. There is a strong argument for targeting public investment in continuing education and training on the lower skilled, because they are less likely to participate on the basis of their own resources, and upgrading the skills of the low skilled has the potential to meet skill shortages. Training of individuals with greater endowments of human capital is more likely to be funded by their employers, particularly where the returns to such training, both to employers and employees, may be more apparent.

RESEARCH AND DEVELOPMENT

Our recommendations for investment priorities reflect three main influences. First, the aspirations of the Enterprise Strategy Group (ESG) and Interdepartmental Committee on R&D, which themselves reflect the wider aspirations of the EU Lisbon Agenda. Building on investment to date, these aim to achieve a step change in the level of R&D investment in Ireland over the period of the NDP 2007-2013, and the measures we are suggesting are designed to support this aspiration.

The detailed priorities include:

- A substantial increase in public investment in both higher education R&D and support measures for private sector R&D activity.

- Continuation of most of the current funding mechanisms for R&D and innovation implemented under the NDP 2000-05 (Enterprise Strategy Group, 2004, pp. 65-76).
- A greater focus on commercialisation.
- In order to ensure the best projects get funding we recommend a reduction in funding for R&D ring fenced for particular sectors, while recognising that policy oriented R&D continues to be of high importance.
- We recommend an increase in funding for business led R&D and collaborative efforts.

We suggest one addition to the current portfolio of schemes following a suggestion by the ESG for a specific measure intended to develop innovation networks in Ireland.

HEALTH

As in all developed countries, healthcare is an important area of Government intervention and the public sector is the major healthcare provider in Ireland. Government policy as set out in the 2001 health strategy entitled *Quality and Fairness: A Health System for You* emphasises the wider concept of health that covers the state of physical, mental and social well-being and not just the absence of illness or disability. Despite the high proportion of current expenditure in the healthcare area substantial capital investment has also been put in place over the last decade.

In order to determine investment needs it is important to identify future demand. In this respect a special study of the impact of demographic change on the need for acute hospital beds was carried out. This study showed that assuming an 85 per cent occupancy over the period 2007-2013, between 1,821 and 3,280 additional acute hospital beds are projected to be required. On the basis of some assumptions about the cost of new beds, the projected bed needs will cost between €97 million and €205 million annually, depending on model and occupancy assumption.

Assessing the need for other expenditure is very difficult due to the lack of data and an appropriate resource allocation model. However, given the stated strategy with respect to care of the elderly, the disabled and individuals suffering from mental illness additional non-acute facilities may be appropriate. Similarly in the area of information technology a significant gap remains.

CHILDCARE

State support for the provision of childcare is relatively new in Ireland, having begun to emerge only in the 1990s. However, childcare is now increasingly thought of as an element within a broader 'early childhood care and education' (ECCE) paradigm (NESF, 2005).

Rough estimates calculated as part of this study suggest that 50,000 additional places would seem to be a reasonable level of provision for new State-supported childcare places.

For the period 2010-2013, the focus would need to be broadened to take account of the need to improve and expand early childhood education.

Additional infrastructure support would be needed to adapt existing school buildings where possible and provide non-school based places. Current experience suggests it would be extremely difficult for many voluntary/community providers to become self sufficient while meeting the social inclusion aims and providing care to the highest professional standard. The costs of replacing community employment (CE) workers with trained staff as *core* staff members are an important issue. In 2005 the costs of CE funding for childcare workers was €24.6 million, the costs of substituting trained workers would be higher.

PRODUCTIVE SECTOR

In an economic climate of full employment and overheating of some sectors it is difficult to justify significant intervention in the productive sector. Rather than proposing significant direct subsidisation of productive activities, we expect that the overall business environment will be significantly improved by the investments in the areas of infrastructure, education and training and research and development.

In the past many of the supports have been aimed at sectors which have underperformed and indeed are not expected to increase their share of national output. Such interventions can only be justified if they result in a restructuring of the sector, which improves competitiveness and ultimately the viability of the sector. With regard to primary production there is little evidence that the continued subsidisation can turn around the fortunes of the industry as a whole. Of course, interventions can have a significant positive effect on individual businesses but the benefits of the interventions appear to be largely captured by those businesses, which implies high deadweight. In this respect it is interesting to note that a significant effort has been made by the industrial development agencies to limit deadweight.

Notwithstanding these criticisms some limited supports to the productive sector are recommended. Support to productive sector activities should be limited to areas of clear market failure and should be concentrated on the development of SMEs and for regional development purposes. There should be a shift from supporting underperforming industries towards enabling resources tied up in these industries to move to better performing industries.

CULTURE AND RECREATION

Strategic planning in regard to the Sports Capital Programme and Swimming Pool Programme needs to be improved and, as far as possible, spending on this area should be delayed until an appropriate plan and information base is put in place.

The programme for Major Capital Projects should be implemented in full, though perhaps on a longer timescale than currently planned in view of construction industry constraints.

Because of existing commitments, spending from the Horse and Greyhound Racing Fund should be continued as currently planned to 2008. The rationale for continuing this programme in its present form beyond 2008 needs to be stringently evaluated and would more appropriately be considered as a question for economic policy (under a heading such as industry and trade or agriculture) rather than sports policy.

Arts facilities make an important contribution to the quality of life. Expenditure on major arts facilities should be backed up by a longer term plan ensuring sufficient demand and efficient management so as to maximise the return, and the spatial distribution of investment should reflect the NSS.

ADM, 2000. *National Childcare Census Report*. Dublin: Area Development Management Ltd.

ADM, 2005. "Results of 2004 EOCP Annual Beneficiary Questionnaire," Dublin: Area Development Management Ltd.

AFFUSO, L., J. MASSON and D. NEWBERY, 2003. "Comparing Investments in New Transport Infrastructure: Road Versus Railways? *Fiscal Studies*, Vol. 24, No. 3, pp. 275-315.

AGHION, P. and P. HOWITT, 1992. "A Model of Growth through Creative Destruction", *Econometrica*, Vol. 60, No. 2, pp. 323-351.

AGHION, P. and P. HOWITT, 1998. *Endogenous Growth Theory*, Cambridge (MA): MIT Press.

AGRI VISION, 2004. Agri Vision 2015. Dublin: Department of Agriculture, Forestry and Food.

ANSELIN L., A. VARGA, Z. ACS, 1997. "Local Geographic Spillovers Between University Research and High Technology Innovations", *Journal of Urban Economics*, Vol. 42, pp. 422-448.

ANSELIN L., A. VARGA, Z. ACS, 2000. "Geographic and Sectoral Characteristics of Academic Knowledge Externalities", *Papers in Regional Science*, Vol. 79, pp. 435-443.

ARCHER, P. and S. WEIR, 2004. "Addressing Disadvantage", Report to the Educational Disadvantage Committee.

ARESTIS, P. and P.O. DEMETRIADES, 1997. "Financial Development and Economic Growth: Assessing the Evidence", *Economic Journal*, Vol. 107, No. 442, pp. 783-799.

ARROW, R. and M. KURZ, 1970. *Public Investment, the Rate of Return and Optimal Fiscal Policy*. Baltimore, MD: Johns Hopkins University Press.

ARTS COUNCIL, 2005a. *Socio-Economic Conditions of Theatre Practitioners in Ireland*, report by Hibernian Consulting.

ARTS COUNCIL, 2005b. "Partnership for the Arts, Arts Council Goals 2006-2010", www.artscouncil.ie

ARTS COUNCIL, 2005c. "Partnership for the Arts in Practice 2006-2008", http://www.artscouncil.ie/future/docs/practice.pdf.

ASCHAUER, D., 1989. "Is Public Capital Productive?", *Journal of Monetary Economics*, Vol. 23, pp. 177-200.

ASHENFELTER, O., C. HARMON, and H. OOSTERBEEK, 1999. "A Review of Estimates of the Schooling/Earnings Relationship, with Tests for Publication Bias," *Labour Economics*, Vol. 6, No. 4, pp. 453-70.

ASHWORTH, K., J. HARDMAN, W.C. LIU, S. MAQUIRE, S. MIDDLETON, L. DEARDEN, C. EMMERSON, C. FRAYNE, A. GOODMAN, H. ICHIMURA, and C. MEGHIR, 2001. *Education Maintenance Allowance: The First Year. A Quantitative Evaluation.* London: Department for Education and Employment.

ATKINS, 2000. *National Water Study*. Dublin: Department of the Environment, Heritage and Local Government.

BACON, P. AND ASSOCIATES, 2004. *A Review and Appraisal of Ireland's Forestry Development Strategy*. Dublin: Stationery Office.

BARNETT, W.S., 1995. "Long-term Effects of Early Childhood Programs on Cognitive and School Outcomes", *The Future of Children* , Vol.5, No. 3, pp. 25-50.

BARRETT, A. and A. BERGIN, 2005. "Assessing Age-related Pressures on the Public Finances, 2005 to 2050" in T. Callan and A. Doris (eds.), *Budget Perspectives 2006*. Dublin: The Economic and Social Research Institute.

BARRETT, A., A. BERGIN and D. DUFFY, 2005. "The Labour Market Characteristics and Labour Market Impacts of Immigrants in Ireland", *The Economic and Social Review*, Vol. 37, No. 1, pp. 1-26.

BARRETT, A., T. CALLAN and B. NOLAN, 1999a. "Rising Wage Inequality, Returns to Education and Labour Market Institutions: Evidence from Ireland", *British Journal of Industrial Relations*, Vol. 37, No. 1, pp. 77-100.

BARRETT, A., T. CALLAN and B. NOLAN, 1999b. "Returns to Education in the Irish Youth Labour Market", *Journal of Population Economics*, Vol. 12, No. 2, pp. 313-26.

BARRETT, A., J. FITZ GERALD and B. NOLAN, 2002. "Earnings Inequality, Returns to Education and Immigration into Ireland", *Labour Economics* Vol. 9, No. 5.

BARRETT, A. and J. LAWLOR, 1995. The Economics of Solid Waste Management in Ireland, Policy Research Series No. 26., Dublin: The Economic and Social Research Institute.

BARRETT, A. and F. TRACE, 1999. "The Impact of Agricultural and Forestry Subsidies on Land Prices and Land Uses in Ireland", Policy Research Series No. 35, Dublin: ESRI.

BARRIOS, S. and E. STROBL, 2005. "The Dynamics of Regional Inequalities", *European Economy Economic Papers,* No. 229. Brussels: Directorate General for Economic and Financial Affairs.

BARRO, R. J., 1990. "Government Spending in a Simple Model of Endogenous Growth," *Journal of Political Economy*, Vol. 98, No. 5, pp. 103-26.

BASSANINI, A. and S. SCARPETTA, 2001. "Does Human Capital Matter for Growth in OECD Countries? Evidence from Pooled Mean-Group Estimates," OECD Economics Department Working Paper No. 282.

BAYINDIR-UPPMAN, T., 1998. "Two Games of Interjurisdictional Competition When Local Governments Provide Industrial Public Goods", *International Tax and Public Finance*, Vol. 5, No. 4, pp. 471-87.

BELFIELD, C., M. NORES., S. BARNETT and L. SCHWEINHART, 2006. "The High/Scope Perry Preschool Program: Cost–Benefit Analysis Using Data from the Age-40 Followup", *Journal of Human Resources*, Vol. 41, No. 1, pp. 162-190.

BELTON, V. and T.J. STEWART, 2002. *Multi Criteria Analysis: An Integrated Approach.* Dordrecht: Kluwer.

BEN-DAVID, D. and M.B. LOEWY, 2000. "Knowledge Dissemination, Capital Accumulation, Trade, and Endogenous Growth", *Oxford Economic Papers*, Vol. 52, No. 4, pp. 637-50.

BENHABIB, J. and M. M. SPIEGEL, 1994. "The Role of Human Capital in Economic Development: Evidence from Aggregate Cross-Country Data", *Journal of Monetary Economics*, Vol. 34, No. 2, pp.143-173.

BERGIN, A. and I. KEARNEY, 2004. "Human Capital, The Labour Market and Productivity Growth in Ireland", ESRI Working Paper No. 158. Dublin: The Economic and Social Research Institute.

BEUGELSDIJK, S. and M. CORNET, 2001. 'How Far Do they Reach? : the Localisation of Industrial and Academic Knowledge Spillovers in the Netherlands', Tilburg University, Center for Economic Research, Discussion Paper No. 47.

BOOZ, ALLAN, HAMILTON, 2003. *Strategic Rail Review*. Dublin: Department of Transport.

BOOZ, ALLEN, HAMILTON, 2004. *Greater Dublin Travel Demand Management Study.* Report submitted to the Dublin Transportation Office.

BORMAN, G.D., J.V. D'AGOSTINO, K.K. WONG and L.V. HEDGES, 1998. "The Longitudinal Achievement of Chapter 1 Students: Preliminary Evidence from the Prospects Study", *The Journal of Education for Students Placed at Risk*, Volume 3, No. 4.

BORMAN, G. and G. HEWES, 2002. "The Long-term Effects and Cost-effectiveness of Success for All", *Educational Evaluation and Policy Analysis*, Vol. 24, No. 4, pp. 243-266.

BOUGHEAS, S., P.O. DEMETRIADES and T. MAMUNEAS, 2000. "Infrastructure, Specialisation and Economic Growth". *Canadian Journal of Economics*, Vol. 33, No. 2, pp. 506-522.

BOVENBERG, A.L., 1989. "The Effects of Capital Income Taxation on International Competitiveness and Trade Flows", *American Economic Review*, Vol. 79, No.5, pp. 1045-64.

BOYLE, G., T. McCARTHY and J. WALSH, 1998-1999. "Regional Income Differentials and the Issue of Regional Equalisation in Ireland", *Journal of the Statistical and Social Inquiry Society of Ireland*. Vol. 28, No. 1, pp. 155-99.

BRADLEY, J. and E. MORGENROTH, 2000. "Celtic Cubs? Regional Manufacturing in Ireland" in D. Duffy, J. Fitz Gerald, I. Kearney and D. Smyth (eds.), *Medium-Term Review 1999-2005*, No. 7, Dublin: The Economic and Social Research Institute.

BRADLEY, J., T. MITZE, E. MORGENROTH and G. UNTIEDT, 2005. "An Integrated Micro-Macro (IMM) Approach to the Evaluation of Large-Scale Public Investment Programmes: The Case of the EU Structural Funds", ESRI Working Paper, No. 167. Dublin: The Economic and Social Research Institute.

BRANDER, J. and P. KRUGMAN, 1983. "A 'Reciprocal Dumping' Model of International Trade", *Journal of International Economics*, Vol. 15, pp. 313-321.

BREEN, R. and S. SHORTALL, 1992. "The Exchequer Costs of Unemployment Among Unqualified Labour Market Participants" in J. Bradley *et al.*, *The Role of the Structural Funds: Analysis of Consequences for Ireland in the Context of 1992*, Policy Research Series Paper No. 13, Dublin: The Economic and Social Research Institute.

BRESCHI, S. and F. LISSONI, 2001. "Knowledge Spillovers and Local Innovation Systems: A Critical Survey", *Industrial and Corporate Change*, Vol. 10, No. 4, pp. 975-1005.

BRYANT, D. and K. MAXWELL, 1996. "The Effectiveness of Early Intervention for Disadvantaged Children" in M.J. Guralnick, (ed.), The Effectiveness of Early Intervention, Baltimore: Paul Brookes.

BUCHANON, C. and PARTNERS, 1968. *Regional Studies in Ireland*. Dublin: An Foras Forbatha.

BŰTTNER, T., R. SCHWAGER and D. STEGARESCU, 2004. "Agglomeration, Population Size, and the Cost of Providing Public Services: An Empirical Analysis for German States", *Public Finance and Management*, Vol. 4, No. 4, pp. 496-520.

BUTTON, K., 2004. "The Rationale for Road Pricing: Standard Theory and Latest Advances", in G. Santos (ed.), *Road Pricing, Theory and Evidence*, Amsterdam : Elsevier.

CALLAN, T. and C. HARMON, 1999. "The Economic Return to Schooling in Ireland", *Labour Economics*, Vol. 6, No. 4, pp. 543-550.

CANADA ARTS COUNCIL, 2005. *Comparisons of Arts Funding in Selected Countries: Preliminary Findings*. Ottawa: Canada Council For the Arts.

CANNON, E., 2000. "Human Capital: Level versus Growth Effects," *Oxford Economic Papers*, Vol. 52, No. 4, pp. 670-676.

CARLIN, W., A. GLYNN and J. VAN REENEN, 2001. "Export Market Performance of OECD Countries: an Empirical Examination of the Role of Cost Competitiveness", *The Economic Journal*, Vol. 111, pp. 128-162.

CASSIMAN, B. and R. VEUGELERS, 2002. "Complementarity in the Innovation Strategy: Internal R&D, External Technology Acquisition, and Co-operation in R&D", EARIE Annual Conference, September Madrid.

CENTRAL STATISTICS OFFICE, 2005. *Regional Population Projections 2006-2021*. Dublin: Central Statistics Office.

CENTRAL STATISTICS OFFICE, 2004. *Population and Labour Force Projections 2006-2036*. Dublin: Central Statistics Office.

CHILDCARE DIRECTORATE, 2005. *Ex-Ante Evaluation National Development Plan 2007-2013 Childcare Paper*, Dublin: Department of Justice Equality and Law Reform.

CHOUDHRI E. U. and L. SCHEMBRI, 2002. "Productivity Performance and International Competitiveness: An Old Test Reconsidered", *Canadian Journal of Economics*, Vol. 35, No. 2, pp. 341-362.

CICCONE, A., 2002. "Agglomeration Effects in Europe", *European Economic Review*, Vol. 46, pp. 213-227.

CICCONE, A. and R. HALL, 1996. "Productivity and the Density of Economic Activity", *American Economic Review*, Vol. 86, No. 1, pp. 54-70.

COASE, R., 1960. The Problem of Social Cost", *Journal of Law and Economics,* Vol. 3, pp. 1-44.

COE, D.T. and R. MOGHADAM, 1993. "Capital and Trade as Engines of Growth in France", *IMF Staff Papers*, Vol. 40, No. 3, pp. 542-566.

COMBAT POVERTY AGENCY/NAPS UNIT DSFCA, 2002. *Pilot on Social Inclusion Indicators*, Report to the Monitoring Committees of the Regional Operational Programmes, Dublin: Combat Poverty Agency.

COMPETITION AUTHORITY, 2005. *Decision COM/108/02*, 30th August 2005. Dublin: Competition Authority.

COOKE, P. and L. LEYDESDORFF, 2006. "Regional Development in the Knowledge-based Economy: the Construction of Advantage", *Journal of Technology Transfer*, Vol. 31, pp. 5-15.

CORNES, R.C. and T. SANDLER, 1996. *The Theory of Externalities, Public Goods and Club Goods* (Second edition), Cambridge: Cambridge University Press.

COSTA, A.X., S.A. RIDLEY, A.K. SHAHANI, P.R. HARPER, V. DE SENNA, M.S. NIELSEN, 2003. "Mathematical Modelling and Simulation for Planning Critical Care Capacity", *Anaesthesia*, April, Vol. 58, No. 4, pp. 320-327.

COTE, A., 1994. "Exchange Rate Volatility and Trade: A Survey", Bank of Canada Working Paper No. 94-5.

COUGHLIN, C., C. J. TERZA and V. ARROMDEE, 1991. "State Characteristics and the Location of Foreign Direct Investment within the United States", *Review of Economics and Statistics*, Vol. 73, No. 4, pp. 675-683.

CSF EVALUATION UNIT, 1999. *Ex-Ante Evaluation of the National Development Plan, 2000-2006*.

CENTRAL STATISTICS OFFICE (CSO), *National Income & Expenditure Accounts*, various years.

COSTELLO, S., 2004. *Future Post-primary Arrangements in Northern Ireland*. Belfast: Department of Education Northern Ireland.

CULLEN, B. and L. WALKER, 2000. "The Department of Education and Science's 8 to 15 Early School Leaver Initiative", Dublin: Children's Research Centre, Trinity College Dublin.

CURTIS, J., 2005. "Anaerobic Digestion: Benefits for Waste Management", Agriculture, Energy, and the Environment, Discussion paper by the Strategic Policy Unit of the EPA, January.

D'ADDIO, A. C. and M. M. D'ERCOLE, 2005. "Trends and Determinants of Fertility Rates", OECD Social, Employment and Migration Working Papers No. 27. Paris: Organisation for Economic Cooperation and Development.

DALHUSEN, J., R. FLORAX, H. de GROOT and P. NIJKAMP, 2003. "Price and Income Elasticities of Residential Water Demand: A Meta-analysis", *Land Economics*, Vol. 79, No. 2, pp. 292-308.

DAVIES, S. and M. HALLET, 2002. "Interactions between National and Regional Development", HWWA Discussion Paper No. 207.

DEARDEN, L., C. EMMERSON, C. FRAYNE and C. MEGHIR, 2005. "Educational Subsidies and School Drop-out Rates", Institute for Fiscal Studies Working Paper WP05/11.

DECOSTER, C., N.P. ROOS, K.C. CARRIERE, S. PETERSON, 1997. "Inappropriate Hospital Use by Patients Receiving Care for Medical Conditions: Targeting Utilization Review". *Canadian Medical Association Journal*, Vol. 157, No. 7, pp. 889-896.

De la FUENTE, A., 1996. "Inversion Publica Y Redistribucion Regional: El Caso De Espana En La Decada de Los Ochenta", Barcelona: (Papers de Treball 50.96).

DELANEY, L. and T. FAHEY, 2005. *The Social and Economic Value of Sport in Ireland,* Books and Monographs No. 180, Dublin: The Economic and Social Research Institute in conjunction with the Irish Sports Council.

DENNY, K., C. HARMON and S. REDMOND, 2000. "Functional Literacy, Educational Attainment and Earnings: Evidence from the International Adult Literacy Survey", Institute for Fiscal Studies, Working Paper 00/09.

DEMETRIADES, P. O. and K.A. HUSSEIN, 1996. "Does Financial Development Cause Economic Growth? Time Series Evidence from 16 Countries", *Journal of Development Economics*, Vol. 51, No. 2, pp. 385-409.

.DEPARTMENT OF ARTS, SPORT AND TOURISM (n.d.) *Expenditure Review of Sports Capital Programme 1997-2002*. Dublin: Department of Arts, Sports and Tourism.

DEPARTMENT OF EDUCATION AND SCIENCE, 2005a. *Retention Rates of Pupils in Second-Level Schools: 1996 Cohort*, Dublin: Department of Education and Science.

DEPARTMENT OF EDUCATION AND SCIENCE, 2005b. *Statistical Report 2003/2004*. Dublin: Stationery Office.

DEPARTMENT OF EDUCATION AND SCIENCE, 2005c. *DEIS – Delivering Equality of Opportunity in Schools: An Action Plan for Educational Inclusion*, Dublin: Department of Education and Science.

DEPARTMENT OF THE ENVIRONMENT, HERITAGE AND LOCAL GOVERNMENT, 2004. "Taking Stock and Moving Forward", in *Regional Planning Guidelines for the Greater Dublin Area 2004-2016*. Dublin: Department of the Environment, Heritage and Local Government.

DEPARTMENT OF THE ENVIRONMENT, HERITAGE AND LOCAL GOVERNMENT, 2004a. *Irish Bulletin of Vehicle and Driver Statistics, 2004*. Dublin: Department of the Environment, Heritage and Local Government.

DEPARTMENT OF THE ENVIRONMENT, HERITAGE AND LOCAL GOVERNMENT, 2004b. *The National Urban Waste Water Study*. Dublin: Department of the Environment, Heritage and Local Government.

DEPARTMENT OF THE ENVIRONMENT, HERITAGE AND LOCAL GOVERNMENT, 2005. *Housing Policy Framework – Building Sustainable Communities,* Dublin: Department of the Environment, Heritage and Local Government.

DEPARTMENT OF THE ENVIRONMENT, HERITAGE AND LOCAL GOVERNMENT, 2005. Local Authority *Assessment of Social Housing Need.* Dublin: Department of the Environment, Heritage and Local Government.

DEPARTMENT OF THE ENVIRONMENT, HERITAGE AND LOCAL GOVERNMENT, 2005. *Review of the Construction Industry 2004 and Outlook 2005-2007*. Dublin: Department of the Environment, Heritage and Local Government.

DEPARTMENT OF THE ENVIRONMENT, HERITAGE AND LOCAL GOVERNMENT, 2005. *Circular WIR: 04/05, Policy guidance pursuant to section 60 of the Waste Management Act, 1996 (as amended)*. Dublin: Department of the Environment, Heritage and Local Government.

DEPARTMENT OF THE ENVIRONMENT, HERITAGE AND LOCAL GOVERNMENT, 2006. *Review of the Implementation of the Government's Integrated and Preventative Homeless Strategies.* Dublin: Department of the Environment, Heritage and Local Government.

DEPARTMENT OF FINANCE, 2005. *Guidelines for the Appraisal and Management of* CSF *Evaluation Unit*, (1999) *Ex-Ante Evaluation of the National Development Plan 2000-2006*. Dublin: Stationery Office.

DEPARTMENT OF HEALTH AND CHILDREN, 2001. *Quality and Fairness: A Health System for You.* Dublin: Stationery Office.

DEPARTMENT OF HEALTH AND CHILDREN, 2002. *Acute Hospital Bed Capacity, A National Review* , Dublin: Government Publications Office.

DLUHOSCH, B., 2000. *Industrial Location and Economic Integration: Centrifugal and Centripetal Forces in the New Europe*, Cheltenham UK: Edward Elgar.

DKM, 2004. *Economic Evaluation of Water Supply and Waste Water Projects – Cost-Benefit Analysis Methodology Paper*. Dublin: Department of the Environment, Heritage and Local Government.

DOWNS, A., 1992. "Stuck in Traffic", Washington DC: Brookings Institution.

DOWNS, A., 2004. "Still Stuck in Traffic", Washington DC: Brookings Institution.

DUBLIN TRANSPORTATION OFFICE, 2001. *A Platform for Change A Transportation Strategy for the Greater Dublin Area.* Dublin: Dublin Transportation Office.

DUFFY, D., J. FITZ GERALD and I. KEARNEY, 2005. "Rising House Prices in an Open Labour Market", *The Economic and Social Review*, Vol. 36, No. 3, Winter, pp. 251-272.

DUGGAL, V. G., C. SALTZMAN and L. R. KLEIN, 1999. "Infrastructure and Productivity: A Nonlinear Approach", *Journal of Econometrics*, Vol. 92, No. 1, pp. 47-74.

DURANTON, G. and D. PUGA, 2005. "From Sectoral to Functional Urban Specialisation", *Journal of Urban Economics*, Vol. 57, No 2, pp. 343-70.

DYER, J.E., P.C. FISHBURN, R.E. STEUER, J. WALLENIUS and S. ZIOTS, 1992. "Multi Criteria Decision Making, Multiattribute Utility Theory: The Next 10 Years", *Management Science,* Vol. 36, No. 5, pp. 645-654.

EDQUIST, C., 2004. "Systems of Innovation – Perspectives and Challenges" in J. Fagerberg, D. Mowery and N. Richard (eds.), *Oxford Handbook of Innovation*, Oxford: Oxford University Press.

el AGRAA, A. M., 1997. "UK Competitiveness Policy vs. Japanese Industrial Policy", *Economic Journal*, Vol. 107, No. 444 pp. 1504-17.

EIVERS, E., E. RYAN and A. BRINKLEY, 2000. *Characteristics of Early School Leavers,* Dublin: Educational Research Centre.

EIVERS, E., G. SHIEL, R. PERKINS and J. COSGROVE, 2005. *The 2004 National Assessment of Reading*. Dublin: Educational Research Centre.

ELLISON, G. and E. L. GLAESER, 1997. "Geographic Concentration in U.S. Manufacturing Industries: A Dartboard Approach", *Journal of Political Economy*, Vol. 105, No. 5, pp. 889-927.

EDUCATIONAL DISADVANTAGE COMMITTEE, 2005. *Moving Beyond Educational Disadvantage*, Dublin: Department of Education and Science.

EDUCATIONAL DISADVANTAGE FORUM, 2003. *Educational Disadvantage Forum: Report of Inaugural Meeting*, Dublin: Educational Disadvantage Committee.

ENTERPRISE STRATEGY GROUP, 2004. *Ahead of the Curve: Ireland's Place in the Global Economy*. Dublin: Forfás.

ENVIRONMENTAL PROTECTION AGENCY, 2003. *National Waste Interim Report*, Johnstown Castle: Environmental Protection Agency.

ENVIRONMENTAL PROTECTION AGENCY, 2004. *National Waste Report 2004*. Johnstown Castle: Environmental Protection Agency.

ENVIRONMENTAL PROTECTION AGENCY (EPA), *National Waste Database*, various years. Johnstown Castle: Environmental Protection Agency.

ENVIRONMENTAL PROTECTION AGENCY, 2005. *National Waste Database 2004*, Dublin: EPA.

ERC, 1998. *Early Start Preschool Programme: Final Evaluation Report*. Dublin: Educational Research Centre.

EUROPEAN COMMISSION, (with INAG), 2001. "Water Pricing: Conceptual and Theoretical Issues" in S. Scott, *Pricing Water: Economics, Environment and Society,* Office for Official Publications of the European Communities.

EUROPEAN COMMISSION, 2003. "Raising EU R&D Intensity", Brussels: European Commission.

EUROPEAN ENVIRONMENT AGENCY, 2005. *The European Environment – State and Outlook 2005*. Copenhagen: European Environment Agency.

EXPERT GROUP ON FUTURE SKILLS NEEDS, 2004. A Model to Predict the Supply and Demand for Researchers and Research Personnel in Line with Ireland's Strategy for Contributing to the European Research Area 3 Per Cent Initiative. Dublin: Forfás.

EXPERT GROUP ON MENTAL HEALTH POLICY, 2006. *Vision for Change: Report of the Expert Group on Mental Health Policy*, Dublin: Department of Health and Children.

FAGERBERG, J., 1996. "Technology and Competitiveness", *Oxford Review of Economic Policy*, Vol. 12, No.3, Autumn, pp. 39-51.

FAHEY, T., R. LAYTE and B. GANNON, 2004. *Sports Participation and Health Among Adults in Ireland*. Books and Monographs, No. 178, Dublin: ESRI in conjunction with the Irish Sports Council.

FAHEY, T., L. DELANEY and B. GANNON, 2005. *School Children and Sport in Ireland*, Books and Monographs No. 182, Dublin: ESRI in conjunction with the Irish Sports Council.

FARMER, R.D., J. EMAMI, 1990. "Models for Forecasting Hospital Bed Requirements in the Acute Sector". *Journal of Epidemiological Community Health*. Dec. Vol. 44, No. 4, pp. 307-12.

FERNALD, J. G., 1999. "Roads to Prosperity? Assessing the Link between Public Capital and Productivity", *American Economic Review*, Vol. 89, No. 3 pp. 619-638.

FERNANDEZ, E., B. JUNQUERA and C.J. VAZQUEZ, 1996. "Government Support for R&D: The Spanish Case", *Technovation*, Vol. 16, pp. 59-66.

FINLAYSON, G.S., D. STEWART, R.E. TATE, L. MACWILLIAM, N. ROOS, 2005. "Anticipating Change: How Many Acute Care Hospital Beds Will Manitoba Regions Need in 2020?", *Canadian Journal of Aging*. Spring; 24 Suppl 1, pp.133-40.

FINN, J.D., S.B. GERBER, C.M. ACHILLES, and J. BOYD-ZAHARIAS, 2001. "The Enduring Effects of Small Classes", Teachers' College Record, Vol. 103, pp. 45-83.

FINN, J.D., S.B. GERBER, and J. BOYD-ZAHARIAS, 2005. "Small Classes in the Early Grades, Academic Achievement and Graduating from High School", *Journal of Educational Psychology*, Vol. 97, No. 2, pp. 214-223.

FISCHER M. M. and A. VARGA, 2003. "Spatial Knowledge Spillovers and University Research: Evidence from Austria", *Annals of Regional Science*, Vol. 37, pp. 303-322.

FITZ GERALD, J., 2000. "Ireland's Failure-And Belated Convergence", ESRI Working Paper No. 133. Dublin: The Economic and Social Research Institute.

FITZ GERALD, J., 2004. "An Expensive Way to Combat Global Warming: Reform Needed in EU Emissions Trading Regime", in D. McCoy, D. Duffy, A. Bergin, and J. Cullen, (eds.), *Quarterly Economic Commentary*. Dublin: The Economic and Social Research Institute.

FITZ GERALD, J., 2005. "The Irish Housing Stock: Growth in the Number of Vacant Dwellings", in D. McCoy, D. Duffy, A. Bergin, S. Garrett, Y. McCarthy (eds.), *Quarterly Economic Commentary*, Spring, Dublin: The Economic and Social Research Institute.

FITZ GERALD, J., 2006. "Lessons from 20 Years of Cohesion", chapter in S. Mundschenk, M. Stierle, U. Stierle-von Schutz, and I. Traistaru (eds.), *Competitiveness and Growth in Europe: Lessons and Policy Implications for the Lisbon Strategy*, Cheltenham: Edward Elgar.

FITZ GERALD J. and O. KEEGAN (eds.), 1993. *The Community Support Framework 1989-1993: Evaluation and Recommendation for the 1994-1997 Framework*. Report prepared for the Department of Finance in association with DKM Economic Consultants, G. Boyle, NUI Maynooth, B. Kearney and A. Conway. Dublin: The Economic and Social Research Institute.

FITZ GERALD, J., I. KEARNEY, E. MORGENROTH and D. SMYTH, 1999. *National Investment Priorities for the Period 2000-2006*. Policy Research Series No. 33, Dublin: The Economic and Social Research Institute.

FITZ GERALD, J. and B. NOLAN, 2002. "Earnings Inequality, Returns to Education and Immigration into Ireland", *Labour Economics*, Vol. 9, No. 5.

FITZ GERALD, J. C. MCCARTHY, E. MORGENROTH and P. O'CONNELL, 2003. *The Mid-Term Evaluation of the NDP and Community Support Framework for Ireland 2000-2006,* Policy Research Series, No. 50, Dublin: The Economic and Social Research Institute, October.

FITZ GERALD, J., A. BERGIN, I. KEARNEY, A. BARRETT, D. DUFFY, S. GARRETT and N. MCCARTHY, 2005. *Medium-Term Review: 2005-2012,* No. 10. Dublin: The Economic and Social Research Institute.

FITZ GERALD, J., M. KEENEY, N. MCCARTHY, E. O'MALLEY and S. SCOTT, 2005. *Aspects of Irish Energy Policy,* Policy Research Series No. 57. Dublin: The Economic and Social Research.

FITZ PATRICK ASSOCIATES, 2004. *Economic Impact of the Professional Performing Arts in Ireland*, Report prepared for Theatre Forum.

FITZPATRICK ASSOCIATES, 2005a. *A Review of the National Development Plan Investment in Water and Waste Water Services During the 2000-2006 Period.* Dublin: CSF Evaluation Unit.

FITZPATRICK ASSOCIATES, 2005b. *Review of the Implementation of the Government's Integrated and Preventative Homeless Strategies*, Dublin: Department of the Environment, Heritage and Local Government.

FITZPATRICK ASSOCIATES, 2005c. *Implementing the NSS: Gateways Investment Priorities Study.* Dublin: Department of the Environment, Heritage and Local Government.

FITZPATRICK ASSOCIATES, 2006. *Review of the Implementation of the Government's Integrated and Preventative Homeless Strategies*, Dublin: Stationery Office.

FLYVBJERG, B. and N. BRUZELIUS, 2003. *Megaprojects and Risk*, Cambridge: Cambridge University Press.

FORFÁS, 2004. *Building Ireland's Knowledge Economy – The Irish Action Plan for Promoting Investment in R&D to 2010*', Dublin: Forfás.

FORFÁS, 2005a. *Science Foundation Ireland: The First Years 2001-2005*. Report of an International Evaluation Panel, October, Dublin: Forfás.

FORFÁS, 2005b. *Business Expenditure on Research and Development – 2003/04*, Forfás, April, Dublin: Forfás.

FORFÁS, 2005c. *Survey of R&D in the Higher Education Sector, 2004*, Dublin: Forfás.

FORFÁS, 2005d. *Skill Needs in the Irish Economy: The Role of Migration*, Expert Group on Future Skill Needs, Dublin: Forfás.

FOX, R., 2003. "Participation of the Employed in Education/Training 2002" in *The Irish Labour Market Review 2003*. Dublin: FÁS.

FUTAGAMI, K., Y. MORITA and A. SHIBATA,. 1993. "Dynamic Analysis of an Endogenous Growth Model with Public Capital," *Scandinavian Journal of Economics*, Vol. 95, No. 4, pp. 607-625.

GANGL, M., W. MÜLLER and D. RAFFE, 2003. "Conclusions: Explaining Cross-national Differences in School to Work Transitions" in W. Müller and M. Gangl (eds.), *Transitions from Education to Work in Europe*, Oxford: Oxford University Press.

GANNON, B. and B. NOLAN, 2004. *Disability and Labour Market Participation.* Dublin: The Equality Authority.

GIANNETTI, M., 2002. "The Effects of Integration on Regional Disparities: Convergence, Divergence of Both?" *European Economic Review*, Vol. 46, pp. 539-657.

GLEESON, J., A. CLIFFORD, T. COLLISON, S. O'DRISCOLL, M. ROONEY and A. TUOHY, 2002. "School Culture and Curriculum Change: the Case of the Leaving Certificate Applied (LCA)" , *Irish Educational Studies*, Vol. 21, No. 3, pp. 21-44.

GOMBY, D.S., 1995. "Long-term Outcomes of Eearly Childhood Programs: Analysis and Recommendations", *The Future of Children*, Vol. 3, No. 5, pp. 6-24.

GOODBODY ECONOMIC CONSULTANTS, 2005. *Review of Area Based Tax Incentive Renewal Schemes,* Dublin: Goodbody Economic Consultants.

GOODMAN, A. and B. SIANESI, 2005. "Early Education and Children's Outcomes: How Long do the Impacts Last?, *Fiscal Studies*, Vol. 26, No. 4, pp.513-548.

GORBY, S., S. MCCOY and D. WATSON, 2006. *2004 Annual School Leavers' Survey of 2002/2003 Leavers*. Dublin: ESRI/Department of Education and Science.

GREENWOOD, J. and B. JOVANOVIC, 1990. "Financial Development, Growth and the Distribution of Income", *Journal of Political Economy*, Vol. 98, No. 5, pp. 1076-1107.

GROSSMAN, G. M. and E. HELPMAN, 1991. *Innovation and Growth in the Global Economy*, Cambridge MA: MIT Press.

GUELLEC, D. and B. VAN POTTLESBERGHE, 2004. "From R&D to Productivity Growth: Do the Institutional Settings and the Source of Funds of R&D Matter?", *Oxford Bulletin of Economics and Statistics*, Vol. 66, No. 3, pp. 353-378.

GUSTAVSSON, P., P. HANSSON and L. LUNDBERG, 1999. "Technology, Resource Endowments and International Competitiveness", *European Economic Review*, Vol. 43, No. 8, pp. 1501-1530.

HALL, R. E. and C. I. JONES, 1999. "Why Do Some Countries Produce so Much More Output per Worker than Others?", *Quarterly Journal of Economics*, Vol. 114, No. 1, pp. 83-116.

HALLET, M., 1997. "National and Regional Development in Central and Eastern Europe: Implications for EU Structural Assistance", EU-DG-2 Economic Paper 120, Brussels.

HANUSHEK, E. and D. KIMKO, 2000. "Schooling, Labour-Force Quality and the Growth of Nations," *American Economic Review*, Vol. 90, No. 5, pp. 1184-1208.

HARPER, P.R., 2002. "A Framework for Operational Modelling of Hospital Resources", *Health Care Management Science*, August, Vol. 5, No. 3, pp. 165-173.

HARVEY, B., 2003. "Mid-term Review of the National Development Plan: Review and Proposals on Strengthening Social Inclusion Indicators" paper prepared for the Combat Poverty Agency, Dublin: Combat Poverty Agency.

HEA 2004. *Review and Prioritisation of Capital Projects in the Higher Education Sector*. Dublin: Higher Education Authority.

HEALTH SERVICE EXECUTIVE, 2006. *Children's Health First*, Dublin: HSE.

HOLLAND, S., 1979. *Rutland Street*. Oxford: Pergamon Press.

HONOHAN, P. (ed.), 1997. *EU Structural Funds in Ireland: A Mid-Term Evaluation of the CSF 1994-1999*, Policy Research Series, No. 31, Dublin: The Economic and Social Research Institute.

HIPE UNIT, 2002. *Hospital In-patient Enquiry, Activity in Acute Public Hospitals in Ireland 1990-1999*, Dublin: The Economic and Social Research Institute.

ILEX, 2005. *Regeneration Plan for Derry-Londonderry*. Derry: ILEX Urban Regeneration Company.

INDECON, 2003. *Mid-Term Evaluation of the Productive Sector Operational Programme*. Report submitted to the Department of Enterprise Trade and Employment.

INDECON, 2004. *An Assessment of the Economic Contribution of the Thoroughbred Breeding and Horse Racing Industry in Ireland: A Final Report for the Irish Thoroughbred Breeders Association*, European Breeders' Fund and Horse Racing Ireland. Typescript, July 2004.

INDECON, 2005. *Review of Local Government Financing*, Dublin: Department of Environment, Heritage and local Government.

INDECON, 2005. *Economic and Social Infrastructure Operational Programme (ESIOP) Update Evaluation 2005*. Dublin: Department of Transport.

INTERNATIONAL ARTS BUREAU, 2000. *A Comparative Study of Levels of Arts Expenditure in Selected Countries and Regions*. Dublin: The Arts Council.

JACOBS, J., 1969. "Strategies for Helping Cities", *American Economic Review*, Vol. 59, No. 4, pp. 652-656.

JONES, C. I., 1995. "R&D-Based Models of Economic Growth", *Journal of Political Economy*, Vol. 103, No. 4, pp. 759-784.

JORDAN D. and E. O'LEARY, 2005. "The Roles of Interaction and Proximity for Innovation by Irish High-Technology Businesses: Policy Implications" in D. McCoy, D. Duffy, A. Bergin, S. Garrett, and Y. McCarthy (eds.), *Quarterly Economic Commentary*., (Summer). Dublin: ESRI.

KAIN, J. F., 1999. "The Urban Transportation Problem: A Re-examination and Update" in J. A. Gómez-Ibáñez, W. B. Tye, and C. Winston (eds), *Essays in Transportation Economics and Policy: A Handbook in Honor of John R. Meyer,* Washington, D.C.: The Brookings Institution.

KELLAGHAN, T., 1977. *The Evaluation of an Intervention Programme for Disadvantaged Children*, Slough: NFER.

KELLAGHAN, T. and B.J. GREANEY, 1993. *The Educational Development of Students Following Participation in a Preschool Programme in a Disadvantaged Area*, Dublin: Educational Research Centre.

KELLY, M., 1997. "The Dynamics of Smithian Growth", *Quarterly Journal of Economics*, Vol. 112, No. 3, pp. 939-964.

KELLY, D. and T. KELLAGHAN, 1999. *The Literacy and Numeracy Achievements of the First Cohort of Early Start Children (1994/95) While They Were in Second Class (1998/99)*. Dublin: Educational Research Centre.

KING, R. G. and R. LEVINE, 1993a. "Finance and Growth: Schumpeter Might Be Right," *Quarterly Journal of Economics*, Vol. 108, No. 3, pp. 717-737.

KING, R. G. and R. LEVINE, 1993b. "Finance, Entrepreneurship and Growth: Theory and Evidence", *Journal of Monetary Economics*, Vol. 32, No. 3, pp. 513-542.

KNACK, S. and P. KEEFER, 1997. "Does Social Capital have an Economic Payoff?", *Quarterly Journal of Economics*, Vol. 112, No. 4, pp. 1252-1288.

KRAVIS, I. and R. LIPSEY, 1992. "Sources of Competitiveness of the United States and of Its Multinational Firms", *Review of Economics and Statistics*, Vol. 74, No. 2, pp. 193-201.

KRUGMAN, P. R., 1980. "Scale Economies, Product Differentiation, and the Pattern of Trade", *American Economic Review*, Vol. 70, pp. 950-959.

KRUGMAN, P., 1996. "Making Sense of the Competitiveness Debate", *Oxford Review of Economic Policy*, Vol.12, No.3, pp. 17-25.

LAYTE, R., B. NOLAN and C.T. WHELAN, 2000. "Trends in Poverty" in B. Nolan, P.J. O'Connell and C.T. Whelan (eds.), *Bust To Boom? The Irish Experience of Growth and Inequality*, Dublin: Institute of Public Administration.

LAYTE, R. and P. O'CONNELL, 2005. *Profiling the Unemployed: An Analysis of the Galway and Waterford Live-Register Surveys*, Policy Research Series No. 55, Dublin: The Economic and Social Research Institute.

LAYTE, R., H. RUSSELL, P. O'CONNELL, B. MAÎTRE and C.T. WHELAN, 2003. "The Dynamics of Household Joblessness in a Booming Economy", ESRI Seminar Paper. Dublin: ESRI.

LEE, F. and J. TANG, 2000. "Productivity Levels and International Competitiveness between Canadian and U.S. Industries", *American Economic Review*, Vol. 90, No. 2, pp. 176-179.

LEWIS, M. and P. ARCHER, 2002. *Further Evaluation of Early Start: Progress Report*. Dublin: Educational Research Centre.

LEWIS, M. and P. ARCHER, 2003. *Early Start Evaluation: Report on Observation Visits to Schools*. Dublin: Educational Research Centre.

LUCAS, R., 1988. "On the Mechanics of Economic Development", *Journal of Monetary Economics*, Vol. 22, No. 1, pp 3-42.

MACKAY, M, 2001. "Practical Experience with Bed Occupancy Management and Planning Systems: an Australian View", *Health Care Management Science*. February, Vol. 4., No. 1, pp. 47-56.

MACKEY, M., M. LEE, 2005. "Choice of Models for the Analysis and Forecasting of Hospital Beds. *Health Care Management Science*. August, Vol. 8, No.3, pp.221-230.

MCCLEAN, S., P.H. MILLIARD, 1995. "A Decision Support System for Bed-occupancy Management and Planning Hospitals", IMA *Journal of Applied Medical Biology*. Sep-Dec, Vol. 12, No. 3-4, pp. 249-257.

MCCOY, S., M. DARMODY, E. SMYTH and A. DUNNE, 2006. *Attendance and Students' School Experiences and Later Life-Chances*. Report to the NEWB.

MCCOY, S. and E. SMYTH, 2003. "Educational Expenditure: Implications for Equality" in T. Callan, A. Doris and D. McCoy (eds.), *Budget Perspectives 2004*, Dublin: ESRI/FFS.

McDOWELL, A. and F. RUANE, 2005. "Capacity of Education/Training Programmes to meet Ireland's Skill Requirements" Paper presented to Glucksman Ireland House Workshop on Issues for Ireland's Labour Market Policies, Forfás, Dublin, 10 January.

McGRATH, R., E. NISHIMURA, P. NOLAN, T. SEMMLER, C. SWEENEY and S. WANG, 2005. *Climate Change: Regional Climate Model Predictions for Ireland*. Johnstown Castle: Environmental Protection Agency.

MCIVER CONSULTING, 2003. The Report of the Steering Group to the PLC Review. Dublin: Department of Education and Science.

MILLIARD, P.H., M. MACKAY, C. VASILAKIS, G. CHRISTODOULOU, 2000. "Measuring and Modelling Surgical Bed Usage", *Annals of Royal College of Surgeons,* England. March, Vol. 82, No. 2, pp. 75-82.

MOLES, R., R. KELLY, B. O'REGAN, J. RAVETZ and D. McEVOY, 2002. *Methodologies for the Estimation of Sustainable Settlement Size,* Johnstown Castle: Environmental Protection Agency.

MORGENROTH, E., 1999. "Estimated Social Rates of Return to Educational Interventions to Prevent Early Educational Failure". Report to the Department of Education and Science.

MORGENROTH, E., 2002. "Commuting in Ireland: An Analysis of Inter-County Commuting Flows", ESRI Working Paper No. 144. Dublin: ESRI.

MORGENROTH, E., 2002. "The Usual Suspects? Factors Affecting the Performance of Irish Regions and Counties", Paper Presented at the Regional Studies Association (Irish Branch) National Conference, "Ireland 2020: People, Place and Space", Bunratty, Co. Clare, April.

MORGENROTH, E., 2005. "Demographic Transition, Migration and Regional Economic Development in Ireland" in C. Dienel, (ed.), *Abwanderung, Geburtenrückgang und regionale Entwicklung: Ursachen und Folgen des Bevölkerungsruckgangs in Ostdeuschland – interdisziplinäre und vergleichende Perspektiven*. Wiesbaden:VS Verlag für Sozialwissenschaften.

MORGENROTH, E., 2005. Regional Structural Change and Cohesion in the EU: Policy Implications of EU Enlargement and Policy Recommendations. *EURECO* Project Policy Paper.

MORGENROTH, E., 2006. "Economic Integration and Structural Change: The Case of Irish Regions" ESRI Working Paper No. 176, Dublin: ESRI.

MORGENROTH, E. and E. O'MALLEY, 2003. "Regional Development and SMEs in Ireland" in B. Fingleton, A. Eraydin, and R. Paci (eds.), *Regional Economic Growth, SMEs and the Wider Europe*. London: Ashgate.

MUSGRAVE, R., 1959. *The Theory of Public Finance,* New York: McGraw-Hill.

MUSIC NETWORK, 2003. *A National System of Local Music Education Services* - Report of a Feasibility Study. Dublin: Music Network.

NATIONAL ROADS AUTHORITY, 1998. *National Road Needs Study*. Dublin: National Roads Authority.

NATIONAL ROADS AUTHORITY, 2003. *Future Traffic Forecasts: 2002-2040*. Dublin: National Roads Authority.

NCCA, 2005. *Proposals for the Future Development of Senior Cycle Education in Ireland*. Dublin: National Council for Curriculum and Assessment.

NESC, 2004. *Housing in Ireland: Performance and Policy*, Dublin: National Economic and Social Council.

NESC, 2005. *NESC Strategy 2006: People, Productivity and Purpose*. Dublin: National Economic and Social Council.

NESF, 2005. *Early Childhood Care and Education*. NESF Report No. 31. Dublin: NESF.

NESF, 2006. *Creating a More Inclusive Labour Market*. NESF Report No. 33. Dublin: NESF.

NOLAN, A. and B. NOLAN, 2004. "Ireland's Health Care System: Some Issues and Challenges", Working Paper No. 14. Research Programme on Health Services, Health Inequalities and Health and Social Gain.

NWCI, 2004. *An Accessible Childcare Model*, Dublin: National Women's Council of Ireland.

OECD, 1987. *Pricing of Water Services,* report by P. Herrington, OECD Environment Programme, Paris: OECD.

OECD, 2003. *The Source of Growth in OECD Countries*, Paris: OECD.

OECD, 2004. An Overview of Early Childhood Education and Care Systems in the Participating Countries – Ireland. Paris: Organisation for Economic Co-operation and Development.

OECD, 2005a. *Education At A Glance 2005*. Paris: Organisation for Economic Co-operation and Development.

OECD, 2005b. *School Factors Related to Quality and Equity: Results from PISA 2000*. Paris: OECD.

OECD, 2006. Education at a Glance. Paris: Organisation for Economic Co-operation and Development.

OFCOM, 2006. *The Communications Market: Nations and Regions*. London: Office of Communications.

OFFICE OF ENVIRONMENTAL ENFORCEMENT (OEE), 2005. *The Nature and Extent of Unauthorised Waste Activity in Ireland*. Johnstown Castle: Environmental Protection Agency.

OIREACHTAS, 2006. *Planning and Development (Strategic Infrastructure) Act 2006*. Dublin: Stationery Office.

O'CONNELL, P., 2000. "The Dynamics of the Irish Labour Market in Comparative Perspective" in B. Nolan, P.J. O'Connell and C. T. Whelan (eds.), *Bust to Boom? The Irish Experience of Growth and Inequality*. Dublin: Institute of Public Administration.

O'CONNELL, P., 2005. *Data Analysis of In-Employment Education and Training in Ireland*, Prepared for the Expert Group on Future Skills Needs. Dublin: Forfás.

O'CONNELL P., D. CLANCY and S. MCCOY, 2006. *Who Went to College in 2004? A National Survey of Entrants to Higher Education*. Dublin: The Higher Education Authority.

O'HAGAN, J., 1998. *The State and the Arts: An Analysis of Key Economic Policy Issues in Europe and the United States* , Cheltenham: Edward Elgar.

O'LEARY, E., 1999. "Regional Income Estimates for Ireland: 1995", *Regional Studies*. Vol. 33, No. 9, pp. 805-814.

O'MAHONY, P., 1997. *Mountjoy Prisoners: A Sociological and Criminological Profile*. Dublin: Stationery Office.

O'MALLEY, E., S. SCOTT and S. SORRELL, 2003. *Barriers to Energy Efficiency: Evidence from Selected Sectors*, Policy Research Series No. 47. Dublin: ESRI.

OFWAT, 2005. *Security of Supply, Leakage and the Efficient Use of Water*, Birmingham: Office of Water Services.

OUGHTON, C., 1997. "Competitiveness Policy in the 1990s", *Economic Journal*, Vol. 107, (444), pp. 1486-1503.

OUGHTON C, M. LANDABASO and K. MORGAN, 2002. "The Regional Innovation Paradox: Innovation Policy and Industrial Policy", *Journal of Technology Transfer*, Vol. 27, pp. 97-110.

PAGANO, M., 1993. "Financial Markets and Growth: An Overview", *European Economic Review*, Vol. 37, No. 2-3, pp. 613-622.

PAPATHEODOROU, A. and S. HAIYAN, 2005. "International Tourism Forecasts: Time-Series Analysis of World and Regional Data", *Tourism Economics*, Vol. 11, No. 1, pp. 11-23.

PETERSEN, S.O., 2005. "Post-War Baby Boom Becomes Elderly Boom - Some Consequences For The Hospital Sector In Norway", PCS/I-conference, Ljubljana, October.

PIERETTI, O. and A. BOURGAIN, 2003. "Competitiveness and Employment in a Small Open Economy", *Journal of Economic Integration*, Vol. 18, No. 2, PP. 391-405.

PRITCHETT, L., 2001. "Where Has All the Education Gone?," *World Bank Economic Review*, Vol. 15, No.3, pp. 367-391.

PUMA, M.J., N. KARWEIT, C. PRICE, A. RICCIUTI, W. THOMPSON, M. VADEN-KIERNAN, 1997. *Prospects: Student Outcomes.* Final Report. Dept. of Education, Washington, D.C.

REYNOLDS, A.J., B. WOLFE, 1997. "School Achievement, Early Intervention and Special Education", *Focus*, Vol. 19, No. 1, pp. 18-21.

RIVERA-BATIZ, L. A., and P.M. ROMER, 1991. "Economic Integration and Endogenous Growth", *Quarterly Journal of Economics*, Vol. 106, No. 2, pp. 531-555.

RODRIGUEZ-POSE, A., 1999. "Convergence or Divergence? Types of Regional Responses to Socio-economic Change in Western Europe", Tijdschrift vooor Economische en Sociale Geografie, 90, pp. 363-378.

ROMER, P. M., 1986. "Increasing Returns and Long-run Growth", *Journal of Political Economy*, Vol. 94, No. 5, 1002-1037.

ROMER, P. M., 1990. "Endogenous Technological Change", *Journal of Political Economy*, Vol. 98, No. 2, pp. 71-102.

ROOS, N.P., 1989. "Hospital Bed Availability: Developing Accurate Estimates", *Canadian Journal of Public Health,* Mar-Apr, Vol. 80, No. 2, pp 105-9.

ROY, B., 2005. "Paradigms and Challenges", in J. Figueira, S. Greco, M. Ehrgott (eds.), *Multi Criteria Decision Analysis. State of the Art Surveys*, New York.

RUSSELL, H., E. SMYTH and P. J. O'CONNELL, 2005. *Degrees of Equality: Gender Pay Differentials among Recent Graduates,* Books and Monographs No. 184. Dublin: The Economic and Social Research Institute.

RUSSELL, H., B. HALPIN, M. STRANDH and A. ZIELFE, 2006. "Comparing the Labour Market Effects of Childbirth in Ireland, Sweden, the UK and Germany", ESRI Working Paper No. 170. Dublin: ESRI.

SAARENHEIMO, T., 1993. "Trade, Human Capital Accumulation and Growth in an Underdeveloped Economy", *Scandinavian Journal of Economics*, Vol. 95, No. 4, pp. 535-557.

SAINT-PAUL, G., 1997. "Is Labour Rigidity Harming Europe's Competitiveness? The Effect of Job Protection on the Pattern of Trade and Welfare", *European Economic Review*, Vol. 41(3-5), pp. 499-506.

SALVATORE, D., 2002. "Relative Taxation and Competitiveness in the European Union: What the European Union Can Learn from the United States", *Journal of Policy Modeling*, Vol. 24(4), pp. 401-10.

SCHMIDT, T., 2005. "Absorptive Capacity – One Size Fits All? A Firm-level Analysis of Absorptive Capacity for Different Kinds of Knowledge", ZEW Discussion Paper 05-72.

SCOTT, S. and F. CONVERY, 1999. "Cohesion Countries: Experience in Countries on the European Periphery" in K. Schlagemilch (ed.), *Green Budget Reform in Europe - Countries at the Forefront*. Berlin: Springer.

SCOTT, S. and J. EAKINS, 2001. "Household Income Effects and Implementation Options" in D. McCoy and S. Scott, (eds.), *Green and bear it? Implementing Market-based Policies for Ireland's Environment,* Dublin : The Economic and Social Research Institute.

SCOTT, S. and D. WATSON, 2006. "Introduction of Weight-based Charges for Household Waste Collection" Paper Presented at the Irish Economics Association Annual Conference, in Bunclody, 28-30 April.

SCOTT, S., D. WATSON and S. GORBY, 2006. "Effect of Weight-based Charges for Solid Waste Services", Report to the Environmental Protection Agency, Dublin: EPA.

SEXTON, J.J., G. HUGHES, B. MCCOMICK, and C. FINN, 2001. *Estimating Labour Force Flows, Job Openings and Human Resource Requirements 1990-2005*. FÁS/ESRI Manpower Forecasting Series Report No. 9, Dublin: The Economic and Social Research Institute.

SEXTON, J.J., G. HUGHES, B. CASEY, C. FINN and E. MORGENROTH, 2004. *Occupational Employment Forecasts by Region for 2010*. FÁS/ESRI Manpower Forecasting Series Report No. 11, Dublin: The Economic and Social Research Institute.

SLAVIN, R.E. and N.A. MADDEN, 1999. *Success for All/Roots and Wings: Summary of Research on Achievement Outcomes*. Baltimore: CRESPAR.

SMYTH, E., 1999. *Do Schools Differ? Academic and Personal Development among Pupils in the Second-Level Sector*. Dublin: Oak Tree Press/ESRI.

SMYTH, E. and D. BYRNE, 2004. *The Potential Supply of Mature Students to Higher Education*. Report to the Higher Education Authority, Dublin: HEA.

SOLOW, R., 1956. "A Contribution to the Theory of Economic Growth," *Quarterly Journal of Economics*, Vol. 70, pp. 65-94.

SORRELL S., E. O'MALLEY, J. SCHLEICH, and S. SCOTT, 2004. *The Economics of Energy Efficiency: Barriers to Cost-Effective Investment*. Cheltenham: Edward Elgar Publishing.

SOUTHSIDE PARTNERSHIP, 2005. *The Southside Partnership Community Childcare Research Project: Towards a Model of Best Practice*.

STEWART D.K., R. TATE, G. FINLAYSON, L. MacWILLIAM, N.P. ROOS, 2002. *Projecting Hospital Bed Needs for 2020*. Manitoba Centre for Health Policy, Department of Community Health Sciences, Faculty of Medicine, University of Manitoba, Canada.

SWEENEY, J., 2002. "Downscaling Climate Change in Ireland: Some Initial Perspectives on the Regional Impacts". Paper Presented at the Regional Studies Association (Irish Branch) National Conference, "Ireland 2020: People, Place and Space", Bunratty, Co. Clare, April.

TASKFORCE ON LIFELONG LEARNING, 2002. Report of the Task Force on Lifelong Learning. Dublin: Stationery Office.

TATE, R. B., 2005. "A Methodology for Evaluating Hospital Bed Need in Manitoba in 2020", *Canadian Journal on Aging*, Volume 24 (Supplement), pp. 141-151.

TAYLOR, L., 1992. "Infrastructural Competition among Jurisdictions", *Journal of Public Economics*, Vol. 49, No. 2, pp. 241-259.

TEMPLE, J., 1999. "A Positive Effect of Human Capital on Growth," *Economics Letters*, Vol. 65, No. 1, pp. 131-134.

TOURISM POLICY REVIEW GROUP, 2003. *New Horizons for Irish Tourism: An Agenda for Action*. Dublin: Stationery Office.

TRANSPORT RESEARCH LABORATORY, 2002. "Future Year Growth Forecasts for Ireland 2002", Dublin: National Roads Authority.

TUSSING D., M.A. WREN, 2005. "The Health Report, An Agenda for Irish Health Care Reform". Dublin: The Irish Congress of Trade Unions.

TYRE, P., N. MURRAY, I. WOLSTENCROFT, A. STEWART, 2002. "Health service capacity modeling", *Australian Health Review* Vol. 25; No. 4, pp. 159-168.

VERSPAGEN, B., 1999. "Large Firms and Knowledge Flows in the Dutch R&D System: a Case Study of Philips Electronics", *Technology Analysis and Strategic Management*, Vol. 11, pp. 211-233.

WALSH, B., 2006. "Labour Market Adjustment in the Irish Regions, 1988-2005" in A. Barrett, I. Kearney and Y. McCarthy (eds.), *Quarterly Economic Commentary* (Autumn). Dublin: The Economic and Social Research Institute.

WATSON, D. and J. WILLIAMS, 2003. *Irish National Survey of Housing Quality: 2001-2002*. Books and Monographs No. 173. Dublin: The Economic and Social Research Institute – in association with the Department of Environment, Heritage & Local Government.

WEIKART, D., 1996. "High-quality Preschool Programs Found to Improve adult status", *Childhood*, Vol. 3, No. 1, pp. 117-120.

WEIR, S., 2003. *An Evaluation of Breaking the Cycle: A Follow-up of the Achievements of 6th Class Pupils in Urban Schools in 2003*. Dublin: Educational Research Centre.

WEIR, S., L. MILIS, and C. RYAN, 2002. *The Breaking the Cycle Scheme in Rural Schools: Final Evaluation Report*. Dublin: Educational Research Centre.

WHELAN, C., B. NOLAN and B. MAÎTRE, 2006. *Reconfiguring the Measurement of Deprivation and Consistent Poverty in Ireland,* Policy Research Series No. 58. Dublin: The Economic and Social Research Institute.

WILEY, M. M., 2005. "The Irish Health System: Developments in Strategy, Structure, Funding and Delivery Since 1980" in *Health Economics*, Vol. 14: S169-S186, Wiley Interscience, September.

WILLIAMSON, 1965. "Regional Inequality and the Process of National Development: A Description of the Patterns", *Economic Development and Cultural Change,* Vol. 13, No. 4, pp. 1-84.

WORTMAN, P.M., 1995. "An Exemplary Evaluation of a Program that Worked", *Evaluation Practice* , Vol. 16, No. 3, pp. 257-265.

ZAHRA S. A. and G. GEORGE, 2002. "Absorptive Capacity: a Review, Re-conceptualization and Extension", *Academy of Management Review*, Vol. 27, pp. 85-203.

ZAK, P. J. and S. KNACK, 2001. "Trust and Growth", *Economic Journal*, Vol.111, No. 470, pp. 295-321.

ZUCKER, L., M. DARBY and M. BREWER, 1998. "Intellectual Human Capital and the Birth of U.S. Biotechnology Enterprises", *American Economic Review*, Vol. 88, No. 1, pp. 290-306.

APPENDIX 1: PAYING FOR TRANSPORT - TAXES AND CHARGES

The road network in particular is free at the point of use, excepting only a small number of point tolls. The fuel tax, while a user charge, is only tenuously related to the economic or social costs of road use. This means that the congestion externality is not properly charged for, and hence that road space is under-priced, especially in cities. The amount of congestion generated is accordingly in excess of the social optimum. In virtually all economically advanced countries, the policy response has been to subsidise public transport, which results in a situation where all modes of vehicular urban transport are too cheap, especially at peak demand. The result is extensive peak-time congestion, and public demands for capacity expansion to meet peak demand.

Even in the absence of externalities, it is not economically rational to expand capacity to eliminate all peak congestion, especially where peak usage is inadequately priced. To do so liberates currently suppressed demand, and can make the peak sharper, as the peak-spreading effect of current congestion is diluted. Since peak users are not faced with the full economic and social costs they impose, peak demand is not a real indication of the level of activity that should optimally be catered for. Procedures, including cost-benefit-type calculations, which take the existing pattern of demand, or extrapolations there from, as an indication of need to be met, accordingly run the risk of recommending excessive investment in peak-time capacity. An analogy would be a sports stadium proprietor who priced the most attractive fixture of the year at the same price as all others, and who proceeded to expand capacity to meet this supposed level of peak 'demand'. The result would be expensive, but idle, additional capacity, the result of a perverse pricing rule.

In many areas, including components of the transport system, there is resort instead to peak-load pricing, for example in parking charges differentiated by city zone, time of day and day of the week. Transport operators also practise peak-load pricing, through, for example, higher air and train fares at busy times such as Friday or Sunday evening. This peak-load pricing permits operators to avoid the heavy capital and operating costs of idle fleets and crew,

unnecessary outside the relatively infrequent peaks. The same principle applies to the calculation of optimal capacities for transportation infrastructure.

There is, however, a further and important feature of these infrastructures when access is free, or under-priced at the point of use. At peak, when the system is congested, each additional user imposes delay costs on other users, which he or she is not required to take into account. This is the congestion externality, and is distinct from, and additional to, the peak-load pricing question. There are of course other externalities, including atmospheric emissions. Economists have long recommended that the use of transportation infrastructures should be charged on a user-pays basis, with charges reflecting all externalities including peak congestion, a recommendation which has been taken up in only a handful of cities around the world.

The reluctance to embrace user charging for roads has been due in part to concerns about the distributional impact – there would necessarily be winners and losers. But technologies to implement efficiently anything beyond crude approximations such as flat cordon fees, area licenses or point tolls have until recently been unavailable. Technologies which would make highly sophisticated charging systems feasible at affordable costs are now believed to be imminent, involving Global Positioning Systems and smartcards in vehicles. The UK Government has recently announced its intention to explore a nationwide pay-as-you-drive charging system to replace most existing motoring taxes, and Transport Secretary Douglas Alexander has allocated a budget of £10 million for this preliminary scheme design. The debate, according to the Secretary of State, is "…no longer about 'why road pricing?', but about how it should be implemented". The time horizon to implementation in the UK could however be a decade or more. It is worth spelling out in some detail what might be involved if a similar departure were to be contemplated in this country.

The Irish system of taxation on private motoring and on commercial road vehicles has three components:

- Purchase taxes, in the form of the two-rate *ad valorem* Vehicle Registration Tax and Value Added Tax;
- Annual circulation taxes differentiated by vehicle type and size (commonly referred to as 'Road Tax'; and
- Fuel Excise Duties, differentiated (to a limited degree by fuel type).

The purchase taxes consist of the *ad valorem* Vehicle Registration Tax, paid once on new cars. To the resultant price is added VAT at the standard rate of 21 per cent. This is actually the highest of four VAT categories, the others being the Zero and 13.5 per cent rates and the Exempt status. This is the procedure for the tax calculation. To the pre-tax price is added VAT at 21 per cent. To this is added the VRT, at 22.5 per cent of the final price for cars up to 1400cc, at 25 per cent for cars in the range 1401 to 1900cc, and at 30 per cent

for cars of 1901cc and upwards. A new mid-range saloon of 1800cc, costing €25,000 retail, would have the price made up as follows:

Table A1.1: Purchase Tax Build Up on a New Car

Pre-tax Price	€15,496
VAT at 21% of Pre-Tax	€3,254
VRT at 25% of Final Price	€6,250
Final Price	€25,000
Tax as % of Pre-Tax Price	61.3%

Source: Calculated from information on Revenue Commissioners' website.

Total purchase taxes work out at €9,504 for this example, corresponding to a tax mark-up of 61 per cent on the pre-tax price. A portion of this purchase tax should not however be regarded as a tax on motoring, but rather as a part of general indirect taxation. We take this portion to be about 15 per cent, roughly the weighted average rate of VAT on goods and services in general. Thus this particular motorist is paying €25,000 instead of €17,820 (not the tax-free price of €15,496) for the new car, and the motoring component comes out at €7,180 in specific 'motoring' tax under this heading. Over an expected ten-year life for the vehicle, the motoring tax component would work out at €718 per annum out of the €950 per annum total tax take. The rest is deemed to be ordinary, non-motoring tax levied on goods in general.

Annual Road Tax is more straightforward. For cars, the rate at 1001cc is €227, rising to €1,343 above 3 litres. For the 1800cc model assumed above, the annual charge is €484. All of this amount can reasonably be seen as constituting a specific 'motoring' tax.

Finally excise duty on fuel is levied at the rate of €442.58 per 1,000 litres of unleaded petrol, and 21 per cent VAT is then added. Thus unleaded petrol costing €1.05 per litre at the pump has a price built up as shown in Table A1.2.

Table A1.2: Price Build-Up for Unleaded Petrol in Cents

Pre-Tax Price per litre	42.52
Excise per litre	44.26
VAT at 21%	18.22
Final Price	105.0
Tax as % of Pre-Tax Price	59.5%

Source: Calculated from information on Revenue Commissioners' website.

Total tax is 62.48 cent per litre. Again, a portion of this fuel tax should be taken as part of general taxation, rather than as a specific imposition on motoring. We compute the motoring element as 57.28 cent, allowing for a presumed average VAT rate at 15 per cent. The next part of the motoring tax calculation requires an assumption about average annual fuel consumption, and we take this to be 1,500 litres per annum (corresponding to 15,000 kilometres, a modest mileage) for our mid-saloon driver. This would give an annual tax take on fuel which could be regarded as a 'motoring' tax of €859.

The total of all three taxes paid each year by this illustrative motorist comes to €2,371. However, we have chosen to regard the slightly lower figure of €2,061 as corresponding to 'motoring' taxes. Motoring lobby groups who draw attention to the substantial tax revenues from these sources tend to quote numbers corresponding to the higher of these two figures, failing to allow for an average VAT rate on cars and fuel. The annual 'motoring' tax payment we have calculated for this illustrative motorist needs to be seen in the light of the enormous levels of State expenditure on road construction, maintenance and policing, and there can be no presumption that the overall tax figure is necessarily excessive.

Finally, we need to add a small item as an estimate of direct payments by motorists for road use in the form of tolls and on-street parking charges. (Off-street charges are not relevant.) Total tolls and relevant parking charges we believe now exceed €200 million per annum, with most of this sum collected in the East region. We estimate that €50 per annum would be a reasonable estimate for the illustrative motorist. The overall picture is thus

Table A1.3: Fixed and Variable Charges per Annum, Illustrative Motorist

	€
Total Taxes	2,371
Less element of General Taxation	310
Plus Tolls and Parking	50
Total 'Motoring' Payments	2,111
of which Fixed	1,202
Variable	909
% Fixed	56.9%

Source: Derived from Tables 8.2, 8.3, calculations in text.

For 15,000 kilometres this motorist would pay €2,111 per annum, corresponding to a charge of 14.1 cent per kilometre. Thus for a 15-kilometre return daily commute, the motorist pays about €4.32 in motoring taxes. But the largest portion, 57 per cent, is actually fixed taxes, invariant to road use. Moreover, only the tolls and parking fees correspond to a form of peak or congestion charging. Fuel taxes are invariant to time of day, day of week or traffic intensity on the road chosen, and approximate only very poorly to an optimal tax.

Thus while our hypothetical motorist is paying significant taxes and charges, these are either fixed, and thus achieve no policy objective beyond the raising of revenue, or are (aside from the small element of tolls and parking fees) only poorly related to an economic charge for road use. If all of these taxes could be turned into pay-as-you-drive charges, targeted at peak usage of congested routes, the effect on driver behaviour, and hence on peak demand and capacity requirements, could be dramatic.

We recommend that current road tolling plans should be seen as preparatory to the ultimate introduction, subject of course to technical and economic feasibility, of countrywide pay-as-you-drive charges as the principal form of road user charging in Ireland.

Extensive studies on external costs, and the response of road users to the new charges and to the reduced purchase and ownership taxes, would be needed.

This would permit, we believe, the abolition of VRT and of annual vehicle license fees. It is possible that fuel taxes could also be reduced, and that all existing point tolls would become unnecessary. We note that what happens in the United Kingdom is important here – a road charging system in Northern Ireland (NI) would have to interface with the Republic's system, and given the extent of 'fuel tourism', the excise duty regime must pay attention to what is happening in NI. Most importantly, a system of this type would reduce peak demand sharply through bringing private and social costs into line. An immediate result would be a reduction in the capacity requirement of the system, and a move away from the current wasteful provision of capacity to cater for socially sub-optimal traffic peaking.

In their report on demand restraint options, Booz, Allen, Hamilton (2004) consider inter alia a system of traditional cordon charging for Dublin. We believe that a more radical review of emerging technology options would be a valuable supplement to their work.

Those entitled to free travel on public transport (including those aged over 65 years) are not subject to the requirement that their free pass does not operate in the peak. This is the reverse of what is required and we recommend that free travel on public transport at peak be withdrawn.

A further pricing issue concerns workplace parking. Many employers offer free workplace parking to their employees in central Dublin and in other cities and towns. This has not been deemed liable to taxation as a benefit in kind. However, the annual rental for a parking place in some areas of central Dublin is now in the range €2,500 to €3,000. Much lower figures would arise in the suburbs and in provincial cities.

This means that, in central Dublin, the untaxed benefit of a parking space is comparable in value to the benefit of a free mid-range company car. Company cars are of course levied to benefit-in-kind, and we recommend that the same should apply to parking spaces. In the Booz Allen Hamilton report, the option of taxing free parking spaces is discussed alongside the option of a local authority tax on these spaces as if these two policies were alternatives. They are not. The exemption of free parking spaces from BIK is just a tax anomaly, and should be dealt with on that basis. A local authority tax on private parking spaces is a distinct option, which would not arise if a full road pricing scheme were to be applied.

On-street parking is not charged for in some provincial towns. The Department of the Environment, Heritage and Local Government might consider the case for mandatory charging in towns with significant pressure on capacity.

Finally, we appreciate that taxes on motoring are a sizeable component of the tax take, and that issues of revenue protection arise. The long time scale to implementation is another concern, and

raises the question of interim measures. In this regard, there is 'headroom' to raise fuel taxes and cut VRT or the annual license fee, given the higher rates of excise in the UK. However we would caution that fuel taxes are not a good proxy for the external costs.

APPENDIX 2: PROJECT APPRAISAL OF TRANSPORT INVESTMENTS

The Department of Finance guidelines require that a post-project analysis be undertaken whenever a major project is completed. We recommend that a high priority should be given to the prompt completion of comprehensive post-project analyses of all major projects.

Particularly where large once-off projects are concerned, a premium must be placed on whatever lessons can be learned from Ireland's own experience. However, we understand that no post-project analyses have as yet been undertaken, since the requirement to do so is recent. An analysis of Luas is due to commence shortly, and it ought, in order to inform the analysis of future light rail schemes, include a post hoc cost-benefit analysis, as well as a review of the *ex-ante* evaluation studies undertaken on the original light rail schemes during the 1990s. Any lessons available would be invaluable going forward. As soon as practicable, a similar exercise should be undertaken with the Dublin Port Tunnel, in view of the presence of further Dublin Tunnel projects in *Transport 21*.

A2. 1 Baseline Traffic Flows are not Optimal

In the project appraisal of urban public transport projects, it is important, in preparing traffic forecasts and other ingredients in the quantification of benefits, to acknowledge the non-optimality, from the social standpoint, of current measures of peak traffic. Thus an approach which measures and extrapolates current road congestion, seeks to eliminate or mitigate it through allocating new rail or other capacity to cater for the resultant traffic levels, is attributing benefit to the reduction of congestion which ought not to be targeted at all. This is the consequence of current mispricing and resultant non-optimality of peak flows. These concerns are not always properly reflected in cost-benefit appraisals.

A2.2 The Compound Project Problem

A further concern revolves around the combination of traffic management and new construction components in transport investment proposals. It is important to understand that any project involving both is now a compound project, either of whose components could be undertaken separately. In particular, since we know that current pricing for peak time road access in particular is too low, and quite likely far too low, demand management measures such as road pricing constitute a policy option which can be seen as an alternative, rather than as a complement, to capacity expansion. This is not to argue that capacity expansion might not prove optimal, even with demand management in place. But the optimal level of capacity provision may be lower, and possibly substantially lower, if vigorous pricing policies are pursued.

Demand management, including in particular road pricing, is an alternative to increasing capacity, including public transport capacity, and all pricing options need to be explored before investment commitments are chosen.

The logical sequence in which to proceed with an economic evaluation in these circumstances is to consider first the component (road pricing) which addresses directly the weakness of current arrangements and the source of congestion, namely under-priced access to the road system. Having designed and modelled a suitable road pricing scheme which accounts for congestion and environmental externalities, and which also serves as a peak-load pricing instrument, the analyst can be more confident that the predicted (and, at peak, lower) traffic flows which result are the ones which it is socially optimal to accommodate. The alternative suburban rail, light rail or bus public transport options should now be evaluated as projects incremental to the road-pricing component. Not to do the analysis in this way runs the risk that the benefits computed for the compound project are erroneously attributed to its elements. A specific risk is that the infrastructure components get credited with benefits, which actually flow from the pricing measures.

Because peak usage of scarce facilities is under-priced, low-priority travel is inadequately discouraged. In Dublin in 2002, the POWSAR data-set derived by the Central Statistics Office from the Census shows approximately 101,000 home-to-work trips into the central area (inside the canals) in the morning peak. Total trips into the central area by all modes in the morning peak are of the order of double this figure. The balance includes of course education-related trips, and there will be some who exit as well as enter the canal cordon area. But it clearly cannot be assumed that only high-priority trips are being made at the peak.

THE COST-BENEFIT TASK

The analytical cost-benefit task to be undertaken in connection with *Transport 21* is daunting, and will need to be adequately resourced. The programme envisages in excess of €30 billion in capital projects,

many of them exceedingly complex and requiring extensive and technically challenging modelling of project benefits. Capital cost estimation has proven difficult with major projects undertaken in Ireland in the recent past, and greater credibility for capital cost estimates will require intensive analytical work too. We believe that the scale of cost-benefit work required to meet the Department of Finance guidelines in connection with *Transport 21* exceeds anything, which has been contemplated in this country up to now.

We are aware that the Department of Transport has engaged advisers who have begun preliminary work on evaluation methodologies. In view of the size and complexity of the evaluation task, we recommend that the Department of Transport should prepare a Project Appraisal Plan for *Transport 21*, detailing the procedures and quantifying the resources that will be required.

The Department of Finance must oversee compliance with its guidelines, not just in connection with *Transport 21* but throughout the Public Capital Programme. The Department of Finance should ensure that it has adequate technical economic resources to oversee compliance with its Capital Appraisal Guidelines.

In the *Mid-Term Review of the 2000-20006 NDP*, we discussed the conduct and quality control of project appraisals, and considered what might be the best institutional arrangements for carrying them out. We drew attention in particular to the difficulties which may arise where appraisals are carried out by project promoters, either directly or by consultants on their behalf.

In order to ensure consistency across the diverse constituents of the Public Capital Programme, and bearing in mind the pressures on Departments and State agencies asked to evaluate projects to which there is already (and arguably premature) political commitment, we favoured a single centralised unit, possibly based in the Department of Finance, charged with the task of undertaking the cost-benefit studies. This remains our advice. If the Government wishes to delegate this function to line Departments or to State agencies, such as, in this instance, the Rail Procurement Agency, the Dublin Transportation Office, Irish Rail or the National Roads Authority, there remains a requirement to ensure comparability and consistency in technical approach and generally to ensure that the studies are technically competent and in compliance with Department of Finance requirements. Thus, even if the conduct of these studies is delegated, the Department of Finance will still need to ensure that it has adequate technical resources in this area. The Department of Finance should also require publication of all such studies, and should consider whether there is a need for an independent peer review system.

CASE STUDY: VALIDATION OF TRAFFIC FORECASTS IN COST BENEFIT ANALYSES FOR THE CORK SUBURBAN RAIL PROJECT

Benefit estimates in transport evaluations depend critically on the assumed traffic and patronage levels. There is an established pattern

of excess optimism about patronage in public transport projects worldwide (see Flyvbjerg *et al.*, 2003). It is accordingly essential that promoter's estimates of future patronage be subjected to critical review.

The Cork suburban rail project included in *Transport 21* would involve:

- A new rail line, along the alignment of an abandoned line, linking Cork's Kent station eastwards to Midleton, a distance of about 21 kms.
- Service improvements on the existing Cork-Cobh line.
- Service improvements on the existing Cork-Mallow service.
- Some new stations intermediate between these points.

At the *2002 Census*, 86 per cent of Cork County (excluding Cork City) households had at least one private car. The following picture of morning peak home-to-work commuting was revealed for Cork County (excluding Cork City).

Table A2.1: Morning Peak Commuting, Cork County, April 2002 Census

Mode	Numbers	as % of Total
Private Motor*	102,450	79.0
Walk	10,434	8.1
Bus and Train	2,947	2.3
Cycle	885	0.7
Other**	12,965	10.0
Total	129,681	100.0

Source: Census Volume "Travel to Work, School and College", Table 87.
* Includes car, motorbike, scooter, lorry, van.
** Mainly work at home.

The existing rail service consists of:

- 22 services per day Cobh-Cork.
- 25 services per day Mallow-Cork.

These frequencies, which include through-trains from Mallow to Cobh as well as trains terminating at Kent, are a considerable improvement, particularly on Mallow-Kent, on what was available until recently.

Cork's Kent station is located approx 1 kilometre east of the city centre. The rail line arriving from Mallow to the North turns East at Kent, and does not penetrate the city centre, nor would it do so under the *Transport 21* investment proposal.

The proposed new line would serve principally Midleton and Carrigtohill. There could be some intermediate stations. Travel patterns of Midleton and Carrigtohill morning peak home-to-work commuters are available from the POWSAR data file, prepared by the CSO from the *2002 Census*. These data show the following pattern (all modes).

Table A2.2: Destinations of Midleton and Carrigtohill Morning Commuters, April 2002

To/From	Midleton	Carrigtohill	Total
Cork City East	504	287	791
Cork City West	156	77	233
Midleton	855	84	939
Carrigtohill	136	238	374
Elsewhere	909	426	1,335
Work at Home	135	56	191
Total	2,695	1,168	3,863

Source: Tabulated from POWSAR, CSO.

Only 640 of the 2,695 morning commuters ex-Midleton had destinations in Cork East or Carrigtohill (both served by the proposed line, although including destinations which are not convenient to it). Ex-Carrigtohill, 371 of the 1,168 morning commuters had destinations in Cork East or Midleton. While the development plans for Cork envisage large population growth rates in both of these areas, it cannot be presumed that most of them will have work destinations convenient to the proposed fixed-line rail investment. The percentage who are in the 'no-car-available' category is already low, and declining.

The consultants Faber Maunsell, in their evaluation of the Cork Suburban Rail project, opted for an Option described as 3b, which would involve the Midleton extension, new stations and higher frequencies. The next table shows the traffic projections on which Faber Maunsell based their cost-benefit calculations.

Table A2.3: Actual and Projected Traffic Flows, Cork Suburban

Year	Cork-Cobh	Cork-Mallow	Total
Actual 1997	440,000	na	na
Actual 2001	447,000	139,000	586,000
'Baseline' 2006	na	na	1,243,000
Forecast 3b 2006	na	na	3,180,000
Forecast 3b 2020	na	na	7,200,000

The Baseline 2006 forecast assumed no service improvements as against 2001. Such improvements have in reality occurred. The 3b forecasts assume the completion of the capital works and rolling-stock acquisition as outlined in the report.

We believe that these traffic forecasts are demanding. It would be advisable to check them against:

- Actual traffic performance in 2006, bearing in mind the service improvements that have occurred, and
- The commuting and place-of-work patterns which will be revealed from the *2006 Census*. These POWSAR data will, we understand, become available before the end of the calendar year 2006.

APPENDIX 3: SUPPLEMENTARY INFORMATION ON PUBLIC INTERVENTIONS AND SUPPORTS IN THE HOUSING MARKET

Table A3.1 brings together all of the various schemes and interventions, which are targeted at a broad range of housing needs not met by market provision. The classification uses the five measures, which make up the Housing Priority in the Economic and Social Infrastructure Operational Programme (ESIOP). It also includes schemes not included in the ESIOP to show the full extent of State housing support for those on low incomes. The asylum seekers accommodation scheme provided for in the NDP, which is funded out of current expenditure from the Department of Justice, Equality and Law Reform, is included as Measure 6.

A brief summary of the various public interventions and supports in the housing market follows Table A3.1. The physical output and expenditure provisions for each measure are set out in Tables A3.2 and A3.3.

MEASURE 1: LOCAL AUTHORITY HOUSING MEASURE

The bulk of the capital investment in 2005, almost 50 per cent represented investment in local authority housing. This measure covers the construction and acquisition of local authority housing units and is funded directly through capital grants from the Exchequer augmented by the local authorities internal housing capital receipts, mainly from the proceeds of tenant purchase schemes in the past.

Table A3.1: The Range of Public Interventions and Supports in the Housing Market

Measure 1: Local Authority Housing
Construction and acquisition of local authority dwellings.
Supplementary Welfare Allowance Rent Supplement and Rental Accommodation Scheme (since July 2004) (+)
Measure 2: Voluntary Housing
Voluntary housing bodies provide housing for rent through Capital Assistance/Capital Loan and Subsidy Schemes,
which include social housing under Part V schemes.
Communal Facilities in voluntary housing.
Measure 3: Improving Access – Affordable Housing
Low cost sites to households approved for local authority or social housing.
Mortgage Allowance Scheme to ease transition from rent to mortgage.
Tenant Purchase Scheme.
Local authority loans for households purchasing under the following schemes:
– Shared Ownership
– 1999 Affordable Housing Scheme
Affordable Housing under 2000 to 2004 Planning and Development Acts – Part V Schemes.
Affordable Housing Initiative under Sustaining Progress.
Measure 4: Housing Stock Improvements
Local Authority maintenance and management of housing stock.
Regeneration Schemes.
A central heating installation programme for the 30 per cent of the LA stock without CH (since 2004).
Disabled Person's Grant.
Essential Repairs Grant for elderly people living in poor housing conditions.
Measure 5: Accommodation for Groups with Special Needs
Provision of traveller accommodation.
Accommodation services for homeless people (+)
Measure 6: Asylum Seekers Accommodation (+).

Note: (+) funded out of current expenditure.

MEASURE 2: VOLUNTARY HOUSING

This measure provides social rented accommodation under two separate schemes: the Capital Assistance Scheme and the Capital and Loan Subsidy Scheme. This accommodation is provided by voluntary housing bodies for low-income households and those with special housing needs, such as the elderly, people with disabilities, the homeless and returning emigrants.

MEASURE 3: AFFORDABLE HOUSING FOR LOWER INCOME HOUSEHOLDS

The second largest funding provision (23 per cent of total) is provided to assist lower-income households meeting certain income eligibility criteria to acquire their own homes. The main schemes originally covered by this measure were the Shared Ownership Scheme and the 1999 Affordable Housing Scheme. Following the introduction of a number of new affordable housing schemes since

the last NDP this measure will now also have to include any expenditure required to facilitate the following schemes:

- Affordable Housing under 2000 to 2004 Planning and Development Acts – Part V Scheme.
- Affordable Housing Initiative under Sustaining Progress.

There are other measures which assist people acquire their own home such as the Mortgage Allowance Scheme, Local Authority House Purchase and Improvement loans, Local Authority low cost housing sites and the tenant purchase scheme. Subsidies for qualifying households that reduce mortgage or rent payments are recouped to local authorities by the DoEHLG.

The vast majority of funding for affordable housing is in the form of non-voted loan finance made available by the Housing Finance Agency (HFA) to local authorities for lending on to borrowers purchasing under the above schemes. According to the estimated outturn in 2005, some €277 million was given out in loans from local authorities last year. The total loan finance available from the HFA in 2006 is €450 million. A number of lending institutions started to offer mortgage finance for affordable housing applicants in 2005, thereby potentially reducing the demands on the Housing Finance Agency. Other institutions are expected to follow.

MEASURE 4: HOUSING STOCK IMPROVEMENTS

Funding under this measure goes towards the conservation and improvement of the local authority housing stock and privately owned housing estates with particular emphasis on those most in need, including the disabled and the elderly. It includes the operation of the Disabled Persons and Essential Repairs Grant Schemes plus the Special Housing Aid for the Elderly. There has been significant increase in investment in the refurbishment and redevelopment of the existing local authority stock due to the inclusion of schemes like the regeneration of Ballymun.

MEASURE 5: ACCOMMODATION FOR GROUPS WITH SPECIAL NEEDS

The objectives of this measure are to ensure that the housing needs for the homeless and travellers are met in a manner appropriate to their needs. The PCP provides for a capital provision of €45 million for travellers. There is a separate current expenditure provision of €50 million for the homeless.

Table A3.2: Physical Indicators of Progress 2000-2005

	2000	2001	2002	2003	2004	2005e	Cumulative 2000-2005e
Local Authority Housing							
Completions (including regeneration units)	2,204	3,622	4,403	4,516	3,539	4,209	22,493
Part V Acquisitions	0	0	0	75	135	203	413
Other Acquisitions	1,003	1,400	671	381	836	715	5,006
Voluntary & Co-operative Housing (1)	951	1,253	1,360	1,617	1,607	1,350	8,138
Improvement Works in Lieu of Re-housing	123	108	164	151	140	121	807
Extensions to LA Houses	153	187	199	203	178	194	1,114
Casual Vacancies (2)	2,854	3,004	3,122	3,795	3,445	3,500	19,720
Total Social Rented Provision	**7,288**	**9,574**	**9,919**	**10,738**	**9,880**	**10,292**	**57,691**
Affordable Housing	**1,369**	**2,015**	**2,802**	**2,839**	**2,265**	**2,756**	**14,046**
of which							
Shared Ownership	1,190	1,611	1,686	998	798	730	7,013
Mortgage Allowance	93	132	188	229	233	207	1,082
1999 Affordable Housing	86	272	882	1,524	860	857	4,481
Part V Affordable Acquisitions	0	0	46	88	374	962	1,470
Total Social and Affordable Provision	**8,657**	**11,589**	**12,721**	**13,577**	**12,145**	**13,048**	**71,737**
Sales under Tenant Purchase Scheme	**1,844**	**1,411**	**1195**	**1,567**	**1652**	**1,738**	**9,407**
Number of Sites Sold	**98**	**188**	**141**	**112**	**87**	**124**	**750**
Groups with Special Housing Needs:							
Traveller Specific Units Provided	176	187	214	228	193	na	
Traveller Families removed from roadside	114	76	78	151	187	na	

(1) Including social housing units acquired under Part V.
(2) Houses available for rent from existing stock.
Figures for other acquisitions and regeneration in 2005 are DKM estimates.

A breakdown of the capital investment under each measure is set out in Table A3.3. There is also current expenditure of approximately €164 million in 2005,[124] which includes a €74 million provision for asylum seekers accommodation from the Department of Justice, Equality and Law Reform.

[124] *Source*: Revised Estimates for Public Service, Department of Finance, 2006, Appendix 3.

Table A3.3: Public Capital Investment in Housing Priority (*)

Measure:	2000	2001	2002	2003	2004	2005	2006e	Average Annual % Change
						(2006 PCP)		
1. Local Authority Housing	**420**	**671**	**792**	**695**	**704**	**805**	**875**	**+13.9**
2. Voluntary Housing	**100**	**145**	**179**	**213**	**185**	**168**	**246**	**+11.0**
Capital Assistance Scheme	32	55	78	96	87	81	108	+20.3
Capital Loan and Subsidy Scheme	67	89	100	115	96	86	135	+5.1
Communal Facilities in Voluntary Housing	1	2	1	2	2	2	2	8.8
3. Improving Access to Affordable Housing	**186**	**247**	**361**	**495**	**347**	**291**	**508**	**+9.4**
Site Subsidy	5	6	21	28	18	13	28	+22.5
Mortgage Allowance	1	1	1	2	2	3	3	+20.9
Local Authority Housing Loans	181	240	339	465	327	276	478	+8.9
4. Housing Stock Improvements	**153**	**210**	**256**	**272**	**253**	**243**	**281**	**+9.8**
Regeneration/Remedial Works	81	125	159	163	173	188	211	+18.5
Private Housing Grants and Subsidies	59	70	80	93	60	40	48	-7.8
Other Housing (e.g. Special Aid for the Elderly)	13	15	17	16	19	16	21	+4.9
5. Groups with Special Needs	**15**	**24**	**27**	**29**	**36**	**37**	**47**	**+19.9**
Provision of Traveller's Accommodation	15	24	27	29	36	37	45	+19.6
Childcare Facilities	0	0	0	0	0	0	2	
Total Capital Investment in Housing	**874**	**1,296**	**1,614**	**1,704**	**1,524**	**1,546**	**1,957**	**+12.1**
of which investment in Local Authority & Social Housing	621	972	1,178	1,130	1,118	1,214	1,409	+14.3

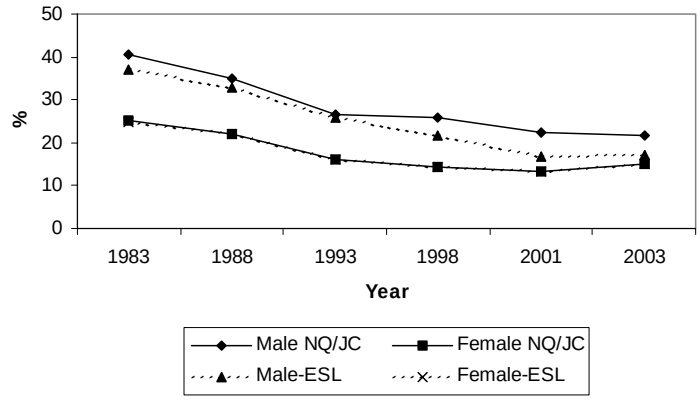
(*)Based on grouping the PCP measures into the five broad measures which make up the Housing Priority.
Source: Public Capital Programme, 2006 Department of Finance.

APPENDIX 4: EARLY SCHOOL LEAVING: IMPLICATIONS FOR POLICY DEVELOPMENT

A4.1 Prevalence of Early School Leaving

The 1980s and early 1990s showed a rapid increase in the proportion of young people staying on in school to Leaving Certificate level. However, recent evidence has indicated senior cycle completion rates have remained relatively stable since the late 1990s in spite of a range of policy interventions designed to prevent early school leaving (Gorby *et al.*, 2006; Department of Education and Science, 2005a). This paper explores the prevalence of early school leaving along with its causes and consequences. It places Ireland in comparative perspective, highlighting policy interventions which have sought to prevent early school leaving in Ireland and internationally.

Figure A4.1: Prevalence of Early School Leaving



Note: Data refer to 'initial' school leavers only, that is, those who left school at or before the age of 21.

Using annual school leavers' data, two groups of leavers can be distinguished: those who left school before the Leaving Certificate (including both the 'no qualifications' and 'Junior Certificate') group, and those who left school before the Leaving Certificate but went

on to take an apprenticeship. Figure 1 indicates trends in the prevalence of both groups by gender. Between 1983 and 1993, there was a rapid decline in the proportion of young women and men leaving school before the Leaving Certificate. Female rates of early school leaving stabilise thereafter. However, male rates contribute to decline, especially when apprentices are excluded from the early school leaver group.[125] From the late 1990s, therefore, apprenticeship has come to play an important role in upgrading the qualifications of young men and reducing the gender gap in rates of early school leaving.

A4.2 Causes of Early School Leaving

Patterns of early school leaving are strongly related to social background; 40 per cent of young people from unemployed backgrounds and almost a fifth of those from working-class backgrounds leave school before the Leaving Certificate compared with a tenth of those from professional and employer/manager households (School Leavers' Survey, 2004). There is also marked variation by parental education with higher levels of school drop-out among those whose parents have primary education only (McCoy *et al.*, forthcoming; Eivers *et al.*, 2000). As might be expected, early school leaving is also significantly related to educational (under)performance. These students tend to have lower reading/numeracy test scores and Junior Certificate exam grades than those who stay on to Leaving Certificate level (McCoy *et al.*, forthcoming).

When asked about the main reason for leaving school early, young people tend to cite school-related factors; 39 per cent did so with 23 per cent citing economic or work factors (Gorby *et al.*, 2006). Early school leavers tend to have more negative attitudes to school, being less likely to see their school life as happy and more dissatisfied with their teachers (McCoy *et al.*, forthcoming; Eivers *et al.*, 2000). Rates of early school leaving are found to vary significantly across schools, even taking into account between-school differences in student intake (Smyth, 1999; Department of Education and Science, 2005a). Drop-out rates tend to be higher in working-class or designated disadvantaged schools and are related to school climate, being lower where there is more positive interaction between teachers and students (McCoy *et al.*, forthcoming; Department of Education and Science, 2005a).

Early school leaving tends to be preceded by a period of recurring absenteeism (Smyth, 1999; McCoy *et al.*, forthcoming), a pattern which can go back as far as primary school level (Eivers *et al.*, 2000). It is also signalled by student misbehaviour at school, with a higher incidence of suspension and expulsion among early school leavers (Eivers *et al.*, 2000).

[125] Apprenticeship participation has no impact on female rates of early school leaving due to the very small number of women involved.

A4.3 Consequences of Early School Leaving

Educational attainment is strongly predictive of labour market outcomes, both in the initial labour market transition and in adult life. Early school leavers are much more likely to be unemployed, with unemployment levels particularly marked for those who left school without any qualifications whatsoever; over two-thirds of the no qualifications group are unemployed two years after leaving schools, compared with 29 per cent of Junior Certificate and 15 per cent of Leaving Certificate leavers (Gorby *et al.*, 2006). Where early school leavers access employment, they are disproportionately employed in manual jobs and have lower pay levels (Gorby *et al.*, 2006). Such disadvantages persist into adult life with lower employment levels, lower quality jobs, lower earnings and higher poverty rates among those with lower levels of educational qualifications (Layte *et al.*, 2001, 2003; Denny *et al.*, 2000; Smyth and Byrne, 2004). While systematic data on crime and educational attainment are not available, evidence indicates very low levels of educational attainment among those serving prison sentences (O'Mahony, 1997).

As a result of its impact on life-chances, early school leaving has social costs in terms of welfare payments, crime, health and so on, as well as consequences for social cohesion. Morgenroth (1999) estimated potential cost savings of over €14 million (1999 figures) from reducing the level of early school leaving. This estimate does not include health and housing costs which would add to the potential savings.

A4.4 Ireland in Comparative Perspective

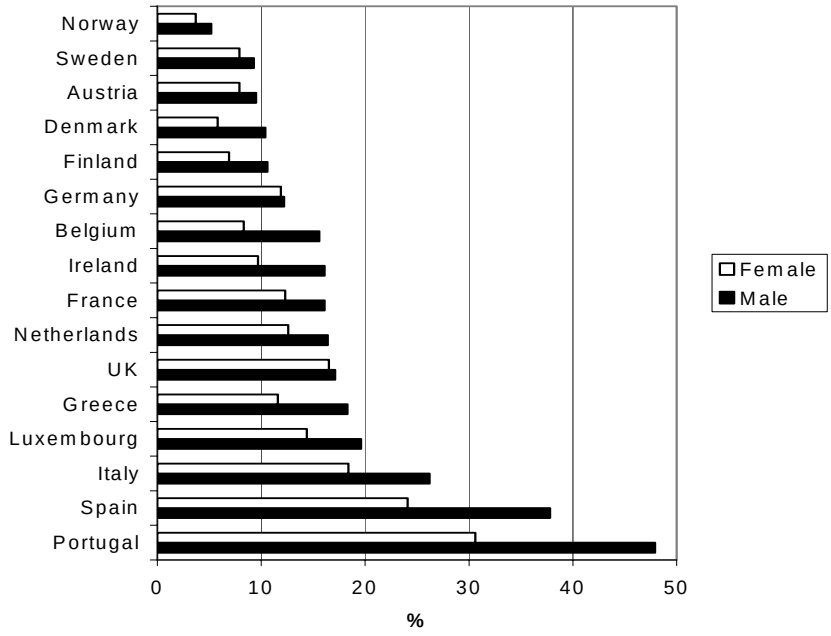
Figure A4.2 indicates the rate of early school leaving in Ireland in 2004 compared to other European countries (the EU-15 along with Norway). The definition of early school leaving is somewhat different from that discussed in the first section, referring to the percentage of the population aged 18-24 years with at most lower secondary education and not in further education or training. Ireland appears around the middle of the distribution. Two groups of countries appear to have significantly lower levels of early school leaving than Ireland: the Nordic countries (Norway, Sweden and Finland) and the dual system countries (Austria, Denmark and Germany.[126]) In Ireland, the disparity between male and female levels of early school leaving is quite high with male rates 1.7 times higher than female rates; this is exceeded only in Denmark and Belgium, countries with very different educational systems from the Irish one.

There is some relationship between levels of per-student expenditure and early school leaving. Spending levels at primary and post-primary level are particularly high in Denmark, Norway, Sweden and Austria (OECD, 2005a), all countries with relatively low levels of early school leaving. However, spending patterns tell only part of the story since expenditure levels for the primary sector are

[126] It should be noted that rates of early school leaving are lower for males in Germany than Ireland but higher for females.

also high in Luxembourg and Italy, which have relatively high early school leaving rates.

Figure A4.2: Prevalence of Early School Leaving Across European Countries, 2004



There is some relationship between levels of per-student expenditure and early school leaving. Spending levels at primary and post-primary level are particularly high in Denmark, Norway, Sweden and Austria (OECD, 2005a), all countries with relatively low levels of early school leaving. However, spending patterns tell only part of the story since expenditure levels for the primary sector are also high in Luxembourg and Italy, which have relatively high early school leaving rates.

The explanation for cross-national variation appears to relate more to the nature of the educational system. Among countries with lower rates of early school leaving than Ireland, two models can be found: the 'Nordic' model and the 'dual systems' model. The Nordic model (found in Norway, Sweden and Finland) involves a comprehensive system with all students taking the same pathway, at least until the end of compulsory schooling. Underpinned by a strong policy commitment to equity, this policy results in smaller differences between social groups and schools in educational outcomes. Cross-nationally standardised tests such as PISA have indicated relatively high levels of overall performance, but a narrow range of variation in scores, within these countries (OECD, 2005b). The 'dual systems' model (prevalent in Germany, Austria and

Denmark[127]) involves a rigid differentiation into academic and vocational tracks, the latter usually combining in-school education and on-the-job training. This model provides a route to achievement for less academically-oriented students, though it has been linked to more restricted career pathways in the longer term (Gangl *et al.*, 2003).

It is clear that both sets of countries achieve higher levels of school retention through very different routes: one by emphasising the inclusion of all students into a comprehensive system, the other by providing a vocational track for students who might otherwise have been at risk of drop-out. A number of alternative policy interventions have been devised to counter early school leaving (either directly or indirectly) across a range of other educational systems. For the purposes of this paper, I will focus on three sets of interventions: early childhood education, measures designed to promote learning and achievement, and financial subsidies.

A4.5 Early Childhood Education

The use of early childhood education to counter educational disadvantage has its origins in the United States in the 1960s as part of the 'war on poverty'. One of these interventions, the High/Scope Perry Pre-school Program, involved structured (but child-initiated) learning activities along with weekly home visits by teachers. Children who had participated in the programme had higher school achievements over the ages of 7 to 14 years. Furthermore, benefits from participation persisted into adulthood, with a higher rate of high school graduation, higher earnings, a lower take-up of welfare and a lower crime rate (Wortman, 1995; Weikart, 1996; Gomby 1995). Other inventions, such as the Child-Parent Centers in Chicago, have indicated lower rates of early school leaving among participants along with lower crime rates (Reynolds, Wolfe, 1997; Bryant and Maxwell, 1996). In general, the positive effects of early childhood education are found to increase with length of time in, and earlier entry to, the programme (Barnett, 1995); the benefits of high quality preschool education are particularly evident for disadvantaged and minority groups.

A4.6 Addressing Academic Under-achievement

A second set of interventions have focused on indirectly countering early school leaving by boosting student performance through smaller class sizes and/or initiatives to promote literacy and numeracy. The impact of class size on student performance has been subject to much debate, in part because of the difficulty in disentangling size from class allocation policies (e.g. less academically able students may be allocated to smaller groups). Insights are available, however, from one study in which students were randomly assigned to smaller or regular classes. Project STAR

[127] In many ways, the Danish system combines elements of the two models with a general track to the end of compulsory schooling and a high degree of differentiation thereafter.

in Tennessee was an experimental intervention to explore the impact of reduced class size (13-17 students) in the early years of primary education. Students in small classes significantly outperformed those in larger classes (22-25 students), an advantage that persisted to the age of 15 years; additional benefits were apparent for those who started in small classes at an earlier age and stayed in small classes for a sustained period (Finn *et al.*, 2001). Students who had been in the smaller classes were less likely to drop out of high school than other students. Among the control group, 76 per cent graduated from high school compared with 88 per cent of those who had been in small classes for four or more years (Finn *et al.*, 2005); the biggest difference was evident for the more disadvantaged students.

The Success for All programme originated in the US but has been adapted for use in schools in other countries. The programme involves intensive reading activities for early grades within schools serving disadvantaged communities along with a strong emphasis on liaison with parents. Significant and substantive positive effects were found for every measure of reading performance across five grades of students. The most positive effects were found in schools which implemented the programme comprehensively over a number of years (Slavin and Madden, 1999). Benefits persisted in the longer term; by the age of 14 years, the participants had better achievement outcomes and lower grade retention (Borman *et al.*, 2002). The evaluations did not explicitly focus on the impact on longer term behaviour, such as high school graduation; however, it might be expected that the reduction in underperformance, especially among initially lower ability groups, would have at least an indirect impact on this outcome.

FINANCIAL SUBSIDIES

The provision of financial support may be seen as one way of discouraging students from dropping out of school. One such initiative in England, the Educational Maintenance Allowance (EMA), involves a means-tested weekly payment (Stg. £30-40) to 16-18 year olds in full-time post-compulsory education in selected pilot areas; the initiative has been extended to a national basis since September 2004. While the initiative is still at an early stage, a positive impact on school retention and attendance has been reported (Ashworth *et al.*, 2001). Dearden *et al.* (2005) indicate a participation rate 4.5 per cent higher in the first year and 6.4 per cent higher in the second year; the impact is found to be stronger for young men, those from the lowest income groups and those who received the maximum payment.

This section has examined some interventions to counter early school leaving in other national contexts; the following section will present an overview of policies adopted in Ireland.

A4.7 Policies to Prevent Early School Leaving in Ireland

Policies to prevent early school leaving must be seen in the context of measures designed to address educational disadvantage more generally. These have included: curricular reform; early childhood education; specific measures to promote school completion; and the targeting of expenditure towards schools serving disadvantaged communities.

(i) CURRICULAR REFORM

The period since the mid-1990s has seen the introduction of two programmes targeting potentially at-risk students. The Junior Certificate School Programme (JSCP) has been "…aimed at those young people who show signs of school failure or early leaving". The emphasis is on cross-curricular work, using teamwork among teachers, basic skills development and personal and social development, along with an individualised record of achievements for students. The programme was taken by 3 per cent of the cohort in 2004. At senior cycle, a new programme, the Leaving Certificate Applied (LCA), was also aimed at students who were not catered for by the traditional academic curriculum. The focus of the programme is to prepare students for adult life with the curriculum consisting of three main elements – general education, vocational education and vocational preparation. Students are assessed on the basis of tasks rather than examinations. Students who take LCA do not have direct access to higher education. The programme was taken by 7 per cent of the cohort in 2004. The impact of JCSP and LCA has not been the subject of systematic evaluation in terms of their net impact on educational outcomes among participants. Case-study evidence (Gleeson *et al.*, 2002) indicates positive perceptions of LCA among both students and teachers but highlights issues around selection into the programme and parity of esteem with the Leaving Certificate Established. A review of the Junior Certificate School Programme by the Inspectorate (Department of Education and Science, 2005) indicated the programme is seen positively by school staff in terms of its effect on students' attendance, motivation and literacy/numeracy skills. However, the report highlighted some areas of concern in relation to the selection of students into the programme, curriculum planning and review, and professional development support for teachers.

(ii) EARLY CHILDHOOD EDUCATION

Levels of early childhood education provision in Ireland are relatively low by comparison with other European countries (OECD, 2005a). The best known example of an early intervention programme in the Irish context is the Rutland Street project. This involved a structured, cognitive programme for 3 to 4 year olds over a two year period, supplemented with activities to involve parents (Holland, 1979). By the end of the programme, participants showed an increase in their intelligence scores and an improvement in measures of pre-school readiness. There was some 'fading' in score

levels on transfer to primary school but a gap in favour of participants was still evident. This difference did not translate into advantages in school performance since the experimental group performed no better on an English reading test than the control group at the age of eight (Kellaghan, 1977). However, longer-term benefits were evident with an improvement in school retention. Participants were more than twice as likely as non-participants to take the Group Certificate and three times as likely to take the Intermediate Certificate. Furthermore, just under one-tenth of the participants took the Leaving Certificate compared with none of the control group (Kellaghan and Greaney, 1993).

The Early Start Programme, informed by the Rutland Street experience, was introduced to cater for 3-4 year olds in disadvantaged areas. The programme covers a very small proportion of the overall cohort with just 2 per cent of entrants to Junior Infants classes in primary schools transferring from Early Start classes (Department of Education and Science, 2005c); €3.6 million was allocated to early education in 2004. Evaluation of the first cohort of children to take part in the programme indicated no gains among participants in cognitive and language behaviour. However, primary school teachers were more positive about participants in measures of school-readiness, such as ability to concentrate, maturity and adaptation to classroom procedures (ERC, 1998). A follow-up of children into second class indicated no significant differences in literacy and numeracy scores (Kelly and Kellaghan, 1999). The absence of an effect has been attributed to the lack of standardisation of activities between centres and the less intensive nature of in-service training in the first year of the project. Subsequent research indicated a change over time in the way Early Start has been implemented, with more emphasis on language and cognitive development along with greater parental involvement (Lewis and Archer, 2002, 2003). However, it is not clear yet whether these changes have impacted on outcomes among participants.

MEASURES TO PROMOTE SCHOOL COMPLETION

These measures have taken two forms: a national agency to address student attendance and funding for schools to develop their own policies to promote retention. The Educational Welfare Act of 2000 raised the legal school leaving age to 16 years of age (with a requirement to complete three years of junior cycle education) and provided a statutory basis for the new National Educational Welfare Board (NEWB), a regularisation and development of pre-existing school attendance services. The activities of the Board, established in 2002, are designed to monitor and promote student attendance within the primary and second-level sectors; €6.5 million was allocated to NEWB in 2004. The operation of the Board has not been evaluated to date. However, this area is likely to be crucial to preventing early school leaving since currently one in five second-level students, and one in ten primary students, miss more than 20 days of school a year.

The School Completion Programme replaced the earlier 8-15 Year Old Early School Leaver Initiative (ESLI) and the Stay-in-School Retention initiative. It focuses on young people aged 4-18 years who are at risk of leaving school early and covers 300 primary and 112 second-level schools (with a budget of €23.5 million in 2004). Selected schools are provided with funds to develop appropriate intervention strategies (such as in-school and after-school supports) to support 'at risk' young people. The School Completion Programme has not yet been subject to systematic evaluation. An evaluation of the 8-15 year old Initiative had indicated modest progress in young people's outcomes (as assessed by teachers and group-workers), including academic outcomes, attendance and social interaction/behaviour; however, a substantial number of young people made little or no gains (Cullen and Walker, 2000).

A4.8 Targeted Expenditure on Disadvantaged Schools

Measures to target additional expenditure at schools serving disadvantaged communities cover both primary and second-level education. These initiatives (including Breaking the Cycle, the Disadvantaged Areas Scheme, and Giving Children an Even Break) involve the provision of extra funding per pupil along with additional teacher allocation for schools which are designated 'disadvantaged' in terms of their student profile. In 2004, €49.9 million was allocated across these schemes with a further €15.7 million allocated to the Home-School-Community-Liaison Scheme, designed to increase co-operation between schools, parents and community agencies. An evaluation of the Breaking the Cycle Scheme indicated that principals and teachers in designated disadvantaged schools were relatively positive about the scheme. However, there was no evidence of improved reading and maths scores among students in these schools and variable results in relation to other outcomes (such as student attitudes, attendance and behaviour) (Weir, Milis and Ryan, 2002a, 2002b; Weir, 2003). Explanations for the lack of a direct impact on student performance have been advanced, including the lack of systematic interventions to address reading and numeracy as well as the persistence of low expectations among teachers, parents and students (Archer and Weir, 2004). The direct impact of targeting expenditure on early school leaving patterns in schools serving disadvantaged communities has not yet been assessed.

To date, there has been little systematic evaluation of the cumulative impact of such policies on educational disadvantage in general and on early school leaving in particular. However, a number of issues have been raised by commentators (Educational Disadvantage Committee, 2005; Educational Disadvantage Forum, 2003; McCoy and Smyth, 2003). First, it is not clear to what extent the schemes cover all 'disadvantaged' students; by allocating expenditure on a school basis, a number of 'at risk' students may be excluded from interventions. Second, it is not clear whether the scale of additional funding is sufficient to make up for pre-existing

resource differentials due to significant differences between schools in their socio-economic profile. Evidence from the United States indicates that positive discrimination in terms of school funding is associated with improved student achievement but the improvements are not sufficient to close the achievement gap between high- and low-income students (see, for example, Borman *et al.*, 1998; Puma *et al.*, 1997). Third, provision has been criticised for fragmentation in terms of agencies, coverage and delivery; in particular, the criteria to identify schools has differed across schemes and there has been a lack of co-ordination across measures designed to achieve similar outcomes.

In a response to a review of measures to combat educational disadvantage, a new scheme, DEIS (Delivering Equality of Opportunity in Schools), was launched in 2005. DEIS is designed to provide an integrated approach covering pre-school to second-level education; it will be phased in over five years and involve additional expenditure of €40 million per year on full implementation. A new system for identifying schools for targeting is being drawn up; fewer schools (640 primary and 200 second level) will be targeted in the scheme than in pre-existing measures for schools serving disadvantaged communities (though the policy document refers to some supports for other schools). Among other dimensions, it is expected to include measures to improve literacy and numeracy levels and to enhance student attendance and retention (Department of Education and Science, 2005c). It is obviously too early to assess the potential impact of this new scheme. The integration of measures and services is to be welcomed as existing provision had been fragmented. The increase in resources to the targeted schools may go further to reducing the disparities between less and more advantaged students. However, while there is a good rationale for providing additional funding for schools with a very high concentration of young people from disadvantaged backgrounds,[128] a number of 'at risk' students attend other schools so provision should take this into account.

A4.9 Priorities for the Future

It is difficult to assess the overall effect of interventions designed, either directly or indirectly, to reduce the level of early school leaving. Overall rates of early school leaving have tended to plateau since the late 1990s;[129] there has been some continuing reduction in the rates for males, largely through post-school apprenticeship participation, but rates for females have remained stable. In the face of a range of interventions, the rate of early school leaving has plateaued rather than declined. It should be acknowledged, however,

[128] The social class mix of the school has a direct impact on school drop-out and student performance, over and above the effects of individual social background (Smyth 1999; McCoy *et al.*, forthcoming).

[129] It is now acknowledged that the National Anti-Poverty Strategy target of 90 per cent leaving at upper secondary level by 2006 will not be met.

that these measures had been introduced in a period of rapid employment expansion, which is likely to have acted as a 'pull' out of school for many young people.

On the basis of international and national evidence, a number of factors would appear to be key to improving school retention in the future:

- High quality pre-school education: This has been found to have positive long-term benefits for young people (especially those from disadvantaged backgrounds) in terms of school completion, among other factors. US research has indicated the benefits of such provision far outweigh the costs. The NESF (2005) has indicated that universal, high-quality provision for 3 year olds would cost €136 million per annum. Alternatively, more targeted provision, focusing on children from disadvantaged backgrounds, may be more cost-effective.
- School improvement: Any measures designed to prevent early school leaving will be unsuccessful unless they are underpinned by improvements at the school level. Currently, there is a significant gap in the reading performance of students in disadvantaged and non-disadvantaged schools, a gap that widens over the school career (Eivers *et al.*, 2005). Given the strong link between underperformance and school drop-out, interventions to improve literacy and numeracy are key aspects of preventing early school leaving. These interventions should be allied to specific learning support for at-risk pupils. Performance is not the only issue, however, since school climate (in the form of interaction between teachers and students) has a significant influence on early school leaving. School development planning (through the School Development Planning Initiative) should seek to promote a positive school climate to underpin specific measures to increase retention. Measures to facilitate greater student and parental involvement in schools are also likely to enhance student engagement and retention.

In spite of measures to target schools serving disadvantaged communities, overall per-student expenditure levels are lower in Ireland than in the OECD as a whole at both primary and secondary levels (OECD, 2005a). Further efforts to provide additional targeted resources early on in young people's schooling career are crucial in order to prevent later problems.