National Economic and Social Council

An Chomhairle Náisúnta Eacnamaíoch agus Sóisialach

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Education and Training Policies for Economic and Social Development

October 1993

No. 95

NATIONAL ECONOMIC AND SOCIAL COUNCIL

Constitution and Terms of Reference

1. The main tasks of the National Economic and Social Council shall be to provide a forum for discussion of the principles relating to the efficient development of the national economy and the achievement of social justice, and to advise the Government through the Taoiseach, on their application. The Council shall have regard, inter alia, to:

   (i) the realisation of the highest possible levels of employment at adequate reward.
   (ii) the attainment of the highest sustainable rate of economic growth.
   (iii) the fair and equitable distribution of the income and wealth of the nation.
   (iv) reasonable price stability and long-term equilibrium in the balance of payments.
   (vi) the balanced development of all regions in the country, and
   (vi) the social implications of economic growth, including the need to protect the environment.

2. The Council may consider such matters either on its own initiative or at the request of the Government.

3. Members of the Government will meet regularly with NESC on their initiative or on the initiative of NESC to discuss any matters arising from the terms of reference and in particular to discuss specific economic and social policy measures and plans and to explore together proposals and actions to improve economic and social conditions. Any reports which the Council may produce shall be submitted to the Government, and shall be laid before each House of the Oireachtas and published.

4. The membership of the Council shall comprise a Chairperson appointed by the Government in consultation with the interests represented on the Council, and

   Five persons nominated by agricultural organisations;
   Five persons nominated by the Confederation of Irish Industry, the Federation of Irish Employers and the Construction Industry Federation;
   Five persons nominated by the Irish Congress of Trade Unions;
   Nine other persons nominated by the Government, including one from the National Youth Council, the Secretary of the Department of Finance, the Secretary of the Department of Tourism and Trade, and the Secretary of the Department of Enterprise and Employment.
   Any other Government Department shall have the right of audience at Council meetings if warranted by the Council's agenda, subject to the right of the Chairperson to regulate the numbers attending.

5. The term of office of members shall be for five years. Casual vacancies shall be filled by the Government or by the nominating body as appropriate. Members filling casual vacancies may hold office until the expiry of the other members' current term of office.

6. The numbers, remuneration and conditions of service of staff are subject to the approval of the Taoiseach.

7. The Council shall regulate its own procedure.

NATIONAL ECONOMIC AND SOCIAL COUNCIL

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ACKNOWLEDGEMENTS

The Council wishes to record its gratitude to those who assisted in the preparation of this Report.

Firstly, it wishes to thank the consultants who were commissioned to write papers. Dr David Hitchens and Mr J.E. Birnie of the Department of Economics, Queen's University, Belfast prepared a paper on productivity, an edited revision of which appears in Chapter 3. Dr Tom Kellaghan of the Educational Research Centre, St. Patrick's College, Drumcondra, prepared a paper on comparative vocational education which is drawn upon heavily in Chapter 4.

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The Council is grateful to the many individuals and organisations who assisted by providing information and material during the preparation of this Report. In particular, the Council is grateful to the three companies which agreed to participate as case studies in the research described in Chapter 3.

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Education and Training Policies for Economic and Social Development

CHAPTER 1

INTRODUCTION

Education absorbs approximately 6% of GNP. Public expenditure on education has risen rapidly since the mid-1960s — a growth associated with demographic changes, increases in the participation rate in education and real increases in the volume of educational services (teachers, schools, equipment etc.). The Council, in *A Strategy for the Nineties*, stated that it was imperative to conduct an overall review of education policy in the light of demographic changes, constraints on public expenditure and changes in the environment in which the education system must function. The Council also stressed that the education and training systems should be assessed jointly.

Subsequently, the Irish educational system was subject to a review by the OECD and, more significantly, the publication of the Green Paper on Education initiated a far-reaching debate on educational structures, processes and outcomes. In parallel, the contribution which education and training policies might make to enhancing Irish economic and employment performance has been considered by the Industrial Policy Review Group. This has also been an important theme in the analysis of the Community Support Framework for Ireland 1989-93, and in the study for the Council by Lars Mjøset of Ireland's development in a comparative institutional perspective. It is, therefore, a critical period for the development of policy. The Council has prepared this report as its contribution to the current debate initiated by publication of the Green Paper. The Council's recommendations go beyond the specific boundaries of the educational system, however, since it remains the Council's strong view that education and training policies should be considered jointly.

Modern educational systems have a number of important, complex and potentially competing objectives. Socialisation into the highly complicated cultural, and ever evolving economic, social and political arrangements of their societies are amongst the most important objectives. But individual and personal development, preparation for work and adult life, and the classification and certification of individuals' attainments are equally important (Hannan and Shortall, 1991).

In the Irish context, it is Department of Education documentation which provides the official statement of the aims and objectives of Irish education. It is frequently argued that the goals and targets of education are not stated clearly and even in discussion of policy issues, there is a general disregard

for clarity of goals. Perusal of the two White Papers published in the 1980s, and The Rules and Guidelines for National and Post-Primary Schools indicates that the aims and objectives of education policy are similar to those of modern societies generally suggested by Hannan and Shortall (1991) above; socialisation into society, intellectual and cognitive preparation, individual and personal development, preparation for work and adult life and classification and certification of individual attainments.

This Introductory Chapter sets out a brief overview of developments in Irish educational policy in pursuit of these goals over recent decades as a background for the issues addressed in the Report. The final section outlines the structure of the rest of the Report.

1. THE 1960S, *INVESTMENT IN EDUCATION* AND SUBSEQUENT POLICY STRATEGIES

It is customary for debates and reports on education policy in Ireland to begin by reference to *Investment in Education* (1966). This document was the report of a survey team appointed by the Minister for Education in 1962. While it was not a policy document, its recommendations became the agenda for policy reform. Reform was substantial and shaped the present education and training system. In many ways the process initiated by *Investment in Education* established the parameters for the current educational policy debate and proposals for change. It is essential, then, to situate the current debate in the context of educational policy decisions since the late 1960s.

The survey team identified a twofold demand on the educational system; it must cater for the numbers seeking education and it must produce the qualified manpower required by an expanding economy (p.315). The team identified three problems in the educational system that they suggested should be overcome in order to meet these demands:

(1) the below average participation of certain sections of the population in post-primary and higher education;

(2) the shortfall in output of certain certificants;

(3) the need to ensure that resources are used to best advantage.

Their study highlighted the extent and nature of educational inequality. The low rate of participation in post-compulsory education by children of lower social groups was stark. So too was the higher rate of early school leaving from vocational schools, where the student clientele were predominantly working class. Furthermore, a much smaller percentage of students from

vocational schools went on to third level education. At university level "The disparity between the social groups has become most marked and the strong association between university entrance and social group is unmistakable" (p.130, p.173). While social groups A, B, C formed 45% of the population, their children provided 64% of the entrants to secondary school, 68% of those sitting the leaving certificate and 85% of university entrants in 1963 (O'Buachalla, 1988). As well as great social inequalities, the Report highlighted marked geographic inequalities of educational opportunity.

The title *Investment in Education* is an indication of the close link the report identified between the educational system and economic and social development. It identified skilled and qualified personnel as vital to the expansion of an economy, especially in an era of rapid technological change (7.2, p.177). From a comparison of the probable manpower requirements and the probable supply of suitably-educated personnel for the labour force projected for 1972, it was estimated that there would be serious deficiencies in the number of persons holding educational certificates at different levels of achievement. It identified three types of educational deficit; first deficiencies in the basic education level of many people. Secondly there was a deficit in the provision of retraining necessary to deal with redundancies and changing occupations. Finally, there was a need to refurbish, broaden and update on a continual basis education and training for skilled workers and the professions. The Report identified the basic education deficit as one of particular concern since it could be a severe handicap in retraining people in new skills throughout their working life. It also pointed out the benefits of having tasks performed by individuals who had a higher skill level than the minimum level required to perform the task. Higher skilled individuals may vary in speed and effectiveness, and not only perform the given task, but discover new tasks to be undertaken (see footnotes 1 and 2, p.317). The survey team reported that the only way of remedying the manpower situation rested with successfully attracting and retaining more pupils in the educational system and extending education and training to those already in the labour force.

In addition to highlighting the inequalities in the educational system and the imbalance in the system's output, the Report also identified structural and organisational weaknesses within the system, the inefficient use of resources, the inadequacy of available statistical data and the absence of any forward planning mechanism within the Department of Education.

The role of the education system is much wider than that of satisfying the manpower needs of the economy, and manpower policy debates are not

synonymous with educational debates. The mid-1960s saw an intense debate specifically on manpower policy and many policy documents emerged.[1] The policy aims of this time were to meet the manpower demands of economic and employment expansion. Training, retraining and manpower forecasting were priority items. The Department of Labour was established in 1966 and the Industrial Training Authority (AnCO) was instituted as a separate body in 1967. AnCO assumed responsibility for existing training arrangements and for further expanding all industrial training activities (Conniffe and Kennedy (eds), 1984).

(i) Subsequent Policy Priorities

The 1960s and early 1970s witnessed a growing public awareness of the importance of education and a growing political commitment to extending educational opportunity. The perceived link between the educational system and economic and social development was strengthened.

The economic expansion of the 1960s both demanded a higher output of skills and attitudes conducive to industrialisation and economic expansion and provided the resources which permitted more generous educational provision. Underlying the many subsequent changes in the educational system were:

(1) A commitment to equality of opportunity;

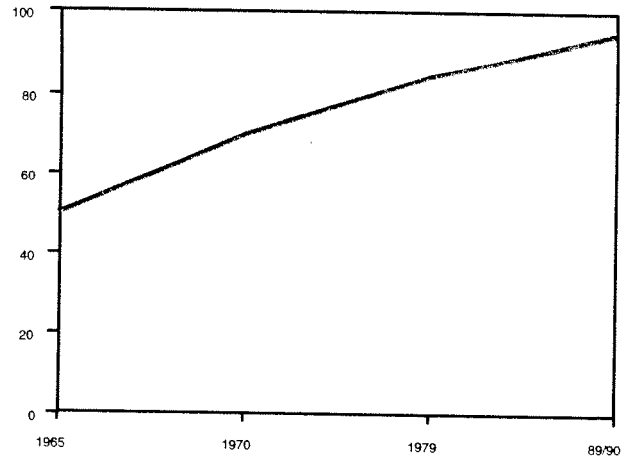
(2) A commitment to broaden the curricular content of education and to erode the academic/vocational and technical education divisions;

(3) A commitment to increase the efficiency of the system.

"Free" post-primary education and transportation schemes were introduced in 1967. Open access to second-level education and free school transport meant that larger percentages of the population could continue in second level. The minimum school leaving age was raised to 15 years in 1972 which made it compulsory for young people to continue in school until that age. The participation rates in post-primary education rose dramatically as Figure 1.1 details.

1 NIEC Report on Manpower Policy (1964), a Government *White Paper on Manpower Policy* (1965) and the NIEC *Report on Full Employment* (1968).

FIGURE 1.1
Rate of Full Time Education age 15 years, 1965-1990



Other significant changes in the mid/late 1960s were the development of "comprehensive" and later community schools. The objective in this instance was to develop schools and curricula which incorporated both academic and technical subjects and which avoided rigid streaming practices. School facilities were built and extended and the sciences and modern languages were promoted. Access to academic examinations was expanded to all those in vocational schools. The Regional Technical Colleges (RTCs) were developed in the late 1960s and included in their remit was a pronounced emphasis on technology, industry and commerce. Another important development in the 1960s was a modified scholarship scheme for third-level education. This scheme later became means-tested and is now much expanded and colloquially known as "The grant scheme". This is means-tested support aimed at providing financial assistance to lower income groups who wish to continue in approved third-level institutions. Quality of education was also a central consideration and in 1972 the National Council for Educational Awards was established, having responsibility for the promotion and validation of courses and the related awards in the non-university institutions.

This is by no means a complete account of the changes that occurred in the educational system at that time, but it does indicate the more significant developments. More important to note than specific changes are the underlying policy objectives, since they continue to be the driving force of educational policy. These are:

(i) a commitment to equality of opportunity;

(ii) a concern with the curricular content of education;

(iii) the academic/vocational balance;

(iv) the efficiency of the educational system.

(ii) **Achievement of Policy Objectives**

There has been massive expansion of post-primary education since the 1960s and this has significantly extended educational opportunity — in the early 1960s approximately half of all 15 year olds were still in school, by 1970 this had increased to 70% and by 1979 to 85%. In 1989/90, 97% of 15 year olds were in full-time education. Table 1.1 shows the increased participation rates between 1971 and 1991. There has been a similar expansion of opportunity at higher level. Figure 1.2 indicates the increase in third-level education.

TABLE 1.1
Age-Specific Participation Rates

	1971	1981	1991
15 yr olds increased from:	71%	87%	99%
17 yr olds increased from:	40%	53%	71%
18 yr olds increased from:	20%	28%	45%
19 yr olds increased from:	11%	16%	29%

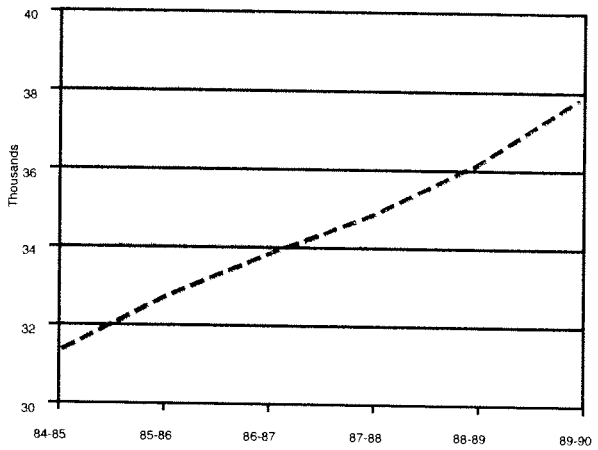
Source: Annual Statistical Reports of Dept. of Education.

Quoted in: D. Hannan (1993).

In addition to the expansion of opportunity, the provision of vocational and technical education has broadened considerably. At second level, most schools offer technical and vocational subjects and options such as pre-employment courses (in the 1970s) and more recently, Vocational, Preparation and Training (VPT) courses, although in each case provision continues to be more extensive in vocational schools. The 10 RTCs and the University of Limerick and Dublin City University (both of which have a pronounced emphasis on technology, industry and commerce) now account for a substantial proportion of new entrants to third level.In some respects, beneficial changes in the structure of the educational system have occurred since the 1960s. However, research throughout

the 1980s has constantly pointed to the continuing inequalities in the educational system and to the inadequate provision of vocational education and training. The dramatic change in participation rates has not been equalled by dramatic changes in levels of educational equality. Irish education continues to be highly inequitable in social class terms (Hannan, 1992). There was little discussion about the precise nature of the inequality which "free" education was meant to address when it was introduced. In terms of increasing the numbers with a certain minimum level of education, it achieved considerable success, but if the intention was to address class differences, it was certainly a blunt instrument (Breen et al, 1990). First, while access was widened, there was considerable variation in the range of subjects available and in the quality of facilities in different schools. In addition, the concentration on "free education" and addressing disadvantage at post-primary level detracted attention for a time from the persistence of disadvantage at primary level. By the time problems are identified at post-primary level, the young person has already had 8 years of education.

FIGURE 1.2
Full-time third-level student numbers 1984/85 to 1989/90



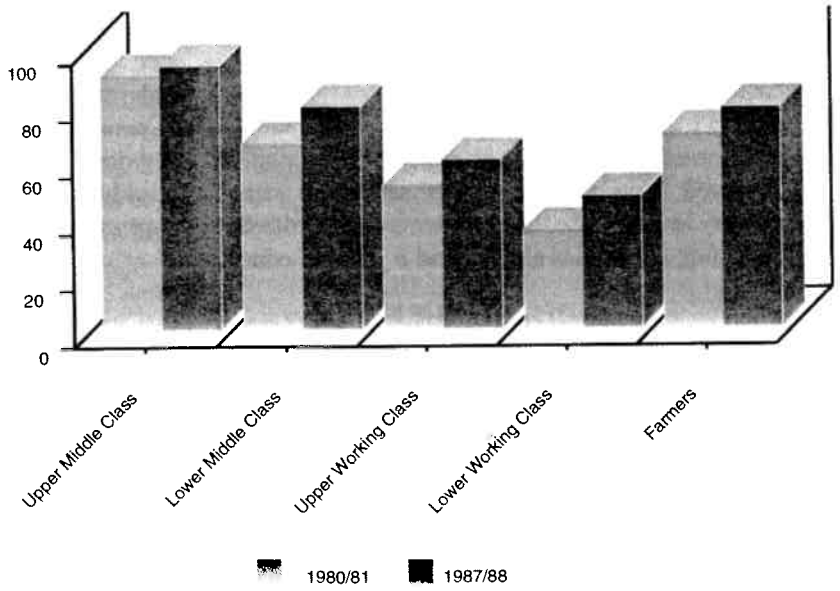
Source: *Higher Education Authority (1990) Report, Accounts and Student Statistics 1989/1990.*

In the long run, "free" education shifted the parameters of educational disadvantage and inequality — it is no longer a question of *access*, it is now a question of *attainment*, and class inequalities in relation to attainment remain (Breen, 1984; Hannan, 1992). Along with increased access to education, there has been increased demand for qualifications

by employers. "Credentialism" is a current focus for those concerned with educational disadvantage.Figure 1.3 illustrates the clear relationship between educational attainment and social class background:

FIGURE 1.3

Proportions of school leavers from each social class background who reached Leaving Certificated Level In 1980/81 and 1987/88

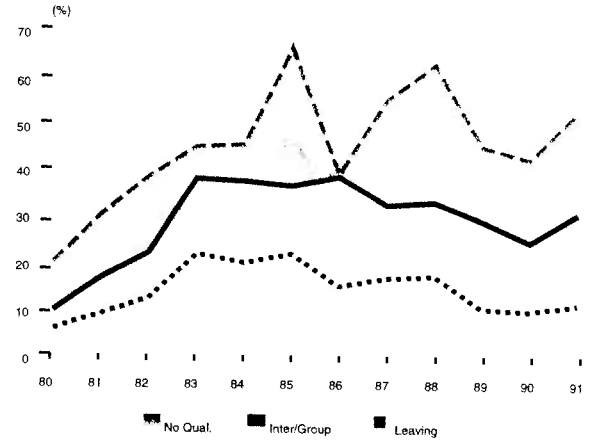


Source: D. Hannan (1993), Paper presented at Co-operation North Conference, *Inequalities in Irish Education: The Southern Experience*, Newcastle, Co. Down, March.

Figure 1.4 illustrates the clear link between educational attainment and the rate of unemployment. The lower the level of qualification the more likely the young person is to be unemployed. The strong links between educational attainment and labour market prospects reflect in part the credentialism referred to earlier: the rationing of limited job opportunities by reference to educational qualifications which are themselves systematically related to social class background. The promotion of labour market opportunities has therefore come to be closely identified with measures to combat educational disadvantage.

FIGURE 1.4

School Leaver Unemployment 1980-1991



Source: J. Sheehan (1992), The Economic Relevance of Irish Education: An Emerging Debate, *The Irish Banking Review*, Autumn.

An additional concern is the finding that educational disadvantage is cumulative through time (Hannan and Shortall, 1991; Breen, 1991). Unless an individual is successful at all stages of the educational system, it penalises at each juncture. Stated simply, following primary school, successful entrance exams are important for entry to, and streaming within second-level schools, a successful junior certificate determines the level at which leaving certificate subjects are taken, and leaving certificate results determine further education options and employment opportunities. The inflexibility of the system is not conducive to second chance education.

In addition to the more visible forms of disadvantage, such as failure and dropping out, there is evidence that there is an increasing number of disadvantaged within the system and continuing to leaving certificate. The question has been raised as to whether schools have kept pace with their changing clientele and whether provision has been sufficiently widened to accommodate the increased variety in educational ability brought about by the higher rates of participation.

The National Council for Curriculum and Assessment's (NCCA) Report *The 1991 Leaving Certificate Examination — A Review of Results*, while acknowledging the high level of confidence the leaving certificate examination enjoys nationally and internationally, expressed some

concern about the number of candidates who failed to achieve basic standards in a reasonable number of subjects, and about the subjects in which high percentages of candidates were awarded very low grades. Almost one-quarter of all leaving certificate students (23%) take all subjects at pass level, and almost half (46%) take two honours subjects or less. Furthermore 14% achieved less than 5 grade Ds, and 12% achieved a bare 5 D's.

TABLE 1.2
Distribution of 1985/86 Leaving Certificate Class and 1986 New Entrants to Higher Education by School Type[2]

School Type	Leaving Certificate Class Enrolments 1985/86		New Entrants to Higher Education 1986		Transfer Rate
	N	%	N	%	%
Fee-Paying Secondary	3,386	6.8	1,526	9.4	45.1
Non-Fee-Paying Secondary	33,225	66.6	11,332	70.2	34.1
Vocational	8,364	16.8	2,015	12.5	24.1
Comprehensive	1,299	2.6	388	2.4	29.9
Community	3,613	7.2	888	5.5	24.6
TOTAL	49,887	100.0	16,149*	100.0	32.4

*In addition to students who attended school outside the state and to those for whom no post-primary school data were available, this table also excludes those students whose last schools was a private non-recognised school.

Source: P. Clancy, (1988), *Who Goes to College?*, HEA.

The extent of low performance in the examination is significant. Secondary school principals regard 1 in 6 of their senior cycle students as low achieving/poorly motivated and consider the leaving certificate as inappropriate for 1 in 4 of their students (Curriculum Awareness Action Group (CAAG), 1990). Research has shown that the young people most dissatisfied with the quality of their education are those who take broad, general pass leaving certificates (Hannan and Shortall, 1991) and the NCCA study confirms that these represent a substantial proportion of the leaving certificate cohort. Is it appropriate to think of

2 These figures, the most recent, are out of date. The HEA are currently updating this study.

these young people as disadvantaged? In many respects they are; they have received an education with which they are dissatisfied, and which provides them with few employment and limited educational opportunities. Nor are school principals completely happy with Vocational Preparation and Training programme alternatives to the Leaving Certificate programme. They suspect that VPT programmes are seen by teachers, parents and students as an admission of failure to come to terms with the higher status Leaving Certificate (CAAG (1990), p.53).

The progression from school type to third-level continues to reflect the different rates of progression to third-level, identified by *Investment in Education*. Vocational schools still have a lower transfer rate, as Table 1.2 indicates. Working class children and boys, in particular, continue to be over-represented in vocational schools and so too are children with numeracy and literacy problems (Breen, 1984).

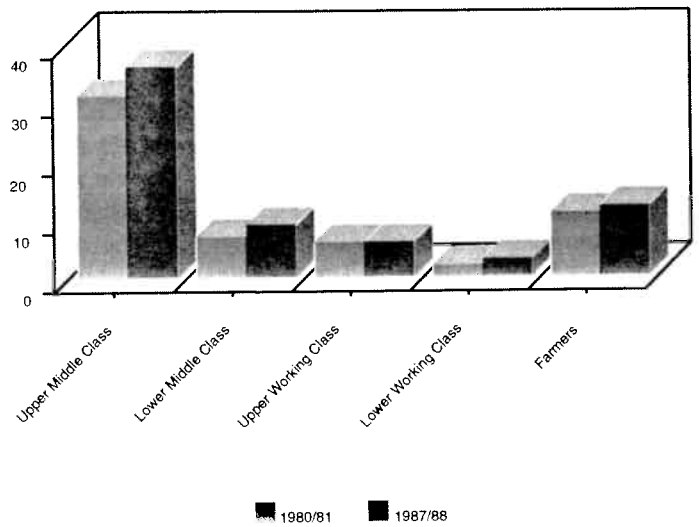
Although there has been substantial expansion in third-level participation, there are still marked social class differences in participation levels, as illustrated in Figure 1.5.

Fifty-five per cent of the new entrants in 1986 came from 5 social groups that represent only 30% of the relevant target population (higher professional, lower professional, employers and managers, salaried employees, intermediate non-manual). It is significant that 24% of new entrants came from 5 social groups that represent 55% of the relevant cohort (other non-manuals, skilled, semi-skilled, unskilled, manual, other agricultural). Farmers were over-represented, providing 21% of the new entrants although the group constitutes only 14% of the appropriate age cohort (Clancy, 1988, p.69). While the pattern of funding is related to socio-economic status, availability of financial assistance has not been sufficient to significantly alter the social class disparities in third-level participation.

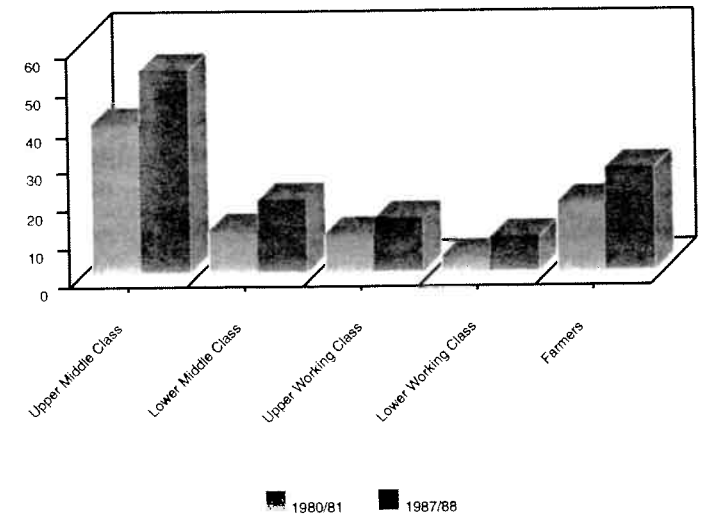
The educational system has continued to be criticised for its inflexibility and over-academic bias. The question has been raised as to whether the secondary school system, by virtue of its structure and subject mix, is directing young people to forms of employment which are declining. It has also been criticised for inducing a sense of dependence and not promoting a sense of self-reliance which would ultimately encourage a higher proportion of young people to become more innovative and make use of their skills independently (Conniffe and Kennedy, 1984 p.237).

FIGURE 1.5
Proportion of School Leavers from each Social Class Background Going on to Third Level

(A) Universities



(B) RTCs and Other Technical/Vocational Colleges



Source: D. Hannan (1993), Paper presented at Co-operation North Conference, *Inequalities in Irish Education: The Southern Experience*, Newcastle, Co. Down, March.

2. THE PRESENT DEBATE

The objectives of educational policy remain equality, efficiency and curricular balance. Research findings and concern about the persistence of educational inequality, inefficiency and imbalance have brought about the current determination to arrive at policy conclusions which will ameliorate these problems. The Council intends this Report to be a contribution to these discussions. There is a very significant contextual difference between the current debate and that of the 1960s. While the concern in the 1960s was to provide the skills and attitudes conducive to the predicted industrialisation and economic expansion, the current debate is conducted in an environment of high unemployment with an emphasis on training and education as a basis for innovation and creative skills. In other words, while education and training policy in the 1960s was structured as a *response* to employment needs arising from economic growth, in the 1990s it is structured as a *contribution* to economic growth through human resource development. The context is different but the objectives remain the same.

The recent OECD report (1991) suggested that the Irish educational system is neither meeting student requirements nor societal needs. The NCCA's data on leaving certificate candidates and Hannan and Shortall's (1991) study confirm the former, while the Industrial Policy Review Group's (1992) conclusions support the latter. The OECD report criticises the *ad hoc* nature of educational policy reform, a criticism Conniffe and Kennedy (1984) also make about manpower policy reform.

The Industrial Policy Review Group (IPRG) argue that Irish second-level education does not place enough emphasis on technical and vocational education. They identify a significant real skills gap between skill levels in firms in Ireland and that of best practice firms in competitor countries. They conclude that the perception of many managers that there is not a skills shortage may *itself* be part of the skills problem facing Irish industry (p.54). The (IPRG) identify skills shortages at various levels and, in particular, an absence of multi-skilling. The IPRG conclude that the skills gap needs to be addressed both by industry and by the educational system. This is stressed too by the Fitzgerald and Keegan (1993) who identify employers' low commitment to training, unwillingness and/or inability to release workers for off-the-job training and the lack of available skills and facilities to provide on-the-job training as major factors leading to the current vocational education and training problems. The ESRI stress too the importance of basic education which enhances subsequent training.

Against the background of experience of past policy and external review, the Green Paper on Education set out a range of proposals for change in the light of emerging needs. It suggested six key aims for policy, although priority status was given to educational equity. The six key aims are:

1. To establish greater equity in education — particularly for those who are disadvantaged socially, economically, physically or mentally.

2. To broaden Irish education — so as to equip students more effectively for life, for work in an enterprise culture, and for citizenship of Europe.

3. To make the best of education resources — by radically devolving administration, introducing the best management practice and strengthening policy-making.

4. To train and develop teachers so as to equip them for a constantly changing environment.

5. To create a system of effective quality assurance.

6. To ensure greater openness and accountability throughout the system, and maximise parent involvement and choice.

3. THE STRUCTURE OF THE REPORT

One of the main assumptions underlying the Green Paper and the IPRG Report, as it underlies much existing activity in the area of human resources development, is that education and training ultimately lead to increased productivity and competitiveness. Key questions which follow from this are: (i) what types of education or training generate aggregate growth; (ii) what institutional or organisational factors limit or enhance the investment in human capital; and (iii) to what extent are the investments in human capital actually employed productively in the economy (Fitzgerald and Keegan, 1993).

This Report first examines, in a comparative context, how differences in physical productivity and value-added are linked to the standards of human capital and training as a means of identifying changes which will be required in education and training policies to achieve competitive international standards and skill levels. It is, of course, difficult to isolate the critical features of an economic system, such as the vocational preparation of workers, that contribute to economic success. However, cross-national comparison has proved a useful basis for a critical appraisal of the functioning

of our system. The role of education and training is considered in the context of the wide range of factors which affect productivity levels, such as technology and management strategy. The fundamental issue addressed is the relationship between human capital and productivity: how, and through what specific mechanisms, does the human capital embodied in education and training, translate into improved productivity. The Council commissioned Dr David Hitchens and Dr J.E. Birnie to prepare a report on this theme and it forms the basis for that section of the report.

In addition to analysing the link between competitiveness and skill levels, the Council was also concerned with the educational basis for skill development, specifically the structure, content and performance of the vocational sub-sector of the educational system. The Council believes that there is much to be learned from a comparative approach to Ireland's vocational education and training system. Such analysis is of particular relevance to policy debates on curricular balance, management policy and the extent and quality of provision. Dr Tom Kellaghan was commissioned by the Council to prepare a paper on this topic, which forms the basis for that section of the report.

The Council was particularly concerned to examine in detail the developments in educational policy since 1966 regarding equality of opportunity and to assess the effectiveness of policy in achieving stated objectives. The Council believes that this stock-taking approach should facilitate the development of more coherent policy strategy proposals. This review of policy on educational disadvantage was prepared by Dr Sally Shortall.

While each of these three topics is of major concern in its own right, the Council believes that they must be considered together, just as they were analysed together in *Investment in Education*: policy must coherently promote skills and competences which advance economic development; the distribution of these skills must represent an equitable response to the needs of the population as a whole; and the institutional arrangements to provide educational and training opportunities must be as efficient and effective as possible. The Council's Report, therefore, is concerned with issues of equity and efficiency and with their full policy implications, irrespective of the functional boundaries which currently apply.

CHAPTER 2

EDUCATION & TRAINING POLICIES AND ECONOMIC PERFORMANCE

1. BACKGROUND

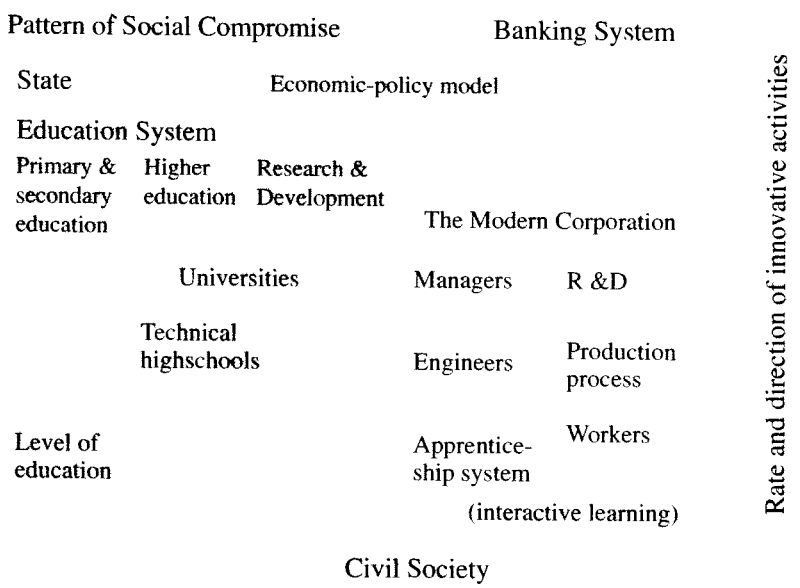
Workforce skills and management — "human capital" — are widely seen as a key determinant of economic performance. The human capital perspective — which treats education and training as an investment and emphasises the direct impact of skill creation on productivity — has been prominent in recent developments in economic theory. Rapid technological and structural change are both increasing the level and altering the nature of skills required in the labour market such that the need for human capital development has been more widely recognised in recent years. Endogenous growth theory has stressed the role of human capital as a key element in providing the research and information base on which technological progress and sustainable productivity can be achieved. Furthermore, OECD Secretariat studies have highlighted human resource development as a factor which enhances labour market flexibility and facilitates structural adjustment.

Human capital issues are also relevant to the analysis of Ireland's long-run development problems. In his Report for the Council, Dr Lars Mjøset emphasised the central role of the national system of innovation, defined as the institutions and economic structures which affect the rate and direction of innovation. The education system is a key component of the national system of innovation, as shown in Figure 2.1.

An example demonstrates how the concept of the national system of innovation can illustrate how education and training policies impact on economic development. In Germany, a very solid apprenticeship system has existed for a long time. It is maintained as something of a collective responsibility of the employers, collaborating with the state-based educational system. Having completed compulsory schooling, young people may establish a contract with a company, receiving a training course under a master craftsperson, attending vocational school one day a week. Household surveys indicate that two-thirds of the workforce had vocational or higher qualifications in Germany, against one-third in the UK. The system has clear-cut career paths, with graded courses, examinations and recognised qualifications for large groups of skilled workers. There is also regular retraining within firms. In contrast, it has been claimed that in the US and the UK, both employer and Government policy has tended to permit or

neglect the development of a larger and larger "periphery" of unskilled and semi-skilled workers, often low paid and insecure, existing round a "core" of skilled or professional secure and relatively highly paid employees. The much less dualistic German system is quite costly for employers, but firms deliberately try to internalise a number of educational functions which, in other countries, only exist outside the factory.

FIGURE 2.1
A Sketch of the National Innovation System



Source: Møjset, p.120.

The role of higher education in strong national systems of innovation is illustrated by the example of Switzerland. Whereas German and British engineers and chemists normally received their training in local colleges and factories, the Swiss in particular moved all over Western Europe for the purpose and returned home to pool their experiences. According to Porter (1990), Swiss firms today have very extensive links to the outside world in this respect:

> "in many of our case studies, including surveying equipment, heating controls, pharmaceuticals, and hearing aids, Swiss companies developed close relationships with foreign research

centres in specific technologies, and in many instances established research subsidiaries in foreign countries. The early establishment of research centres in the United States and the United Kingdom by Swiss pharmaceutical companies, for example, has been vital to their output of innovative new drugs. The adeptness of Swiss companies at sourcing foreign technology, common to a number of nations that have been unusually successful in upgrading industry, seems to stem from a number of factors. The Swiss do not for a moment entertain the possibility that all technology can be developed in Switzerland, given its small size. The high skill level of Swiss scientists and engineers provides a foundation for assimilating foreign technology. Also, language and cultural skills make them particularly able to forge strong relationships abroad."

While the concept of the national system of innovation is one perspective on the economic role of education and training policies, there is general acceptance that economic success in large measure depends on the ability of firms to develop more advanced production processes that meet international requirements. This can occur only if accompanied by corresponding development of workforce and management skills. Even in sectors relatively sheltered from international competition, adoption of new technologies and work practices is important to achieve rapid increases in living standards.

Estimating the quality of labour and quantifying its effects are difficult. However, empirical testing offers support for — or is at least consistent with — the importance of human capital development for economic performance. Growth accounting studies for various countries suggest that improved labour quality due to education contributes up to one-quarter to the rate of growth of national income, with an average contribution of just under one-tenth. High education participation rates — which are often used as proxies for human capital — are typically accompanied by high levels of per capita GDP. While this does not establish causality, a recent study covering 98 countries found that low-income countries tend to catch up with high-income countries if they have high human capital per person in relation to their level of per capita GDP (Barro, 1991).

The influence of education and training attainment on an *individual's* labour-market experience is clearly seen in the much higher likelihood of long-term unemployment for those holding no qualifications. Although those with qualifications now account for a substantial share of the unemployed, they tend to remain without work for a relatively short spell of time, while the core of the long-term unemployed have no formal school qualifications.

Despite the complex ways in which educational attainment interacts with the factors determining employment prospects at the aggregate level, evidence for OECD countries shows a close negative relationship between educational attainment and unemployment rates. In general, those in the labour force with uncompleted upper-secondary education and no vocational training are more likely to be unemployed: in the OECD area, the average unemployment rate for these categories is more than twice that of the categories with a higher level of education.

Recognition of the contribution of education and training to economic development and the relationship with labour market performance has prompted international concern in policy reform. Although the scale and specific content of reforms in the area of human capital development have been strongly influenced by varying economic and institutional contexts, some common features emerge from individual OECD countries' experience. Linking basic skills to international competitiveness, countries have put increasing emphasis on curriculum, assessment and certification. Several countries have introduced national curriculum guidelines while others, which already had a core curriculum for primary education, have moved to include higher levels of schooling. An underlying concern has been the search for institutional arrangements conducive to a larger return from the substantial resources invested.

Most countries are promoting increased private-sector training, both on-and off-the-job, as well as school-to-work transition mechanisms. It is difficult, however, to draw general lessons from individual countries' experience in the area of further education and training, as favourable outcomes have been achieved by completely different systems (in Japan and Germany, for instance). One finding has been that increased spending on training may yield little if not complemented by changes in work practices and management. Also, the conception of training should not be too narrow: in view of the uncertainty surrounding future qualification needs, the emphasis has increasingly been on alternating classroom and workplace training. The State is generally seen to have an active role to play in ensuring that skill requirements beyond those that are immediately relevant to the workplace are met. Setting agreed standards is a way to enhance transferability of skills. The Government may also serve a co-ordinating function by setting up sector-specific training programmes. While employers' concern about staff turnover implies a preference for firm-specific training, their short-term orientation also means a focus on efficiency. Thus, there is scope for both greater industry involvement in decision-making and cost-sharing. Some countries have introduced compulsory training levies but financing models differ widely.

2. EDUCATION & TRAINING POLICIES AND IRISH PERFORMANCE

This section considers the process by which policies designed to enhance economic development and employment performance might be identified. First, it is necessary to go beyond the assumption (or assertion) of a general link between education and training and economic development.[3] Recent commentary and research cautions against general arguments that "more" education and training is correlated with improved economic performance. For example, the time series and cross section evidence on the relationship between aggregate measures of education (participation rates, educational expenditure as % of GNP) and indicators of economic performance is ambiguous and difficult to interpret. To conceptualise this education and training relationship and to proceed to *policy* conclusions it is therefore necessary to identify, in the Irish context, the *precise* mechanisms through which education and training affect the economy at large.[4]

Second, there has been little *comparative* policy analysis of the Irish education and training system. In particular, there is little evidence of, or discussion about, its *comparative performance*. The Council's Report on comparative institutional aspects of the Irish economy notes that Ireland's "national system of innovation" is weak — this system includes the education/training system and its linkages with industrial and scientific innovation. Most comparative quantitative data, or qualitative observations' about the Irish education and training system focus on aspects of either *size* or *inputs* such as the overall participation rate, the ratio of school teachers to pupils, average class size, or public expenditure (on education and training) relative to GNP. Such measures say little about the *output* of education systems in terms of, for example, actual levels of competence in technical, mathematical, linguistic or other skills. These precise measures are more relevant to an analysis of countries' education and training systems in two ways: they focus attention on the implied or explicit *objectives* of education and training and on the effectiveness of education and training resources in achieving these objectives; they highlight very specific characteristics of countries' education and training arrangements which may be correlated with particular features of countries' economies (thus, the undoubtedly superior

3 See OECD, *Structural Adjustment* and *Economic Performance* (Chapter 7, Human Capital), Paris, 1987b.

4 It can be taken as given that at an individual level enhanced education is associated with increments of future earnings. This micro-economic feature of education is the most widely acknowledged economic aspect of education. At a macro level the role of education and training in ameliorating skill shortages -of a specific or general nature — is taken as a key economic function.

apprenticeship systems of Switzerland, Germany and Austria is related to these countries' comparative industrial strength).

Underpinning the comparative search for education and training — economy links is a growing scepticism of commonly used criteria of educational performance (relative quality of a countries' graduates, average pupil teacher ratio) and an increasing recognition that the *attainment levels of the lower-to-middle ability stratum*, i.e. *the generality of pupils* is the key criterion. In the US, for instance, despite the huge international demand for its high quality post-graduate education and the acknowledged high quality of the upper reaches of its private education, there is now an acute awareness of the relationship between America's declining economic hegemony and its inferior education and training regime. This extended quotation from the US Department of Labour's *Investing in People* Report aptly summarises the point:

> The educational task before our nation is enormous. Vast numbers of our students fail to meet the educational requirements of the workplace or match the academic accomplishments of their counterparts abroad. Employers report that many young people's skills are insufficient to qualify them for entry-level jobs. Even taking into account institutional and cultural differences, the consistent and significant underachievement of American students, relative to their counterparts in other countries, is of grave concern. US students lag behind in science and mathematics at every grade level and at every stratum of ability and background. Compared with students in the developed countries of Western Europe and the Pacific rim, the average mathematics attainment of students in our middle and secondary schools places them in the bottom quartile. Worse perhaps, the top 5 percent of college-bound high school seniors in the US have scores in advanced mathematics comparable to the average score of all Japanese seniors.

Note that this expressed official concern about the US's relative educational effectiveness is couched in terms of the *observed* and *measured* attainments (outputs) of the generality of students and school leavers — not in terms of years of schooling, or particular ratios of teachers per pupil, for example.

Third, *comparative institutional* analyses of education/training systems can highlight the linkages between education and training and the economy thus identifying possible institutional and policy options. For example, a number of countries have developed highly successful vocational elements in their mainstream education systems and linked its enhanced vocational sector with

increased productivity and improved economic performance (Worswick, 1985). In France, for instance, this vocationalism was deliberately and centrally planned and implemented through the establishment of vocational (Lycée d'enseignement professionel) institutions for 14-18 year olds within the national education system. Germany, on the other hand, has improved its already historically superior training regime through the development of workplace training in conjunction with part-time off-the-job education.

Other countries, notably Britain and the USA, have disimproved in their relative education performance both on general educational aspects and in relation to vocational skill development. Recent comparative research points to institutional characteristics in the widest sense as the source of these variations in national educational and vocational effectiveness. These characteristics would include: the mix of schools in the education system; the access to, financing of, and certification of apprenticeships; the relative social "statuses" accorded to vocational vis-à-vis academic education; the nature and organisation of employer-union co-operation in relation to education and training; the role of the State and in particular the presence/absence of a strong, central strategy in education and training.

Given the diversity of international experience the Council believes that it is valuable to place current and prospective Irish arrangements in an international context and to derive policy lessons for the future.

Fourth, any policy in relation to education and training should have as a starting point a detailed *analysis of the education/training profile of the labour force* as a whole. In recent years various studies have provided data at varying levels of detail on the education and training of the *inflow* into the labour force (Sexton *et al* 1988). More recently, 1986 Census data on education has become available for analysis, and recent Labour Force Surveys have included questions on education and training. Policy formulation in the education and training area requires a thorough analysis of these available data and, furthermore, additional primary research on education and training, representative of the labour force as a whole. There is a clear need to examine the experience of the labour force *stock* (and not just recent cohorts or flows), as the effect of education and training on the economy as a whole is mediated through the *entire* labour force.

Specifically, the following questions need to be addressed:

» The educational qualifications and experience of the labour force;

» The extent of "post school" training undertaken by employers;

» The experience of employers and employees in relation to further education and training on criteria such as cost, access, quality and impact on employment and earnings;

» Employee perceptions of their current and future education and training needs and their views on the roles of training agencies, employers, educational authorities, etc.

(i) **Education and Training Research**

Applied policy analysis in education has been traditionally directed at three general areas. First, since education is in most countries largely in the public sector, the conventional equity/efficiency principles have loomed large in the analysis of the role of the State in education and, in particular, in the rationale for State funding of education. Much analytical work has concentrated on theoretical justifications for, and the costs/benefits of, alternative modes of financing equal access to third-level education.[5] This work by economists has been paralleled by controversial research in sociology and social psychology which has attempted to document the relative importance of heredity, environment, socio-economic and educational factors in determining inequalities in educational attainment.

Second, a large body of literature has been generated on the micro-economics of education as an investment. The concern here is with quantifying the rate of return on education and training experienced by individuals in the labour market. The importance of this research was given an impetus by international policy interest in labour market discrimination — first racial, and more recently, gender discrimination. Rate of return methodology can be applied in such a way as to identify the significance of discrimination vis-à-vis other variables such as education, in explaining variations in labour market performance such as earnings and employment experience.[6] The rate of return issue is of course related to the public finance issues in that the analytical arguments about the State's role in education has been informed, in part, by evidence on private and social rates of return and by a discussion about divergence between private and social returns. Third, the most long standing element in education and training analysis has been manpower

5 The key Irish work in this area is A. Dale Tussing, *Irish Educational Expenditures: Past, Present, Future*. ESRI Paper No. 92, 1978, Dublin and A.C. Barlow, *The Financing of Third-Level Education*, ESRI Paper No. 106, 1981, Dublin.

6 An Irish sample in this vein is: Frances Ruane and Elma Dobson, "The Academic Salary Differentials. Some Evidence from an Irish Survey", *The Economic and Social Review*, vol. 21, no. 2, 1990.

planning. In earlier decades, continuously high economic growth and potential labour shortages led policy-makers and analysts to engage in forecasting and long-term manpower planning exercises. The analytical significance of this research went into decline with increasing recognition of its methodological difficulties, uncertain results, and, more recently, the disappearance of labour shortages in many advanced economies. Nevertheless, a recurring issue in both sectoral and macro-economic policy discussion is the impact of specific or general skill shortages on the economy (skill shortages have been linked, for example, to wage cost inflation and under-utilisation of capital stock). In an Irish context perhaps the nearest reflection of this approach was the OECD's *Investment in Education* Report which set out a general role for the education system in terms of the labour market, and skill, and social requirements of Ireland's then rapidly industrialising economy (Department of Education, 1966).

A new, and more institutionally focused, analysis of education and training systems has emerged in the last decade in response to a number of well documented social and economic changes. These changes — to which the Council has already referred in its earlier work on Manpower Policy[7] — include:

» a rapid rate of technological change;

» a growing internationalisation of the world economy and an intensification of international economic competition;

» a drastic deterioration in the labour market in many economies and a consequent growth in training and retraining programmes.[8]

The 'new' analysis, which will be more fully illustrated in the next sub-section, is distinguished by a number of features. First, it documents the intricate relationship between the education and skill levels and various factors which affect the *demand* in the economy for education and skill in the workforce viz. patterns of work organisation, workplace industrial relations, systems of social and occupational status, wage differentials between skilled and unskilled employees. Second, it embodies more precise

7 NESC, *Manpower Policy in Ireland*, Report No. 82. Dublin, 1985.

8 The proliferation of labour market programmes has, in turn, spawned a whole school of evaluation studies directed at quantifying the employment, income and other effects of these programmes. An Irish example of this approach is R. Breen, *Education, Employment and Training in the Youth Labour Market*, ESRI Paper No. 152, 1991, Dublin.

and standardised measures of "human capital". For example, in this analysis aggregate measures of education and training in the economy are avoided in favour of specific descriptions of (for example) actual curricula in key subjects, pass rates and average outcomes in examinations, comparisons across countries of levels of "difficulty" in (for instance) maths or technical subjects in apparently comparable levels of education. Third, this approach is emphatically comparative: it starts from *a prima facie* relationship between education and training experience and policies, on the one hand, and national and sectoral economic performance, on the other.

3. THE 'NEW' INSTITUTIONAL APPROACH OUTLINED

The institutional critique is exemplified in the now widely known analysis of Britain's relative decline in manufacturing industry and the role of Britain's education and training in that decline. In their authoritative survey, which is summarily recounted here, Finegold and Soskice (1988), refer to "The Failure of Training in Britain....".[9] Finegold and Soskice start from an insistence *not* on the independent effect of education and training on productivity but on "the two way nature of the relationship between education and training and the economy". They argue that:

> Britain's failure to educate and train its workforce to the same levels as its international competitors has been both a product and a cause of the nation's poor relative economic performance... The best way to visualise this argument is to see Britain as trapped in a *low-skills equilibrium*, in which the majority of enterprises staffed by poorly trained managers and workers produce low quality goods and services. The term equilibrium is used to connote a self-reinforcing network of societal and state institutions which interact to stifle the demand for improvements in skill levels (emphasis added).

Before summarising the low-skills equilibrium argument and sketching its relevance to Ireland it is useful to illustrate the UK's failure in education and training. Britain is the only one of the major industrial nations in which a *majority* of students leave full-time education or training at age 16. Furthermore, the educational attainment of British students is markedly inferior in many respects: comparisons of maths test results for German and British students show that the attainments of the lower half of the German pupils was *higher* than that of the average of *all* British pupils; English 14

9 David Finegold and David Soskice, "The Failure of Training in Britain: Analysis and Description", *Oxford Review of Economic Policy*, vol. 4, no. 3, *Autumn 1988*.

year olds have lower attainments in science subjects than their counterparts in *all* 17 countries included in a recent study. A review of international educational achievement tests among 13 year olds (1982 data) found that almost 80% of Japanese children scored higher than the *average* English pupil (these results are *not* explicable in terms of educational *resources* such as staff/pupil ratios, or educational expenditure per pupil, or expenditure on education as a proportion of GNP). English school leavers for the most part commence their employment with significantly lower attainments than their counterparts elsewhere. Moreover, this is *not* compensated for by employer based training as UK employers and employees undertake *less* training than their peers internationally (both absolutely and proportionately).

What then is the low skills equilibrium which results in a limited demand for education and training? Finegold and Soskice, as quoted earlier, ascribe this to "a self reinforcing network of societal and state institutions", which consists in their analysis of:

(i) a post war *political* consensus in favour of a gradual expansion of general and academic education and of delegation of training largely to employers;

(ii) An inappropriate *policy making structure* characterised by a weak central bureaucracy and decentralisation of power throughout the educational and training systems;

(iii) An *attenuated role for the vocational element* in the education and training system as a whole due to the lower social status accorded to "non-academic" education, the domination of the central bureaucracies by those with no background in, or empathy with, vocational education, the equation of training with apprenticeships leading to rigidities in overall training provisions (access to apprenticeships fixed "time serving" procedures, etc.)

(iv) A range of inter-related aspects of the UK's *industrial and economic structure* which in combination diminish both the demand for and supply of education and training; these include (very summarily):[10] comparatively weak management with an under emphasis on technical

10 The more recent picture in relation to the UK is a good deal more complicated. From the 1970s to the mid-1980s macroeconomic and public expenditure and education policies there *worsened* the underlying tendencies. Since then, however, specific initiatives in training and further education have been adopted which — very briefly — have increased the number of young trainees in short-term training but which have by no means confronted the major institutional issues.

skills and production and an over-emphasis on accounting — the latter exacerbated by a short-term perspective on profit maximisation and enhanced shareholder value;

a lack of cohesion and central control in both the employer and employee organisations which leave them without effective incentives or sanctions in relation to education/training;

a strong concentration of British industry on *standardised price elastic products* and a limited presence in, and poorer than average trade performance in' skill and innovation intensive products — these features being recently exacerbated by a trend towards sub-contracting of skilled maintenance work and the deskilling of work by new technologies:

patterns of authority, work organisation, recruitment and career structure which are inimical to an emphasis on long-term skill development.

This necessarily brief survey of the critique of education and training, *in the UK* is given to indicate the range of issues which may affect the nature and scale of education and training in any society. It is especially important to note two aspects of this institutional approach to training. First, the inter-relatedness of the various elements: "each element" is "part of a historically evolved institutional structure" (Finegold and Soskice, p.30). Second, the two way nature of the causation: a "vicious circle" of low productivity weak education and training systems low productivity is underpinned and reinforced by an inter-locking series of institutions and practices.

Does this institutional critique of education and training apply to Ireland? The Council believes that it would be facile to simply transplant the specifics of the above "low skill equilibrium" to Irish conditions. However, some of its elements do have a telling parallel in a review of past policy and performance in Ireland. Moreover, an analysis of the industrial and sectoral structure of the Irish economy would suggest how this structure interacts with Irish institutions to produce an Irish variant of the low skills equilibrium. The perspective can be applied to current Irish conditions to counter the danger of over simplistic approaches to education and training policy. In particular, this low skills equilibrium analysis would suggest that future education and training policy and initiatives should be *strategic*, i.e., related to particular sectors and sub-sectors and to the specific role of training as *one element* in long-term development and competitiveness strategies.

(i) **General Issues about Countries' Education and Training Systems**

Study of, for example 'the French and German education and training regimes have indicated their generally more successful record in relation to skill development and vocational training. However, these features are set in wider educational contexts which merit some description here if the implications for Irish policy are to be discerned.

In the German case, the system is selective in that school types (three main types, *Gymnasium, Realschule, and Hauptschulabschluss* accounting for 92% of school leavers) cater to different ability and aptitude systems (Prais and Wagner, 1985; Prais, 1985). At the top the Gymnasium caters to pre-University academic pupils, although a sub type (*Fachoberschulen*) is a special higher *technical* school which permits entry to the well known *Technische Hochschulen* (Technical Universities). This selectivity 'however' is combined with high attainment levels and examination pass rates at the *Realschule* and *Hauptschule* levels. Furthermore, when subject comparisons and curricula are compared in Britain and Germany, attainment levels in languages, science and maths subjects are higher (for example, comparing the *Realschule* qualifications with O levels for the UK and *Hauptschulabschluss* qualifications with UK GCSE pass examination levels). The explicit retention of different types of school contrasts with the recurrent attempts in the UK to establish and propagate a preferable type of school — comprehensive, mixed ability schools.

The impact of the education and training systems is best grasped if some simple contrasts are drawn between the education and training regime for those in the lower attainment streams. German pupils in the lower *Hauptschule* schools have a higher overall certification rate than their secondary modern UK counterparts, and more rigorous standards in terms of subject choice, and certification requirements, and higher measured attainments in technical and maths subjects.

A background contributory factor in the superior German apprenticeship system is the quality of general second-level education. Entrants to apprenticeships will have better and broader educational qualifications (from either *Realschulen* or *Hauptschulen*) than UK apprentices. The improved quality of this intake is then compounded by a more institutionalised commitment by employers and Trade Unions to training, and by wide (and, in the 1980s, rising) earnings differentials between unskilled and skilled workers. In the higher education and training system in Germany, qualified craftspeople are not necessarily then finished training. The Meister (or Master Craftsperson) qualification, sought by tradespeople and endorsed by employers,

requires attendance at perhaps a specialised *Technische Hochschulen*. The vocational training route in Germany, in short, may lead ultimately to the higher echelons of the educational system.

In the French case the common denominator is the successful development of the vocational element in the second level of the education system (Steedman, 1990; D'Irbaine, 1985). Britain and France in the late 1960s both had low levels of vocational qualifications. However, they pursued contrasting policies and obtained contrasting outcomes. The French in the first instance linked long-term national plans for skill development to overall national development plans. Quantified targets were set out in relation to the desired proportion of the workforce to be qualified.

In France, the quantified targets were pursued by means of specific legislative and institutional measures. These included:

(a) Development of new vocational qualifications;[11]

(b) Establishment of specific vocational institutions at second and third level;

(c) Deliberate control on access to the elite academic third-level institutions;

(d) Active involvement of employers in the financing, design and certification of qualifications.

This centrally directed initiative based in the mainstream schools system contrasted with the British policy of relying largely on work based training with responsibility devolved through sector-based "Industrial Training Board" type institutions. Data on skills levels in the respective work forces show that the French level of skills improved dramatically:

> "Policies of setting educational goals in terms of proportions qualified to different levels with strong emphasis on the upgrading of skills have served France well in the period 1960 — 1988 — to the extent that from a position of relative

11 There is now a tiered system of nationally recognised vocational qualifications in France. There are:
Level V (Lower): Certificate d'Aptitude Professionnelle Brevet d'Études du Premier.
Level IV (Intermediate): Brevet de Technicien, Technician A Level.
Level III (Higher): Brevet de Technicien Superiére Diploma Universitaire de Technologie.

disadvantage France has now overtaken Britain ...." (Steedman, 1988).

By 1988 France had higher proportions of the workforce with vocational qualifications — 40% compared with 26% in the UK.[12] The comparison is sustained if supervisors and shop floor workers, for instance, are analysed separately, and if a wide range of individual sectors are considered. It is important also to note that historically the French second-level system was shaped by the elite, academic third-level institutions. A specific part of recent French policy was to combine expansion of the vocational system with specific controls on the access to the academic elite institutions. In this way the French system has significantly improved the educational and economic opportunities of the lower to middle educational population despite "the handicap of an elitist academic tradition" (Steedman, 1990).

As with the earlier critique of British education and training policy and practice it is important not to assume that specific aspects of these countries' institutions can be transplanted into Ireland. However, the Council considered that a number of key issues about education and training in Ireland merit comparative examination in the light of the above.

(ii) Is the Institutional Approach Too Narrow?

It has sometimes been suggested that analysis of education and training policy of this type is unduly economic and productionist in its orientation, implying a very instrumental and vocational view of the purpose of education. To raise this question is, perhaps, to assume that vocational and general education are mutually exclusive. The Council is satisfied that this is neither logically nor empirically the case. The instances in other countries of superior vocational education were characterised by two important features (among others):

(a) Effective vocational training systems with good employment and production records are built on, and require, good *general* educational foundations, and;

12 It is difficult to find an exactly comparable figure for Ireland. If the figures for persons 15-24 who have left full time education are taken, then in 1982, 22% had vocational qualifications. This estimate refers to "leavers" with Group Certs *completed* and Group Certs *incomplete*. The figure is lower than that for the UK or France. See Table 3.1, Sexton, Whelan and Williams, 1988.

(b) The countries with apparently superior vocational training have *broad* vocational training with significant general educational requirements — the general and vocational are inter-related (the authors of one study observed vocational classes in practise in France and remarked on the high quality of humanities classes — students completing essays on, and discussing the novels of Hugo and poetry of Baudelaire!).

A related question is whether the perspective neglects the issue of access to education and equality of opportunity in favour of a narrow focus on improving skills. What the institutional focus does is to analyse critically the adequacy of education and training systems as they effect the *lower to middle range of attainment* students. Indirectly, but quite emphatically, this focus is on the skill and employment needs of the majority of pupils, especially those from lower socio-economic groups. In the Irish context, there are serious problems affecting the education and labour market experience of school leavers, in particular those from lower socio-economic groups. The Council believes that it is as important from an equity perspective, to analyse how the mainstream system affects them as to examine how best to increase their participation in the higher levels of the educational system.

(1) A comparative analysis of the link between training and productivity in Irish/Dutch/Danish industrial companies;

(2) A comparative analysis of the Irish vocational education and training system with the systems in The Netherlands and Denmark;

(3) A detailed examination of the developments in educational policy since 1966 regarding equality of opportunity and an assessment of the effectiveness of policies in attaining stated policy objectives.

4. THE COUNCIL'S ANALYSIS: COMPARISONS WITH DENMARK AND THE NETHERLANDS

Against the background of the foregoing review of approaches to analysing the contribution of education and training policies to growth and employment, the Council decided to undertake its own analysis of aspects of the Irish system. The Council believes that the comparative nature of the study is important, given the lack of comparative analysis of the Irish education and training system. The Netherlands and Denmark were chosen as the basis of the comparison because they have some structural similarities to Ireland (size, EC membership, presence in certain sectors) while having a

generally superior economic performance. Furthermore, both have vocational education and training systems which are different to Ireland's and which also differ from each other.

TABLE 2.1
Total Population 1990 (millions)

Ireland	3.503
Denmark	5.141
The Netherlands	14.951

Source: OECD 1993.

Both Denmark and The Netherlands have relatively successful economies even though both have experienced rising unemployment in recent years. Because they also have relatively small populations compared to the major European Community (EC) countries, comparisons between their economies and the Irish economy are instructive. Denmark may be of particular interest for a number of reasons. First, with just over 5 million people, it is closer in population size to Ireland.

Second, neither Ireland nor Denmark is characterised by substantial reserves of national resources: the most important resource in both countries is its workforce. Third, Ireland is now following the transition which Denmark made over the last four decades from a heavily agricultural economy. It is of particular interest that the development of the country to its present state as an industrialised and service community has been attributed to its well-functioning and flexible education system (Denmark, Ministry of Education and Research/Ministry of Labour, 1992, p.2).

While employment in most OECD countries stopped growing or even declined in 1992, it continued to grow in The Netherlands for the eighth year in a row. However, the high proportion of part-time jobs in new employment means that growth measured in full-time equivalents is only half of that measured in persons. The unemployment rate of 6.1% in mid-1992 is the lowest since the early 1980s and below both the EC and OECD averages. The low rate of unemployment in The Netherlands must, however, be tempered by the high number of people receiving disability benefit, widely believed to contain a "hidden unemployment" component. The Netherlands has the highest proportion of population receiving disability benefits in the OECD and the dependency ratio is also one of the highest, with 1 employed person supporting almost 1 person on social benefits.

While economic growth has been sluggish in Denmark since early 1991, it was still stronger than other OECD countries, with a resulting lower rise in unemployment. The main challenge to Danish economic policy is to reduce their persistent high level of unemployment. In 1992 1 in 5 workers was estimated to receive some kind of public support linked to unemployment. Amongst OECD member countries, Denmark spends most on support to the unemployed (5.7% of GDP, followed by Ireland with 4.3%).

The comparison with Denmark and The Netherlands is two-fold: the next chapter contains an account of the analysis by Dr David Hitchens and Dr E.J. Birnie of the links between education and training policies and productivity and economic performance. Chapter 4 contains an overview of the analysis by Dr Tom Kellaghan of the comparison of vocational education and training systems in the three countries.

CHAPTER 3

PRODUCTIVITY AND ECONOMIC PERFORMANCE

1. INTRODUCTION

The growth performance of the Irish economy has been quite strong in recent years, with growth rates significantly higher than the European average. However, this recent, relatively strong performance contrasts with the long-run pattern. The fact that other small open economies in Europe have, over the long run, experienced higher levels of economic growth and associated economic achievements, notably low levels of unemployment, led the Council to commission a study to examine the institutional background to this economic divergence.

In a report to the Council[13] Dr. Lars Mjøset stated that Ireland's development experience since the industrial revolution can be outlined in broad terms as a sequence of vicious circles, contrasted with the virtuous circles of a number of small countries which he had examined. The interaction of a number of structural features of the Irish economy and society, notably a weak national system of innovation, was the dynamic underlying the long-run underdevelopment.

This pattern of cumulative divergence has been reversed over more recent decades. Over the past 30 years, Ireland's long-run rate of economic growth (3.2% per annum) has been only slightly below both the EC (3.4% p.a.) and OECD (3.6% p.a.) averages. Ireland's rate of employment growth (0.3% p.a.) has been in line with that of other late-developing European countries (e.g., Spain and Greece) while being slightly below the average rate of employment growth for the EC as a whole (0.4% p.a.). Viewed from the perspective of a late-developing, peripheral economy, Ireland's record of output growth appears somewhat less satisfactory than the global figures might suggest, and has undoubtedly contributed to our relatively poor employment performance. Despite this, it remains the case that the gap between Ireland and the high employment-growth countries *primarily* reflects differences in the employment-intensity of growth, with differences in output growth rates playing a secondary role.

The relatively large size of Ireland's agricultural sector meant that reductions in agricultural employment had a disproportionate impact on Ireland's

13 NESC Report No. 93, *The Irish Economy in a Comparative Institutional Perspective.*

overall output/employment relationship. In effect, Ireland was obliged to achieve above-average employment returns from growth in its non-agricultural sectors in order to compensate for the impact of falling agricultural employment. By the 1980s, agriculture's influence on aggregate employment intensity in Ireland had declined (although it remained more important than in other countries) and the role of *manufacturing industry* in determining output/employment relationships in the economy had become more critical. During the 1980s, the proportion of growth coming from the relatively low labour-intensity manufacturing sector was significantly higher in Ireland than in other countries. In addition, the rate of productivity growth within Irish manufacturing in the 1980s was substantially above that of any other OECD country. Both of these factors served to reduce the employment impact of Irish economic growth relative to other countries in the 1980s.

The principal characteristics which distinguish recent Irish economic growth from that of other western economies are (i) the very high proportion of growth accounted for by the manufacturing sector, (ii) the exceptionally rapid rates of productivity growth recorded in that sector, and (iii) the unusually severe contraction in the non-market services sector in Ireland during the second half of the 1980s. The first two of these characteristics are significantly overstated due to the effects of transfer pricing. Adjusting the data to control for these effects shows, however, that the substantive conclusions arrived at are exaggerated, but not invalidated, by this phenomenon. In particular, it is clear that, even without transfer pricing, the rate of growth of Irish manufacturing output and productivity remains high relative to other countries, and the share of manufacturing industry in overall output growth continues to exceed that of most other western economies.

The relatively fast rate of growth in Irish labour productivity has been reflected in the closing of the productivity "gap", as Ireland catches up with the levels of productivity achieved in more developed economies. Average productivity for the manufacturing sector as a whole rose from 71% of the EC average in 1980 to 123% of average in 1988. What is of more concern is to consider differences in *sectoral* productivity trends, focusing in particular on the non-high-tech sectors.

In 7 of 14 sectors examined in a recent report,[14] the Council found that the gap between Ireland and the EC narrowed over the period 1980-1988, but in a further 6 sectors the gap has widened, pointing to relatively slow rates of productivity growth in Ireland.

14 NESC Report No. 94, *The Association between Economic Growth and Employment Growth in Ireland.*

The existence of an exceptionally wide productivity differential between high-tech and low-tech industry in Ireland, and the fact that Ireland experienced significantly above-average change in the structure of its manufacturing sector during the 1980s, testify to the "dual" nature of Ireland's industrial growth. High-tech industry in Ireland is dominated by overseas-owned companies, which accounted for 96.5% of net output and 84.6% of employment in this segment in 1989. Productivity levels in these foreign companies are *high* by international standards reflecting, among other things, the fact that they are concentrated in relatively fast-growing areas of high-tech industry and the fact that they represent in the main the more successful elements of US and international industry. By contrast, the low-tech sectors of Irish industry derive most of their characteristics from the *indigenous* industrial base. Irish-owned industry is heavily concentrated in this segment, with 76% of its net output and a similar proportion of its employment classified as low-tech. Productivity levels among Irish-owned firms are *low* by international standards, thus accentuating the gap in productivity levels between high-tech and low-tech industry. These underlying features of Ireland's industrial structure provide part of the explanation for the relatively large productivity differential between high-tech and low-tech industry in Ireland. The differential has been further increased by the impact of transfer pricing.

In the light of this experience, the Council considered that an important focus for analysis of the links between education and training policies and economic performance would be their contribution to increasing productivity, profitability and employment in the indigenous sector. The Council was conscious of the extent to which the availability of a skilled workforce was a significant factor in attracting overseas investment in high-tech industry. The contribution which education and training policies might make to addressing structural weaknesses in the *indigenous* sector is a matter of considerable interest. The Council therefore commissioned **Dr David Hitchens** and **Mr J.E. Birnie** of **Queen's University, Belfast** to prepare a report on this aspect of economic performance. An abridged version of their report is set out in the following sections of this Chapter.

2. THE LINK BETWEEN PRODUCTIVITY AND LIVING STANDARDS[15]

As the Report for the Council by Dr Lars Mjøset demonstrated, over the long run the relative performance of the Irish economy in the twentieth century has shown divergence rather than convergence when compared to most other western economies. On the basis of large scale data samples, Barro and Sala-i-Martin (1991) identify a "normal" rate of international and inter-regional convergence within the capitalist world, by which standard also the Irish economy is found wanting. It is also worth bearing in mind that the estimate of relative performance depends upon the measure chosen. Comparisons couched in terms of GDP per capita are most favourable from the point of view of Ireland, given that in recent years GNP has been about one-tenth lower than GDP (this is a result of interest repayments on foreign debt and the outflows of profits from international companies).

The performance of NI and especially the Republic is even less impressive when considered in terms of total output. The comparative growth performance of the Irish economies in per capita terms was boosted by the fact that the number of heads was increasing relatively slowly (i.e., the high rate of emigration from Ireland enabled the Irish economies to attain higher growth of per capita income despite relatively low rates of increase of total product). Given this, the comparison of levels of GDP per capita may present an unduly favourable impression of the relative performance of the Irish economies in raising living standards for the population, inclusive of those who were in effect "exported" to other countries (Lee, 1990).

Table 3.1 shows that the comparatively low level of living standards in Ireland is paralleled by the relatively low level of productivity achieved by the Irish economy (i.e., GDP per person in employment).

In 5 out of the 11 sectors shown, Ireland has a lower level of output per head than the UK (in 2 further sectors, agriculture, etc., and building and construction, the result is ambiguous and depends on the method of comparison, i.e., whether exchange rates or purchasing power parities (PPPs) are used). Where Ireland's comparative performance falls short of that in the UK it does so by a wide margin, e.g., in fuel etc., retail etc., transport etc. and services of credit etc. On the other hand, in 4 sectors, manufacturing, building etc., lodgings and catering etc., and other market services, productivity levels in Ireland exceed those in the UK when comparisons are based on PPPs

15 The following sections of Chapter 3 are an edited version of the paper commissioned from Dr Hitchens and Mr Birnie. Copies of the full paper are available from the Council Secretariat.

(which might be expected to give a more reliable indication of relative price differences, and hence the volume of output, than the market exchange rate).

TABLE 3.1
Ireland and NI Comparative Sectoral[a] Productivity, 1985
Ireland/UK: GVA per person engaged* (Market Prices)
NI/UK: GDP per employee* (Factor Cost)

	Ireland/UK	Ireland/UK	NI/UK
	Exchange Rate[b]	PPPc	
	(UK=100)	(UK=100)	(UK=100)
Agriculture, Fishing & Forestry	105	87	62
Fuel & Power	39	29	50
Manufacturing	119	110	81
Building & Construction	83	110	78
Recovery & Repair, Wholesale & Retail Services	88	76	}
Lodgings & Catering Services	137	137	}106
Inland Transport, Maritime & Air, Auxiliary Transport Services	78	51	}
Communication Services	60	80	}99
Services of Credit & Insurance Institutions	42	43	99
Other Market Services	149	163	}
Non-Market Services	107	99	}102
GDP Market Prices[d]	93	89	86

Note: a: Sectors defined as in SOEC (1991) except manufacturing and fuel and power which were defined using the pre-NACE classification of activities so as to maintain comparability with the definition of manufacturing (i.e., exclusive of mining and quarrying, but including mineral oil refining) used in the Census of Production comparisons presented later in this Chapter. Despite a common industrial classification the Irish comparative productivity ratio obtained here from the use of national accounts data is still markedly lower that shown in the later Census of Production based comparisons. The reasons for this discrepancy require further investigation (Birnie, 1993).)

b: Using an exchange rate of 1 £IR = 0.8235 £ sterling.

c: Where a PPPs using both Irish and the UK output weights were available the geometric average was taken. Source of PPPs; Commission of the European Communities (1988). For agriculture, etc., a weighted average of farm product farm-gate prices was used (this was estimated in Birnie (forthcoming)).

d: Value added tax could not be allocated on a sectoral basis but the sectoral incidence of other indirect taxes is included. The aggregate of VAT payments is included in total GDP at market prices. That part of the income of the banking system which derives from net interest receipts to financial intermediaries (i.e., the excess of interest paid by borrowers over that received by depositors) is not treated as a contribution to GDP.

* The Ireland/UK comparison is based on output per person engaged in the industry (i.e., total employment inclusive of the self-employed with comparable data sources, e.g., those of the ILO, being used where possible though it was sometimes necessary to use results from the Irish 1986 Census of Population to obtain estimates at the correct level of aggregation). Because of difficulties of apportioning the self-employed on a regional basis within the UK and also between sectors, the NI/UK comparison is based on output per employee in employment.

Source: CSO (1990), Regional Trends; CSO (Ireland) (1986), The Trend in Employment and Unemployment; ILO (1988), Yearbook of Labour Statistics 1988; SOEC (1991), National Accounts — Detailed tables by branch 1980-1988.

A similar picture can be drawn in the case of NI, though the comparative productivity shortfall is concentrated in sectors other than the services (i.e., in the public and private services the output per head of NI is indicated to be comparable to the UK average).

The Table demonstrates that whereas GDP per capita in Ireland stands at roughly two-thirds of the level in Britain, and in NI at about three-quarters, the relative aggregate productivity achieved is more impressive. In both cases GDP *per person in employment* is about 90 per cent of the level attained in the UK. The relatively low living standards achieved are therefore partly a function, as the following tables show, of comparatively low activity rates (i.e., total number in employment/population) and high dependency ratios (i.e., 0-14, 60 or 65+/population), as well as the relatively low productivity of those who are in work (Haughton, 1991).

TABLE 3.2
Per Cent of Population in Dependent Age Groups*
1988

Ireland	NI	EC12	USA
39.3	41.3	32.7	33.9

Note: * age 0-14 and 65+, except in NI where 0-15 and 60+ for females and 65+ for males.

Source: CSO (1990), Regional Trends; Kennedy (1991a).

TABLE 3.3
Overall Activity Rate
(Employed Labour Force as Per Cent of Population)
1986

Ireland	NI	UK	USA	Japan	West Germany	France	Canada
30	36	43	45	48	41	38	46

Source: HM Treasury (1989); CSO (1990), Regional Trends; Hitchens, Wagner and Birnie (1990).

It should also be stressed that the low activity rate is itself partly the result of relatively low productivity, i.e., a lack of competitiveness constrains the growth of the tradeable sectors and therefore these activities employ fewer people in Ireland than might have been expected. The persistence of the very large living standards gap between the Irish, NI and the UK and EC averages is therefore the outcome *both* of the relatively low productivity of many of those who are in work and also of the relatively small number of persons who are productively employed.

To put it crudely, the manufacturing sector in Ireland and NI is too small (and it would have been even smaller if Ireland had not been able to supplement its homespun development with imported investment). For example, the Programme for National Recovery (1987) projected that the manufacturing sector in the Republic should have 100,000 more jobs, i.e., an expansion of more than 50 per cent. If these extra jobs were added, whilst maintaining the average productivity levels currently attained by the manufacturing sector, Ireland's GDP would grow by about 14 per cent (i.e., half the current share of manufacturing in total Irish GDP). *Ceteris paribus,* Irish comparative GDP per capita would advance from being about two-thirds of the UK level to three-quarters of that level.

(i) **Higher Productivity as a Desirable Means of Achieving Greater Competitiveness.**

A further reason for emphasising productivity is that, given constraints such as the implications of commitment to EMU, policy makers in the Irish economies will have little scope to use alternative means of attaining improved cost competitiveness, e.g., through reductions in the nominal exchange rate, while economic integration generates pressure for convergence in the comparative level of labour costs.

Gross wage levels in Ireland are now comparable to those in Great Britain for some sectors. Some commentators have argued that large

scale migration means that the two labour markets have been highly integrated as far as skilled workers are concerned for a number of decades (Haughton, 1991). This would imply that there will be little scope to decouple wage levels in Ireland from those in Great Britain (if the wage rate for skilled occupations in Ireland fell below that in Great Britain this would give rise to increased out-migration and the consequent bidding up of wage levels). In short, comparative wage levels in the Irish owned sector are probably higher than could be warranted by relative productivity levels (a high incidence of personal taxation has also exerted some upward pressure and the labour costs to employers are further increased by taxes on employment). It is of interest that during the late 1980s relative wage levels in NI as compared to those in Great Britain did fall back. Nevertheless, the institutional resistance to any further widening of the gap in wage rates would probably be very great (Black, 1987). It is probably more realistic for policy in both the Republic and NI to aim to raise comparative productivity levels rather than simply hope to lower relative wage levels (though this is not to deny that it might be desirable to constrain the relative rate of growth of wage levels given the high levels of unemployment in both the Republic and NI).

(ii) **Productivity and Growth of the Tradeable Sectors**

The first reason why policy makers should be concerned to stimulate high productivity and competitive activities in Ireland is so as to attain higher living standards. The second reason is that such activities are likely to win increased market shares in international markets and thereby generate net gains to output and employment. From a policy point of view it is most desirable to expand employment and output without causing displacement of other current activities. This has led to an emphasis on those activities which produce tradeable goods or services, these being the most likely to realise extra-regional or international sales.

In the context of the Irish economies the following sectors can be considered for their potential for further development of tradeable activity: agriculture; banking and financial and other producer services; tourism; and manufacturing (Hitchens and Birnie, 1992).

Whilst agriculture, banking, producer services and tourism all have potential to a greater or lesser extent to develop further tradeable activities, the greatest scope for further expansion probably derives from manufacturing. This is partly because the total of world trade in

manufacturing is larger than that in services and also because manufacturing seems to have a strategic role as an initiator of and agent for diffusion of technological change (Harris, 1988; Geroski, 1991). Manufacturing has, in fact, received the lion's share of attention from policy makers in Ireland since the 1950s and it is probably in manufacturing that policy makers should expect to create most of the new jobs in *higher productivity activities* which are necessary to lift overall productivity and living standards.

In the remainder of this chapter the primary focus is therefore on the manufacturing sector and primarily on the indigenous element. Some of the problems that will be identified as relating to manufacturing: a weak indigenous sector, inadequate human capital and an expensive reliance on subsidies in order to cushion locally owned firms and influence potential inward investors, are also likely to apply to a greater or lesser extent to the other tradeable sectors.

(iii) Convergence and Divergence in Manufacturing Productivity

We focus on the comparative productivity of manufacturing given the significance of this sector in terms of linkages and its large share of the total production of tradeable products.

A number of conclusions can be drawn from Table 3.4 which illustrates the comparative manufacturing productivity performance of NI, the Republic, the UK, the USA, East and West Germany (most of the results shown are based on comparisons of real output derived from production censuses, i.e., nominal value added in terms of each country's currency is converted to common terms using indicators of the relative factory-gate prices of principal products; Smith, Hitchens and Davies (1982), van Ark (1993)). Given that manufacturing in the UK exhibits a substantial productivity gap relative to international best practice (represented here by West Germany and the USA) it can be seen that NI is very far behind the international productivity frontier, notwithstanding the so-called "productivity miracle" experienced by UK manufacturing during the 1980s. An apparently more sanguine conclusion can be drawn for Ireland, where levels of net output per head are shown to be similar to those in West Germany in the mid-1980s and then pulling ahead (though still lagging behind those found in the USA). However, it should be stressed that a strong contrast can be drawn between the performance of the indigenous and the non-Irish owned sectors in Ireland. Thus, in 1988 the productivity of the externally owned sector in Ireland was around twice that of the level attained by UK manufacturing (admittedly

some of this very high measured productivity could be attributable to transfer pricing; NESC (1993), Birnie (forthcoming)). Irish owned firms, however, had a net output per head which was only 79 per cent of the UK average.

TABLE 3.4

Manufacturing Productivity of Ireland, NI, UK, USA and East and West Germany, 1935-1990

(Net Output Per Head as Per Cent of Average for UK, UK= 100)

	1935	1968	1985	1990
Ireland	88	82	128[a]	152[b]
NI	62	85	76	73(1989)
East Germany	n.a	n.a	n.a	34[c] 51(1991)[d]
West Germany	102[e]	135[f]	127[g]	110[g]
UK	100	100	100	100
USA	208[h]	289[f]	187(1987)[i]	

Note: a: Ireland adjusted by removal of establishments employing less than 20 workers (this was to increase compatibility with the size range represented in the UK Census of Production).

b: 1985 results updated using national volume series for output and employment.

c: An estimate of East German/West German value added per head (assuming like levels of utilisation) was derived from the sample study of Hitchens, Wagner and Birnie (1993) and linked to the UK using O'Mahony (1992) estimate of West Germany/UK in 1990.

d: Method as in c with the assumption that Germany/UK comparative Productivity in 1991 was the same as in 1990.

e: Weighted comparative physical output per head (Broadberry and Fremdling, 1990).

f: Currency conversion using weighted average relative price of principal products (Smith, Hitchens and Davies, 1968).

g: Unit value ratios used to compare gross value added per head in 1987 which was then adjusted using national volume series of output and employment (O'Mahony, 1992).

h: Weighted comparative physical output per head (Rostas, 1948).

i: Unit value ratios used to compare net output per head (van Ark, 1992).

Source: As in note and comparisons of Ireland, NI, and the UK derived from Hitchens and Birnie (1992) and Birnie (forthcoming).A further reason why comparisons of the Republic with East Germany are of interest is as an illustration of how the German apprenticeship system (which was retained in East Germany during 1949-1990) created the potential for rapid growth in productivity levels which could be realised once market incentives were restored (Hitchens, Wagner and Birnie, 1993).

Comparing the performance of the Irish economies relative to one of the former communist bloc economies, the former East Germany, is of particular interest, given that its development since the onset of German

economic and monetary union represents to some extent a controlled experiment for NI and the Republic as to what may happen to a low productivity economy when it is suddenly integrated with a strong high productivity economy (e.g., within the context of European Monetary Union). In 1991, levels of value added per head in East Germany were still lower than those in either NI manufacturing or the indigenous sector in the Republic, though the gap was no longer very large (indeed, the physical productivity of a sample of firms, i.e., the volume of output without making allowance for quality or price differences, has been indicated to be comparable to that of NI; Hitchens, Wagner and Birnie, 1993). It is significant that, given the chronic nature of the productivity deficiencies of NI manufacturing and of Irish owned firms in the Republic, firms in East Germany have been shown to have made very rapid progress in narrowing the productivity differential relative to best practice in Western Europe (levels of output per head rising by 50 per cent in the first year of German monetary and economic union; Hitchens, Wagner and Birnie, 1993).

(iv) Summary and Conclusions on Comparative Manufacturing Productivity

Despite an apparently strong position relative to NI and perhaps even the UK average, Ireland's productivity and competitive achievement remains seriously flawed in two crucial respects. First, high performance is unevenly distributed between the indigenous and external sectors. Secondly, the extent to which the social benefits of inward investment policy exceed the costs may not be large. Regardless of the extent to which the high measured productivity of the foreign owed sector is exaggerated by transfer pricing, it is significant that the wages paid in those firms are not substantially higher than those in the indigenous firms (Foley, 1991) and the proportion of material and service inputs purchased within the country remains low (Kennedy, 1991b).

Thus, in some respects, Ireland shares the manufacturing problems experienced in NI. The comparatively high level of productivity is primarily the responsibility of foreign owned firms in a limited number of industrial sectors (especially pharmaceuticals, electronics, office machinery and data processing equipment and soft drinks; the role of industrial structure is considered in the next section).

Table 3.5 shows the gulf separating the average productivity performance of Irish-owned and externally owned firms in the Republic. During the late 1980s, levels of output per head in the external sector

were about twice as high as those achieved by manufacturing in the UK However, productivity levels in the indigenous sector remained 15-2 per cent below those in the UK. Account must be taken, however, of th differing composition of output in drawing conclusions from th comparison. Nevertheless, the productivity performance of the locall owned firms in Ireland is much closer to that of manufacturing in N than it is to the foreign subsidiaries operating within the Republic.

TABLE 3.5
Ireland's Comparative Manufacturing Productivity by Ownership Type (Ireland/UK, UK= 100)*

	1985	1987	1988
Indigenous Irish	81	85	79
External	198	211	210
Total Irish	129	139	137
All NI/UK	76	74	72

Note: * Net output per head using average market exchange rates (Irish data include firms in the 3-employees size band, the UK data does not).

Source: Census of Industrial Production (Ireland), Census of Production (UK) and Birn (forthcoming).

In fact the weaker performance of the indigenous sector is demonstrate by a range of indicators. For example, whereas the indigenou manufacturing sector experienced an employment decline of 13 during 1973-80, the decline for the whole of manufacturing was onl 5%. During the 1980s employment in the foreign owned sector actuall grew by 3% (to 93,000 in 1990) but the numbers engaged in Irish owne firms dropped by 21% (to 120,000). The indigenous firms have prove able to increase the share of output exported; 19% in 1960, 26% in 197 31% in 1984, 36% in 1988 (the figures for 1960 and 1973 are those c O'Malley (1989) for "all firms other than new external", i.e., firms whic were established in Ireland before 1960 and will include some foreig owned establishments). However, even though exports have bee increased, imports have expanded even more rapidly. O'Malley (198 estimates that for a number of sectors such as wood and furniture, met goods and engineering, chemicals, textiles and clothing and footwea competing imports expanded their market share in Ireland by more tha 2% per annum. The consequence of this market penetration has bee that the bulk of Irish indigenous firms are now found in those secto

(e.g., mineral products, food, drink and tobacco) which are somewhat, though to a declining extent, sheltered from international competition.

3. EDUCATION AND TRAINING — LINKS TO ECONOMIC PERFORMANCE: THE IMPLICATIONS OF GROWTH THEORIES

As a foundation to the empirical consideration of the case of Ireland it is useful to consider theories of economic growth to trace implications for the links between education and training and output growth and productivity.

The results of the growth accounting method (e.g., Denison (1967)), where the productivity effects of education and training are proxied by differential earnings, suggest a comparatively small contribution to post-war European economic growth. However, a consideration of the more recent theories of economic growth (e.g. Romer, 1986; Lucas, 1988) illustrates how the cumulative impact of human capital may greatly exceed that suggested in the Denison-type exercises.

In the early neoclassical growth models, such as those of Solow, Swan and Meade, technological change was either assumed to be zero or to be an entirely exogenous factor (Hahn and Matthews, 1964). In the growth accounting approach technological change is equivalent to advances in the stock of knowledge and this is assumed to be part of the residual of the unexplained part of growth, after allowing for the contributions of the specific factors. A number of commentators have noted that the growth accounting equations usually leave more than half of total growth as "unexplained" and they consider that this casts doubt on the whole approach (total factor productivity is treated as a measure of ignorance; Cornwall (1976)).

Another approach has been to attempt to endogenise technological change. Arrow (1962) viewed new machinery as the vehicle of progress, through embodiment of learning from experience. The experience derived in production means that successive vintages of machinery have lower manning requirements. In Arrow's model there are therefore increasing returns to output. Kaldor and Mirlees postulated a technological progress function, whereby the productivity growth on the latest machinery is an increasing function of growth in investment per employee. Thus technical change is to some large extent driven by investment.

Within this approach, education and training are seen to have a role in endogenous technological change. For example, using Arrow's model,

technical training is the means whereby past and present production experience is mediated to the present and future work-force. If successive vintages of machinery are more technically advanced this is to assume a labour force which is capable of utilising such machinery. Likewise, in the case of Kaldor and Mirlees, continuous upgrading of the labour force is likely to be required to absorb the new investment.

Romer (1986) represents perhaps the most notable recent attempt to conceptualise the role of knowledge (and therefore by implication education) as a contribution to economic growth. In his model profit-seeking, forward-looking individuals invest in knowledge which is a factor of production (an intangible capital input). Because private investment in knowledge is likely to have external effects (i.e., once an idea or process is discovered or applied it is likely to become a public good) the production of knowledge can lead to an increasing return on physical capital and an increasing rate of economic growth. In the Romer model, education and training can be seen as the means which facilitate individual investment in knowledge production (indeed, on occasions, the education and training may itself represent part of that investment). Lucas (1988) has also emphasised human capital *externalities*. Human capital in aggregate has an effect on productivity, but economic agents in making their own personal decision as to how much human capital to accumulate do not take this into account, since their own decision will only have a negligible impact on the aggregate. If there are such external effects then workers with the same level of human capital will have higher marginal productivity in an environment characterised by generally high levels of human capital. Lucas (1988) also postulated that one economy could maintain a growth rate advantage relative to another economy to the extent that it had a greater specialisation in goods characterised by learning by doing. Yet, notwithstanding a large difference between UK and West German growth rates during 1950-1973, Crafts (1993) could discern little evidence of a marked difference in specialisation between the two economies.

The empirical analysis of Barro (1991) on international differences in growth rates during 1960-1985 suggests that there is a statistically significant correlation between the initial stock of educational input (i.e., schooling in 1960) and subsequent growth performance. This has been hailed as proof of the contribution of "human capital" to economic growth performance, albeit that Barro's human capital measure remains weak (i.e., school enrolment). Mankiw, Romer and Weil (1992) estimated that inclusion of a human capital variable increases the level of explanation of the variance of per capita GDP across 121 less developed and OECD economies by about one-fifth.

Consideration of the limitations of the Denison-type growth accounting exercises, as well as the emphasis on training in the new theories of economic growth, imply that there is scope for a detailed, micro-based investigation of the impact of human capital on the performance of individual firms. The method of matched plant comparisons provides a means of doing this.

4. TRAINING AND EDUCATION / PRODUCTIVITY RELATIONSHIPS

(i) The Evidence from NI and BRITAIN

Before considering the evidence on the relationship between education and training and economic performance in Ireland, this section uses the extensive literature on the competitiveness problems of industry in NI and Great Britain to highlight the mechanisms through which training affects productivity levels.

Given that productivity levels in the indigenous sector in the Republic are comparable with those of manufacturing in Northern Ireland, and therefore lag behind those of Great Britain, this prompts the question whether the so-called "British Disease" of manufacturing (Allen, 1979; Crafts, 1988), and particularly the role of training and education as explanatory variables, provide an appropriate model to apply to the case of low productivity in Ireland.

Investigations of the causes of the British disease suggest that certain factors are not of crucial significance. For example, the structure of manufacturing industry has been shown to be similar to that in the USA and West Germany (Smith, Hitchens and Davies, 1982). Moreover, the UK does not appear to be generally disadvantaged in terms of the relative size of British companies (UK firms have a larger representation amongst the 100 or 500 largest public companies in Europe than would be expected given the overall size of the UK economy). Admittedly, certain large chemicals, car and engineering producers in the UK are substantially smaller than competitors in West Germany or Japan (Pratten, 1986) though this could be as much the consequence of lack of competitiveness as its cause.

Careful matching of the productive capital stock in manufacturing suggests that a deficiency in terms of the quantity of capital may be less marked than comparison of the aggregate economy-wide capital and investment data (Maddison, 1982) would suggest. Indeed, one survey suggested that the capital intensity of British metal working companies exceeded that of counterparts in the USA (Prais, 1986). Certain high

technology items of equipment (e.g., computer numerically controlled machine tools, CNCs) may be less well represented in UK companies (Daly, Hitchens and Wagner, 1985; Hitchens, Wagner and Birnie, 1990) but UK firms are not always at a disadvantage in terms of the quality of their machine stock: matched comparisons of clothing producers suggested that plants in Great Britain were well stocked with advanced pieces of equipment, and firms in Northern Ireland were, if anything, ahead of West Germany in their purchases of computerised and automatic machines (Steedman and Wagner, 1989; Hitchens, Wagner and Birnie, 1991). In fact, a mix of statistical and survey evidence suggests that the machine stock in UK industry is not substantially older than that in either West Germany or the USA (Rostas, 1948; Bacon and Eltis, 1974; Daly, Hitchens and Wagner, 1985; Prais, 1986; Hitchens, Wagner and Birnie, 1990).

Given that industrial structure, size of firms, and quantity and quality of the capital stock are not major explanations of the UK productivity gap, most commentators have focused on the labour force as the crucial determinant of the "British disease" (Barnett, 1986). Particular reference is made to a long-standing failure to provide technical and vocational training and education of a standard comparable with that achieved in other industrial economies. Statistical evidence and the results of matched plant comparisons indicate that NI is a worse case of the British disease, in the sense that manufacturing productivity has been substantially lower throughout 1920s-1980s (even when the effects of industrial structure are allowed for) and the representation of skill levels was also correspondingly lower (Hitchens, Wagner and Birnie, 1990).

The following table illustrates that the deficiency is quantitative (i.e., the *stock* of skills in UK manufacturing is comparatively small) while the *quality* of those qualifications which are produced by the training and education system is also suspect.

Matched comparisons of national training systems have also identified a flaw in the UK with respect to the supervisory or foreperson grade (Prais and Wagner, 1988). In British factories these are normally time served, without formal qualification. In contrast, their West German counterparts, the Meister, have completed the standard 2-3 year German apprenticeship and then an additional 2 years of practical and theoretical training. As a result, the Meister could manage a range of tasks (e.g., production flow, product quality, maintenance and adaptation of machinery) which in UK factories would be reserved to plant managers

or specialists (Steedman and Wagner, 1987). The Meister were instrumental in ensuring that West German companies could maintain flexible and high value added production.

TABLE 3.6
The British Skills Shortfall in Manufacturing

Level of Skills	Quantity*	Quality
Graduates (all subjects)	c.10% more in WG	German degrees longer, more Technik
Graduate engineers	50% more in WG	German degrees longer plus more practical
Technician engineers	50% more in WG	
Supervisors (formally qualified)	Many times more in WG	Usually time served in UK, rarely equivalent to WG Meister
Craftspeople (formally qualified)	2-3 times higher in WG	Fewer written/theoretical tests in UK apprentice.

Note: * = Per cent of the manufacturing labour force qualified to this level.

Source: The NIESR studies, e.g., Prais (1981), Prais and Wagner (1988), Prais (1989).Studies by the National Institute of Economic and Social Research have highlighted a series of weaknesses. Despite some improvements during the 1980s, the bulk of the labour force in UK manufacturing (about 60 per cent) lacks any formal technical or intermediate qualification (e.g., craft apprenticeship, BTEC, HND or degree) (Prais, 1981; Prais and Wagner, 1983; Steedman, 1988). This can be contrasted with the much higher rates of formal qualification in most other western economies (about 50 per cent of French manufacturing workers are unqualified, 30 per cent of West German and only one-quarter of Dutch). A more highly trained shop-floor labour force is translated into higher levels of physical productivity (i.e. a higher rate of output is achieved from workers who are more flexible and dextrous; van Ark, 1990a, 1990b; Hitchens, Wagner and Birnie, 1990). Moreover, the quality of that output is also promoted (more highly trained operatives are more conscious of product quality).

It has also been demonstrated that the UK has a relatively low output of engineers at graduate level (Prais, 1989). The managers of British companies are less likely to have university qualifications (Handy, 1987; Hitchens, Wagner and Birnie, 1990) and accountancy backgrounds predominate, whereas in West Germany scientific and engineering training is heavily represented at the top. As a result, West German companies are likely to have a stronger commitment to continual upgrading of products through product and process innovation.

If the quality of labour force and management is the crucial failure of UK industry, then it cannot be separated from a host of other linked

cultural, institutional and political factors (Olson, 1982; Barnett, 1986 Porter, 1990). For example, complacency induced by Britain's succes as the first industrial economy, the lack of any substantial politica shocks equivalent to those suffered by the defeated powers during th Second World War, an adversarial system of industrial relations an strong vested interests in the educational sector, have all conspire against a thorough-going reform of the industrial training systen Furthermore, short-termism on the part of British managers may in pa represent a constraint placed upon them because of heavy reliance o stock market finance. The quality of human capital in the upper reache of UK industry may have been weakened because of cultural bias agains manufacturing in favour of employment in other activities (Wiene (1981), Rubinstein, 1988).

Labour-related problems are also interlinked with other competitiv difficulties. For example, disharmonious industrial relations may hav made it particularly difficult to operate large factories (i.e., those wit more than 1000 employees) in the UK (Prais, 1981). The consequer under-representation of giant plants in the UK car, steel and engineerin industries led to a lack of economies of scale relative to competitors i West Germany and the USA.

A number of problems may arise as a result of the undertrained natu of shop-floor workers. A lack of flexibility means that firms have carry excess labour in order to cope with expected absenteeis (Hitchens, Wagner and Birnie, 1990). Machine breakdowns occur mo frequently when operators do not understand the basic mechanics their machines (and also fail to maintain or even clean them on a regul basis; Daly, Hitchens and Wagner, 1985). When breakdowns did occ British workers usually had to wait for a specialist engineer. In son cases their West German counterparts were able to make repai themselves. Thus, in some cases poor *capital* productivity w attributable to standards of work-force training.

(ii) The Matched Plant Technique

A series of matched plant comparisons between the UK and We Germany have been of particular importance in elucidating the caus of the "British disease". Although comparisons of factories in Brita with counterparts in Germany and the USA have a long histo (Shadwell, 1906; Platt, 1944; Hutton, 1953; Gauge and Tool SWP, 198 Barnett, 1986) the rigorous and academic development of the techniq of matched plant comparisons was achieved by the National Institute Economic and Social Research in three studies.

In the first exercise of its kind Daly, Hitchens and Wagner (1985) compared a total of 32 British and German engineering component manufacturers (e.g., screws, nuts, coil springs, drill bits and hydraulic valves). In subsequent studies, 8 German kitchen furniture makers were matched with a similar number in the UK and 10 German ladies' garments manufacturers with a dozen factories in Britain (Steedman and Wagner, 1987, 1989). A larger total sample size (45 plants in Northern Ireland and 39 in Germany) and a wider sectoral coverage (engineering, food, drink and tobacco, textiles, clothing and miscellaneous) were achieved in a further study (Hitchens, Wagner and Birnie, 1990).

When the data from these five matched studies are pooled together they provide a unique opportunity to consider the extent of the international productivity gap and its causes and consequences. All of the studies related to small and medium-sized plants and the combined sample size is about 90 in the UK and over 70 from Germany (Table 3.7) across 6 sectors.

TABLE 3.7
UK-Germany Matched Plant Comparisons

	Number of Factories Compared		Size of Factories (No. Employed)	
	UK	WG	UK	WG
Engineering	28	26	50-500	
Furniture	10	9	136*	107*
Clothing	28(+12**)	22	100-500	
Textiles	6	5	306*	246*
Food, Drink & Tobacco	5	4	690*	440*
Miscellaneous	5	7	225*	175*
TOTAL	82(+12**)	73		

Note: * = Arithmetic mean.
** =A further 12 smaller producers were also visited.

The matched plant comparisons involving UK firms have indicated that counterparts in West Germany were much more likely to manufacture specialised, high quality and high value added products. The West German firms were in fact much more likely to engage in continuous and adaptive product and process innovation. A high level of

management, technician, supervisory and operative skills was a key factor in the cumulative process whereby these firms retained their competitive advantage. (The trained labour in West Germany was also expensive, which in turn placed pressure on the firms to upgrade continuously the quality of their products.)

In contrast the UK firms, and especially those in NI, could be seen as stuck in a low skill, low productivity equilibrium (Finegold and Soskice, 1988). Given that some NI firms are able to achieve reasonable profit levels through making standardised products using semi-skilled labour there may not be a strong market signal to upgrade human capital and product quality. Such a low level equilibrium situation could be seen to be reinforced by large scale and repeated grant payments to firms in NI which further blunt market incentives to achieve improvement in efficiency and effectiveness; Hitchens, Wagner and Birnie (1990, 1991, 1993). Given that the Republic has also been characterised by a very generous package of assistance to manufacturing, this raises the possibility that a human capital problem may also be aggravated by dependence on state assistance; Hitchens, Wagner and Birnie (1992). The following section considers how far the training hypothesis can be applied to Ireland.

5. TRAINING AND SKILLS IN IRELAND

(i) Skills Profile

The current interest in the interaction between education and economic performance in Ireland (Roche and Tansey, 1992) comes a quarter of a century after an earlier wave of interest in the same topic (OECD, 1965; NIEC, 1966).

The previous section considered how a shortfall in technical and vocational training and education has contributed to the British disease. While the Irish education and training system is different in form to the British system, there is still reason to believe that the Irish system exhibits some features of the British disease. The case is strengthened by consideration of the experience of NI. Matched plant comparisons between larger firms in NI and West Germany implied that the NI companies were victims of a more intense version of the British disease, particularly with regard to low levels of technical and vocational skills (Hitchens, Wagner and Birnie, 1990). We have already seen that levels of value added per head in the indigenous sector in Ireland are similar to those in NI. The implication is that Irish-owned firms in the Republic may share the difficulties of their counterparts in the North with respect

to low levels of physical productivity and comparatively poor product quality, reflecting in turn the outcome of a lack of production skills and restricted management capabilities.

TABLE 3.8

Comparative Stock of Skills in Manufacturing, End 1980s
Per Cent of Labour Force Qualified to Each Level:
Ireland, NI and UK shown as a Percentage of West Germany*
(Per Cent in WG=100)

Level of Qualification	Quantity		Quality
Graduates (all subjects)	UK NI Ireland	110 45 88	German degrees longer, more Technik
Technician Level	UK NI Ireland	53 49 100[a]	German Meister, Techniker, compared with HND, HNC in UK and output of Regional Technical Colleges in ROI.[a]
Lower intermediate level "craftsmen"	UK NI Ireland	47 60[b] 51[b]	In UK and WG apprenticeships similar in content though WG may have more rigorous theoretical application. NI figures include all A levels and ROI all Leaving Cert.b
Without any of the above	UK NI Ireland	212 180[c] 196[c]	

Note: *: The per cent of the manufacturing labour force with each qualification level as its highest qualification is shown as a percentage of the per cent level for West Germany (UK and WG relate to 1987, NI and Ireland per cent results for 1989 were compared to these WG results).

a: The Irish figures include all diploma and certificates from the Regional Technical Colleges and many of these are unlikely to be comparable with the UK and WG qualifications in terms of length of study or depth of content.

b: The inclusion of non-vocational qualifications in Ireland and NI figures inflates performance relative to the UK average and WG.

c: Irish and NI performance relative to the UK average and WG is again inflated for the reason given under note b.

Source: UK/WG: the NIESR studies, i.e. Prais and Wagner (1988), Steedman (1988), Prais (1989), O'Mahony (1992). Ireland: figures by the education authorities in the Republic.
NI: figures supplied by DENI.

NI's competitiveness problems would seem to be part of a general problem in the UK, where there has been a long-standing failure to provide technical and vocational training and education to a standard comparable with that achieved in other industrial economies. The Republic may have experienced a similar problem, with qualitative and

quantitative differences between the qualifications produced by the Irish training and education system and those of other industrial economies. For example, Ireland appears to have proportionately as many workers at the technician level as West Germany; this strengthens the case of those who argue that it is wrong to argue simple-mindedly that the Irish system produces an inadequate quantity of skills Sheehan (1992). However, this rests on the assumption that everyone who qualifies from a Regional Technical College has attained the level of a German Meister (2-3 years on top of 2-3 years of training as an apprentice) or Techniker (4 years of study). Nevertheless, the figures are strongly indicative of the conclusion that Ireland has a skills gap. Even when the favourable assumption is made that the definitional basis of the statistics is comparable, Ireland has proportionally twice as many "unqualified" as the West German labour force (Table 3.8). Moreover, the annual inflow of formally qualified craft apprentices and supervisors into West German manufacturing is several times greater than that into industry in Ireland, Great Britain or NI regardless of the way in which the figures are standardised for varying sizes of industry and population (Table 3.9).

TABLE 3.9

Comparison of the Flows of Technical Qualifications Standardised by Manufacturing Labour Force and Population Size, End 1980s*

	Labour Force		Population	German degrees
Graduate engineers	UK NI Ireland	100 100 167	71 61 82	Longer + more practical
Technician engineers	UK NI Ireland	100 na 150	71 na 75	
Supervisors (formally qualified)	Many times higher in WG			Usually time served in UK, rarely equivalent to WG Meister
Craftsmen	UK NI Ireland	41 41 41	31 17 20	Fewer written/theoretical tests in UK apprentice.

Note: * Standardised on output per 100,000 manufacturing employees (5 million in the UK, 7 million in WG, 100000 in NI, and 200,000 in the Republic), and on output per million of the population (57 million in the UK, 61 million in WG, 1.5 million in NI and 3.5 million in the Republic).

Source: UK/WG; the NIESR studies, i.e. Prais and Wagner (1988), Prais (1989), O'Mahoney (1992).
NI/WG: Labour Force Survey and City and Guilds.
Ireland/WG: Higher Education Authority and FAS.

(ii) Emigration and the Demand for Skills in Ireland

It must be stressed that the Irish experience is not an exact replica of that of Britain. It is, for example, unusual in the sense that a very high proportion of the annual output of those qualifying at the higher levels have been lost to the domestic economy through migration (in 1987-88 about 40 per cent of Irish engineering graduates left to find work elsewhere, though Sheehan (1992) shows that graduate emigration had declined by 1990). Such out-migration indicates that the level of skills in Ireland is not simply a supply side issue *but a demand side one as well.* Indeed, when the output of graduate and technician engineers is considered relative to the size of manufacturing employment in Ireland it might appear that Ireland is producing too many of these qualifications and therefore it is natural that migration should be so marked. This conclusion would however be a misperception. The fact that industry in Ireland is unable to employ all of the graduates and technicians coming out of the universities and colleges is less an indication of over-production of technological skills and more a measure of the relatively small size of manufacturing in Ireland and a lack of use of these graduates and technicians when compared with population size (in the late 1980s less than 6 per cent of the Irish population were employed in manufacturing compared to 11.5 per cent in West Germany and 8.8 per cent in the UK). When population is used as the standardisation factor, then Ireland's output of these skills is indicated to be substantially lower than that of West Germany (with the implication that the supply side of the Irish economy will be correspondingly weaker).

There is also the possibility that, even given the relatively small size of manufacturing in Ireland, the demand for these higher skills is lower than might be expected. If this were the case there would also be some similarities with the British disease. For example, whilst the relatively low numbers of graduate engineers in UK manufacturing has sometimes been attributed to a cultural aversion to industrial activity, as opposed to professional and financial careers, (Wiener, 1981; but see Rubinstein, 1988), Silberston (1987) argues there is also a demand side problem which is reflected in the relatively low salaries which British companies offer to engineering and production management specialists, compared to those with financial, accountancy and marketing specialism. The high rates of out-migration of Irish graduates may partly be because industry in Ireland does not perceive the need to offer them employment. It is also likely to be driven by the significant difference between the marginal tax rate facing a single person at the average industrial wage

in Ireland compared to his/her counterpart in Britain (Arthur Andersen, 1991).

In a survey study (Roche and Tansey, 1992), the chief executives of the 1000 largest private companies ranked the technical (14 per cent) and production management (6 per cent) training needs of top managers relatively low (far behind the perceived need for more training in general management, finance, marketing and industrial relations). Such results are indicative of one aspect of the British disease, i.e. a complacency about technological matters with the accountancy side of business being given priority. Moreover, a lack of experience of world class manufacturing standards (Roche and Tansey, 1991) may make Irish managers poor judges of their own training requirements. A technique of exchange visits between managers in the NI and West German clothing industries revealed a similar myopia on the part of the managers in the low productivity NI sector, who were similarly reluctant to admit how much they had to learn from the higher training standards they had observed in the West German factories; Hitchens, Wagner and Birnie, 1991. At the same time, some critical skill deficiencies have been identified, e.g. 36 per cent of clothing companies surveyed reported problems relating to machinists and 29 per cent to production managers, design and technicians (FAS/Colin McIver as reported in Roche and Tansey, 1992). For example, lack of technical skills meant that operatives could not repair their own machines when these broke down. This represented a classic symptom of the British disease.

(iii) The Need for Further Research on Links between Training and Performance

The British skills shortfall and its probable impact on comparative productivity have been intensively researched, for example, by the National Institute of Economic and Social Research and usually through the technique of matched plant comparisons (Prais, 1981; Prais and Wagner, 1983; Daly, Hitchens and Wagner, 1985; Steedman and Wagner, 1987; Prais and Wagner, 1988; Steedman and Wagner, 1989; Prais, 1989).

The matched plant comparisons of small firms in Ireland with those in regions of Britain (O'Farrell and Hitchens, 1988) collected data on the proportion of persons designated as skilled, but this revealed nothing about the quality of those skills. Skill quality was a problem for small firms in all the regions considered but it was indicated as critical in the case of Ireland (as it was for Northern Ireland, Hitchens and O'Farrell,

1988). Many of the criticisms of Irish products which were reported by the managers of British firms in this study may be interpreted largely as a consequence of poor quality skills, lack of attention to detail and inadequate supervision and quality control procedures. Furthermore, in skill- intensive product segments such as precision engineering, injection mould and tool making, many Irish companies, when showed samples from matched English firms, conceded under questioning that they could not produce to the tolerances and finish displayed by the English samples, especially those in the Bristol area.

Matched plant comparisons with Continental counterpart firms would allow the impact of training levels on physical productivity and product quality to be traced, identifying the specific links which the general statistical studies of education and economic performance have usually only been able to assert without strong proof (OECD, 1987b)). Given the small size of the industrial base in Ireland and the historical lateness of industrialisation it is likely that the Republic shares with NI a problem of a lack of diversity of skills (i.e. certain precision engineering, mechanical and electrical skills are likely to be under-represented in Ireland). Research might identify gaps and the possibility that selectively encouraged in-migration by talented outsiders could be used to fill holes in the skills base.

This would complement the profile arising from the indicators which suggest that, in certain respects, Ireland is deficient in terms of the output from the education system of technically skilled persons (OECD, 1991) and that these weaknesses are reinforced by the relatively low priority given to training/retraining of those in employment. A variety of recent sample surveys in Ireland suggest that only 21 per cent of employees receive off-the-job training, 35 per cent of managers and 11 per cent of craftspeople (as compared to 25-40 per cent, 50 per cent and 15-48 per cent respectively amongst other industrial economies (Roche and Tansey, 1992)). It has been estimated that private companies devote the equivalent of 0.9 per cent of payroll costs to training, compared to 1.4 per cent in the US, 2.1 per cent in France and 2.9 per cent in West Germany. All this is notwithstanding a widespread recognition that some aspects of the Irish skill base are weak, e.g. management training (e.g. CIP, 1973).

The National Institute studies linked poor training standards in Britain to relatively low rates of physical productivity and inferior product quality. In the case of Ireland it has been noted that greater training would

enable the absorption of changes in product and process technology and facilitate the adoption of more advanced capital equipment (Roche and Tansey, 1992). The same is certainly true in NI, where a dearth of technical skills has contributed to the under-utilisation and ineffective application of the technically sophisticated machinery already in operation (Hitchens, Wagner and Birnie, 1990, 1991). The relatively low rates of R&D spending in Ireland and NI are in part a function of the lack of technically qualified personnel. During the 1970s the rate of R&D spending in Irish industry actually declined and in 1975 stood at only one-quarter of the EC average and one-sixth of the US average (Maguire, 1979). In 1990, Irish manufacturing was estimated to spend the equivalent of 0.5 per cent of value added on R&D and NI manufacturing 0.9 per cent, compared to around 2 per cent in most major industrial economies (CBI, 1992).

Moreover, even more than in the case of the UK, it might be anticipated to yield further benefits through providing an incentive to foreign investors to locate plants (including those which engaged in higher value added activities) in Ireland (Reich, 1990)).

TABLE 3.10
Importance of Differences in Product Quality in West German/NI Comparisons 1987/88*

	Percentage of Cases where W German Quality Greater+	Percent of W German Productivity Advantage Attributable to —	
		(1) Physical Productivity	(2) Other Factors
Engineering	50	40	60
Food, Drink etc.	0	100	0
Textiles	50	48	52
Clothing	57	53	47
Miscellaneous	60	62	38
TOTAL CASES	48	61	39

Note: * The partition of the value-added gap between quality and physical productivity is based upon a total of 22 matched pairs where it was possible to compare both value-added and physical productivity.

\+ In only a minority of cases did NI companies enjoy a product quality superiority. Total number of matched comparisons: engineering 10, food 5, textiles 6, clothing 16, miscellaneous 5, and total manufacturing 42.

Source: Hitchens, Wagner and Birnie (1990).

In addition to the link between a lack of training and inadequate performance regarding innovation, a second mechanism through which poor skill standards are translated into poor competitiveness is that of product quality. In a matched plant comparison of productivity between NI and West Germany the authors used a simple method to partition responsibility for the West German value added advantage between *physical productivity* (i.e. number of units per worker) and *quality* (i.e. the value added arising from each of these units).

The excess of value added per head at the West German firm over that of the NI company after allowing for the physical productivity difference is a measure of the relative importance of quality (and other factors) to productivity. Although the method is unsophisticated it was derived from a detailed and time consuming set of managerial interviews and is (as far as the authors are aware) the first attempt which has been made to separate out the responsibility for the international productivity gap between physical productivity and other factors, inclusive of quality. The table shows that on average *three-fifths* of the value added gap was attributable to physical productivity differences and *two-fifths* to other factors, inclusive of quality. Alongside the figures is shown the proportion of products matched which were agreed by managing directors at the matched plants to be superior in the West German case.

Like their counterparts in NI, sample surveys of small firms in the Republic have found a general gap in product quality performance relative to firms in regions of Great Britain (Hitchens and O'Farrell, 1989). The generally low levels of value added per head throughout the indigenous sector suggest that this could be a widespread problem.

6. BACKGROUND TO COMPARISON OF IRISH MANUFACTURING, PERFORMANCE WITH THAT OF DENMARK AND THE NETHERLANDS

The justification for matched firm comparisons between Ireland and Denmark and the Netherlands is partly the superior performance of these economies and also the fact that, in some ways, the Danish and Dutch economies are sufficiently similar to Ireland to be reasonable standards of comparison (all three are small open economies, not characterised by strong natural resource endowments, although the Dutch exploitation of gas is something of an exception). The general value of comparative international research has been demonstrated by NESC (1992).

TABLE 3.11
Comparative GDP per Capita, 1960-1993
Per Cent of the UK Average, UK=100

	Ireland	Denmark	The Netherlands
1960	47	92	92
1973	54	102	104
1986	60	111	101
1991	67	110	102
1993	67*	108*	99*

Note: * Forecast.

Source: Commission of the European Communities (1992).

This section uses summary statistics to outline the comparative performance of the three economies, their overall productivity record and the structure and productivity of the manufacturing sector. While the accuracy of historical data on the level of national income prior to the foundation of the State may be questioned, the available evidence demonstrates that income per head in Ireland has grown significantly more slowly over the long run compared to Denmark and The Netherlands. The gap in living standards has been reduced, with output growth rates in Ireland over the thirty-year period 1960-90, at 3.2% p.a. close to The Netherlands (3.3%) and above Denmark (2.9%).

Over the long run, the rate of convergence has been slow and Ireland has failed to demonstrate the degree of catch-up with the leaders which might have been expected (Baumol, 1986; de Long, 1988; Barro and Sala-i-Martin, 1991; Maddison, 1991).

The relatively low rate of population growth can itself be taken as a further indicator of less satisfactory economic performance in Ireland relative to Denmark and The Netherlands. The Commission on Emigration and other Population Problems (1954) reported "A steadily rising population should occupy a high place among the criteria by which the success of national policy should be judged", but despite such statements high net migration continued throughout most of the post-war period. NESC (1992) argued that such an outflow was not only undesirable on social grounds but could itself be a contributory cause to relative economic under-performance.

TABLE 3.12
Comparative Population Levels, 1891-1986 (Thousands)

	Ireland	Denmark	Netherlands
1891	3469	2195	4601
1921	3096	3285	6921
1981	3443	5122	14247
1986	3541	5121	14572

Source: Kennedy, Giblin and McHugh (1988), Maddison (1991).

Table 3.12 shows that in the late nineteenth century the Irish population was still considerably larger than that of Denmark and about three-quarters that of The Netherlands. One hundred years later there had been hardly any advance in the Irish population, whereas the Danish population had grown by 133 per cent and that of The Netherlands by 217 per cent. Thus the performance of the Danish and Dutch economies has been superior both in terms of GDP per capita growth throughout most of the twentieth century and also in terms of the total number of heads which are being supported.

A further performance indicator is that of unemployment. This is especially significant given that Ireland has, over the very long run, been characterised by an over-supply of labour (Kennedy, Giblin and McHugh, 1988).

TABLE 3.13
Comparative Unemployment Rates, 1926-1989
Unemployment as per cent of the Total Labour Force

	Ireland	Denmark	Netherlands
1926	6.5	10.5	2.1
1961	5.5[a]-5.1[b]	1.9	0.9
1977	9.2	7.0	3.3
1981	9.9	10.3	8.5
1986	18.2	5.8	10.0
1989	17.1	8.5	7.7

Note: a: Based on Census of Population.
b: Based on Labour Force Survey.

Source: Ireland for 1926, 1961 and 1981 from Kennedy, Giblin and McHugh (1988) and Denmark and The Netherlands for these years from Maddison (1991). The comparisons for 1977, 1986 and 1989 are drawn from the EC Labour Force Surveys and are therefore more likely to be based on comparable definitions of employment and unemployment.

During the inter-war period Irish unemployment is indicated to have been higher than that of The Netherlands but lower than that for Denmark. However, during the post-war "golden age" Ireland had a much higher rate of unemployment. The differences between the three countries narrowed during the recession of the early 1980s but in the later 1980s Ireland once again stood out with an unemployment rate which was very high both in absolute and relative terms.

(i) **Aggregate Productivity Performance**

A link between aggregate productivity performance and comparative per capita income was traced in Section 2, while recognising that the extent of participation of the population in the active labour force is also of key significance.

Table 3.14 shows that there was little improvement in Ireland's comparative aggregate productivity between the 1920s and 1960, but thereafter the pace of convergence quickened. Indeed, by the late 1980s the productivity gap relative to Denmark had been completely closed. This suggests that the continuing gap in the level of comparative living standards was the outcome of a lower rate of involvement of the population in the employed labour force.

TABLE 3.14
Comparative Aggregate Productivity, 1913-1989
GDP per person in Employment

	Ireland/Denmark (=100)	Ireland/ The Netherlands (=100)
1926	58[a]	47[a]
1960	65	57
1971	77[b]	62[b]
1987	96	85[c]
1989	101[d]	90[d]

Note: a: Ireland for 1926 compared to Denmark and the Netherlands for the 1929.
b: Ireland for 1971 (estimated by Ferris (1989) compared to Denmark and The Netherlands for 1973).
c: Maddison (1991) indicates a marked drop in average hours worked in The Netherlands with a consequent reduction in comparative GDP per person in employment.
d: SOEC (1991).

Source: As in note. For all years other than 1989 estimates of Denmark/UK and The Netherlands/UK (Maddison, 1991) were linked to our own estimates of Ireland/UK (Birnie, forthcoming). This linking of two different sets of comparisons means that these results should be regarded as approximate.

TABLE 3.15

Total Employment and Activity Rates, 1926-1989

(Thousands, Total in Employment as per cent of Population)

	Ireland		Denmark		Netherlands	
	L	% of pop.	L	% of pop.	L	% of pop.
1926	1220	41.1	1476c	42.0	3023[c]	38.8
1961	1018[a] 1053[b]	36.1[a] 37.3[b]	2152[d]	47.0	4630[d]	40.3
1981	1146	33.3				
1986	1075	30.4	2643[e]	51.6	5990[e]	40.8
1989	1090	30.9[f]	2695[g]	52.5	6150	41.4

Note: a: Estimate from Census of Population.
b: Estimate from Labour Force Survey.
c: 1929.
d: 1960.
e: 1987.
f: Population estimate interpolated between 1986 and 1991.
g: 1988.

Source: Ireland: Kennedy, Giblin and McHugh (1988); Denmark and The Netherlands: Maddison (1991).

Table 3.15 shows that the percentage of the Irish population which was in employment dropped from 41 per cent in the mid-1920s to only 30 per cent in the late 1980s. In contrast the activity rates in Denmark and The Netherlands rose. Table 3.11 shows that in 1986 GDP per capita in Ireland was 54 per cent of the level in Denmark and 60 per cent of the level in the Netherlands. Given the activity rates shown in Table 3.15, but assuming equal aggregate productivity levels, comparative GDP per capita would have risen to 59 per cent and 75 per cent respectively. In other words, nine-tenths of the shortfall in living standards relative to Denmark could be attributed to the lower activity rate in Ireland. Relative to The Netherlands the lower activity rate in Ireland is indicated to be responsible for almost two-thirds of the gap in terms of GDP per capita. *The low rate of participation of the Irish population in employment is therefore the dominant influence on comparative living standards.*

This does not mean, however, that comparative productivity performance can be neglected. Table 3.15 also illustrates the very disappointing performance of Ireland with respect to growth of total employment. Between the late 1920s and late 1980s total employment in the two Continental economies roughly doubled. In contrast total employment in Ireland fell. Due

account must be taken of the structural disadvantage faced by Ireland given the much larger proportion of the labour force in agriculture, as shown below (NESC, 1993)). However, to some extent this can be attributed to a lack of competitiveness, which in turn could reflect relatively low levels of labour productivity.

(ii) **Economic Structure and Manufacturing Productivity Performance**

The following table shows how the economic structures of the three countries differed and how they developed during the post-war period.

TABLE 3.16

Sectoral Composition of the Labour Force, 1950-1987

(As Per Cent of Total Employment)

	Ireland[a]			Denmark			The Netherlands		
	Agric.	Ind.	Serv.	Agric.	Ind.	Serv.	Agric.	Ind.	Serv.
1950	40.8	23.2	36.0	25.1	33.3	41.6	13.9	40.2	45.9
1973	25.9	30.5	43.6	9.4	33.2	57.4	6.1	35.2	58.4
1987	15.6	28.0	56.4	5.8	27.9	66.3	4.7	26.3	69.0

Note: a: 1951, 1981 and 1986.
Agric.: Agriculture, fishing and forestry.
Ind.: Mining, manufacturing, electricity, gas, water and construction.
Serv.: Residual sectors of economy.

Source: Ireland:Kennedy, Giblin and McHugh (1988). Otherwise, Maddison (1991).

Throughout the period, Ireland has been characterised by the largest agricultural sector. Denmark became more like The Netherlands in terms of the relative size of its agricultural sector. Whereas in 1950 Ireland had a relatively small industrial sector, by 1987 the three economies were very similar in terms of the proportional size of industry. In 1987 Ireland continued to lag in terms of the size of its service sector.

Turning to comparative productivity performance at the sectoral level, there is unfortunately a lack of previous direct and detailed comparisons between Ireland and Denmark and The Netherlands. Roy (1989) indicates the following results for 1985.

TABLE 3.17
Comparative Sectoral Productivity, 1985 GDP per person in Employment, using PPPs

	Ireland/Denmark (Denmark = 100)	Ireland/ The Netherlands (The Netherlands = 100)
Agriculture, Fishing & Forestry	122	102
Mining, Fuel & Power	23	6
Manufacturing	92	57
Construction	97	84
Distributive	49	41
Transport & Communic.	49	24
Other Market Services	111	127
Whole Economy	91	64

Source: Roy (1989).

These comparisons are based on national accounts-based measures of output, together with surveys of employment, while purchasing power parities (PPPs) are used to compare real output. A more reliable measure of productivity in each country is likely to emerge when output and employment are taken from a single source (e.g. a production census). Moreover, PPPs may give a misleading indication of differences in ex-factory output prices (PPPs include the effects of indirect taxes, retail margins, transport costs and imported goods, but they will not allow for the intermediate part of output). A number of commentators (Paige and Bombach, 1959; Smith, Hitchens and Davies, 1982; van Ark, 1993) have therefore treated national accounts and PPP-based comparisons as very much a second best to an industry of origin approach where output, employment and price indicators are extracted from production censuses with careful regard for definitional differences (this approach has been adopted in sectoral comparisons of Irish and UK productivity by Birnie (1993). Notwithstanding this, the data in the table provide a useful summary of Ireland's comparative productivity performance across the broad economic sectors.

The relatively favourable Irish comparative productivity in agriculture is consistent with other measures (though it is not clear that Irish farming

productivity should be indicated as being roughly equal to that in the Netherlands; Birnie (forthcoming)) as is the very unfavourable position in mining, fuel and power (the very high Dutch productivity presumably reflects the impact of natural gas). The Irish manufacturing productivity level is indicated to be close to that in Denmark but not much more than half of the level in The Netherlands (since Roy (1989) estimates that average hours worked in Denmark were only 79 per cent of the Irish level and in The Netherlands 92 per cent, the implication would be that Ireland would have an even lower comparative output per hour worked). The following table illustrates comparative productivity for individual branches of manufacturing.

TABLE 3.18
Comparative Productivity by Manufacturing Branch, 1985 GDP per person in Employment (Using PPPs)

	Ireland/Denmark (Denmark = 100)	Ireland/ The Netherlands (The Netherlands = 100)
Food, Drink & Tobacco	92	57
Textiles, Clothing, Leather & Footwear	116	69
Wood & Furniture	40	31
Paper, Printing & Publishing	63	44
Chemicals, Oil Refining, Rubber & Plastics	185	92
Non-Metallic Minerals	16	15
Metal Production	30	17
Engineering	92	57
Other Manufacturing	29	24

Source: Roy (1989).

Results at the disaggregated level are likely to be less reliable (PPPs may be less representative) and caution needs to be applied since Roy (1989) has been shown to give a much lower comparative productivity relative to the UK than would be indicated by a range of other approaches (notably comparisons of net output per head as measured by the production censuses, Birnie (forthcoming)). It may therefore be significant that a linking of our own industry of origin comparison of

Irish and UK manufacturing productivity (Birnie, forthcoming) with a comparison of UK and The Netherlands productivity which used the same technique, indicates that Irish average manufacturing productivity actually exceeded that of The Netherlands. It is to these comparisons which we now turn (unfortunately no industry of origin study has yet been applied to Denmark).

Van Ark (1993) provides comparisons of the comparative productivity of the UK and the Netherlands in 1984 (these results have already been discussed in Section 3). For example, total manufacturing output per head in The Netherlands was measured as 143 per cent of the UK. When these results are updated to 1987 using volume indices of output (SOEC, 1989) and measures of total employment (SOEC, 1991) the following comparative productivity ratios are implied:

TABLE 3.19
Irish Comparative Manufacturing Productivity: Ireland, UK, And The Netherlands, 1987
Output Per Head

The Netherlands/UK[a] (UK= 100)	Ireland/The Netherlands[b] (The Netherlands= 100)
130	106

Note: a: Netherlands/UK, GVA per person in employment, while Ireland/UK is net output per person in employment.
b: Estimated using the Ireland/UK productivity ratio of 137.

Source: van Ark (1993) and as in Table 5.12.

Several caveats should be applied to these comparisons. Two separate binary comparisons of productivity levels (i.e. Ireland/UK and The Netherlands/UK) have been linked together through the common country, but it cannot be assumed that transitivity will necessarily apply (van Ark, 1993). The ideal would be a direct binary comparison between Ireland and Netherlands (and, indeed, Denmark as well). A further source of unreliability is introduced is that the Ireland/UK productivity comparisons relating to net output are being linked to those based on Gross Value Added. Nevertheless, it seems safe to assume that by the late-1980s Irish average manufacturing levels were substantially higher than those in Dutch manufacturing. The table outlines the implied Ireland/The Netherlands performance at the level of branches of manufacturing.

TABLE 3.20
Irish Comparative Manufacturing Productivity: Ireland, UK and The Netherlands, 1984-1985
Net Output Per Head, Using Relative Product Prices

	Ireland/UK 1985[a] (UK = 100)	The Netherlands/ UK 1984[b] (UK = 100)	Ireland/ The Netherlands[c] (Neth. = 100)
Petroleum Refining	28	176	16
Non-Metallic Mineral Products	119	187	64
Chemicals & Man-Made Fibres	229	139	164
Rubber & Plastics	112	146	77
Metal Production & Metal Products	86	139	62
Mechanical Engineering, Motor Vehicles & Transport Equipment, Office Machinery & Data Proc. Equipment	184	95	193
Electrical Engineering	118	140	85
Food & Drink	119	141	85
Tobacco	93	113	82
Textiles	95	174	55
Clothing	79	123	64
Footwear & Leather	104	95	110
Timber & Furniture	81	129	63
Paper Products	106	273	39
Printing & Publishing	64	118	55
Instrument Engineering & Miscellaneous Manufacturing	188	130	145

Note: a: Derived as in our own productivity comparisons in Birnie (forthcoming) (the definitions of industries are chosen so as to be compatible with those used by van Ark (1993)).
b: Taken from van Ark (1993), except petroleum refining from van Ark (1990a).
c: A simple division of our own estimate of Ireland/UK comparative productivity for 1985 by van Ark's for The Netherlands/UK comparative productivity for 1984.

Source: As in note.

In many sectors The Netherlands probably represents best practice within Western Europe in terms of comparative productivity (van Ark, 1990a, 1993). Once again, a strong comparative productivity performance by Ireland is indicated in electrical engineering, office machinery and data processing equipment, chemicals and man-made fibres and rubber and plastics, and instrument engineering and miscellaneous manufacturing. In all these cases, Ireland was indicated to have a higher productivity level than The Netherlands.

(iii) **Performance of the Clothing and Dairy Products Sectors**

The performance of the sectors in which the firms selected for the case studies for this Report are located, is discussed in this section.

(a) Dairy Products

In the early 1990s the food, drink and tobacco sector as a whole in Ireland employed around 40,000 persons, about one-fifth of the total manufacturing labour force. Dairy products in turn employed about 10,000 persons. Table 3.21 illustrates that the recent decline in food, drink and tobacco employment in Ireland has exceeded that in Denmark and The Netherlands but, as Table 3.22 shows, the employment performance of dairying has been similar in the three economies.

TABLE 3.21
Food, Drink and Tobacco Employment, 1980-1990 (000s)

	Ireland	Denmark	The Netherlands
1980	56.0	68.1	134.4
1989	43.9	61.5	113.7
Per Cent Decline	-21.6	-9.7	-15.4

Source: Commission of the European Communities (1991).

TABLE 3.22
Dairy Products Employment, 1980-1989 (000s)

	Ireland	Denmark	The Netherlands
1980	12008	9430	22113 (1982)
1989	10065	7866	19327
Per Cent Decline	-16	-17	-13

Source: Commission of the European Communities (1991).

Apart from its importance in terms of size, interest in dairying in Ireland could be further justified given the possibility that Ireland may have scope to develop a competitive advantage in this sector (the direct production cost of milk production may be relatively low; NESC (1992b)). Table 3.23 illustrates that the nominal output growth of this sector in Ireland exceeded that of the continental economies.

TABLE 3.23
Dairy Products: Growth of Nominal Gross Output, 1980-1990
ECUs Million

	Ireland	Denmark	The Netherlands
1980	1284	1531	5183
1990	2715	2643	4979
Per Cent Decline	+111	+73	-4

Source: Commission of the European Communities (1991).

TABLE 3.24
The Physical Output Of Dairy Products, Thousand Tonnes

	Ireland	Denmark	The Netherlands
Dairy Butter			
1983	162	131	300
1989	145	92	213
Per Cent Change	-10	-30	-29
Cheese			
1983	522	514	89
1989	74	295	572
Per Cent Change	+42	+18	+17
Fresh Products			
1980	659	878	1863
1989	687	829	1487
Per Cent Change	+4	-6	-20
Milk Powder			
1983	192	134	480
1989	165	125	314
Per Cent Change	-14	-7	-35

Source: Commission of the European Communities (1991).

piloted on three good practice firms in Ireland (one of the Irish companies was multi-plant, so the results were drawn from five different plant visits). These represent that which is achievable by indigenous companies with current and past policies. The firms were chosen with the help of the IDA and the CII (now IBEC). Three sectors were initially considered but time constraints enabled attention to be focused on two only: food processing and clothing while engineering, the third, has been dropped from this initial study.

The approach has involved inviting senior managers from counterpart companies in Denmark and The Netherlands to assess productivity and a range of causal factors at the Irish companies. This method has been successfully implemented by the authors at a similar set of plants in NI (seven) where it was shown to be a method of identifying deficiencies in industrial practice there (Hitchens, Wagner and Birnie, 1991). It is of passing interest that the more traditional approach to the identification of weaknesses has been to assume that industrialists from low productivity countries, such as the UK, can recognise how higher productivity counterparts e.g. USA or West Germany achieve this (Gauge and Tool SWP, 1981) by making visits to high productivity countries.

Three managers, one from Denmark and two from The Netherlands visited respectively one food and two clothing companies in Ireland. The managers were traced by NESC staff using trade directories, industrial and academic contacts and recommendations made by pilot Irish firms. The appropriateness of the counterpart firm was checked with the Irish company for product type etc. and positioning in the comparator country's industry. All choices were accepted as fair. However, given that only good practice plants are included here it must be cautioned that these do not necessarily reflect competitiveness constraints facing *average* companies. This Section focuses on the managers' observations on the Irish plants with, where relevant, comparative data shown.

All visiting managers extended an invitation to their Irish counterparts to make reciprocal visits to the foreign company. One Irish company had already done so. These exchange visits do not however form part of this study but are recommended as important in understanding Irish constraints on reaching continental European standards.

Earlier matched plant studies undertaken by the authors have provided the basis for the collection of factual data on productivity and related causal factors and questionnaires to address the visiting experts (Daly, Hitchens and Wagner, 1985; Hitchens, Wagner and Birnie, 1990, 1993). Topics covered include product quality, markets served, competitive advantages and

disadvantages, comparative productivity, machine type and appropriateness, shop floor skills, qualifications, flexibility and effort, quality of management and supervision etc. Before considering their observations, we set out some general comments on the sectors in which the firms are located.

(i) **The Firms**

Details of the sample firms are sketched only, to preserve anonymity while allowing the reader an understanding of the essential background to the study.

The dairy processing company is a leading international supplier of dairy products and undertakes a wide variety of allied activities within Ireland but also in the UK and US. Just under half their processed output comprises intervention products. This is a reduction on the70 per cent of milk products for intervention in 1987, and it is the policy of the company to reduce this proportion further by a greater emphasis on the production of cheese, fresh dairy products, liquid milk and non-intervention butter for markets. The company employs 2,500 people. The Danish company undertakes each of these activities, together with a wide range of other national and international production and marketing activities. Research visits were undertaken to three processing plants in the group, making butter and skim milk powder, cheeses, and yoghurt. These plants are designated C, B and A.

Visits were also made to two clothing companies, X and Y. X makes quality knitwear for men, and incorporates an Italian name and designs. Forty per cent of output is exported to Great Britain and 10 percent to the US and France. Products are designed for Ireland, with the exception of the American market which favours ethnic emerald green. X sells to mainly small menswear shops while its Dutch counterpart, which makes womenswear, mainly sells to wholesalers and retail chains. The degree of dependence of each company on its largest customer is the same, at 15 per cent. X is a small company employing 50 persons. X's Dutch counterpart employs more, 75 persons and exports 10 per cent of its output. (X considered its export dependency and small home market a weakness). While the showpiece of X's production retails at an average of 39 per cent more than its Dutch counterpart, in practice (and unlike the firm in The Netherlands) X is involved in "a bit of everything", for example three-eighths of X's current output is very cheap school-wear, priced at marginal cost and continued in order to maintain capacity and employment at the firm. X operates a single plant.

X considers it has no competitive advantages overall, though in Ireland they claim better designs and technology. Their main disadvantage is a lack of demand.

Y is a long-established firm making quality menswear. The plant visited employs approximately 160. They sell to independent retailers and to multiples. Half the output is sold in the UK and 25 per cent in Continental Europe. These further exports are a relatively new development for Y. The firm occupies a medium to high point in the market in terms of price and quality. Their Dutch counterpart also makes menswear to a medium market position: suits, jackets and trousers. Some capacity is also concerned with the production of military and security uniforms. Like Y, the Dutch counterpart has many customers. It exports 15-20 per cent to Germany, Belgium, France, Italy and the UK. The main market is the home market and the managing director emphasised the advantage of being located "close to the market". The Irish firm did not consider the home market a constraint on their business and overcame any such marketing disadvantage by employing German design consultants to help give their garments a continental comfortable finish and finesse. Constant effort is also maintained to keep abreast of fashion in France and Italy. Y advertises and has a brand name. The Dutch counterpart does not advertise but has a good name among insiders in the industry. The Dutch company only employs 75 persons. Ninety per cent of their garments are manufactured in Eastern Europe (especially at six plants in Poland; they have also used small production plants in Croatia, Bulgaria, Bosnia and Romania). As many as 1,000 people are engaged in their production in Poland. The company in The Netherlands employs principally managerial, design, supervisory and technical staff, and a small complement of 20 sewing operatives to finish or adjust garments processed elsewhere.

Y consider their competitive advantages to be price, on comparable German imports, and the advantages of a strong fabric range. Their disadvantage was a lack of cost competitiveness on trousers, a traditional image which they were trying to modify, and a static and limited market for their products.

(ii) **Products**

In food processing the team was shown seven products made at three plants. The product made at B was considered to be of good quality but that made at A poor and variable. Products made at C were of average quality. Products made at A would be manufactured in Denmark,

products at C would be subject to further processing (raising their value added) in Denmark, and at plant B only one product would be made in Denmark, the other related product being considered to be too basic to be manufactured there. Across the whole range of output the balance would differ at the Danish firm, with a greater use of milk towards higher value added products compared with what was being undertaken in Ireland. This difference between the two companies was further evidenced by the fact that three and a half times the quantity of output of the Irish firm, as compared with the Danish counterpart, was concerned with production for intervention or the manufacture of commodities dependent on subsidies. In addition, products at the Irish company were much more likely to be produced in bulk packaging for business to business sale; their Danish counterparts would package and sell for the retail market. A reorientation of product strategy towards market requirements and consumer preferences and away from bulk production would be required to bring the product range into line with that in Denmark.

The Danish manager considered this company to be "techniques oriented" and very concerned with systems rather than the market question. He suspected that there was little understanding of matters other than production at the *plant* level. Ireland, he considered, similar to Denmark 10 years ago — in its emphasis on commodity products. In Denmark today 60-65 per cent of milk compared with 10 per cent at this Irish company, would be processed for consumer products for the retail market.

Management in Ireland, he argued, would require to be re-educated in order to adopt a marketing perspective. This required a move away from being a low cost producer to a strategy of selling products throughout Europe. To achieve this management would need to develop a greater emphasis on marketing expertise. While noting that the home Irish market is small it would be possible, for example, to sell fresh-cooled products to the British market. This would be possible provided that funds were available for R&D investment, and given a sufficient supply of educated people. Production, he argued, would need to move from simple bulk products to a more "pharmaceutical" system of manufacture. In as much as seasonality in milk supply was a constraint on continuous production, he considered that such problems could easily be "bought off" by the production of higher value added products. This had been achieved in Denmark. Only two products made in the Irish company had counterpart equivalents at the Danish company and significantly these

were made under license (the company barely undertook any R&D or marketing).

He considered that the actual strategy revealed by the Irish company was somewhat vague and in any case unlikely to be useful to the development of the underlying business. This has been one of growth through acquisition, by buying turnover and businesses unrelated to the requirements of the principal products and the need for markets. While diversification was wise it required to be related to overall goals. His own company would have a more coherent strategy and would focus on very long-term goals in purchasing companies.

In *clothing*, X made garments of good quality according to the Dutch managing director. These garments were also selling for a slightly higher price than those of the counterpart firm's products in The Netherlands. However the Dutch manager considered that a design opportunity had been lost, since the company was making Italian copies, limiting its market to Ireland and Great Britain. Prices, given wage and productivity differences, are 90 per cent of that for which the Dutch manufacturer could make. That was not a competitive advantage, since such prices could be obtained elsewhere in The Netherlands and without the risk and inconvenience of sourcing outside the country. The product, in the Dutch manager's view, needed to be Irish and perhaps a "green" design would have more export potential.

While the product is not sufficiently original to be exported, the survival of the company is hampered by the low per capita incomes characteristic of the home market. This indicated that the company should address the problems associated with product design and marketing. This was a more urgent requirement than that of addressing difficulties on the technical side of the business. Competition was seen to be critically dependent firstly on design, and then price.

Y occupies a medium to high price market position, and the Dutch manager considered the market to be moving against Y's product. The trend he considered to be towards comfortable casual and knitted clothes and he questioned whether Y, with its high quality standards and orientation, would be able to make the change and trade down.

In addition to the market moving against Y's product,the Dutch managing director anticipated increasing competition within the next 5 to 10 years. In the 1970s, 5 similar Dutch plants had been forced out of business by such price competition. Ideally he considered this company

should move quickly toward outward processing in Eastern Europe, maintaining the production and quality know-how in Ireland, together with management and marketing. Newer, lower-priced quality goods should be made with a greater emphasis on casual wear and womenswear. This would require a new design team (design is in any case reported in need of strengthening at Y). Such a move would require changes in the attitudes of management and labour (for example the need to trade down) which he considered would represent a challenge.

(iii) Results of Visits

(a) *Peripherality*

Peripherality was said to be significant by Y, in as much as the factory is located far away from the fashion centres of France and Italy. The food company recognised distance from the market and customers as important, in addition to access to computer repairs, while X emphasised difficulties in obtaining raw material supplies, repairs and ease of making returns etc.

(iv) Productivity

For the food company, physical productivity at two plants was equal to or greater than at comparable plants in Denmark. This was because the products are basic and simple, while more processes or a greater variety would be made at the counterpart plants. Value added per head would however be lower. At plant A products were directly comparable and physical productivity (number of units per head) was estimated at two-thirds that of the Danish company.

In clothing, the Dutch manufacturer made 5,000 pieces per person per annum compared with 2,177 at the plant of X, indicating a productivity level just 44 per cent of the continental plant. Standard minutes were one-third lower in Holland. Value added calculations indicated productivity at this company to be 77 per cent of that of the comparator.

At Y, the Dutch manager judged physical productivity (i.e. number of garments produced per operative) to be the same as between his and the Irish firm. However, on a value added basis productivity was just 80 per cent that of the Dutch counterpart.

(a) *Scale of Production*

Clothing plants X and Y were not disadvantaged technically by size and were comparable with their Dutch counterparts. The typical batch size and colour change was the same as that at the Dutch firm,

as were the typical number of standard minutes to produce a garment. The spread of order sizes at Y fell within the range of that of the Dutch company but lay above their minimum (both companies found it difficult to specify an average batch size).

Management at the food plant specified scale as a principal disadvantage relative to their continental counterparts (along with seasonality of milk supply and distance from customers). For example they estimated that in cheese, if output were doubled, marginal costs would fall by 30 per cent. The Danish manager disagreed. In his view although scale of production of product B is smaller than that of Denmark and The Netherlands, and East Germany (where plants are extremely large), the scale in Ireland was reasonable relative to other European countries. The size of production of product A was also not a disadvantage in his view, though Danish and other European producers would manufacture at a scale perhaps 50 per cent greater.

(b) *Premises and Machinery, Organisation and Layout*

Premises were not a major hindrance on productivity, though in food the use of old creameries was not appropriate to today's products (hygiene standards were good but in Denmark more would be spent on decoration and cleaning). The Dutch counterparts to X and Y operated out of modern factories. Y's plant was cramped but without obvious penalties to workflow. There are many old premises successfully manufacturing to high productivity levels in continental Europe. In clothing no difficulties were reported or observed.

In food, the plant manufacturing product B was of a high standard, modern and well laid out. Engineering this factory had caused considerable problems, perhaps symptomatic of weak or inexperienced technical skills. Machine manning levels were acceptable. Product A was made in a factory where, compared with Denmark, the product flow was said to be illogical, machines were not well placed, the layout of the factory was poor creating too much internal transport and was consequently overmanned by 8-10 per cent. The essential manufacturing equipment at this plant was of an acceptable standard but, overall, one-third of the equipment was either out of date or had been technically superseded. Product C was made in an old factory where no natural product flow was visible and the layout of the factory was poor. The machinery on average

was not up to date and was old fashioned in two of the three product lines.

Maintenance was best in plant B, poorest in the plant producing A (and recognised to be a problem by their newly appointed engineer). A suffered from an absence of good engineering skills because it lacked a good knowledge of machines, knowledge of where to source parts, documentation on the machines, etc. Down-time was 16-20 per cent. An indication of a lack of knowledge on the technical side at C was indicated by an inability to adapt new machines. Excess capacity (with the exception of A) was observed as a consequence of seasonality.

Machinery at X was more modern than in the Dutch factory, with 64 per cent less than 5 years old compared with 30 per cent in Holland. Three times as many machines were computerised at the Irish company too. In both countries machinery purchased was appropriate and German. However maintenance and breakdowns are a major problem at X. The quality of the underlying training of the graduate engineers was openly questioned because of the frequency of breakdowns, especially at the early stages of introducing computerised technology. One graduate engineer had received 20 weeks of training to understand the machinery, his counterpart in Holland received 4. (The Dutch manager offered to retrain him at his own plant.)

Plant Y also had more modern machinery, with 60 per cent less than 5 years old compared with 25 per cent in Holland. The use of computers was broadly similar. In this factory machines are well maintained and appropriate for the job with the exception of cutting, where insufficient machinery and consequent overmanning was found.

Cutting at X was less productive than at the Dutch counterpart firm because of the method of using scissors, change-overs were longer because of their lack of engineering expertise, and style changes were reported to cause chaos (nevertheless the machines were set up to achieve the same 85 per cent level of efficiency as that of their Dutch counterparts). Bundling, work organisation and flow were better organised in Holland and assembly was noted to be poorly organised at X too. Y was well laid out and production routing was observed to be good.

(c) *Overmanning*

At the food plant, new investment at C would reduce employment by 10-12 persons. Maintenance is overmanned at this plant. At A there are 5 to 6 extra persons out of 61 as a consequence of a lack of automation, in addition to 8-10 per cent consequent on poor layout.

Y is overmanned in cutting and supervision, with between 4 and 6 unnecessary persons. The firm also operates "double" quality control. This additional work would not be required in Holland. There was also overmanning in administration. X was said to be overmanned by 6 to 7 indirects, including its production manager (given the small level of output no production manager would be required in The Netherlands, though his presence in Ireland may be symptomatic of an absence of required knowledge or skills elsewhere in the factory). X also undertakes more checking of individual pieces of work than its Dutch counterpart. At X 6 machines were manned by a knitter compared with 10 machines in Holland. Assembly was also identified as overmanned.

(v) Qualifications and Skills

(a) *Management*

The Danish manager observed that at the managerial level all persons have the highest educational qualifications (principally dairy science degrees and diplomas). Degrees at the food company were more common than in Denmark, although he believed that education in food and dairying in Denmark would be of a better quality than in Ireland (the Danes would have studied longer and would have a more general grounding for the food industry as a whole, the degree would be less theoretical and the diploma would take more time, 4 years). From discussions with plant managers he formed the view that their counterparts in Denmark would know more about the cost structure of the company and of the plant. They would also be more knowledgeable about the sales, marketing and planning sides of the company. Danish plant managers would have more power and indeed there was evidence that the Irish plant managers and perhaps other staff grades were unsure about their role. The Danish manager was especially critical of one factory where there was an absence of data on a number of key management control variables. In general, the production of more complex and sophisticated products in Denmark would place greater demands on

the knowledge and training of managerial personnel. The Danish company would spend more on management training. More would also be spent on R&D and allied personnel. He found very little impression of R&D activities at the Irish company. There was very little marketing effort too (that which did exist was not of the same professional order and qualifications were poorer). While product A had a marketing division attached, the company recognised a training deficiency in both marketing and personnel management. In Denmark production would be better integrated into marketing.

At clothing plant Y, formal management qualifications were comparable numerically with those of the Dutch company, but in both cases they were few in number. (The personnel manager at Y would have liked more third-level qualifications in the company as well as more new blood to counteract the tendency towards an inward looking culture). At X qualifications of management were also comparable. However the Dutch plants engaged more persons with engineering degrees. Skills of other managerial staff were acquired in-house, production managers were considered competent and their spectrum of tasks similar. However at X the production manager was said to be untrained.

(b) *Labour*

In food, semi-skilled and unskilled operatives dominate the employment structure. Their performance was considered good because any lack of training was countered by the long service and acquired experience of employees. In one plant, for example, nobody had been taken on since 1986, while most persons in another had leaving certificates. Persons are employed without any special background and receive on the job training. Their basic education is the same as in Denmark, but in Denmark they would receive more systematic training by attending basic courses on general topics on the food industry and courses specific to production. In Ireland training was very narrow and dedicated to the job (the minimum required for the job); but long service had allowed a build up of training through time (though older persons were harder to train in computer skills). There would be fewer operators employed in Denmark.

Supervisors in Denmark would be apprentice trained, skilled dairypersons and have a diploma in dairy science. At the Irish company a number of creamery supervisors and charge hands are

promoted (without qualifications) from the shop-floor. The Danish counterpart would be a skilled dairyperson, involving more precise and relevant training. This better qualification, the Danish manager argued, helped individuals answer the question, "how can this task be undertaken better?". Supervisors overall would be better trained and, compared with the Irish plant, in some instances they would not be considered necessary, e.g. in maintenance. Technicians would be similarly qualified but in Denmark fewer would be employed. Laboratory personnel were often promoted from the shop-floor while in Denmark they would have received formal training. The greater knowledge of hygiene and production control in Denmark required fewer persons to be employed in laboratories and quality control than in Ireland.

However the overall level of shop-floor training at the food company was not considered an insuperable barrier to making higher value added products. The younger workforce is well educated and can be given more general training. Few difficulties with absenteeism were indicated, except at one plant where it was high relative to the other plants, reflecting a lack of tight management, according to the Danish visitor. Labour turnover is lower in Ireland.

Shop floor training at X and Y, like their Dutch counterparts, is based on on-the -job training (there is no apprentice training in The Netherlands in this occupation). Recruitment at the Irish plants was concerned with aptitude, trainability and character rather than educational attainment. It was not possible to contrast in detail underlying school qualifications.

In X and Y as at their Dutch counterparts, training took place in house. At Y the plant had a training school and typically 14 weeks training might be given. In both cases the level of on-the-job training was not significantly different from the training input at the Dutch plant, but it was not possible to test the quality of training for flexibility between the two countries. Work done on single tasks observed was good.

The Dutch managers were not critical of supervisory qualifications at X or Y. In both cases those at counterpart plants would be qualified by experience too. Absenteeism, reported at 4.5 per cent at Y, was higher in The Netherlands at 6-8 per cent. At X

absenteeism was 16 per cent compared with 6 per cent at the Dutch plant. Labour turnover was similar at X but lower at Y.

(vi) Prices and Costs

Details of cost structure were given for X and Y. These comparisons indicated for Y a higher share in total costs of labour and overheads, while the share of material costs was less. The profit rate at the Dutch plant was greater largely because of the use of outward processing.

At X the share of labour costs and overheads was also higher than that of the Dutch plant, and the latter was nearly twice as profitable as its Irish counterpart.

Although there are difficulties in making such comparisons an attempt was made to compare wage costs across a number of grades. In food, Irish staff are paid two-thirds of that of their Danish counterparts and operatives half the Danish pay.

Sewing operatives would be paid between 40 and 47 per cent more than their Irish counterparts at the two plants (based on a 39 hour week with PRSI at 12.2%, and a working week in the Netherlands of 38 hours, 5 weeks holiday and employer's contribution of 28 per cent; normal bonuses were included). Supervisors are paid 21-38 per cent more, technicians 88 per cent more, designers 200 per cent more, managers 21-38 per cent more and salespeople 26 per cent more in the comparisons made.

It was also possible to compare costs per standard minute. At X these averaged 72p per garment, compared with 99p in the Netherlands, and when taking account of planned productivity differences (actual productivity differences were higher) the Irish costs rose to 95 per cent of that of the Dutch firm. This difference was not considered to signify a cost advantage given that such lower costs were available in The Netherlands without the difficulties associated with producing on the periphery. At Y labour costs per standard minute were 11.5p compared with 8p in Poland. Differential productivity still gave the Polish a cost advantage after taking transport costs into consideration (a truck load of outwardly processed garments cost 15,000 guilders on a consignment valued at 400,000 guilders).

The Dutch company considered Y's wage costs too high. Indeed Y is suffering competitive cost pressure on one product and is considering outward processing on this one item to take place in the next 2 years.

The company is also looking to reduce labour costs overall by 15 per cent (by use of appropriate costing systems and rationalising the organisation of production). The Dutch manager considered the need for Y to find cheap CMT producers to be much more urgent because of the requirement to build up an appropriate quality response in Eastern Europe. This might take up to 3 years. He foresaw much of Y's production moving from Ireland where only the knowledge (and supervisory) base, involving perhaps 80 persons, would be retained. The next 5 years he thought critical. Y will have to develop the know how for this. Their training and 80 per cent of machinery would be adequate for the task.

(vii) Conclusions

These three case studies are illustrative of how an assessment of productivity, its division between value added and physical productivity, and the sources of its shortfall can be examined and assessed using international best practice expertise. The strength of the approach is that it gives more qualitative detail, much of it supplied directly by those who have expert experience in each sector, than is the case with similar statistical or survey data. It also introduces an outside perspective to what otherwise might lack objectivity.

In these conclusions we draw attention to those factors on which there was consensus between the three international managers and also to the support provided by other studies. However before doing so it must be restated that these cases form just three studies; they are based on good practice in Ireland and say nothing of where the average level stands relative to best practice continental standards. Also, more coverage of industries and sectors are required before a clear picture will emerge on the relative importance of sources of Irish productivity weaknesses. Other skills require to be examined for example in the engineering sectors, for craft-based shop floor skills, and electronics for electrician skills and so forth. Despite these caveats, the descriptions of the managers' findings indicate much consistency with British studies and studies undertaken by the present authors in comparisons made with NI firms. What differs in this study is that the shortcomings are signalled by industrialists from small European countries, while the international comparisons referred to above have been concerned with comparisons mainly with Western Germany.

There are three important sets of conclusions. The *first* concerns products, R&D and design. The second is concerned with the broad

adequacy of the capital stock. And the *third* is concerned with a widespread lack of satisfaction with the quality of the labour force, beyond the broad structures of the proportions of skilled and semiskilled or the formal educational qualifications of management.

In the *first* case managers were concerned with the need to produce higher value added products in food, original designs in clothing and to keep ahead of the market in clothing. Each of these requires an increase in inputs in R&D, design, marketing and improved managerial responses towards the requirements of the market, including responding quickly to market pressures. The findings on the relative importance of these factors, which were greatly emphasised by the visiting managers, have been noted elsewhere for Northern Ireland (Hitchens, Wagner and Birnie, 1991). Less emphasis is placed on this factor in studies comparing Britain with Germany and other continental economies, except to note product quality differences, but not to quantify even roughly the importance of those differences for productivity improvements. This difference in emphasis arises from the strength of the methodology used here, where experts assess the companies in the low productivity countries. Other studies involve researchers comparing firms internationally in products and production methods about which they are technically unqualified to comment.

In the *second* case, the broad conclusion is that machinery and equipment are adequate, that there is no great shortfall in capital stock, but that the productivity of that capital stock is hampered by the quality of skills. In these case studies, engineering skills have affected the ease with which new technology can be introduced and the running of that equipment. Overmanning in maintenance is characteristic of such engineering weaknesses. Production and managerial deficiencies are highlighted by instances indicated of poor machine layout and methods etc. These findings are comparable with other studies of low productivity in Britain and Ireland.

Finally, on the nature of the skills themselves, the broad structure of skills is indicated to be the same as in Denmark or The Netherlands. Comparisons with West Germany as indicated by other studies would show more apprentice-trained persons on the shop floor (see Section 3). This is not the case with The Netherlands and Denmark in the industries considered here. In food, the appropriateness of the educational standards at the tertiary level have been questioned. The lack of training of semi-skilled operatives and the promotion of untrained persons from

the shop floor to supervisory positions were also questioned. Fewer criticisms were made of the clothing plants, except with regard to management and marketing, possibly an absence of engineers from the senior levels of the organisations, and engineering skills as noted above. Unnecessary supervision was noted and double quality control may signal a greater variability in the quality of workmanship.

8. CONCLUSIONS ON THE IRELAND-DENMARK/ THE NETHERLANDS TRAINING AND PRODUCTIVITY COMPARISONS

When the results of the visits by the international experts to the three Irish firms are analysed in the light of the more general data on the comparative performance of indigenous manufacturing in Ireland the following conclusions can be drawn:

1. The physical productivity of the sample plants in Ireland was in three out of the five plants considered similar to or greater than that of the Dutch or Danish counterpart (this being defined as the volume or number of goods produced per worker). At the remaining two plants comparative productivity was 66 per cent and 44 per cent of the continental level.

2. The probably more significant deficiency displayed by the Irish plants relative to the international counterparts was in terms of the *kind of product* being made. The Irish goods were generally of lower value added per unit.

   In food, the Irish products were less likely to be aimed at sophisticated consumer markets (e.g. the Irish firm concentrated more on milk powders, whereas the Danish counterpart had developed higher value consumer products; retail products were only 10 per cent of the total compared to 65 per cent in Denmark). The Irish food processor was also heavily dependent on sales to EC intervention stores (50 per cent of the sales of the Irish company compared to 20 per cent at the Danish counterpart). Thus the Irish firm was reliant on a market where the competitive pressures were less.

   The Irish clothing firms had older products (at one company copies of Italian styles) which were subject to adverse market trends (admittedly, in one case the Irish firm was producing for a higher price/quality position than its Dutch counterpart, but any advantage gained from this was reduced by the out-dated nature of the Irish garment).

3. Despite fairly good comparative performance in terms of physical productivity, the relative value added per head of the Irish sample firms was less favourable. It fell below the continental level at all three of the Irish companies. The Ireland-Denmark/The Netherlands value added per head productivity gap can be thought of as being composed of two parts; first, the difference in terms of physical productivity and, secondly, the extent to which the quality and hence value added of individual products differ (see Section 4). The Irish productivity shortfall was mainly caused by the latter and this has implications for the kinds of explanatory factors which might be considered (Hitchens, Wagner and Birnie, 1992).

   For example, international differences in physical productivity have usually been attributed to factors such as the extent of economies of scale, variations in the amount of capital available per worker and an unfavourable industrial relations record in certain countries. The sample visits failed to indicate that these were significant factors in determining the comparative performance of the Irish firms.

   Product quality was, however, indicated to be unfavourable compared to the Dutch and Danish counterparts. This deficiency was related to causal factors, such as the type of machinery, a lower rate of innovation and more cautious product and company strategies (these reflecting how the abilities, motivation and experience of Irish management differed from those of their international counterparts).

4. At all three Irish companies the representation of formal skills on the shop-floor was similar to that of the continental counterparts. However, a number of specific weaknesses and symptoms of weakness were apparent. In the Danish food firm supervisors were generally apprentice trained, whereas their Irish counterparts were time served. The in-company training provided by the Danish firm for the shop-floor (e.g. short courses) was judged to be superior. The maintenance departments in the Irish food company were larger than those of its Danish counterpart and the quality of maintenance at one clothing firm was poor, indicating a possible skills shortfall.

   One clothing firm used supervisors on the shop-floor where The Netherlands counterpart would not. This too may be indicative of a general qualitative shortfall amongst both the shop-floor workers and their supervisors in Ireland. The fact that both Irish clothing firms used double quality control might indicate that attention to detail may be variable.

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It should be stressed that these conclusions are derived from three companies which were above average in their industries in Ireland. Moreover, the activities considered, food processing and clothing, are usually characterised by semi-skilled/unskilled labour, *so a large gap in terms of formal skills should not have been expected.*

5. When considering training apart from the shop-floor it is important to stress that the Irish plants were attaining generally lower product quality. To some extent the Irish firms could not seize this opportunity to increase the value added of their products because they were constrained by the lack of specific skills. For example, design was indicated to be a weakness (productivity comparisons of Northern Ireland (NI) firms with West German counterparts indicated the same problem as did a visit by a German manager to NI clothing plants; Hitchens, Wagner and Birnie (1990, 1991)). One of the clothing firms doubted whether suitable industrial designers were being trained in Ireland; they had used Germans to re-design their styles (relative to their continental counterparts the designers in the Irish plants were particularly badly paid).

   Apart from external constraints, the attitudes and approach of the managers themselves was a constraint. They leaned towards caution, maintenance of established methods and concentration on the home market. Notwithstanding the observation of a high degree of professionalism in certain cases, the Danish manager claimed that the company strategy he saw at the Irish food firm reminded him of his own company 10-15 years earlier. He thought they did not know enough about the cost structures within their plants. Although the top managers in the Irish company were more likely to have degrees, the Danish counterpart judged that in Denmark the tertiary level qualifications would be superior in terms of breadth and appropriateness. The Irish company relied less on training courses to up-date continually the managers already in the firm.

   In the case of clothing, one of the Dutch managers viewed his Irish counterpart as being on the turning point where previous growth would be changed into inexorable decline (a falling market and an inability to compete with low cost, East European producers). Even if the firm acted now to adopt a strategy similar to that the Dutch company (e.g. by sourcing outward processing in Eastern Europe or north Africa) perhaps only one-third of present employment in Ireland would be preserved. As it was, the Irish management did not envisage change until 2 years from

now. At both Irish clothing firms, engineering skills were considered by the Dutch counterparts to be under-represented.

   The formal qualifications of matched companies were similar, which implies that the implications for training relate partly to acquired skills and the processes whereby company strategies are formed.

6. The management style of the Irish companies should not be considered in isolation from other factors. Some of these were specific to the sectors considered and other were more general.

   In terms of sector-specific factors, the Irish food firm claimed that the seasonality of the milk input prevented it from adopting a higher value added consumer products strategy (though, if higher value added products were being sold the company could then afford to pay farmers to produce non-seasonal milk). Undoubtedly the Irish clothing firms found their distance from the market and indeed from the main fashion centres made it more difficult for them to keep their products up-to-date.

   There were some more general factors which allowed the Irish firms to maintain their present management and company strategies. Perhaps the most notable of these was the relatively low level of wages in Ireland (about 50-70 per cent of the level in the continental companies reflecting lower levels of labour productivity). This ensured that, notwithstanding relatively low product quality, profitability was generally "satisfactory" (and probably at least as high as that of the counterparts). However, this did not guarantee longer-term survival (the food firm was exposed to EC policy regarding intervention and, as noted above, the clothing companies were being rendered uncompetitive relative to Eastern Europe). A study of the NI clothing industry (using a similar method of visits by German managers to sample visits) indicated the same gloomy conclusion. Current market signals, including those arising from the low productivity of labour, did not give firms the incentive to change their product strategy (current profitability was adequate) but in the absence of such change, longer-term survival was in doubt (Hitchens, Wagner and Birnie, 1991).

7. Having drawn these conclusions from the sample firms it needs to be asked whether they can be generalised to indigenous Irish manufacturing. Statistical analysis in an earlier section has indicated that Irish manufacturing productivity, outside of the chemicals and electrical and electronic engineering sectors, is generally substantially lower than that in The Netherlands (Section 6). Irish comparative value added per

head in food (combined with drink) was indicated to be 80-90 per cent of The Netherland's level in 1985 and comparative productivity in clothing about 60 per cent. Irish comparative performance would seem to be more favourable when considered relative to Denmark, though food processing productivity probably still falls short of the continental standard (see Section 6 and Roy (1989)).

Given that these three companies represented some of the better firms in Ireland, it is less surprising that their physical productivity performance was favourable (increased competition within the EC market would in any case be expected to reduce steadily the number of Irish firms characterised by gross overmanning and inefficiency). It is also notable that the output of the three sample firms had grown in recent years. Whilst this would be consistent with the performance of indigenous industry as a whole (the real output index for the traditional manufacturing sectors where most of the indigenous firms would be found, i.e. those other than chemicals, computers, electronics and miscellaneous foods, rose by 18 per cent during 1985-1991 (Baker, Scott and Cantillon, 1993)), the sample firms were in fact out-performing their own particular sectors (real output was static in dairy products during 1985-1991 and fell by 20 per cent in clothing (O'Donnell and Kenny, 1993)). It could therefore be argued that the three sample firms represent a picture of comparative performance which is more favourable that is actually the case.

Problems of relatively low product quality have previously been indicated in studies of small firms in Ireland (O'Farrell and Hitchens, 1988). In these cases there were also problems of lack of attention to detail and loose production management. OECD (1991) suggested that certain technical qualifications were under-represented in Irish industry and Tansey and Roche (1992) demonstrated that Irish firms have a lower commitment in terms of money spent on on-the-job training than continental counterparts. It is also known that Irish manufacturing is characterised by relatively low rates of R&D. All these findings are consistent with those of our own study.

What is very notable is the extent to which even some of the better Irish firms have problems. Moreover, these weaknesses may be cumulative in nature. The gaps in shop-floor and management skills would make it very difficult for these companies to try to up-grade their products to continental standards but this may not be appreciated by the current management because they are unlikely to make such an attempt, given a preference for the traditional methods and products. The performance

of these sample firms may be indicative of a more general deficiency in the Irish economy which slows down the pace of innovation (NESC, 1992). Traditionally low rates of economic growth and high levels of emigration have deprived firms of the incentives to innovate. Such a lack of corporate dynamism has in turn led to slower expansion of income and population.

8. Further research would seek to increase the generality of these findings. For example, it would be worthwhile to consider activities (e.g. parts of engineering) where formal skills are significant. This would be designed to test whether in such cases Irish firms were indicated to have a shortfall in terms of qualifications and what impact this had on productivity and competitiveness.

   What is significant is that even at some of the better indigenous companies in Ireland a range of problems emerged which were similar to those presented in the earlier matched plant studies involving around 40 firms in NI and a similar number in Great Britain (see Section 4). For example, variable quality control, poor standards of supervision and cases of overmanning. This was true despite the fact that the comparisons were with Denmark and The Netherlands, rather than West Germany (Germany having a more extensive apprenticeship training system than either of those countries). The method of visits by international managers was also able to throw light on weaknesses relating to product type and quality. The lower quality of the Irish products and lack of innovation is consistent with the results of previous comparative research (NESC, 1992).

   There are several lessons for policy makers with respect to training. For example, certain types of specialised skills seem to be missing at some indigenous companies, such as R&D, design and marketing. In the absence of such "missing persons" it will be very difficult for these companies to upgrade their products to continental standards. The level and consistency of product quality could also be improved if in-company training courses for the shop-floor staff were better. The results for one of the companies visited implied that there would gains to capital productivity, and probably labour productivity as well, if the underlying training of engineers and maintenance workers were improved. At the food company it was suggested that tertiary level qualifications, whilst quantitatively more common than those in the Danish counterpart, lagged Danish standards in terms of breadth and appropriateness.

CHAPTER 4

VOCATIONAL EDUCATION IN A COMPARATIVE PERSPECTIVE

Previous Chapters have outlined the significance of education and training for economic performance. Chapter 3 provided evidence in support of the view that divergent skill levels are a significant factor underlying Ireland's generally lower productivity and poorer economic performance compared to Denmark and The Netherlands. This Chapter compares vocational education and training in Ireland with that of The Netherlands and Denmark.[16] The comparison is generally restricted to the nature of provision and the kind of curriculum and experience to which individuals are exposed. A much more detailed study would be required to assess the variations in *curricula* of individual subjects and resulting variations in knowledge and skills.

The levels of vocational preparation discussed, for the most part, are those related to Occupational Levels 2 and 3 as defined by the European Community (*Official Journal of the European Communities*, 31 July 1985). In this classification, Level 1 refers to knowledge and skills attained at the end of compulsory education with perhaps some initiation to work. Individuals at this level are regarded as semi-skilled. Level 2 refers to basic craft skills. A holder of a Level 2 qualification is regarded as fully qualified to carry out (using relevant instruments and techniques) work in a variety of trades (e.g., motor mechanic, electrical fitter, mason bricklayer, painter, decorator, carpenter, plasterer, dental technician, hairdresser, tailor, shoemaker, printer, office worker, baker, butcher, hotel receptionist, or telephonist). Frequently, access to such a qualification involves a period of apprenticeship, though it may also be gained through training and education in the upper section of a vocational school. Activity at Level 3 involves technical work which can be performed independently and/or executive and co-ordinating duties and usually involves a greater degree of theoretical knowledge than that required to function at Level 2. Examples of occupations at Level 3 are accounts clerk, bank clerk, laboratory technician, master craftsperson', foreperson, and legal secretary. Education and training for Level 3 may, like that for Level 2, be provided in a vocational school or it may involve further training on the job. A Level 4 qualification, which is not dealt with in this Chapter, will normally require post-secondary education

16 This Chapter draws heavily on a paper commissioned by the Council from Dr Tom Kellaghan, copies of which are available from the Council's Secretariat.

and training. Work at this level requires sufficient mastery of the scientific basis of an occupation to allow autonomously pursued vocational activity in management or administration as an employee or self-employed person.

While the distinction between general and vocational education might at first sight seem fairly clear, in practice it is difficult to say whether a particular subject has vocational relevance or not, or to what extent skills developed in a general education curriculum are important in a vocational context. The focus in this section of the report is on vocational education concerned with the acquisition of what are normally called technical skills.

It should not be inferred from this approach that vocational education involves only the acquisition of the particular technical skills required for specific occupations. To do so would be to undervalue the importance of personal qualities and of the more general demands of the workplace. There is wide agreement that in addition to specific occupational skills, preparation for work involves the knowledge and skills of general education (such as literacy, numeracy, the ability to solve problems, to cope with complex situations, to communicate clearly) as well as personal and social competencies, the ability to adapt, work habits and attitudes and enterprise skills.

The qualities required in a vocation may be categorised under the following five headings to provide a working, perhaps idealised, description of the characteristics of an individual who has been prepared for work.

1. Basic competencies in literacy, numeracy, science and information technology.

2. The ability to apply the knowledge and skills which have been acquired in school or training in the work situation.

3. The ability to work with others and a sense of responsibility.

4. Positive attitudes towards flexibility, innovation and entrepreneurial activity.

5. General and specific knowledge and skills relating to a particular occupation which are acquired in special training or apprenticeships.

It is generally accepted that vocational education or training should be preceded by a sound general education. The next section considers the performances of Irish students relative to those of students in other countries

close to the completion of compulsory education in the areas of literacy, numeracy and science.

1. BASIC SCHOOL ACHIEVEMENTS

Data from international studies of mathematics achievement carried out by the International Association for the Evaluation of Educational Achievements (IEA) were analysed to compare the performances of 13-year-old students in Ireland and The Netherlands. Data on reading literacy for 14-year-olds, also obtained in IEA studies, are available for all three countries (Denmark, Ireland, The Netherlands) and the performances of students in the three countries were compared. Comparable data relating to achievement in science are not available for the three countries. However, data from the International Association of Educational Progress (IAEP) studies are available for Ireland and for a number of other countries for 13-year-olds and these data will be considered since they throw light on where Irish students stand in an international context.

Mathematics surveys have found the performance of Irish 13-year-old students to be just above the international mean. Irish students performed above the mean in arithmetic and descriptive statistics, around the mean in algebra and geometry and below the mean in measurement. The performance of Dutch students exceeded the international mean in all areas of the curriculum. It did not differ markedly from the performance of Irish students in arithmetic, algebra, or descriptive statistics. The Dutch students, however, were considerably ahead of Irish students in geometry and measurement. The superior mean performance of Dutch students in mathematics achievements can be attributed to the superior performance of high-achieving students rather than to the higher performance of lower achieving students.

In reading literacy tests, Irish students performed above the international mean for 32 countries in all reading literacy areas. Their performance was close to the performance of Dutch students in all areas. Danish students, who were somewhat older on average, performed better than both Irish and Dutch students. In the category of low-achieving students (scoring more than one standard deviation below the mean), there are 3 boys to every girl in the Irish group. Looked at another way, 10.92% of boys fell in the low-achieving group, but only 4.46% of girls. While there are fewer girls than boys among lower scores in Denmark and Holland also, the disparities are not so great. It would appear that boys are at a greater disadvantage in literacy achievement relative to girls in the Irish system of education than in other systems.

Ireland was among the 6 countries which participated in the studies of achievement in science of 13-year-olds sponsored by the International Assessment of Educational Progress (IAEP) in 1988 and among the 21 countries which participated in similar studies in 1991. Neither Denmark nor The Netherlands participated. However, the findings throw some further light on the international standing of Irish students.

The performance of Irish students in science was among the poorest of all countries, lagging well behind the performance of students in Korea, Taiwan, Switzerland, the Soviet Union and Slovenia. (Results were similar in a survey of nine-year-olds carried out at the same time.) Irish students performed poorly in tests of their basic knowledge of everyday science facts and concepts, in tests of their understanding of simple scientific principles, and in tests of their ability to generalise, hypothesise, and reason by synthesising specific information.

In conclusion then, the level of achievement of Danish, Irish and Dutch students in reading literacy seems comparable. Ireland has proportionately more boys in the lower-achieving group than The Netherlands or Denmark. In the case of mathematics, Irish students did somewhat less well than Dutch students in a number of mathematical areas but other data indicate that Irish students perform at an average level in comparisons with other countries. The performance of Irish students in science, however, was well below the international average.

2. GENERAL AND VOCATIONAL EDUCATION IN THE EUROPEAN COMMUNITY

Before considering provision for vocational education in Denmark, Ireland and The Netherlands, the enrolment rates in education for students aged 15 to 18 in European Community countries will be considered briefly, together with the percentages of upper secondary students who are enrolled in technical/vocational education in OECD countries.[17]

In 1987-88, the enrolment rates for Irish students at ages 16 and 17 were lower than in all other EC countries with the exception of Greece, Portugal, Spain and the United Kingdom. At age 18, they were lower than the enrolment rates of all countries except Portugal, Spain and the United Kingdom.

17 See the consultant's report for full details. The data are somewhat out of date and the Irish participation rates have certainly increased since the data was collected. However, 1987-88 is the last year for which we have comparative international data.

The proportion of students enrolled in technical/vocational and apprenticeship programmes in the Irish educational system is low by international standards. In 1988, 17.4% of Irish students were in vocational, technical and apprenticeship programmes (12.5% boys, 22.5% girls) while in Denmark 71.7% were in these programmes (77.9% boys, 65.3% girls) and 60.4% in The Netherlands (70% boys, 50.4% girls) (OECD, 1992, p.75). A much greater proportion of the total population of 16 to 18 year olds receive formal vocational preparation in the educational systems of Denmark and The Netherlands than in the Irish system of education.

The levels of education in Ireland in the general population are lower than in many European countries, including Denmark and The Netherlands. For example, largely consequent on the substantial costs of educational participation that were not removed until the late 1960s, Ireland has a much higher percentage of 25 to 64-year-olds who have received only primary education than has either Denmark or THe Netherlands. Conversely, it has a lower percentage of individuals who have attended upper secondary school. This has obvious implications for recurrent education in the vocational field. Efforts to tackle low levels of education and training must not only focus on new entrants to the labour force, efforts are also necessary to tackle problems among the existing stock. The implications for adult training and learning are elaborated later in the Report.

3. VOCATIONAL EDUCATION IN IRELAND

(i) Brief Overview

Education in Ireland is compulsory for 9 years, for children aged between 6 and 15 years. Children aged 6 to 12 years are educated in primary schools and although school attendance is not compulsory until the age of 6, 55% of 4-year olds and almost all 5-year-olds attend primary schools where they are taught by trained primary-school teachers. Second-level education is provided in five types of schools: secondary, vocational, comprehensive, community schools and community colleges. Traditionally, secondary schools were classical-academic in orientation and prepared students for third-level education and white-collar occupations, while vocational schools provided technical education and general and practical training in preparation for employment. In the late 1960s, attempts were made to provide comprehensive education. Comprehensive schools, community schools and colleges were established. Common courses were introduced in all types of schools and examinations previously confined to schools of one type were made available to all types. Today, while the basic curriculum is common to each type of school, schools reflect their traditions in the students they attract and in their choice of subjects.

At the primary level, schools are funded by the central exchequer but administered and managed by boards of management, with ownership of the school buildings and sites vested in patrons, generally Church authorities. At second level, secondary, community and comprehensive schools are managed by individual boards of management made up of trustee, parental and teacher representatives, and are largely state funded.[18] Vocational schools, wholly state-funded, are under the control of Vocational Educational Committees (VECs). VECs are statutory committees of the relevant local authorities.

(ii) Curriculum

At primary level, an integrated approach to teaching is encouraged. There are eleven subject areas on the curriculum: religion, Irish, English, mathematics, art and craft activities, social and environmental studies, history, civics, geography, music and physical education. Provision for science is included under social and environmental studies. Recently concern has been expressed about the lack of emphasis on science and teachers' lack of confidence in relation to the teaching of the subject. The recent Green Paper contains a recommendation to develop a new science programme at primary level.

At second level there are two state examinations, the Junior Certificate and the Leaving Certificate and all schools offer preparation programmes for these examinations. Students are prepared over a three-year period for the Junior Certificate examination. It is recommended that students should be provided with a wide range of educational experiences and particular attention should be paid to numerary, literacy, oral expression, social and environmental education, science and technology and modern languages (National Council for Curriculum and Assessment, 1989). Twenty eight subjects are available in the Junior Certificate programme although no school offers the full range of subjects and those on offer reflect the school's vocational/academic tradition.

18 In the case of private fee-paying secondary schools, capital and capitation grants are not paid.

TABLE 4.1
Percentage of Schools Offering Particular Subjects

	%
Irish, English, Mathematics, Science, History and Geography	96.0%
Business Studies	91.2%
Art, Craft and Design	81.1%
Home Economics	74.2%
Mechanical Drawing	67.1%
Woodwork	60.7%
Metal Work	37.4%

Seventy three per cent of those entering second level education complete the senior cycle. Of these, 85% follow the Leaving Certificate programme. Other in-school options (though not available in all schools) are a transition year, Vocational Preparation and Training programme (VPT), Leaving Certificate Vocational Training Certificate (LCVT) and a senior cycle certificate. A major alternative in the vocational area is an apprenticeship. These various options will be considered in turn.

(iii) The Leaving Certificate Programme

This is the most important senior cycle option, followed by 85% of students. The Leaving Certificate programme at present lasts two years and it is necessary to study subjects at higher level to progress to university. There are 31 approved Leaving Certificate subjects, both technical and academic, grouped into language, science, business studies, applied science and social studies. No school offers the full range of subjects. Some details of subject provision and take up are provided in Tables 4.2 to 4.4.

TABLE 4.2
Percentage of Students Taking 6/7/8 Leaving Certificate Subjects 1991

No. of Subjects	% Students
6	13
7	76
8	8

TABLE 4.3
Ten Most Popular Leaving Certificate Subjects 1991

Subjects	Chosen by % Students
English	99
Mathematics	99
Irish	92
French	65
Biology	48
Business Organisation	41
Geography	37
Home Economics	32
Accounting	27
History	24

TABLE 4.4
Percentage of Schools Offering Particular Subjects

Subjects	Offered by % Schools
English, Mathematics, Irish	100
French	96
Biology	94
Geography	89
History	85
Business Organisation	83
Accounting	80
Technical Subjects:	
Technical Drawing	63%(chosen by 14% students in L.C. Exam)
Construction Studies	45%(chosen by 9% students in L.C. Exam)
Engineering	37%(chosen by 8% students in L.C. Exam)
Agricultural Science	18%(chosen by 4% students in L.C. Exam)

Table 4.4 illustrates the limited availability of technical subjects and their low take-up as examination subjects. Although a great deal of emphasis has been placed on technical education in policy statements since the 1960s, not a great deal of change took place in regulations governing curricula or examinations which might have encouraged the desired changes. While a small number of new technical courses were added, the same four subjects remained compulsory at junior cycle[19]. At senior cycle, in addition to Irish (compulsory), it is recommended that students take at least three subjects from one of five groups of subjects (languages, sciences, business studies, applied sciences and social studies) and at least two subjects from outside the group. In the 1991 Leaving Certificate examination, 77% of regular school candidates followed this recommendation.

Group of Subjects	% Students
Languages	69
Sciences	17
Applied Sciences	4
Social Studies	2
Business Studies	1

The figures for applied sciences and business studies are particularly revealing, given recent calls for a greater emphasis on vocational education.

There has been a considerable increase in the numbers taking business and applied science subjects since the late 1960s. Some subjects have been far more popular than others, for example at senior cycle business organisation, accounting, technical drawing and home economics have been taken by much higher percentages than engineering workshop, agricultural science, construction studies and technical drawing. Gender stereotyping is still very evident in the numbers studying vocational subjects, with less than 2% of girls taking agricultural science or technical drawing and less than 1% studying engineering or construction studies.

19 English, Irish, Mathematics, History and Geography combined (except in vocational schools).

(iv) Transition Year

In 1991-92, approximately 12.6% of Junior Certificate candidates went on to take a transition year[20], which is an optional year between the Junior Certificate and senior cycle. In 1990/91, it was on offer in 115 of the 828 second-level schools, mostly secondary schools. There is almost total transfer to the Leaving Certificate programme after the year. The year aims to provide broad educational experiences and should include, among other things, social education, moral education, education for living, philosophy, visual education, media education and communication skills. Interpersonal and experiential learning and practical qualities which are difficult to accommodate in the pressurised Leaving Certificate cycle are emphasised.

(v) The Leaving Certificate Vocational Programme (LCVP)

The LCVP, established in 1989, is a subset of the traditional Leaving Certificate. The aim is to provide a more practical, vocational option within the Leaving Certificate. Students are required to take two of three technical subjects (construction studies, technical drawing and engineering), Irish, a modern continental European language and at least one other subject from those approved. A minimum of four weeks work experience is also undertaken. While it is not compulsory, most LCVP students take English and mathematics. Few take science and it is not required. At present it is estimated that 5% of the Leaving Certificate cohort take this option. There has been disappointment at the low take-up rate and it is hoped to increase participation to 30% from 1994. Participation is necessarily limited to those students attending schools which provide two of the three compulsory technical subjects and this factor also partly accounts for the low take-up by girls. Very few girls' schools provide the required technical subjects.

(vi) Senior Certificate Programme

Since 1986, 15,000 students have followed the experimental senior certificate course in approximately 60 selected schools, mostly in the Munster area. The programme comprises work and communication skills, general technology, food and agriculture, computer applications, mathematics, social and cultural studies and Irish. The programme appears to place equal emphasis on the development of practical skills and on skills associated with traditional schooling, although the teaching methods and approach used are very different to those of traditional

20 12.6% is the number enroled in the transition year 1991/1992 as a percentage of the number in the third year of the Junior Certificate 1990/1991.

schooling. External examinations are provided by the Department of Education. Unlike the Leaving Certificate, the senior certificate is not marked in grades.[21] This programme is considered to have been very successful and it is expected to move beyond the pilot phase, as discussed later in this Report.

(vii) Vocational Preparation and Training Programmes (VPTP)

The VPTP, available since 1984, provides vocational training for young people who have completed compulsory schooling but whose skills are inadequate for the labour market. The objective of VPT programmes is to bridge the gap between traditional education and the world of work.

The content of VPT programmes is divided into three sectors: vocational studies, work experience and preparation for working life. A key feature of VPT programmes was the scope allowed to schools to respond flexibly to the needs of their localities. Schools were encouraged to carry out an examination of local requirements and resources prior to introducing VPT programmes.

TABLE 4.5
The Structure of VPT Programmes

Sector	Time Allocated	VPT2	Activities
(i) Vocational Studies	40%	20-30%	Practical work in one of the following: Engineering, Construction, Agriculture, Services, Crafts and Design, Commerce, Electrics/ Electronics and Science
(ii) Work Experience	25%	30-40%	Related to vocational sector chosen, although in some cases work simulation may be accepted as a substitute.
(iii) General Studies	35%	10-20%	Designed to promote personal development and generalisable knowledge, interpersonal skills, computer familiarisation, mathematical and literacy skills, along with a positive attitude to learning, adaptability and initiative.

21 Students obtain a pass, a pass with merit or a distinction.

VPT programmes were divided into two one-year, self-contained programmes (VPT1 and VPT2) in 1985. VPT1 is a basic programme to provide students between 15-18 years who have completed compulsory education with basic skills. VPT2, no longer of only one year's duration, is commonly referred to as Post Leaving Certificate Courses (PLCs). Some VPT2 participants have taken VPT1 but most have completed the Leaving Certificate. In VPT2 there is a greater emphasis on the development of vocational skills and on work experience. While initially more students took VPT1 than VPT2, this has changed radically:

	VPT1	VPT2
1985/86	17,740	1,220
1991/92	5,879	15,837

Today, VPT programmes provide training in 60 different modules and some programmes have been developed as a direct response to the needs of a particular locality.

The VPT programmes have a number of problematic features:

» Standard official certification records only completion of the course. The availability of further certification varies from school to school. In some schools students take external tests, in others work experience is assessed by teachers and employers. There is a lack of standardisation in assessment and certification procedures.

» VPT programmes were not introduced as formal vocational preparation schemes based on an analysis of labour market needs, but were part of the Department of Education's response to the social guarantee provision for early school leavers and those inadequately prepared for the world of work. They are largely funded by the European Social Fund and concern has been expressed in the past that they were more fund-driven than driven by the requirements of the labour market. However, they have developed as a significant part of the educational system, with strong demand for many courses.

Both of the above reservations have been addressed by recent developments and programmes now tend to be less fund driven and more planned initiatives. First, the National Council for Vocational Awards (NCVA) established in 1991 has responsibility for the certification and assessment of second-level vocational programmes. The Council includes representatives of the Department of Enterprise &

Employment, FÁS, CERT, along with the social partners and educational interests. Secondly, the Departments of Enterprise & Employment and Education have established an education/training advisory committee which includes representation of FÁS and CERT. The brief is to liaise on issues of mutual interest and respond to skill shortages. It is a formal structure which aims to facilitate an integrated education and training response to labour market needs.

(viii) Apprenticeship

Apprenticeship is the traditional path to employment in skilled occupations in Ireland. It primarily operates in a number of "designated trades" in engineering, construction, motor, electrical, printing and furniture. Approximately 3,000 young people are recruited each year and at present there are about 14,000 apprentices in 40 separate trades.

Traditionally, a young person was apprenticed on completion of compulsory schooling. In practice, about half now have achieved Leaving Certificate standard.

The following represents the educational entry qualifications amongst the registered apprentice population on October 31, 1992:

	%
Intermediate Certificate	38
Group Certificate	12
Leaving Certificate	47
Exempt	3

Source: Apprenticeship Services, Dec. 1992.

Department of Education statistics over the period 1983-1991 show the changes that have occurred in educational qualifications on entry (Table 4.6).

TABLE 4.6
The Educational Standard of New Apprentices

Year (%)	1983 (%)	1991 (%)	1983-1991 (% Change)
Inter	49	38	-22
Group	21	14	-33
Leaving	25	44	+76
Exempt	5	4	-25

The statistics suggest an increasing reliance on the Leaving Certificate as the entry requirement for certain trades. It is not possible from existing data, however, to identify which trades are using the Leaving Certificate as the entry requirement.

The training of persons employed in statutory apprenticeships is regulated by FÁS. Apprentices are recruited by industry (employers) and employed for the period of apprenticeship, normally four years. Usually, the first year off-the-job is spent in a FÁS training centre or VEC college of technology learning the practice and theory of the trade. The remainder of the apprenticeship is spent in employment with further release to a technical college for theoretical instruction. Apprentices who successfully complete the programme as laid down are issued with a completion of apprenticeship certificate by FÁS[22] and the Senior Trade Certificate by the Department of Education. They are also eligible for the award of the National Craft Certificate which is awarded jointly by the Department of Education and FÁS.

In the new revised system now coming into effect, apprenticeship will be based on standards achieved rather than time served. Other revisions are the improvement of entry mechanisms. Entry requirements will now be at least a Grade D in any five junior certificate examinations, although, as noted earlier, a substantial proportion of apprenticeships are now of Leaving Certificate standard. The new system will be modular in structure. The stated goal of policy is to increase the number of apprentices and to extend apprenticeship to other occupations. The number of designated trades for apprenticeships in Ireland is much lower than in Denmark or in The Netherlands.

(ix) Other Vocational Training Bodies and Schemes

A number of other bodies are engaged in the provision and certification of vocational training. CERT deals with training for the hotel, catering and tourism industry. The National Craft Curricula and Certification Board (NCCB) was established in 1982 by CERT following consultations with the Irish Vocational Education Association, the industry and the Department of Education. The board operates under the auspices of CERT and the Department of Education and through its committees undertakes research on industry and educational needs, design of training courses, implementation of assessment procedures

22 FÁS is involved with VECs in programmes for early school leavers with no formal qualifications. This will be discussed in greater detail in the section dealing with education and disadvantage.

and award of certificates. Certificates are recognised throughout the industry in Ireland and the EC.

TEAGASC provides and certifies a wide number of courses in agriculture and horticulture. Students are advised to complete second-level education before embarking on a course. The Farm Apprenticeship Scheme and the Trainee Farmer Scheme are three-year training programmes conducted by the Farm Apprenticeship Board. A feature of the training programmes is that participants spend periods with "master" farmers as well as in formal education.

Education and training for the professions is generally conducted by individual, recognised professional bodies. For example, An Bord Altranais (ABA) is the state body responsible for the training of nurses in Ireland. Training culminates in registration, which certifies the person's competence to practice as a nurse. Registered nurses can practice in all EC countries.

(x) Recent Developments

Recent reviews of industrial policy and of education have been critical of the provision for vocational education.

The Industrial Policy Review Group (IPRG), (1992), concluded that there is not enough emphasis on technical and vocational education at second level and that the educational system is not attuned to the economic needs of society. The Group criticised the system for providing a poor platform for subsequent vocational or industrial training and for becoming progressively more academic in nature over the years (although the latter point is not borne out by the available data). The Group made a number of recommendations, including a call to correct the bias towards academic education and the development of a high quality, respected technical and vocational education stream at second level. It recommended that industry should be more involved in policy development and that on-the-job training should be supported by study in vocational and technical schools. The report of *The Moriarty Task Force* on the implementation of the Industrial Review Group's recommendations rejected the Group's call for a separate vocational stream in favour of the development of vocational courses within an integrated secondary school system. The Task Force further recommended an emphasis at all educational levels on the skills, knowledge and attitudes conducive to enterprise and self-reliance. It recommended that general education should foster "a solid basis" on which to build high-level skills and knowledge for work.

The Green Paper on Education (1992) is the other major recent commentary on vocational education. Its proposals are less radical than those of the IPRG and seek to build on existing provision, rather than return to the dual system of second-level education. Training, it is argued, should be broad based rather than job specific. It proposes the reinforcement and expansion of vocational education and provision for technical subjects within the senior cycle of second-level schools. It proposes a co-ordinated set of national arrangements for the provision of vocational education and training. A modular, graduated system is favoured, since it allows for transfer, progression and second-chance education. A rigorous, coherent system of assessment, certification and accreditation is also advocated. It proposes too that the interests of employers and trade unions be represented in decision-making about vocational education and training in order to improve the flow of information to the providers of education and training programmes concerning the skills required for economic growth and development.

The **National Council for Vocational Awards** (NCVA) was established in 1991 and it has already carried out work on an assessment and certification system. The NCVA's brief is to develop a comprehensive system for a wide range of vocational programmes, with particular reference to the vocational sector. The NCVA, with the active participation of industry, aims to ensure that certification is performance related, has national status and credibility in the labour market. In line with EC practice, it has proposed a five-level framework for vocational qualifications. The Green Paper proposed its amalgamation with the National Council for Education Awards (NCEA) in a new Council for Educational and Vocational Awards (CEVA), catering for all vocational awards regardless of the agency delivering training.

4. VOCATIONAL EDUCATION IN DENMARK

(i) Brief Overview

Education in Denmark is compulsory for 9 years, for children aged between 7 and 16 years. Compulsory schooling is comprehensive and it is provided, from beginning to end, in the one school *(Folkeskole)*. There is also a tenth form in the folkeskole.

Folkeskoles are the responsibility of municipalities, of which there are 275 throughout the country. While the starting age seems high, all municipalities are required to set up pre-school classes for 5 and 6 year old children. In 1988, 88% of all children of this age were enrolled in

public pre-schools and 97% in public and private pre-schools combined (OECD, 1992).

(ii) Folkeskole Curriculum

The aim of the curriculum is to:

> give pupils the possibility of acquiring knowledge, skills,working methods and ways of expressing themselves which will contribute to the all-round development of the individual pupil (CEDEFOP, 1991).

Particular subjects are obligatory at varying stages throughout the 9 years of compulsory education. The obligatory subjects during the first two years are Danish, arithmetic/mathematics, physical education and sport, Christian studies, creative art and music. Later, history, geography, biology (from third to seventh years), physics/chemistry (from seventh to ninth years), needlework, woodwork and domestic science are compulsory for one year or more.

Students may choose vocational studies in the eighth, ninth and tenth years. These include information and discussion on career options, study visits, visits to training centres and work placements in firms. On average, about half an hour is set aside for these activities each week. From the eighth year (approximate age 15 years) schools may offer a number of options to more practically minded students such as typing, photography, drama, film and motor knowledge.

(iii) After Folkeskole

On completion of folkeskole, about 7% of students leave the educational system without any further education or training. This is regarded as a serious, though diminishing, problem in Danish education. For students who remain in the educational system there are two main options: general secondary education and vocational education and training. In 1990, 33% of students went to an academic upper secondary school and 59% started a vocational education course. While participation in academic education was much the same as in 1982, the percentage starting vocational education increased from 54 to 59%. This indicates that it was *vocational education* in Denmark which in 1990 attracted those students who would have left the educational system in the early 1980s.

(iv) General Education

Within general education there are two main options: (i) the Gymnasium; and (ii) Higher Preparatory Examination (HF) courses.

(i) Higher achieving students choose the Gymnasium. Following a three year course they take a leaving examination *(Studentereksamen)* which is a qualification in itself and also qualifies for university entrance.

(ii) Gymnasia and other schools also provide general education courses which prepare students for the HF. Students who pass this examination may proceed to non-degree level further education. Courses are also provided on a two-year full-time basis and on a part-time basis in evening schools. The examination often attracts somewhat older students who have worked for some years and is an important example of recurrent education in Denmark. HF courses have achieved great popularity. In 1967, when they were introduced, 500 students attended such courses. In 1988/89, nearly 12,000 full-time and over 48,000 part-time students were enrolled.

(v) Vocational Education and Training

Since the mid-1950s, vocational education and training has undergone substantial restructuring and revisions on a number of occasions. It is useful to consider the reasons for these revisions since it highlights the concerns which motivated change in a system considered an example of "better practice".

Some of the main factors which lead to restructuring in the Danish vocational education and training system, between the mid-1950s and 1991 included;

» an attempt to improve the interface between training and the labour market;

» concern that students were choosing future occupations at too early an age and that the rigidity of the system did not allow for transfer;

» companies had become too specialised to provide a sufficiently rounded training;

» unsatisfactory co-ordination between on-the-job and school training;

» insufficient instruction in general subjects during the apprenticeship period.

More recent concerns have included

» the view that the vocational training system was not providing trade and industry with required support;

» too many individual schemes had developed and consequently, the system was perceived to lack clarity and coherence;

» the whole system was considered to suffer from inertia;

» it was considered necessary to provide additional vocational qualifications and a better basis for further training.

It is somewhat consoling to note that some of our current concerns have also concerned the Danes in the past.

The current structure of vocational education and training in Denmark has been in place since 1991. There are three main strands to the current system: (a) apprenticeship training, basic vocational training courses and basic technician training courses; (b) commercial courses; (c) technical courses.

(a) *Training Courses*

The new training system is designed to motivate young persons to train, to contribute to their personal development and to their understanding of society, to meet the needs of the labour market, and to provide young people with a basis for further training. There are about 85 different training courses covering 200 subjects at commercial schools and technical schools. Courses are organised as alternative or sandwich courses; students alternate between periods of academic study and periods of practical work experience. All courses lead to a skilled-worker EC level 2 certificate.

Training courses consist of two parts.

(i) The first part, of one year's duration, has two 20 week school periods. The first school period allows students to explore several training areas. Some subjects are general and common to several areas of training, others are more specific and optional subjects allow students to pursue their interests. During the second school period, students select a particular area for training. Some students who have already obtained a contract with an employer skip the first school period and go straight into the second period.

(ii) The second part of training generally does not last more than three years. Students *must have* a contract with an employer, and not all students are successful in meeting this requirement.

During this part of the training, students alternate between in-firm training and schools. The total amount of time spent in school during training cannot exceed 50 weeks. Master craftspersons in the firm are responsible for in-firm training.

The Ministry of Education, in close co-operation with trade committees, sets the overall objectives and framework for courses. The trade committees are made up of employer and employee representatives. The courses which must be covered are agreed, as well as the objectives and standard of subjects and the form and type of assessment. The 120 commercial and training schools, in collaboration with local training committees which again consist of equal numbers of employer and employee representatives, plan the actual *content* of instruction. There is then in Denmark considerable involvement by the social partners in determining conditions of training, curricula and standards of achievement. The system is also quite decentralised; central authorities decide only the general framework of curricula and local committees work out the details for their own particular area. This system fits in with the more general system of devolved authority which exists in Denmark.

(b) *Commercial Courses*

Commercial courses are provided in commercial schools which teach Danish, foreign languages, accountancy, finance, commercial law, data processing, organisation and communications and economics. Courses lead to the Higher Commercial Examination (HHX), which is taken after a three year period. The first year consists of vocational training followed by two years of school-based studies. The HHX is considered to be a more vocationally oriented equivalent to the examination taken at the end of the *Gymnasium*. Admission to the course requires completion of the ninth form of Folkeskole.

(c) *Technical Courses*

Technical courses are provided in technical schools which teach Danish, a foreign language, management and co-operation, mathematics, physics, chemistry and technical subjects. Courses lead to the Higher Technical Examination (HTX). Like the HHX, this is a three year course, vocational training is provided in the first year followed by two years of school-based studies. Completion of

the ninth form of folkeskole is required. In most cases, the HHX and HTX are considered preparatory and are not used for direct entry to the labour market.

In addition to mainstream vocational preparation, there are also training schemes to help combat youth unemployment. Courses have been in operation since 1992 and the average length is eight to 10 weeks, with an additional four-week practical period. Production schools, also established in the 1970s, are aimed at 14-18 year olds who leave school without a formal qualification. Schools provide practical work and theoretical instruction. There is great flexibility in the curriculum and teaching methods of such schools. It is hoped to bring students to a point where they can start a course of training leading to a recognised qualification or obtain employment.

5. VOCATIONAL EDUCATION IN THE NETHERLANDS

(i) Brief Overview

Education in The Netherlands is compulsory for 11 years, for young people aged between 5 and 16 years. Sixteen year olds who do not wish to continue in full-time attendance must attend for one or two days a week for a year. Like Ireland, however, schools make a provision for pre-school children, and the vast majority attend primary schools from age 4 to 12. Following this, students must attend full-time secondary education for 4 years. Three major categories available to students at this point are: secondary academic education, general secondary education and vocational education. Like Ireland too, the majority of schools are "privately-run", mostly by religious groups or communities, and state-funded.

Policy provides that the curriculum at primary level be presented in an integrated way. Subjects covered are:, Dutch, arithmetic and mathematics, sensory co-ordination and physical exercise, English, "factual" subjects (geography, history, science, social structures, religious movements), creative activities (language, drawing, music, handicrafts, play), self-reliance (social and life skills), and health instruction.

At the end of primary school children sit school tests and these help parents and teachers decide which type of secondary school is most appropriate. Students then enter one of a number of transitional classes

which feed adjacent streams in secondary schools. At the end of that year a final decision is made.

At post-primary level the options are as follows:

(a) *Secondary Academic Education (VWO):*
This is a 6 year preparatory course for university entrance. VWO is provided in the *Gymnasium*, the *Athenaeum* or the *Lyceum*, which is a combination of the Gymnasium and Athenaeum. Latin and Greek are taught in the Gymnasium but not in the Athenaeum. After their fourth or fifth year students in the Gymnasium specialise in mathematics and science or in classical languages. Those in the Athenaeum specialise in economics and modern languages. Increasingly, however, there are attempts to avoid specialisation and allow students take a wide range of subjects.

(b) *General Secondary Education (AVO):*
Students choosing this stream of education have two options. They can choose junior secondary school or senior secondary school. The Junior School course lasts 4 years, the senior school course lasts 5 years. Junior school students have the option on completion of taking the fifth year in a senior school or of transferring to a senior secondary vocational school (MBO). Senior school students also have the option of moving to senior secondary vocational schools (MBO) and they also have the option of moving to higher vocational education (HBO), where standards are comparable to higher diplomas.

Subjects are taught at a lower level in the junior schools and the leaving examinations are quite separate. For the leaving examinations, students must take 6 or 7 subjects and these must include Dutch and one modern foreign language. Although the curriculum is very general in secondary schools, the certificate obtained at the end does allow for progression to vocational education.

(c) *Junior Vocational School (LBO)*
The curriculum during the first 2 years of LBO is devoted to general education. For the last 2 years, time is divided between general subjects and vocational subjects. It is possible to specialise in technical subjects, domestic science, agriculture, commercial subjects and retailing. Sex differences are still marked in the different sectors. Commercial subjects and domestic science are

taken mostly by girls, technical and agricultural subjects mostly by boys. LBOs are constantly combatting the perception that this type of education is aimed at young people who have dropped out of other kinds of education. In recent years the content of provision by LBOs has moved closer to that of general secondary education.

In 1989, 65.7% of second and third year secondary school students were attending academic or general educational schools, while 34.4% were attending vocational schools. Boys (40%) were more likely than girls (28.1%) to attend vocational schools.

There are two major routes leading to a vocational educational qualification following the completion of junior cycle in secondary education:

(a) *Senior Secondary Vocational School (MBO)*
436 MBO schools cater for 300,000 students, preparing them for positions in industry, the services sector and administration. Schools specialise in one of six areas — technical work, services and health care, home economics, commercial work, retail trade and agriculture. Compulsory work experience is an important part of the course. Courses last a maximum of 4 years. Shorter 2 year courses provide EC level 2 training, while intermediate and longer courses provide higher qualifications. MBO students have relatively good labour market prospects; unemployment among people with MBO certificates was 2.9% in 1991.

(b) *Apprenticeship Training*
Apprenticeship training, also open to adults, is provided by 31 national apprenticeship bodies for 350 occupations. Each body deals with a particular branch of apprenticeship training and is responsible for curricula, quality control of programmes, examinations and the supervision of apprentices in the workplace. Regional offices provide information and back-up support. The apprenticeship system has expanded in recent years and the number of first-year apprentices has grown from 35,000 in 1985 to 55,000 in 1991.

There are no entry requirements, although apprenticeship may be lengthened if a trainee's level of education is low at entry. The elementary phase of the apprenticeship lasts 2 or 3 years, at the end of which an apprentice achieves an EC Level 2 starting qualification, becoming a qualified trainee. Apprentices spend three

or four days a week in a firm or in a training workshop and one or two days in a training institute or school. Wages are paid by the firm for the days worked. When an individual has a place in a firm, a legal agreement is drawn up between the apprentice, the firm, and the national training body. Students who do not obtain a place in industry get their practical experience in training workshops set up by firms. About two-thirds of the school time is devoted to vocational subjects and one-third to general subjects.

Advanced specialised courses, lasting 1 to 3 years, are available for young people who have passed the apprenticeship examination at the end of the elementary phase. Following 1 year of the advanced course, the apprentice achieves EC Level 3 status, that of a skilled worker who works on his or her own responsibility. Further time in the advanced course leads to a middle management or specialised work.

There has been a large increase in the number of young people who take apprenticeships in The Netherlands, increasing from about 20,000 in the 1950s to about 70,000 in the 1960s. Following a decline in the 1970s and 1980s, the number again increased in the late 1980s. In 1989, there were about 136,000 apprentices in training, about two-thirds of whom were in primary training and a third in secondary training.

There are still concerns about the rigidity of the apprenticeship system, in terms of the structure of programmes and the limitations imposed on students' choices. To overcome these problems, suggestions have been made that would make it easier to transfer from one form of vocational education to another. One such suggestion would involve breaking training courses into modules. There are also concerns about the appropriateness of vocational training provided in upper secondary schools (MBO). In view of these, proposals have been accepted by the Dutch government to increase contacts between schools and industry, allowing schools and business firms to work more closely together to make education more responsive to the needs of industry. Implementation of the proposals will involve a greater integration of school-based theory and work-based practice and increase the length of time students spend at work, uninterrupted by the demands of schooling.

It is hoped that these modifications to the training system will result in increasing students' flexibility, reflection, and eagerness to learn,

help to ensure that every one obtains a basic qualification before entering the labour market, and stimulate recurrent education. However, it remains to be seen whether general agreement with the reforms will be translated into the action that will be required of schools and industry if the reforms are to be realised.

As in other European Community countries, there are various training schemes for students (about 5%) who have obtained no formal qualifications in the education system who are unemployed. These include Youth Development Employment (JOB), Vocational Training for Youths (BVJ), the Youth Guarantee Plan (JWG), and community job-creation initiatives (TV).

The Dutch are increasingly concerned about the early age at which specialisation occurs. From 1993, a basic 3-year programme is being introduced into all types of schools which offer second-level education. Some 80% of teaching time will be devoted to a core curriculum of 15 subjects. This will include 200 hours of technical education (including woodwork, metalwork, robotics, and information technology) which all students will take. Schools will determine what they do in the remaining time. Reasons given by government for the introduction of a basic education programme are to raise the level of education of young people, to strengthen the cultural basis of the community, to adapt to the requirements of the social environment, to defer the point at which definitive educational and vocational choices are made, and to promote the equal treatment of boys and girls.

Following 3 years in the lower cycle of secondary education, students will have the choice of a further three years in preparation for university or a polytechnical institution or a further 4 years in vocational education. Government policy is to maintain, and indeed reassert, the differentiation between general and vocational education in the post-compulsory system (OECD, 1991).

Senior secondary vocational education (MBO) is being reorganised to merge training courses and provide a variety of programmes of varying length, level and content. Greater flexibility is being introduced into the curriculum and the management of schools and consultation with industry is being increased. There is also a general effort to improve the interface between vocational education and the labour market.

While numbers in vocational education at the junior secondary school have been decreasing, there has been a sharp growth in the numbers in senior secondary vocational education. This has been attributed to increasing specialisation in the labour market, a strong expansion of the services sector, and increasing demand for courses for students leaving junior vocational and junior general secondary education.

6. IMPLICATIONS OF VOCATIONAL EDUCATION PROVISION IN DENMARK AND THE NETHERLANDS FOR IRELAND

Comparisons between Denmark, Ireland and The Netherlands during the period of compulsory education reveal considerable similarity during primary schooling. In the case of provision at lower secondary education, Ireland falls somewhere between Denmark and The Netherlands. Denmark operates a fully comprehensive system up to age 16, while students in The Netherlands still divide into different types of school on commencement of second-level schooling at about the age of 12 years. However, the Dutch system is changing. In recent years, the content of lower vocational education has been moving increasingly closer to lower secondary education and in 1993 a basic 3-year programme common to all second-level schools is being introduced. Thus, The Netherlands is in the process of abandoning its practice of dividing students into general and vocational streams at the beginning of second-level education. Hence, an interpretation of the recommendation of the Industrial Policy Review Group (1992) for a parallel stream of non-academic vocationally-oriented education at second level (p.54) that involved a separate vocational track during the lower cycle of second-leveleducation would not find support in current Danish practice or planned Dutch practice. Neither would the proposal of the National Council for Vocational Awards (1992) that a National Vocational Certificate be available at Junior Certificate level.

While the curricula during the compulsory period of education in Denmark, Ireland and The Netherlands exhibit many similarities, differences in provision for science, technical subjects and vocational studies should be noted. In The Netherlands, science is accorded a more important role in the primary school programme than it is in Ireland and, during lower secondary school, all students take courses in technical education (including woodwork, metal work and information technology). In Denmark, biology and physics/chemistry are compulsory in the later grades of basic education and there is also provision to offer vocational studies (including work experience).

The levels of achievement of Danish, Irish and Dutch students in the limited though important area of reading literacy seem comparable. The only data available for comparison in mathematics are less recent than those available for reading literacy and do not include data for Denmark. Irish students did somewhat less well than Dutch students in a number of mathematical areas but other data indicate that Irish students perform at an average level in comparisons with other countries. With the possible exception of the performance of Irish students in science, the Council is not aware of any evidence that would support the view of the Industrial Policy Review Group (1992) that the educational system in Ireland provides a poor platform for subsequent vocational or industrial training (p.53).

While differences between educational provision during the compulsory period (up to 15 in Ireland, up to 16 in Denmark and The Netherlands) are slight, there are major differences between Ireland and the two other countries during the upper secondary school period. At this stage, in both Denmark and The Netherlands, students are separated into different types of school depending on whether they are following an academic general education programme or a vocational programme. Furthermore, many students begin apprenticeships at this stage, when they are 16 or 17 years of age. While in theory, Irish students could begin an apprenticeship when they leave school at 15 or 16, in practice about half sit the Leaving Certificate first. This means they are probably slightly older than many who are beginning apprenticeships in Denmark or The Netherlands (though many apprentices there are older than 16). If they spend 3 years at school after Junior Certificate, Irish students will of course be older still.

Perhaps of greater significance than the types of school in which post-compulsory education is provided are the large differences between Ireland, on the one hand, and Denmark and The Netherlands on the other in the proportions of students who receive vocational education after completing compulsory education. While it is difficult to obtain precise figures on the proportions involved in vocational and general education in the three countries, it would seem that about 60% of Danish students and over 50% of Dutch students, compared to less than 20% of Irish students, are enrolled in technical vocational courses. Though the figures may change somewhat, depending on how one defines vocational education, the differences between Ireland and the other two countries seem sufficiently large to indicate that provision for vocational education in Irish schools is very limited compared to provision in Denmark and The Netherlands. Further, the Irish provision is even more limited than the figures indicate, since the type of vocational education that is provided is more pre-vocational

and less job-specific than the types provided in Denmark and The Netherlands.

As far as the structure of provision for vocational education is concerned, a replication of the Danish or Dutch system in Ireland would involve the creation of separate vocational schools for students who have completed lower secondary education and who wish to begin vocational studies. Such an approach is not supported by the Council. First, it has to be recognised that national education systems are complex, reflecting national history, culture and values, and cannot easily be altered. Besides, harmonisation between systems can be achieved without major structural changes (European Communities Commission, 1990). Second, efforts have been made in Ireland over the past two decades to remove the distinction between the old secondary and vocational schools. To decide now that vocational schools should be dedicated to vocational studies would involve a major reversal of policy. In this regard, the Council notes that the Green Paper proposes that future development of vocational education in this country will focus on an expansion of technical subjects within the senior cycle of all second-level schools (Department of Education, 1992).

While present administrative arrangements, combined with economic factors, may point to a system in which academic and vocational education are best provided within the same school, at the same time it should be acknowledged that this situation raises a number of questions. What will be the nature of vocational education provided in this situation? What new programmes will have to be developed? What will be the relationship between academic and vocational education and qualifications? How will adequate facilities be provided in all second-level schools? What arrangements will be made to relate school-based preparation to industry-based preparation?

Given the many constraints under which schools will operate, it would seem likely that the Green Paper proposal will, in practice, result in providing an education in second-level schools that is more general than vocational. The vocational component of programmes will more realistically be directed towards making students generally adaptable in the work environment as well as, perhaps, providing them with widely applicable skills (e.g., keyboard skills) (see Kellaghan & Lewis, 1991). Students will not receive preparation for specific jobs or acquire vocational qualifications of the type which students in Denmark and The Netherlands acquire at this stage. In terms of the elements required in work preparation described earlier in this Report, the emphasis in the Danish and Dutch systems is on work-related skills,

values and attitudes, rather than on more general competencies. The envisaged Irish approach will provide greater opportunities for the development of general competencies which should enhance students' ability to benefit from subsequent job training (Sheehan, 1989). This, however, will be at the cost of keeping students in the formal education system for a longer time than on the basis of practice in other countries, appears to be necessary to obtain particular qualifications.

The task of developing a programme of broadly based education for all advocated in the Green Paper (Ireland, 1992, p.102) is more formidable than it might appear. There can be little doubt that the present Leaving Certificate programme is not suitable for all the students who take it at present, nor will it be suitable for the 90% of pupils who, it is envisaged, will be completing senior cycle by the end of the 1990s (Ireland, 1992). The available research evidence, as well as teachers' comments, indicate that students who take ordinary level Leaving Certificate courses express dissatisfaction with their schooling, both while they are students (Lewis, 1989) and after they leave school (Hannan and Shortall, 1991). It remains to be seen whether the movement of more students into the Leaving Certificate Vocational Training programme or the provision of less academic courses as proposed in the Green Paper will resolve this problem. What will be required will be a radical development of senior-cycle programmes that will take into account not only existing Leaving Certificate subjects but also the experience gained from Vocational Training and Preparation programmes and Senior Certificate programmes. Further, the process will have to take account of the needs, achievement levels, and learning styles of students, as well as the vocational relevance of courses. The Council believes that this will be a long-term, rather than a short-term exercise, requiring additional resources for schools, in-service education for teachers, and collaboration between schools at the local level (see Ireland, 1992, p.106). As far as the vocational element of a new senior cycle is concerned, the opportunity might be taken to follow the Danish practice of allowing students to explore a number of general vocational areas in anticipation of the more specialised choices that will have to be made at a later date.

Apart from the question of the provision of vocational education in separate establishments, many proposals of the Green Paper fit well with practice in Denmark and The Netherlands. Proposals relating to the provision of modular courses, the facility for students to develop progressively their vocational skills, and provision for second-chance education all echo approaches in the continental systems.

The proposal in the Green Paper to develop a co-ordinated set of national arrangements for apprenticeships mirrors a major concern in Denmark and The Netherlands. Several recent reforms in these countries have been directed towards rationalising very complex systems. The system in Ireland is also complex, but obviously has not as long a tradition and is not as well developed as continental systems. For example, while the Danish and Dutch systems are reducing the numbers of designated trades and training courses, the task faced in the Irish system is to provide formal vocational training for a wider range of occupations than at present. Although the work of the Task Force on Human Resources Education Training Youth (European Communities Commission, 1992) on the comparability of vocational training qualifications is designed primarily to promote the freedom of movement of workers, it also provides a ready index to a wider range of skilled worker occupations which will have to be considered in the development of the Irish system.

Major problems with vocational preparation courses in Ireland (Vocational Preparation and Training Programmes, apprenticeships) arise from the lack of systematic formal assessment and certification procedures. Formal assessment and certification procedures serve several purposes. They promote labour mobility; they reduce costs to employers who do not have to invest in their own testing system; they set standards of achievement that can guide curriculum development; and they serve as criteria for monitoring the performance of training institutions (Middleton & Demsky, 1989). In Denmark and The Netherlands, formal examinations are assuming an increasing importance in the assessment of students. Such examinations have been introduced in Denmark for apprentices, who up to recently were certified on the basis of a general informal assessment of their performance. It is believed that examinations for apprentices, as well as in other areas of vocational preparation, will serve to raise standards. Further, the certification associated with examination performance is designed to allow students who reach certain standards to progress to higher levels of training and qualification. Proposals in the Green Paper to develop a national framework for certification and a system which would ensure satisfactory standards and their comparability within a graded system (p.115) are obviously in line with developments on the continent. However, the implications of the proposals, in terms of both human and financial resources, need a great deal more consideration. The co-ordination and rationalisation of the efforts of a variety of bodies engaged in certification, including FÁS, the Department of Education's Technical Schools Examinations branch, and other agencies, will not be a trivial task.

The greater involvement of industry in vocational preparation proposed in the Green Paper is also a concern in Denmark and The Netherlands. In general, there would seem to be a move in the continental countries towards longer placements of students in industrial settings during their vocational training. Efforts are also being made to make the school-based experiences of students more relevant to their work requirements. This is partly for motivational reasons. Students who in the past might have shown little interest in subjects such as mathematics, science or a foreign language, may develop an interest when the relevance of these subjects to their work becomes apparent.

In both Denmark and The Netherlands, there is considerable involvement by the social partners in determining conditions of training, curricula, and standards of achievement. Committees operate at national and at local level for vocational education in general, as well as for particular areas of vocational competence. The system is more decentralised in Denmark than in The Netherlands. For example, in Denmark, central authorities decide only the general framework of curricula and it is left to local committees to work out the details for their own particular area. This system fits into a more general system of devolution of authority which exists in Denmark.

Whatever system of vocational preparation is adopted in Ireland, experience in both Denmark and The Netherlands would indicate that it should be kept under continual review. Indeed, a problem in the present study was to come to terms with the amount of change which the systems have undergone in recent years and are still undergoing. In The Netherlands, review is usually in the hands of *ad hoc* groups set up by government with representation of employers, employees and vocational education specialists. The Netherlands also has a very considerable research capacity which investigates various aspects of vocational education, including the implementation of proposed reforms. In Denmark, the government works through a variety of established committees to report on such matters as the content of subjects, the form of examinations, the quality of instruction, teacher qualifications and teacher training. As in The Netherlands, considerable research resources are also available in Denmark.

Such reviews serve to underline the fact that, while individuals in Denmark and The Netherlands express general satisfaction with their systems of vocational preparation and the quality of its products, they are not complacent, recognising the existence of problems in the current operation of systems and the need for change to meet future demands. Since the problems seem relevant to the Irish situation, they will be considered briefly.

One problem arises from what is perceived to be the complexity of systems and, from the point of view of students, their inflexibility. Approaches to deal with this involve rationalisation of systems, co-ordinating different approaches to vocational education, developing modular courses and making transfer between courses easier for students. A second problem relates to the perceived lack of ability of systems during the 1980s to respond quickly enough to changing economic and labour market conditions. While recognising the problems involved in forecasting the needs of the labour market, efforts to improve contact between education and industry, at both national and local levels, were seen as helping to deal with this problem.

The present involvement of industry in vocational education in Denmark and The Netherlands is not unproblematic. For one thing, a lack of places for apprentices in industry in Denmark has serious consequences for some students who, having commenced a vocational training course, cannot proceed with that course because they cannot find a placement. Second, there is concern in both Denmark and The Netherlands that industry will not be prepared to make the level of financial contribution to vocational training that is considered necessary if the quality of training is to be improved.

Another problem in both Denmark and The Netherlands relates to the prestige of vocational education relative to more academic education. Not only do high achieving students choose the academic route in second-level schools, but, as in Ireland, many students of lower achievement levels also aspire to an academic education. This aspiration seems to have created particular problems in The Netherlands, where students who would like to go to a school leading to university education choose a general secondary education in preference to vocational education in the hope that they will acquire the necessary qualifications for university entrance. They do this even though the likelihood of qualifying for university entrance and job prospects at the end of general secondary education are poor, while there is a shortage of individuals with crafts skills in the country.

A further problem relates to gender stereotyping, which is common in vocational education in Denmark and The Netherlands. Training in certain areas (e.g., motor mechanic) is confined almost exclusively to males, while in other areas, females predominate (e.g., dental assistant). A similar pattern, of course, is to be found in Ireland. A further problem relating to gender which appears specific to Ireland is the large proportion of boys, relative to girls, among low-achieving students in reading literacy.

In conclusion, it may be noted that the 1990s are likely to be a period of intense pressure, not just on the vocational training systems of the three

countries considered in this report, but on the vocational training systems of all member states of the European Community. The considerations set out by the EC Commission (1990) as relevant to the preparation of the labour force in the coming decades reflect many of the issues raised in this paper. First, it points out there is already a greater appreciation throughout the Community of the importance of training, both initial and continuing. Second, in future there will have to be a much stronger emphasis in that training on quality and higher standards of both general and technical skills. Third, the capacity to respond to changes in demand from the labour market will have to be developed. These changes will arise both from changes in the nature of work and from the fact that the labour market will not only be increasingly European, but also more generally international, in character. Fourth, within the context of the European Community, there will be a need to establish comparability of training qualifications in member states. Finally, provision will have to be made to review on a continuous basis the content and adequacy of existing structures.

The fact that Ireland lags behind many European countries, particularly Denmark and The Netherlands, in its provision for vocational education has obvious disadvantages as it attempts to match its educational and vocational training system to the needs of the next century. This situation may also confer advantages, however, if the opportunity is taken to draw on the experience of other countries, as well as experience accumulated in Ireland, in building a system that is comprehensive and flexible as well as rigorous in the standards that it seek to attain. The Council's views on how this might be achieved are set out in the final Chapter of this Report.