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ABSTRACT

The Census of Population provides data on the structure of employment by occupation and industry for Ireland that are supplemented by the Labor Force Survey (LFS), which collects information on employment by occupation and industry. Expected strong growth in the Irish economy from 1993-98 should lead to a significant increase in employment. This increase will not be large enough to absorb the expected rapid rise in labor force participation. In terms of sectoral forecasts, decreases are expected in the agricultural, manufacturing, and clothing and textiles sectors; increases are expected in all other sectors. Different sectoral trends in employment and continuing change in the occupational structure of sectors mean the aggregate expected change in employment will differ across occupations. Significant increases are forecast for professional, associate professional and managerial, and proprietors occupations. Occupational groups expected to experience employment declines are agricultural workers, laborers and unskilled workers, and foremen and supervisors. More than two-thirds of all net new projected jobs are likely to be secured by women. Educational data on those at work are from the LFS 1991. Analysis shows that those occupations that are predicted to grow fastest are also those with high levels of education. An assessment of the educational profile required for the new jobs that will be created from 1991-98 shows a strong trend toward higher educational requirements. (Contains 23 references) (YLB)

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Occupational forecasts for 1998 for Ireland and their implications for educational qualifications

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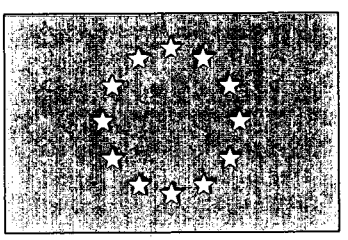

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Occupational forecasts for 1998 for Ireland and their implications for educational qualifications

Paper for meeting of CEDEFOP network
'Circle for research cooperation on trends
in occupations and qualifications' (CIRETOQ)
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List of contents

Occupational Forecasts for Ireland in 1998 and their Implications for Educational Qualifications

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Summary

The economic background to the sectoral and occupational employment forecasts presented in this paper is set out in the ESRI *Medium-Term Review 1994-2000.* The Review envisages a recovery in the world economy over this period, with all the main economies expected to record real growth rates in the region of 2 to 3 per cent. Furthermore, a fall in unemployment in the U.K. is expected to stimulate an increase in outward migration from Ireland. A fall in the Irish birth rate will mean a decline in the numbers in second level education from 1997 onwards and a reduction in the numbers entering the labour force from 2000 onwards. However, the demand for third level education will continue to increase by around one percentage point per annum so that by 1998 about 58% of those aged 15-24 will be in higher education.

During the forecast period the prospects for the Irish economy are good. as strong growth is expected over the next five years. This should also lead to a significant increase in employment. Total employment is forecast to increase by 115,000 from 1,134,000 in 1991 to 1,249,000 in 1998; an annual increase in excess of 16,000. However, the rapid rise in labour force participation, means that this growth in employment will not be large enough to absorb all labour market entrants. Thus, the unemployment rate is likely to fall only slowly, from its current level of almost 16 per cent to over 14 per cent by 1998.

In terms of sectoral forecasts the expected change in employment of 115,000 is predicted to result from decreases in employment in three sectors and increases in the remaining sectors. The main decrease is expected to occur in the agricultural sector, with a decrease of nearly 30,000 jobs. Smaller decreases are expected in the traditional manufacturing sectors of food, drink and tobacco (4,000) and clothing, footwear and, textiles (6,000). The sectors which are expected to have the largest increases in the number of jobs are distribution and catering (42,000), finance, business, and professional services (38,000), other non-market services (22,000), and metals and engineering (19,000). In relative terms,

the fastest growing sectors are expected to be finance, business and professional services (35%), metals and engineering (23%), distribution and catering (20%) and other services (20%).

Different sectoral trends in employment together with continuing change in the occupational structure of individual sectors, mean that the aggregate expected change in employment will differ across occupations. The most rapid growth forecast is, for managers and proprietors (27,000), professionals (26,000), sales workers (15,800), service workers (15, 7000), other associate professionals (10,700), and security workers (7,000). In contrast, the numbers employed in agricultural occupations are expected to fall by 29,000. Only two other occupational groups are expected to experience employment declines: labourers and unskilled workers (2,400), and foremen and supervisors (500). Significant increases are, therefore, forecast for professional, associate professional and managerial and proprietors occupations; the combined share for these groups is forecast to increase from, 26.3% in 1991 to 29.2% in 1998. Skilled and semi-skilled manual occupations are expected to hold their share at 21.4%, while the combined service-related occupations, sales, security and personal services are expected to increase from 17.1% to 18.6%.

The employment increases will have different impacts for male and female shares of employment. More than two-thirds of all net new jobs projected for the period are likely to be secured by women. Women's employment in managerial, skilled maintenance, operative, and supervisory occupations is expected to increase from 40% to 70%. In all of the remaining occupations, with the exception of agricultural and craft occupations, employment increases ranging from, 16% to 37% are expected. Thus, the female share of total employment is expected to increase from 34.1% in 1991 to 37.2% in 1998.

Implications for Education

To date, there has been limited research on the skill levels of the workforce by examining, for example, the occupations in which the most qualified and the least qualified are found and there are no published assessments of the implications of changes in the demand for labour for future skill levels. This paper goes some way to bridge this gap. Using the *Labour*

Force Survey 1991, we examine the educational and occupational profile of those at work in 1991. Occupational forecasts are then used to assess the implications of occupational change for educational qualifications. The educational data is based on "highest level of education" completed. It ranges from primary education to higher university degree.

Schooling is compulsory in Ireland from the ages of 6 to 15 years. While the minimum school leaving age is low by international standards, participation in post-compulsory levels is comparatively high. The OECD report divides the educational system into four levels: pre-primary; primary; secondary and tertiary education. There is no real distinction between pre-primary and primary education. Most children start pre-primary at the ages of 4/5 and finish primary education at the age of 12/13 years. Secondary education consists of lower and upper levels. The lower level lasts for three years and after completing the Junior Certificate examination, students move onto the upper cycle, which lasts two years and culminates in the Leaving Certificate examination. This examination is generally taken around the ages of 17/18 years. The current participation rate in higher education is around 40 per cent. Of those who enter third level, approximately 40 per cent enter non-university level and the remainder enter university level education.

It is evident from previous research that qualifications and labour force experience are closely related. The annual school leavers surveys show clearly that the less qualified have fewer employment opportunities now than in previous decades. It is important to assess the future occupational structure of the workforce in order to understand the implications for educational qualifications of the types of occupations which are expanding or contracting. In 1991, over 30 per cent of the workforce had completed at least a Leaving Certificate level of education, while over 21 per cent had completed only primary education. However, the educational profile differed by occupational group. A summary measure of the level of education in each occupational sub-group is provided by the median years education of the numbers employed in the sub-group. The median years of education for the total workforce is 9.13 year, which is just above Junior Certificate level. Fifteen occupations were above the average with the remaining 24 occupations below it. The top nine occupations with the highest median years of education consist of all the professional, associate professional and higher managers occupational sub-groups. Health professionals, engineering and science

professionals, other professional workers, religious and other associate professionals being the highest. Other occupational groups with relatively high median years of education were: clerical, typists/telephonists, electricians/electrical fitters, other sales workers and catering occupations. At the other end of the continuum, those with the lowest median years of education, attaining just primary level education were: drivers, labourers and agricultural occupations. This compares to secondary level education for fitters/mechanics, other skilled workers and skilled building workers. It would appear from the initial analysis that, third level education is necessary for employment in professional, associate professional and proprietor/managerial occupations. Upper secondary education is required for employment in clerical and technician occupations and security occupations. Primary certificate suffices for employment in driving, labouring and agricultural occupations. The remaining occupations require predominantly lower secondary education.

An assessment is made of the educational profile of those occupations which are expected to grow or decline over the period 1991-98. It is evident from the analysis that, those occupations which are predicted to grow fastest are also those occupations with high levels of education. Business/finance and legal professions are predicted to increase by 42 per cent, followed by electrical/electronics operatives, other professional workers and engineering and science professionals. All of these occupations, with the exception of electrical/electronics operatives group have a median level of education in excess of 11 years. As the absolute growth rate declines, so too does the median years of education; health and education professionals and religious being the only exceptions. All the remaining occupations in decline, agriculture, skilled clothing/textile workers, clothing/textile operatives and other transport workers, have an educational level of Junior Certificate standard or less.

Those occupations which are predicted to contribute most to employment growth over the forecast period are also those occupations with high median years of education. It is predicted that total employment will increase by 10.2 per cent between 1991-98. Five occupational groups, proprietors and managers, higher managers, other sales worker, clerks and business, finance and legal professions, account for almost 54 per cent of the growth. All of these have high median years of education. In contrast, nearly all of those occupations contributing less than 1 per cent to total growth have low median years of education. These

include: warehouse/dispatch clerks, packers/bottlers, other transport workers, labourers. The paper shows that those occupations which are likely to contribute least to total employment are predominantly those which traditionally have attracted the less qualified. This suggests that the poorly educated will increasingly experience employment difficulties in the future; men are more likely to experience such difficulties than women.

The education/occupation relationship is explored further by focusing on the contribution which each occupational subgroup is expected to make to total employment. It is evident that those occupations which are expected to contribute little to total employment growth have noticeably lower levels of education and this suggests that the greatest contributions to total employment growth over the forecast period will be made by occupations which have high median years of education.

An assessment of the educational profile required for the new jobs which will be created over the period 1991-98, shows a strong trend toward higher educational requirements. The median years of education required for new jobs is predicted to be 10.4 years. This compares with 9.1 years in 1991. It is evident, therefore, that a significant proportion of new jobs will require individuals with at least a Leaving Certificate education. In addition, nearly 40 per cent of new jobs will require third level education. There will be virtually no opportunities for individuals with only primary level education since less than one tenth of a per cent of all new jobs are expected to require individuals with this minimum level of education. There should, however, continue to be opportunities for those with Junior Certificate level education. Our estimates suggest that about 21 per cent of all new jobs will require this level of education.

Occupational Forecasts for 1998 for Ireland and their Implications for Educational Qualifications[1]

Occupational Forecasts

Introduction

Occupational forecasts for Ireland are made to provide information on employment trends for broadly defined occupational groups for labour market policy purposes rather than to supply information on employment trends for a large number of occupations for career guidance purposes. The basic information required to make forecasts for the whole occupational structure is employment data for the labour force classified by occupation and sector. Occupational data show the quality of the labour force in terms of intrinsic abilities and skills acquired through education and training. Sectoral data show the industries in which people work. The great value of using this kind of information to make occupational forecasts is that every occupational and sectoral group has to be taken into account.

The prime source of comprehensive data on the structure of employment by occupation and industry for Ireland is the Census of Population (CP) which is taken at five year intervals. These data are supplemented by the Labour Force Survey (LFS) which collects information in the Spring of each year on employment by occupation and industry. The employment analysis in the 1971 Census of Population identifies 144 individual occupations and 142 industries. A process of sub-division increased these numbers to 199 occupations and 199 industries in the 1981 Census and to 213 occupations and 199 industries in the 1986 Census and 1991 Labour Force Survey.

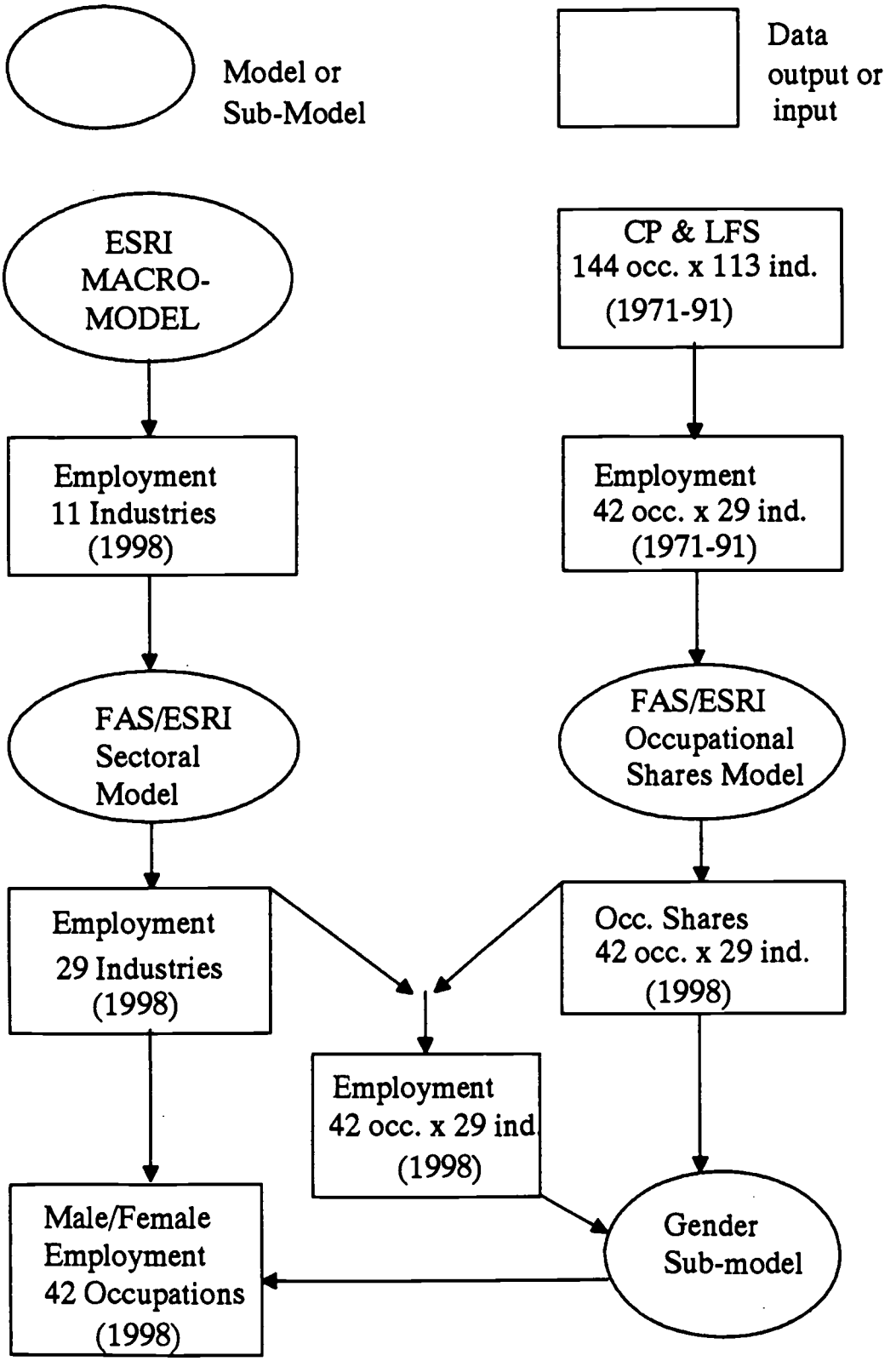
Since the numbers of occupations and industries for which the employment data is available have changed over time it is necessary to reclassify the data to produce an occupation by industry classification which is consistent for the four data points. This produces a classification of 144 occupations and 113 industries which covers the whole labour force in the four years for which we have observations. International experience in OECD countries suggests that the accuracy of occupational forecasts for labour market policy purposes is improved if they are confined to a relatively small number of groups (see Hughes, 1994). Hence, the basic data for employment in 144 occupations and 113 industries are aggregated to provide information on employment in 42 occupational and 29 industrial sub-groups and in 14 occupational and 13 industrial groups.

Forecasting Employment by Occupation

The group and sub-group classifications used in the FAS/ESRI project provide a framework within which forecasts of the occupational structure of the whole labour force can be derived from medium-term forecasts of employment by sector using the manpower requirements method. This method takes forecasts of employment by industry from a macroeconometric or input-output model and uses them in an occupational shares model to provide forecasts of what the occupational composition of employment will be within each industry. Figure 1 shows the steps which are followed in the FAS/ESRI occupational forecasting model to produce forecasts of employment by occupation from the

[1] We are grateful to Jerry Sexton for comments on an earlier draft and to Denis Conniffe for statistical advice.

Figure 1: FAS/ESRI Occupational Forecasting Model



macroeconometric forecasts of employment by sector given by the ESRI medium-term model.

The forecasts are made in two stages. In the first stage, shown on the left hand side of Figure 1, employment forecasts provided by the ESRI medium-term macroeconomic model for 11 sectors are disaggregated to give expected employment in 29 sub-sectors. Trend projections of sub-sector shares of employment within each sector are used to disaggregate the sectoral forecasts. In the second stage, shown on the right hand side of Figure 1, the trend in the employment share of each cell of the 42 by 29 matrix of employment by occupational and industrial sub-group is examined and projected to the target year using linear, logarithmic, or semi-logarithmic equations.

The forecasts of the number expected to be employed in each sub-sector and of occupational shares within each sector in the target year are brought together, as shown in the middle of Figure 1, to provide forecasts of the numbers expected to be employed in the target year in each occupational sub-group. Finally, the female share of employment for each occupational sub-group is projected using a gender sub-model. In this sub-model linear trend regressions of the female share of employment and semi-log regressions are used to make forecasts of the female share of employment in each occupational sub-group. Total female employment for each occupational sub-group is then derived by multiplying the projection of total occupational employment for each sub-group for 1998 by the projected female share.

The performance of the occupational forecasts will, of course, depend on the accuracy of the employment forecasts for each sector given by the ESRI medium-term model and on the accuracy of the forecasts of occupational shares within each sector.

Medium-Term Macroeconomic Forecasts

The economic background to the sectoral and occupational employment forecasts presented in this report is set out in the ESRI *Medium-Term Review 1994-2000* written by Cantillon, Curtis, and Fitz Gerald (1994) and published in April 1994. Forecasts of the principal aggregates for Ireland for the period 1991-98 are given in Table 1. The underlying assumptions regarding world economic growth envisage a recovery in the world economy in the period up to the end of the century with all of the main economies expected to record real growth rates within the broad 2 per cent to 3 per cent range.

The position in the U.K. labour market is of particular importance for the Irish economy because of its influence on migration behaviour. A continuing, but modest, fall in unemployment in the U.K. during the forecast period is expected to stimulate an increasae in outward migration from Ireland.

Irish society is expected to undergo significant demographic change over the next ten years. A fall in the birth rate has led to a substantial reduction in the number of children which, from 1997 onwards, will result in a decline in the number in second level education and which, from 2000 onwards, will mean a rapid fall in the numbers entering the labour force. However, demand for third level education by 15 to 24 year olds should continue to expand from its 1991 level of 50 percent by around one percentage point per annum over the next decade.

The choice of an appropriate set of fiscal policy options for Ireland is not straightforward. Domestic considerations dictate that the optimal strategy on the public finances will involve staying well within the Maastricht guidelines in order to continue reducing the debt/GNP ratio. An important long-term objective is to keep the exchequer borrowing requirement in the range 0-2 per cent of GNP. Pressures for a significant reduction in the overall tax burden suggest that much of the growth over the forecast period will be used to reduce rates of direct taxation while the demographic changes referred to above mean that some of the growth is likely to be used to increase public services. However, the increase in public expenditure should be slower than the increase in GNP so the direct tax burden should fall from around 25 per cent in 1994 to about 21 per cent in the year 2000. These forecasts take into account the substantial Structural Funds receipts in the period up to 1999.

Table 1: Principal economic aggregates 1991-1994 and 1998

Indicator	1991	1994	1998
GNP % change	2.8	5.5	4.8
Balance of Payments (% GNP)	3.7	6.7	2.3
Exchequer Borrowing Requirement (% GNP)	-0.8	-1.9	-0.5
Debt/GDP Ratio (%)	90.1	83.0	66.7
Consumption Deflator	2.5	2.8	.2.4
Total Employment (000)	1,134	1,176	1,249
Unemployment Rate (%)	15.6	15.8	14.2
Net Migration (000)	-2	-10	-18

Sources: Cantillon, Curtis, and Fitz Gerald (1994); CSO Annual Labour Force Estimates

The forecasts in Table 1 suggest that the Irish economy is in a strong position to benefit from the developing European Recovery. The Central Forecast in the ESRI Medium-Term Review predicts that Ireland will experience a period of rapid growth over the next five years and that there will also be a significant increase in employment.

The competitive strength of the Irish economy is reflected in its relative success in recent years at a time of European recession. In the period up to 1998 the growth rate is expected to average 51/2 per cent per annum and particularly rapid growth is forecast for 1995 and 1996. The economic recovery coupled with a fall in interest rates, increased competitiveness following the devaluation in 1993 and a general improvement in business confidence are forecast to lead to an investment boom in the next few years. Private consumption should also grow quite rapidly. Together these two factors should see a strong increase in domestic demand. The change in the composition of demand and the increasing pace of output growth is expected to be particularly favourable to employment growth. Total employment is forecast to increase by 115,000 from 1,134,000 in 1991 to 1,249,000 in 1998 or in excess of 16,000 on an annual average basis.

The rapid rise in the labour force, however, means that this growth in employment will not be enough to absorb all labour market entrants even if this flow is reduced by increased emigration. Consequently the unemployment rate, as measured by the Labour

Force Survey is likely to fall only slowly from its current level of nearly 16 per cent to just over 14 per cent by 1998.

Sectoral Forecasts 1991-98

The main features of the latest forecasts for Ireland for the period 1991-98, showing expected employment developments at the major sectoral group level, are presented in Figures 2 and 3. The ESRI *Medium-Term Review: 1994-2000* (see Cantillon, Curtis, and Fitz Gerald, 1994) envisages a reversal of the decline in employment which occurred during the 1980s and forecasts an increase of 115,000, or just over 10%, between 1991 and 1998. The annualised growth rate for the forecast period is 1.39% - a figure which is significantly greater than those recorded for the period 1971-81, 0.76%, and for the period 1981-91, -0.04%. Figure 2 shows the FAS/ESRI forecasts of the expected change in employment during the period 1991-98 in each sector and Figure 3 shows the percentage change in employment expected during the same period. Detailed analyses of the factors underlying the occupational forecasts for 1998 are given by Canny, Hughes, and Sexton (1995).

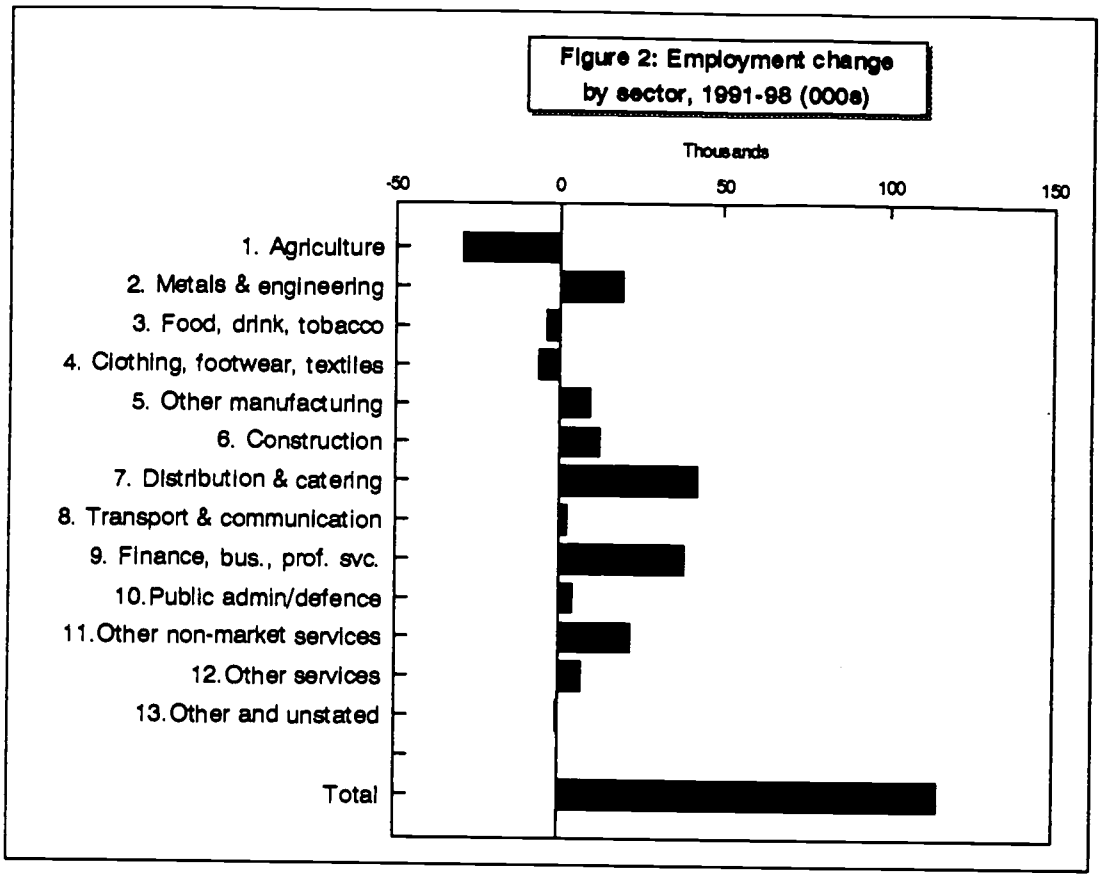
The expected change in employment of 115,000 is likely to result from decreases in employment in three sectors and increases in the remaining sectors. Losses of nearly 30,000 jobs are projected in agriculture, as this sector continues its long-term decline. Smaller losses of 4,000 and 6,000 jobs respectively are projected in the traditional manufacturing sectors of food, drink and tobacco, and clothing, footwear, and textiles. These job losses are expected to be outweighed by significant gains in employment in the remaining sectors. Figure 2 shows that the sectors which are expected to have the largest increases in the number of jobs are distribution and catering (42,000), finance, business, and professional services (38,000), other non-market services (22,000), and metals and engineering (19,000).

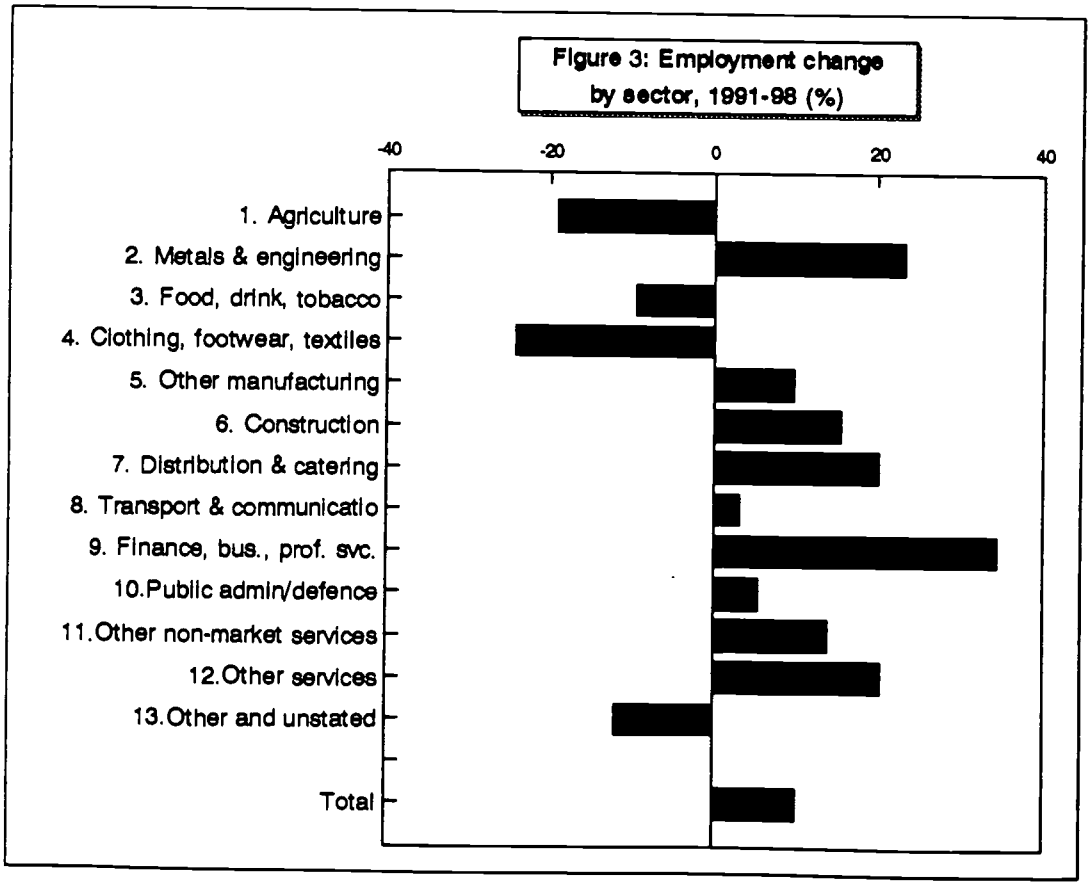
Figure 3 shows that in relative terms the fastest growing sectors are expected to be finance, business, and professional services (35%), metals and engineering (23%), distribution and catering and other services (20% in both cases). The sectors which are projected to decline fastest during the 1990s are agriculture (-19%) and the traditional manufacturing industries clothing, footwear, and textiles (-24%) and food, drink, and tobacco (-10%).

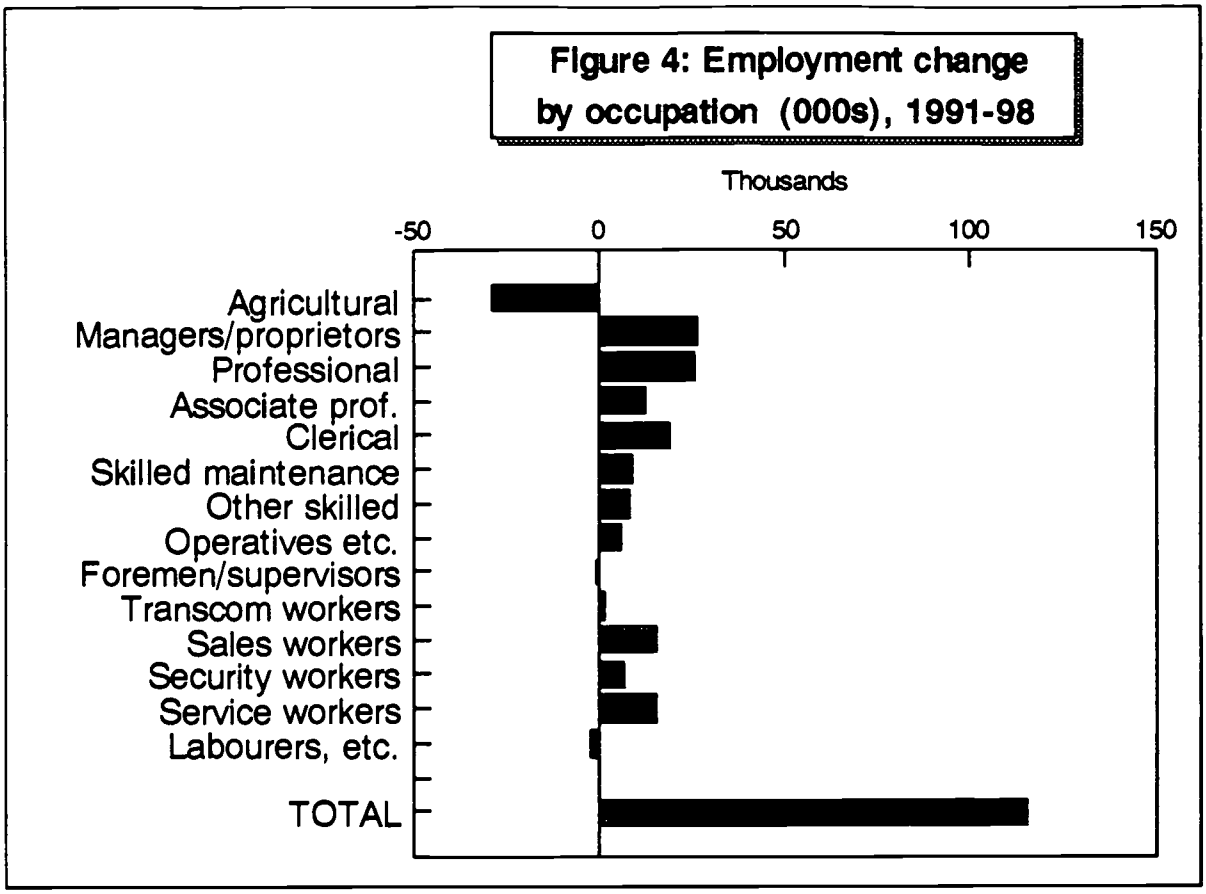
Occupational Forecasts 1991-98

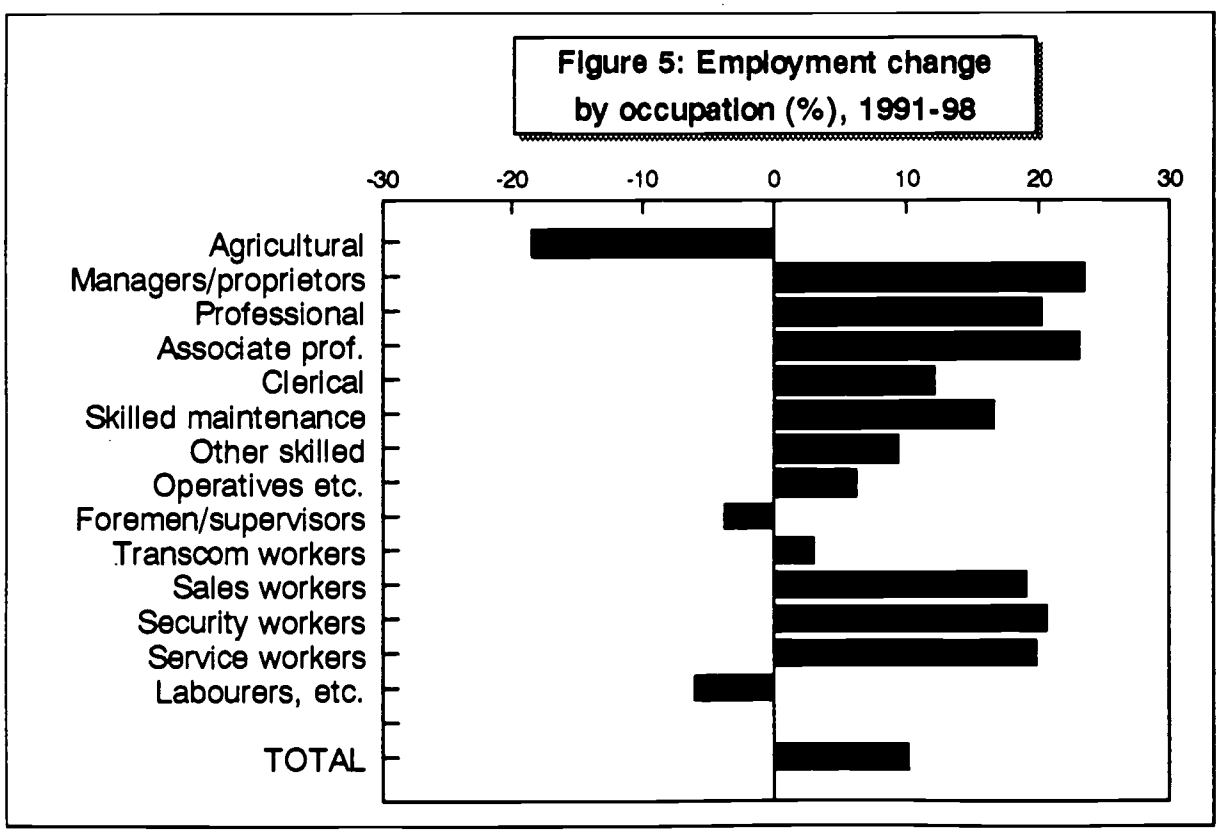
Different sectoral trends in employment together with continuing change in the occupational structure of individual sectors, mean that the aggregate expected change in employment will be unevenly spread across occupations. Figures 4 and 5 show that employment growth is projected to be about double the average for highly qualified workers in management and the professions and for moderately skilled workers in sales, security, and service occupations. Employment is expected to increase only moderately for other skilled workers and operatives and to decline in agricultural, labouring, and foremen/supervisory occupations.

The most rapid growth forecast for 1991-98 is for managers and proprietors (27,000 or 23.5%), associate professionals (10,700 or 23.0%), security workers (7,000 or 21.1%), professionals (26,000 or 20.3%), service workers (15,700 or 20%) and sales workers (15,800 or 19.1%). Clerical workers, skilled and semi-skilled workers and operatives, and transport









and service workers are forecast to show employment increases ranging from just under 3% to nearly 17%.

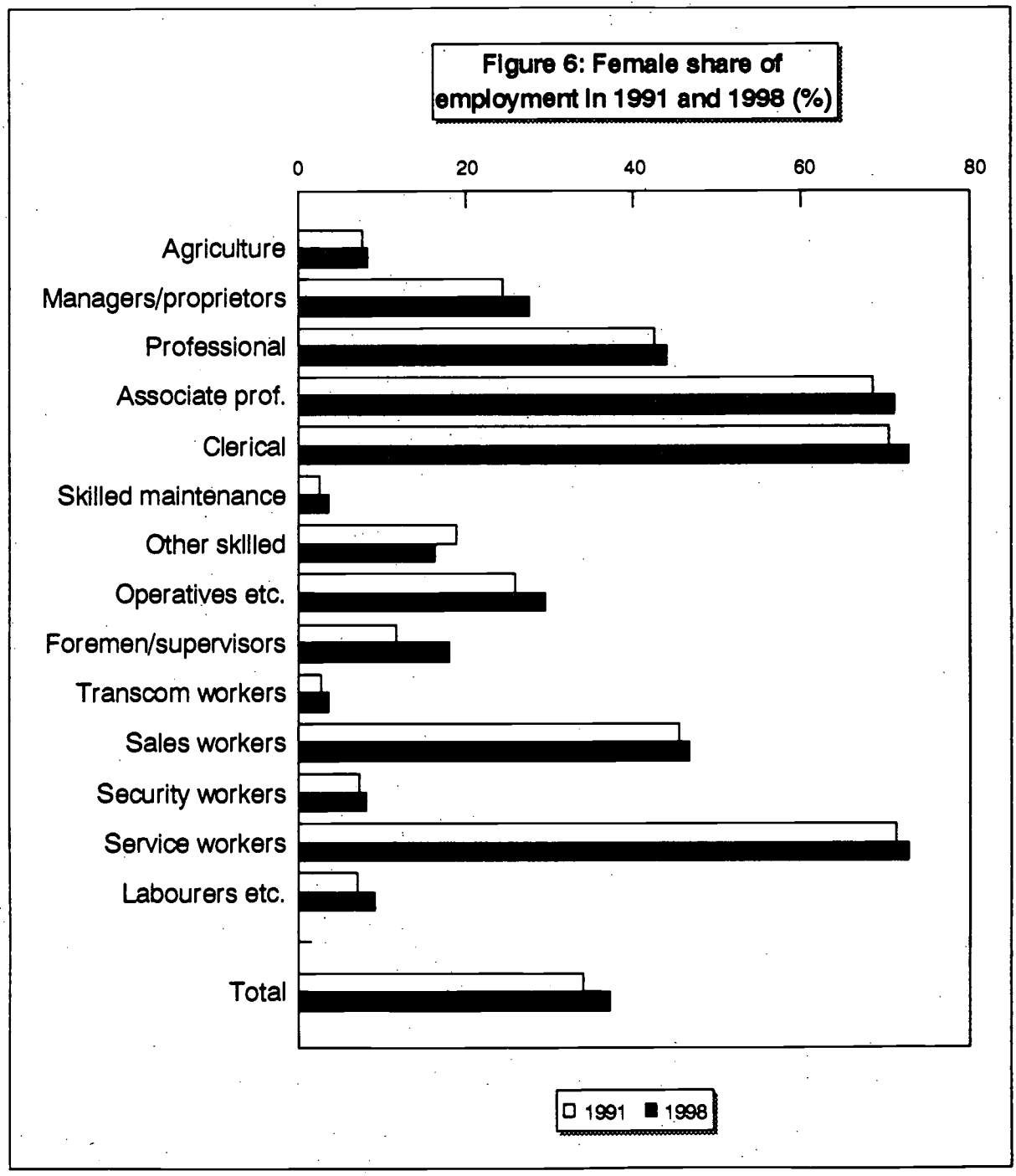
The number employed in agricultural occupations is expected to fall by 29,000, or more than 18%, over the seven-year period covered by the forecasts, whereas employment in the aggregate of all other occupations is expected to grow by nearly 145,000 or slightly under 15%. The forecast for agricultural occupations implies a resumption of relatively rapid decline after a period of near-stability in the late 1980s. By 1998, agricultural workers are projected to account for just over 10% of all employment, as compared with nearly 14% in 1991 and 26% in 1971.

Only two other occupational groups are expected to experience employment declines. The first of these is the group which includes labourers and unskilled workers, where the forecast drop in employment of 2,400 (6.0%) represents a continuation of a long-standing trend. A much smaller reduction of 500 or 3.8% is projected for foremen and supervisors; this represents a levelling off of the trend in employment for this group in the 1981-91 period when job losses amounted to 4,500 or 26.5%.

These developments have implications for the occupational distribution of total employment. Significant increases in share will continue to be made by professionals, associate professionals and managers and proprietors; the combined share for these groups is forecast to reach 29.2% in 1998, as compared with 26.3% in 1991 and 16% in 1971. The share of clerical workers will rise slightly to 14.2% from the 1991 level of 13.9%. The combined service-related occupations, sales, security and personal services, are expected to show an increase from 17.1% to 18.6%. Skilled and semi-skilled manual occupation (including foremen) will hold their share at 21.4%. Labourers and agricultural workers, which are expected to show absolute employment declines at a time when the overall numbers at work are increasing, are likely to experience further significant declines in share. The share of transport and communication workers is also expected to decline although the numbers employed are forecast to increase by nearly 1,300.

Trends in Female Employment

Forecasts of the female share of total employment in each of the major occupational groups suggest that the anticipated changes will follow the pattern established in the recent past. More than two-thirds of all net new jobs projected for the period 1991-98 are likely to be secured by women. Women's employment in managerial, skilled maintenance, operative, and foremen/supervisory occupations is expected to increase from 40 to 70 per cent In all of the remaining occupational groups except agricultural and craft, where the number of women employed is likely to decline, their employment is projected to increase from 16 to 37 per cent. Figure 6 shows that these employment changes are expected to lead to significant increases in the female share of total employment in the occupational sub-groups skilled maintenance, foremen/supervisory, driving and labouring where women's presence has been increasing rapidly from a low base. The only group for which a decrease in the female share is expected is craft occupations for which a decline from 18.9% to 16.4% is projected. When these changes at the major occupational group level are considered together with the forecast changes in the occupational structure of employment, the outcome is a forecast increase in the female share of total employment in the economy from 34.1% in 1991 to 37.2% in 1998.



Occupation and Education

Introduction

One of the most significant developments in Ireland over recent decades has been the rapid expansion in educational provision, particularly at third level; there has been a marked orientation in educational policy towards a concern with the labour market needs of a developing economy (Clancy, 1988). To date, very little research has been carried out which investigates the skill levels of the workforce by examining, for example, the occupations in which the most qualified and the least qualified are found or by assessing the implications of occupational forecasts for future skill levels. In this section we will try to bridge this gap. Since information on the educational qualifications of the workforce has only been collected since the 1988 Labour Force Survey the data period is a little too short to project trends in the educational qualifications of the workforce. Hence, we will use occupational and educational data from the 1991 labour force survey to analyse the educational profile of those at work in 1991 and we will use the occupational forecasts presented in the first part of this paper to explore the implications of occupational change for educational qualifications.

Method

The data used in our analysis is derived from the 1991 Labour Force Survey, utilising employment data for the labour force classified by occupation and educational qualifications. The Labour Force Survey question on educational qualifications is based on the "highest level of education the person has completed" and the respondent chooses from the following six levels of education:

	No. of Years[2]
•No Formal Education	0
•Primary Education	1-6
•Intermediate Certificate/'O' Levels/Group Certificate	7-9
•Leaving Certificate	10-11
•Third Level Non-University	12-13
•Third Level University	12-14
•Higher University Degree Level	15-16

In this paper the 213 occupations identified in the 1991 labour force survey are reclassified into the 39 occupational sub-groups used in the FAS/ESRI manpower forecasting project.

Overview of the Irish Education System

Nearly one-third of the population are engaged in full-time education according to Department of Education figures (Ireland, 1994A). Schooling is compulsory in Ireland from the ages of 6 to 15 years; thus in the 6-15 age group participation is almost universal. While the minimum school leaving age is low by international standards, participation rates in post-compulsory levels is comparatively high. Almost 73 per cent of the 4-24 age cohort is in full-time education (Drudy and Lynch, 1993). The OECD (1995) report *Education at a*

[2] The number of years spent in each level are taken from the OECD (1995) report *Education at a Glance*. We are excluding infant education from the analysis (education before 6 years of age).

Glance provides a concise overview of the educational system. It divides the educational system into pre-primary education, primary education, lower-secondary and upper-secondary, and tertiary education. Tertiary education is divided into sub-degree level, primary university degree level and post-graduate degree level. These levels correspond to the educational classification used in the Labour Force Survey.

Pre-primary and primary education: Most children start pre-primary education at the age of 4/5 years. Pre-primary education lasts for two years and includes junior and senior infants classes. There is no formal distinction between pre-primary and primary education as both are provided in the same National Schools. Primary education comprises 6 grade classes after pre-primary and most children finish at the age of 12/13 years.

Secondary education: Second level education is sub-divided into lower and upper cycles. The lower second level lasts for three years and culminates in the Junior Certificate.[3] The Junior Certificate examination is generally taken around the ages of 15/16 years. After the Junior Certificate students transfer into upper second level education, which lasts for two years and culminates in the Leaving Certificate examination. The Leaving Certificate examination is generally taken around the ages of 17/18 years. There is a high participation rate at this stage, some 73 per cent of those who enter second level education complete the senior cycle (Ireland, Department of Education 1992). Over the period 1980-1994, as Murphy and Whelan (1995) note, the proportion of school leavers who sat for the Leaving Certificate examination rose from 60 per cent to 79 per cent. This increase clearly illustrates the increasing demand for certification both for entry into third level education and success in the labour market. The main types of secondary schools are voluntary secondary, vocational, community and comprehensive. The majority of students attend voluntary secondary schools, which are state-aided.

Tertiary education: Almost 40 per cent of those who sit the Leaving Certificate examination transfer onto third level education. A further 20 per cent follow a post-second level vocational training programme within the existing school system (Ireland, Department of Education 1992). The green paper on education envisages that by the end of the century, some 45 per cent of those taking the Leaving Certificate examination will pursue some form of third level education. Third level education can be sub-divided into two levels: non-university and university level. Education at non-university level is provided primarily in Regional Technical Colleges (there are 11 Regional Technical Colleges), the Dublin Institute of Technology and a number of smaller private colleges. The course of study generally extends over two years and culminates in national certificate examinations. In the 1990/91 academic year some 40 per cent of those who entered third level were in technological colleges. Courses provided at this level are generally in scientific, technological or business subjects. Students have the option of pursuing a further year of studies, leading to national diploma level providing they attain sufficient credits in their final national certificate examination. Nearly 60 per cent of the 1990/91 cohort who entered third level education entered at university degree level[4] (Drudy and Lynch, 1993). Education at this level includes all primary/bachelor degree programmes whether taken in university or non-university institutions. This level generally requires three years of study leading to degree status qualifications. However, some courses

[3] Prior to 1992 the Junior Certificate was called the Intermediate Certificate. The Group Certificate was an examination taken by students attending vocational schools and was taken after two years of lower secondary education. This examination was abolished in 1992.

[4] The remainder entered private institutions.

are of a longer duration (medicine, engineering and courses provided in some third level colleges). Higher University degree level comprises all master's degree and Ph.d. programmes. masters degrees are generally of one to two years duration. The percentage of post-graduates in third level education has risen from 8 per cent in 1975 to 14 per cent in 1994 (Higher Education Authority, 1995).

One of the most striking features of Irish education in the 1990s is its very high participation rates. The dramatic rise in participation rates in post-compulsory education has brought about a four-fold increase in the number of full-time enrolments in higher education since the mid-1960s (Ireland, 1994B). Currently, around 40 per cent of the age group who complete secondary education transfer to third level colleges. The increase in the number of people with qualifications, particularly at third level, has had important consequences for the fortunes of unqualified school leavers. Over 78 per cent of school leavers who entered the labour market in 1993 without qualifications were unemployed one year later, compared to 47.6 per cent of those who completed the Junior Certificate examination and 28.5 per cent of those who completed the Leaving Certificate examination (Murphy and Whelan, 1995). It is clear that the less qualified have fewer opportunities now than in previous decades and the indications are that this trend is set to continue. Indeed Murphy and Whelan (1995) argue that in addition to the divergence between the employment prospects of those with and without qualifications it is becoming increasingly important to have a Leaving Certificate level of education rather than the Intermediate level which was the norm in the past.

Educational Structure of Occupations in 1991

Following Jaffe (1987) we will use educational data and occupational forecasts to estimate the educational profile implied by the numbers expected to be at work in Ireland in 1998. It is important to assess the future occupational structure of the workforce in order to understand the implications for educational qualifications of the types of occupations which are expanding or contracting. Such information should be of interest to educational policy makers and school leavers, particularly those who may be considering leaving the school system without an educational qualification. There is a need to provide this information for those who are responsible for the development of educational and training policies and for career advisers who face regular requests for advice on future employment prospects.

The educational profile of each occupational sub-group is shown in actual terms in Table 2 and in percentage terms in Table 3. In addition, figure 7 provides a clear picture of the occupation and educational qualifications link; educational qualifications have been aggregrated into three groups: primary, secondary and third level education. In 1991 over 30 per cent of the workforce had completed at least a Leaving Certificate level of education while over 21 per cent had completed only primary education. Surprisingly, about a half a percent had no education despite the existence of compulsory education in Ireland for many years. However, it is likely that the majority of this group would be older workers who had left the education system prior to the introduction of compulsory education. Nearly 57 per cent had attained either an Intermediate or Leaving Certificate level education and over 20 per cent had completed third level education; just 2% had attained higher degree level education. Examining occupational sub-groups clearly shows that the best educated are to be found, not unsurprisingly in professional occupations. Almost 33 per cent of health professionals had attained higher university degree level education, with religious coming nextt

Table 2: Educational profile of Irish work force in 1991 by occupational subgroup

Occupation				Third Level Educ			
	Primary	Intermed.	Leaving	Non-Univ	Univ	High Deg	Total
1.1 Agriculture	82,700	41,300	23,200	6,300	1,900	100	155,500
2.1 Higher Managers	2,300	5,000	19,300	9,100	10,500	2,700	48,900
2.2 Proprietors/Managers	11,700	17,300	25,200	6,800	3,300	300	64,600
3.1 Health Professionals	0	100	100	600	5,800	3,200	9,800
3.2 Education Professionals	300	1,000	2,200	14,000	25,600	6,400	49,500
3.3 Engineering/Science	100	200	700	4,200	8,500	2,000	15,700
3.4 Business/Finance and Legal	200	400	3,900	7,000	11,100	3,400	26,000
3.5 Religious	200	300	1,200	2,500	5,200	1,600	11,000
3.6 Other Professional workers	800	1,400	3,900	2,900	4,800	800	14,600
4.1 Health Associate workers	700	2,400	14,300	15,600	1,900	100	35,000
4.2/3 Other Associate Profess	700	1,500	4,500	8,000	3,500	600	18,800
5.1 Clerks	3,600	14,200	72,600	11,400	4,400	400	106,600
5.2 Typists/Telephonists	800	5,100	23,700	4,500	700	100	34,900
5.3 Warehouse Dispatch Clerks	3,200	4,100	4,800	500	100	0	12,700
6.1 Electricians/Electrical Fitters	1,800	8,600	8,500	4,500	1,600	100	25,100
6.2 Fitters/Mechanics	3,400	14,800	8,000	2,800	600	0	29,600
7.1 Metal/Engineer. Craft wkrs	2,600	7,600	4,200	800	100	0	15,300
7.2 Wood Craft workers	2,500	10,300	4,300	400	0	0	17,500
7.3 Skilled Clothing/Textile wkr	5,400	7,100	2,800	300	0	0	15,600
7.5 Skilled Building workers	8,500	12,400	6,000	900	300	0	28,100
7.4/6 Other Skilled workers	2,100	4,800	3,300	500	0	0	10,700
8.1 Electrical/Electronics Oper	2,600	5,900	6,000	700	200	0	15,400
8.2 Metals/Engineering Oper	2,700	6,000	2,800	500	0	0	12,000
8.3 Food/Drink/Tobacco Oper	5,000	7,000	3,600	600	200	0	16,400
8.4 Clothing/Textile Operatives	1,400	2,300	1,200	100	0	0	5,000
8.5 Other Plant/Production Oper	11,600	13,800	6,500	500	100	0	32,500
8.6 Packers/Bottlers	1,900	2,100	1,200	100	0	0	5,300
9.1 Foremen	3,800	4,700	3,000	900	100	0	12,500
10.1 Drivers	14,700	13,100	5,100	500	200	0	33,600
10.2 Postmen/Couriers	2,200	2,200	1,700	100	0	0	6,200
10.3 Other Transport workers	1,100	1,500	700	0	0	0	3,300
11.1 Brokers and Agents	1,200	3,700	8,900	2,800	1,400	100	18,100
11.2/3 Other Sales workers	8,000	23,700	28,900	2,800	700	0	64,100
12.1 Army/Gardai (Other Ranks)	2,000	5,400	9,200	1,400	200	0	18,200
12.2 Other Security workers	5,200	5,200	3,500	500	200	100	14,700
13.1 Catering Occupations	4,200	7,100	5,600	2,400	100	0	19,400
13.2 Other Personal Service wkrs	20,200	18,400	15,800	2,600	700	100	57,800
14.1 Labourers	19,100	12,600	4,400	300	200	0	36,600
14.2 Occupation Unstated	1,900	600	1,000	300	100	0	3,900
Total	244,100	295,200	345,900	121,900	94,800	23,100	1,125,000

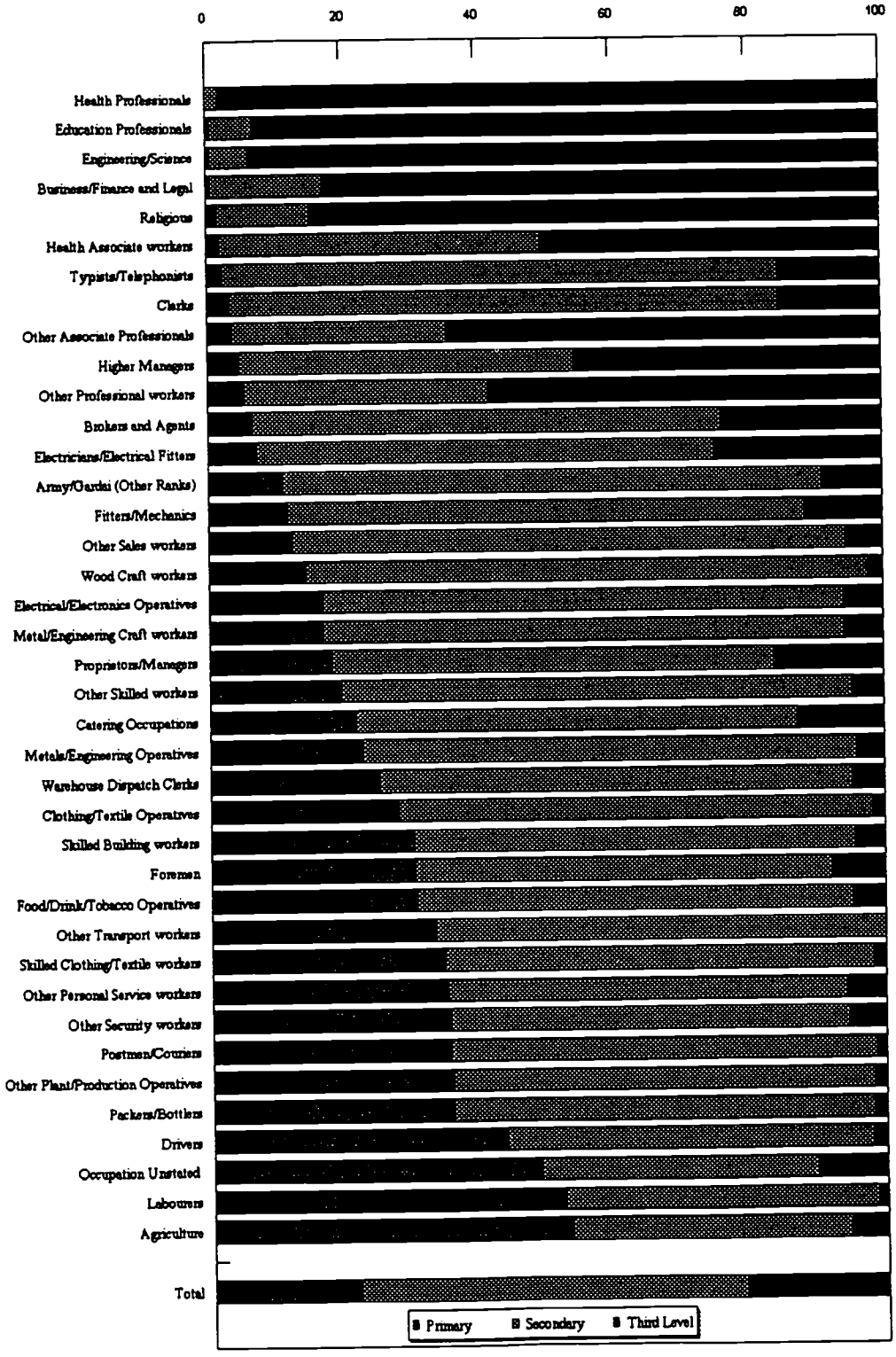
Source: Labour Force Survey 1991

Table 3: Educational profile of Irish work force in 1991 by occupational sub-group (%)

Occupation	Primary	Intermed.	Leaving	Third Level Educ		
				Non-Univ	Univ	Higher Deg
1.1 Agriculture	53.18	26.56	14.92	4.05	1.22	0.06
2.1 Higher Managers	4.70	10.22	39.47	18.61	21.47	5.52
2.2 Proprietors/Managers	18.11	26.78	39.01	10.53	5.11	0.46
3.1 Health Professionals	0.00	1.02	1.02	6.12	59.18	32.65
3.2 Education Professionals	0.61	2.02	4.44	28.28	51.72	12.93
3.3 Engineering/Science	0.64	1.27	4.46	26.75	54.14	12.74
3.4 Business/Finance and Legal	0.77	1.54	15.00	26.92	42.69	13.08
3.5 Religious	1.82	2.73	10.91	22.73	47.27	14.55
3.6 Other Professional workers	5.48	9.59	26.71	19.86	32.88	5.48
4.1 Health Associate workers	2.00	6.86	40.86	44.57	5.43	0.29
4.2/3 Other Associate Professionals	3.72	7.98	23.94	42.55	18.62	3.19
5.1 Clerks	3.38	13.32	68.11	10.69	4.13	0.38
5.2 Typists/Telephonists	2.29	14.61	67.91	12.89	2.01	0.29
5.3 Warehouse Dispatch Clerks	25.20	32.28	37.80	3.94	0.79	0.00
6.1 Electricians/Electrical Fitters	7.17	34.26	33.86	17.93	6.37	0.40
6.2 Fitters/Mechanics	11.49	50.00	27.03	9.46	2.03	0.00
7.1 Metal/Engineering Craft workers	16.99	49.67	27.45	5.23	0.65	0.00
7.2 Wood Craft workers	14.29	58.86	24.57	2.29	0.00	0.00
7.3 Skilled Clothing/Textile workers	34.62	45.51	17.95	1.92	0.00	0.00
7.5 Skilled Building workers	30.25	44.13	21.35	3.20	1.07	0.00
7.4/6 Other Skilled workers	19.63	44.86	30.84	4.67	0.00	0.00
8.1 Electrical/Electronics Operatives	16.88	38.31	38.96	4.55	1.30	0.00
8.2 Metals/Engineering Operatives	22.50	50.00	23.33	4.17	0.00	0.00
8.3 Food/Drink/Tobacco Operatives	30.49	42.68	21.95	3.66	1.22	0.00
8.4 Clothing/Textile Operatives	28.00	46.00	24.00	2.00	0.00	0.00
8.5 Other Plant/Production Oper	35.69	42.46	20.00	1.54	0.31	0.00
8.6 Packers/Bottlers	35.85	39.62	22.64	1.89	0.00	0.00
9.1 Foremen	30.40	37.60	24.00	7.20	0.80	0.00
10.1 Drivers	43.75	38.99	15.18	1.49	0.60	0.00
10.2 Postmen/Couriers	35.48	35.48	27.42	1.61	0.00	0.00
10.3 Other Transport workers	33.33	45.45	21.21	0.00	0.00	0.00
11.1 Brokers and Agents	6.63	20.44	49.17	15.47	7.73	0.55
11.2/3 Other Sales workers	12.48	36.97	45.09	4.37	1.09	0.00
12.1 Army/Gardai (Other Ranks)	10.99	29.67	50.55	7.69	1.10	0.00
12.2 Other Security workers	35.37	35.37	23.81	3.40	1.36	0.68
13.1 Catering Occupations	21.65	36.60	28.87	12.37	0.52	0.00
13.2 Other Personal Service workers	34.95	31.83	27.34	4.50	1.21	0.17
14.1 Labourers	52.19	34.43	12.02	0.82	0.55	0.00
14.2 Occupation Unstated	48.72	15.38	25.64	7.69	2.56	0.00
Total	21.70	26.24	30.75	10.84	8.43	2.05

Source: Labour Force Survey 1991

Figure 7: Individuals employed in an occupation by educational level 1991



highest at 15 per cent followed by business, finance and legal professionals and education professions. Focusing on primary and higher degrees, 92 per cent of health professionals had attained this level of education, engineering and science professionals were next at 67 per cent, followed by education professionals (65 per cent), religious (62 per cent), business, finance and legal (56 per cent) and other professional workers (38 per cent). Almost 27 per cent of higher managers and 22 per cent of other associate professionals had attained third level education. The highest percentage of associate professionals were concentrated in the non-university sector (45 per cent of health and 43 per cent of other associate professional workers). Surprisingly, as is clearly outlined in figure 7, the proprietors/managers group had low levels of educational attainment compared to either the higher managers group or the professional and associate professional sub-groups. Just 16 per cent of proprietors and managers had some form of third level education; 66 per cent possessed either intermediate or leaving certificate education. Indeed, 45 per cent of this group had less than a leaving certificate education. It is likely that age may partly explain this, as the majority of proprietors and managers may be older workers who by virtue of their experience and seniority have moved into managerial and ownership positions.

In addition to the professional, associate professional and managers/proprietors occupations, a number of other occupations had over 13 per cent possessing non-university or university third level education. Electricians/electrical fitters, brokers/agents, typists/telephonists, catering occupations and clerks were in this category. Fitters and mechanics and army, gardai (other ranks) were also relatively high at 11 per cent and 9 per cent respectively. Conversely, 53 per cent of agricultural workers possessed just primary level education, they were followed by labourers (51 per cent), drivers (43 per cent), postmen/couriers, other plant production operatives, skilled clothing/textile workers, and other security workers (all with around 35 per cent), other personal service workers (34 per cent) and other transport workers (33 per cent).

Median Years of Education for Each Occupation

A summary measure of the level of education in each occupational sub-group is provided by the median years education of the numbers employed in the sub-group. Table 4 provides an overview of the median number of years for each of the 39 occupational sub-groups in descending order. The median years of education for the total workforce is 9.13 years, which is just above Intermediate Certificate level. Fifteen occupations are above the average with the remaining 24 occupations below it. The top nine occupations with the highest median of years of education consist of all the professional, associate professional and higher managers occupational sub-groups. Health professionals have the highest median number of years of education (13.12 years) and they are followed by engineering/science professionals (11.94), other professional workers (11.83), religious (11.75) and other associate professionals (11.68 years).

Examination of the occupations shows that clerical and typists/telephonists occupations have a median educational level above average at 9.98 and 9.97 years respectively. Other occupational groups with relatively high median educational levels are electricians/electrical fitters (9.51), other sales workers (9.02) and catering occupations at 8.32 years. Moving down the table, the median for foremen/supervisors is 7.56 years, food/drink/tobacco operatives is 7.37 years and packers/bottlers (7.07 years). Those with the lowest median years of education, attaining just primary level education were: drivers (6.48)

Table 4: Median years of education ranked from highest to lowest 1991

Occupation	Median Years of Education
3.1 Health Professionals	13.12
3.3 Engineering/Science	11.94
3.6 Other Professional workers	11.83
3.5 Religious	11.75
4.2/3 Other Associate Professionals	11.68
3.4 Business/Finance and Legal	11.41
3.2 Education Professionals	11.06
4.1 Health Associate workers	11.01
2.1 Higher Managers	10.78
5.1 Clerks	9.98
5.2 Typists/Telephonists	9.97
6.1 Electricians/Electrical Fitters	9.51
12.1 Army/Gardai (Other Ranks)	9.37
2.2 Proprietors/Managers	9.26
11.2/3 Other Sales workers	9.02
8.1 Electrical/Electronics Operatives	8.59
13.1 Catering Occupations	8.32
6.2 Fitters/Mechanics	8.31
5.3 Warehouse Dispatch Clerks	8.30
7.4/6 Other Skilled workers	8.03
7.1 Metal/Engineering Craft workers	7.99
7.2 Wood Craft workers	7.82
8.2 Metals/Engineering Operatives	7.65
9.1 Foremen	7.56
8.4 Clothing/Textile Operatives	7.43
13.2 Other Personal Service workers	7.42
8.3 Food/Drink/Tobacco Operatives	7.37
7.5 Skilled Building workers	7.34
12.2 Other Security workers	7.24
10.2 Postmen/Couriers	7.23
10.3 Other Transport workers	7.10
8.6 Packers/Bottlers	7.07
8.5 Other Plant/Production Operat	7.01
7.3 Skilled Clothing/Textile workers	7.01
10.1 Drivers	6.48
14.2 Occupation Unstated	6.25
14.1 Labourers	5.74
1.1 Agriculture	5.64
Total	9.13

Source: See text

years), labourers (5.74 years) and agricultural occupations with a median of just 5.64 years of education. This indicates the majority of those employed in agricultural occupations have only attained a primary education compared to Intermediate Certificate level for fitters/mechanics, other skilled workers and skilled building workers.

Analysis of the differences between occupational sub-groups in their median years education suggests that, for summary purposes, they can be classified into four groups for which a distinct level of education is associated with employment in the sub-group. Third level education appears to be a prerequisite for employment in professional, associate professional and higher managerial occupations. Upper secondary education is required for employment in clerical and technician occupations and security occupations in the public sector. Primary certificate education suffices for employment in driving, labouring, and agricultural occupations and the remaining occupations require predominantly lower secondary education.

Relationship Between Occupational Growth and Median Years of Education

The results at this stage of the analysis show that the occupations of professional status are also those with high median years of education. It is important to move on from this and assess the educational profile of those occupations which are expected to grow and those occupations which are expected to decline over the period 1991-1998. Two measures of growth will be utilised in this paper: absolute and relative growth. Absolute growth is defined as the percentage each occupation is expected to grow/decline over the period and is expressed as a percentage of its base figure. The relative growth rate is defined as the occupations contribution to total employment growth over the period. Table 5 presents the median years of education by occupation in descending order by absolute growth for 39 occupational sub-groups and Table 6 presents the median years of education by occupation in descending order by the relative growth rate.

Table 5 presents in descending order the absolute growth rate projected for each occupational sub-group over the period 1991-98 together with the median years of education for the sub-groups. It suggests that those occupations which are predicted to grow fastest are also those occupations with high levels of education. Thus, business/finance and legal professions are predicted to increase by 42 per cent, followed by electrical/electronics operatives at 36 per cent, other professional workers (35 per cent) and engineering and science professionals (34 per cent). With the exception of electrical/electronics operatives, all of these occupational groups have a median level of education in excess of 11 years (third level education). Other security workers, catering occupations, skilled building workers and electrical/electronics operatives are the only exceptions in terms of median years of education (they have a median education of Intermediate Certificate level or less), where the occupation is predicted to increase its share by over 20 per cent. As the absolute growth rate declines so too does the median years of education; health professionals, education professionals and religious being the main exceptions. All the declining occupations have low median years of education, with the exception of religious occupations for which a high level of education is required. Agriculture, skilled clothing/textile workers, clothing/textile operatives and other transport workers have an educational level of Intermediate Certificate standard or less.

Occupational sub-groups which grow very fast may not add a great deal to total employment if the number in the sub-group is small. Hence, it is worth examining the

Table 5: Median years of education in 1991 ranked by absolute growth rates projected for the period 1991-98

Occupation	Median years of education	'Absolute' growth rate 1991-98	Total 1998
3.4 Business/Finance and Legal	11.41	41.55	37,195
8.1 Electrical/Electronics Operatives	8.59	36.07	21,183
3.6 Other Professional workers	11.83	34.77	20,151
3.3 Engineering/Science	11.94	33.74	21,207
12.2 Other Security workers	7.24	33.39	19,698
13.1 Catering Occupations	8.32	30.34	25,751
2.1 Higher Managers	10.78	29.45	56,627
4.1 Health Associate workers	11.01	23.82	44,413
4.2/3 Other Associate Professionals	11.68	21.61	23,337
7.5 Skilled Building workers	7.34	20.92	34,051
2.2 Proprietors/Managers	9.26	19.83	84,859
11.1 Brokers and Agents	9.93	19.32	21,774
11.2/3 Other Sales workers	9.02	19.04	76,833
5.2 Typists/Telephonists	9.97	18.02	42,447
6.1 Electricians/Electrical Fitters	9.51	17.98	29,307
13.2 Other Personal Service workers	7.42	16.44	68,551
14.2 Occupation Unstated	6.25	15.85	4,499
6.2 Fitters/Mechanics	8.31	15.76	34,055
7.4/6 Other Skilled workers	8.03	14.60	12,145
7.1 Metal/Engineering Craft workers	7.99	13.95	17,386
3.1 Health Professionals	13.12	13.94	11,621
7.2 Wood Craft workers	7.82	12.23	19,512
8.2 Metals/Engineering Operatives	7.65	11.88	13,585
3.2 Education Professionals	11.06	11.34	55,816
5.1 Clerks	9.98	10.85	121,277
12.1 Army/Gardai (Other Ranks)	9.37	10.49	20,258
10.1 Drivers	6.48	10.20	37,348
5.3 Warehouse Dispatch Clerks	8.30	5.58	13,378
8.6 Packers/Bottlers	7.07	3.43	5,476
8.5 Other Plant/Production Operatives	7.01	1.43	33,744
9.1 Foremen	7.56	-3.75	12,110
8.3 Food/Drink/Tobacco Operatives	7.37	-5.17	15,628
14.1 Labourers	5.74	-8.34	33,281
10.2 Postmen/Couriers	7.23	-11.82	5,689
1.1 Agriculture	5.64	-18.66	127,124
7.3 Skilled Clothing/Textile workers	7.01	-21.41	12,622
3.5 Religious	11.75	-22.25	8,732
8.4 Clothing/Textile Operatives	7.43	-24.61	3,962
10.3 Other Transport workers	7.10	-37.89	2,217
Total	9.13	10.17	1,248,850

Source: See text

Table 6: Median years of education in 1991 ranked by relative growth rates projected for the period 1991-98

Occupation	Median years of education	'Relative' growth rate 1991-98	Total 1998
2.2 Proprietors/Managers	9.26	12.18	84,859
2.1 Higher Managers	10.78	11.17	56,627
11.2/3 Other Sales workers	9.02	10.66	76,833
5.1 Clerks	9.98	10.30	121,277
3.4 Business/Finance and Legal	11.41	9.47	37,195
13.2 Other Personal Service workers	7.42	8.39	68,551
4.1 Health Associate workers	11.01	7.41	44,413
5.2 Typists/Telephonists	9.97	5.62	42,447
13.1 Catering Occupations	8.32	5.20	25,751
7.5 Skilled Building workers	7.34	5.11	34,051
3.2 Education Professionals	11.06	4.93	55,816
8.1 Electrical/Electronics Operatives	8.59	4.87	21,183
3.3 Engineering/Science	11.94	4.64	21,207
3.6 Other Professional workers	11.83	4.51	20,151
12.2 Other Security workers	7.24	4.28	19,698
6.2 Fitters/Mechanics	8.31	4.02	34,055
6.1 Electricians/Electrical Fitters	9.51	3.87	29,307
4.2/3 Other Associate Professionals	11.68	3.60	23,337
11.1 Brokers and Agents	9.93	3.06	21,774
10.1 Drivers	6.48	3.00	37,348
7.1 Metal/Engineering Craft workers	7.99	1.85	17,386
7.2 Wood Craft workers	7.82	1.84	19,512
12.1 Army/Gardai (Other Ranks)	9.37	1.67	20,258
7.4/6 Other Skilled workers	8.03	1.34	12,145
8.2 Metals/Engineering Operatives	7.65	1.25	13,585
3.1 Health Professionals	13.12	1.23	11,621
5.3 Warehouse Dispatch Clerks	8.30	0.61	13,378
14.2 Occupation Unstated	6.25	0.53	4,499
8.5 Other Plant/Production Operatives	7.01	0.41	33,744
8.6 Packers/Bottlers	7.07	0.16	5,476
9.1 Foremen	7.56	-0.41	12,110
10.2 Postmen/Couriers	7.23	-0.66	5,689
8.3 Food/Drink/Tobacco Operatives	7.37	-0.74	15,628
8.4 Clothing/Textile Operatives	7.43	-1.12	3,962
10.3 Other Transport workers	7.10	-1.17	2,217
3.5 Religious	11.75	-2.17	8,732
14.1 Labourers	5.74	-2.62	33,281
7.3 Skilled Clothing/Textile workers	7.01	-2.98	12,622
1.1 Agriculture	5.64	-25.29	127,124
Total	9.13	100.00	1,248,850

Source: See text

contribution which each occupational sub-group makes to the total employment growth which is projected for the period 1991-98. This measure of growth will be referred to as "relative growth". Focusing on the relative growth rates in Table 6 for the period 1991-98 for each of 39 occupational groups there is some evidence that those occupations which are predicted to contribute most to the employment growth over the period 1991-98 are also those occupations with high median years of education, although this relationship is not as strong as for the absolute growth case. It is predicted that total employment will increase by 10.2 per cent between 1991-98. From Table 6 it is clear that the top five occupational groups, which account for almost 54 per cent of the growth over the period, all have high median years of education. Proprietors and managers (9.26 years), higher managers (10.78 years), other sales workers (9.02 years), clerks (9.91 years) and business/finance and legal professionals (11.41 years). As the contribution to total employment growth falls so too does the median years of education. Those occupations which contribute less than 1 per cent to total growth over the period, have with the exception of religious occupations, low median years of education - none have a qualification above the Intermediate Certificate level (e.g. warehouse and dispatch clerks (8.30 years), packers/bottlers (7.07 years), other transport workers (7.10 years),.labourers (5.74 years)). There are a number of exceptions in which the median years of education is high but relative growth rate is low - particularly, health professionals which have a median education of 13.12 years but account for just 1.23 per cent of total growth over the period. Similarly, other associate professionals, other professional workers and engineering/science professionals are only expected to contribute from 3 to 5 per cent to total employment growth. In contrast, while skilled building workers have a median education of Intermediate Certificate level, they are predicted to contribute over 5 per cent to total growth.

It is evident that production operatives, and transport and communication workers are expected to contribute very little to occupational employment growth over the period while foremen, labourers and agricultural workers are expected to retard growth. These occupations traditionally attract the less qualified and the fact that they are the occupations which are likely to contribute least to the expected growth over the period suggests there will be fewer opportunities for less qualified workers in the future. In contrast those employed in proprietor/managerial, professional, clerical, sales and personal service occupations are expected to make positive contributions to employment growth. These are occupations in which female participation is high and increasing, while in general those occupations in which the relative growth is low (foremen, labourers and agriculture) have a workforce which is predominately male. This suggests that the poorly educated male workforce will increasingly experience employment difficulties in the future.

Implications of Occupational Change for Educational Qualifications

The education/occupation relationship is explored further in Tables 7 and 8. Table 7 refers to the median years of education for occupations which are expected to exhibit high, medium, and low absolute growth rates during the period 1991-98. The 39 occupational sub-groups are divided into three categories. The first category lists those occupations where the absolute growth rate is expected to be more than 19 per cent, the second lists those where the absolute growth rate is projected to be between 10 and 19 per cent, and the third lists those where the absolute growth rates is expected to be less than 10 per cent. Column B shows projected employment for each of the occupations in 1998, column C is a weight assigned to each occupation which is based on the number of individuals employed in the occupation as a percentage of those employed in the category. Column D gives the median

education for each of the occupations and column E multiples the median years of education by the weight. The sum of column E approximates the median years of education for each of the three categories.

The measure for the first (highest growth) category equals 9.80 years of education completed, the second category equals 9.07 years and the third (lowest growth) category equals 6.49 years. Thus, there is a clear decline in median education as one moves from the highest to the lowest growth category. With the sole exception of religious occupations, none of the 11 occupations in the low growth category exhibit a median education level in excess of the Intermediate Certificate level. In general, the low growth occupations are those in which male workers are concentrated.

Table 8 shows the median years of education required in 1998 for occupational sub-groups which are projected to make large, moderate, and small or negative contributions to total employment growth over the period 1991-98. The first column divides the 39 occupations into three groups: the first group is expected to contribute 5 per cent or more to total employment growth, the second to contribute between 1 and 5 per cent and the third 1 per cent or less. It is evident that those occupations which are expected to contribute little to total employment growth have noticeably lower levels of education completed. In the first category, there are 10 occupational sub-groups exhibiting high relative growth rates, of which only other personal service workers, catering occupations and skilled building workers exhibit low median education levels. The second group has a lower median level of education, with drivers having the lowest number of years, just attaining a primary level education. In the third category none of the occupational sub-groups, with the sole exception of religious, have a median education level above the Intermediate Certificate level. The table shows that there is a positive relationship between median years of education for the category and its average contribution to total employment growth. This suggests that the greatest contributions to total employment growth over the period 1991-98 will be made by occupational sub-groups which have high median years of education. This would seem to indicate that while there will be employment opportunities for individuals at all educational levels; those with high educational qualifications will be better positioned to take advantage of the new and expanding opportunities in labour market.

The results would also seem to suggest that the poorly qualified females may fare better than poorly qualified males in availing of employment opportunities in the future. Of the three occupations exhibiting high relative growth rates and low median education levels, other personal service workers, catering occupations and skilled building workers, two are predominately female (in 1991 the female share of employment in catering occupations was 67 per cent and for other personal service workers it was 73 per cent). Furthermore, the female share of employment in catering and other personal service workers is predicted to increase to 71 per cent and 73 per cent respectively by 1998. Moreover, while the female share of employment in skilled building occupations was just 2.9 per cent in 1991, it is predicted to increase to 3.7 per cent in 1998 (see Canny, Hughes and Sexton, 1995).

We can take our analysis one step further to show the educational profile required for the new jobs which will be created over the period 1991-98 (Table 9). The educational composition of the workforce shown in Table 3 is used in conjunction with the relative growth rates projected for each group in Table 6 to do this. An assumption underlying this calculation is that the level of education required for the net new jobs created will remain

Table 7: Median years of education required in 1998 for groups of occupations exhibiting high, medium and low absolute growth rates

Column A *Occupations*	*Column B* *Emp 1998*	*Column C* *Weight*	*Column D* *Median Ed*	*Column E* *C*D*
Growth >19%				
3.4 Business/Finance and Legal	37,195	0.08	11.41	0.87
8.1 Electrical/Electronics Operatives	21,183	0.04	8.59	0.37
3.6 Other Professional workers	20,151	0.04	11.83	0.49
3.3 Engineering/Science	21,207	0.04	11.94	0.52
12.2 Other Security workers	19,698	0.04	7.24	0.29
13.1 Catering Occupations	25,751	0.05	8.32	0.44
2.1 Higher Managers	56,627	0.12	10.78	1.25
4.1 Health Associate workers	44,413	0.09	11.01	1.00
4.2/3 Other Associate Professionals	23,337	0.05	11.68	0.56
7.5 Skilled Building workers	34,051	0.07	7.34	0.51
2.2 Proprietors/Managers	84,859	0.17	9.26	1.61
11.1 Brokers and Agents	21,774	0.04	9.93	0.44
11.2/3 Other Sales workers	76,833	0.16	9.02	1.42
Sum	487,078	1.00		9.80
Growth >10-19%				
5.2 Typists/Telephonists	42,447	0.09	9.97	0.87
6.1 Electricians/Electrical Fitters	29,307	0.06	9.51	0.57
13.2 Other Personal Service workers	68,551	0.14	7.42	1.04
14.2 Occupation Unstated	4,499	0.01	6.25	0.06
6.2 Fitters/Mechanics	34,055	0.07	8.31	0.58
7.4/6 Other Skilled workers	12,145	0.02	8.03	0.20
7.1 Metal/Engineering Craft workers	17,386	0.04	7.99	0.28
3.1 Health Professionals	11,621	0.02	13.12	0.31
7.2 Wood Craft workers	19,512	0.04	7.82	0.31
8.2 Metals/Engineering Operatives	13,585	0.03	7.65	0.21
3.2 Education Professionals	55,816	0.11	11.06	1.27
5.1 Clerks	121,277	0.25	9.98	2.48
12.1 Army/Gardai (Other Ranks)	20,258	0.04	9.37	0.39
10.1 Drivers	37,348	0.08	6.48	0.50
Sum	487,808	1.00		9.07
Growth <10%				
5.3 Warehouse Dispatch Clerks	13,378	0.05	8.30	0.41
8.6 Packers/Bottlers	5,476	0.02	7.07	0.14
8.5 Other Plant/Production Operatives	33,744	0.12	7.01	0.86
9.1 Foremen	12,110	0.04	7.56	0.33
8.3 Food/Drink/Tobacco Operatives	15,628	0.06	7.37	0.42
14.1 Labourers	33,281	0.12	5.74	0.70
10.2 Postmen/Couriers	5,689	0.02	7.23	0.15
1.1 Agriculture	127,124	0.46	5.64	2.62
7.3 Skilled Clothing/Textile workers	12,622	0.05	7.01	0.32
3.5 Religious	8,732	0.03	11.75	0.37
8.4 Clothing/Textile Operatives	3,962	0.01	7.43	0.11
10.3 Other Transport workers	2,217	0.01	7.10	0.06
Sum	273,964	1.00		6.49

Source: See text

Table 8: Median years of education required in 1998 for groups of occupations exhibiting high, medium and low relative growth rates

Column A *Occupations*	*Column B* *Emp 1998*	*Column C* *Weight*	*Column D* *Median Ed*	*Column E* *C*D*
Growth >5%				
2.2 Proprietors/Managers	84,859	0.14	9.26	1.33
2.1 Higher Managers	56,627	0.10	10.78	1.03
11.2/3 Other Sales workers	76,833	0.13	9.02	1.17
5.1 Clerks	121,277	0.20	9.98	2.04
3.4 Business/Finance and Legal	37,195	0.06	11.41	0.72
13.2 Other Personal Service workers	68,551	0.12	7.42	0.86
4.1 Health Associate workers	44,413	0.08	11.01	0.83
5.2 Typists/Telephonists	42,447	0.07	9.97	0.71
13.1 Catering Occupations	25,751	0.04	8.32	0.36
7.5 Skilled Building workers	34,051	0.06	7.34	0.42
Sum	592,004.98	1.00		9.47
Growth >1-5%				
3.2 Education Professionals	55,816	0.15	11.06	1.63
8.1 Electrical/Electronics Operatives	21,183	0.06	8.59	0.48
3.3 Engineering/Science	21,207	0.06	11.94	0.67
3.6 Other Professional workers	20,151	0.05	11.83	0.63
12.2 Other Security workers	19,698	0.05	7.24	0.38
6.2 Fitters/Mechanics	34,055	0.09	8.31	0.75
6.1 Electricians/Electrical Fitters	29,307	0.08	9.51	0.74
4.2/3 Other Associate Professionals	23,337	0.06	11.68	0.72
11.1 Brokers and Agents	21,774	0.06	9.93	0.57
10.1 Drivers	37,348	0.10	6.48	0.64
7.1 Metal/Engineering Craft workers	17,386	0.05	7.99	0.37
7.2 Wood Craft workers	19,512	0.05	7.82	0.40
12.1 Army/Gardai (Other Ranks)	20,258	0.05	9.37	0.50
7.4/6 Other Skilled workers	12,145	0.03	8.03	0.26
8.2 Metals/Engineering Operatives	13,585	0.04	7.65	0.27
3.1 Health Professionals	11,621	0.03	13.12	0.40
Sum	378,383	1.00		9.41
Growth <1%				
5.3 Warehouse Dispatch Clerks	13,378	0.05	8.30	0.40
14.2 Occupation Unstated	4,499	0.02	6.25	0.10
8.5 Other Plant/Production Operatives	33,744	0.12	7.01	0.85
8.6 Packers/Bottlers	5,476	0.02	7.07	0.14
9.1 Foremen	12,110	0.04	7.56	0.33
10.2 Postmen/Couriers	5,689	0.02	7.23	0.15
8.3 Food/Drink/Tobacco Operatives	15,628	0.06	7.37	0.41
8.4 Clothing/Textile Operatives	3,962	0.01	7.43	0.11
10.3 Other Transport workers	2,217	0.01	7.10	0.06
3.5 Religious	8,732	0.03	11.75	0.37
14.1 Labourers	33,281	0.12	5.74	0.69
7.3 Skilled Clothing/Textile workers	12,622	0.05	7.01	0.32
1.1 Agriculture	127,124	0.46	5.64	2.57
Sum	278,462	1.00		6.49

Source: See text

Table 9: Projected percentages of individuals employed in Ireland in 1998 in all occupations by educational level based on relative growth rates

Occupation						Third Level Education		
	Relative Growth	None	Primary	Inter	Leaving	Non-Univ	Univ	High Deg
1.1 Agriculture	-25.29	-0.05	-13.4	-6.72	-3.77	-1.02	-0.31	-0.02
2.1 Higher Managers	11.17	0.02	0.50	1.14	4.41	2.08	2.40	0.62
2.2 Proprietors/Managers	12.18	0.06	2.15	3.26	4.75	1.28	0.62	0.06
3.1 Health Professionals	1.23	0.00	0.00	0.01	0.01	0.08	0.73	0.40
3.2 Education Professionals	4.93	0.01	0.02	0.10	0.22	1.39	2.55	0.64
3.3 Engineering/Science	4.64	0.00	0.03	0.06	0.21	1.24	2.51	0.59
3.4 Business/Finance and Legal	9.47	0.00	0.07	0.15	1.42	2.55	4.04	1.24
3.5 Religious	-2.17	0.00	-0.04	-0.06	-0.24	-0.49	-1.03	-0.32
3.6 Other Professional wkrs	4.51	0.00	0.25	0.43	1.20	0.90	1.48	0.25
4.1 Health Associate workers	7.41	0.02	0.13	0.51	3.03	3.30	0.40	0.02
4.2/3 Other Associate Profs	3.60	0.00	0.13	0.29	0.86	1.53	0.67	0.11
5.1 Clerks	10.3	0.03	0.32	1.37	7.01	1.10	0.43	0.04
5.2 Typists/Telephonists	5.62	0.02	0.11	0.82	3.82	0.72	0.11	0.02
5.3 Warehouse Dispatch Clerks	0.61	0.00	0.15	0.20	0.23	0.02	0.00	0.00
6.1 Electricians/Electrical Fitters	3.87	0.02	0.26	1.33	1.31	0.69	0.25	0.02
6.2 Fitters/Mechanics	4.02	0.00	0.46	2.01	1.09	0.38	0.08	0.00
7.1 Metal/Engineering Craft wkrs	1.85	0.00	0.31	0.92	0.51	0.10	0.01	0.00
7.2 Wood Craft workers	1.84	0.00	0.26	1.08	0.45	0.04	0.00	0.00
7.3 Skilled Clothing/Textile wkrs	-2.98	0.00	-1.03	-1.36	-0.53	-0.06	0.00	0.00
7.5 Skilled Building workers	5.11	0.02	1.53	2.25	1.09	0.16	0.05	0.00
7.4/6 Other Skilled workers	1.34	0.00	0.26	0.60	0.41	0.06	0.00	0.00
8.1 Electrical/Electronics Oper	4.87	0.00	0.82	1.87	1.90	0.22	0.06	0.00
8.2 Metals/Engineering Oper	1.25	0.00	0.28	0.63	0.29	0.05	0.00	0.00
8.3 Food/Drink/Tobacco Oper	-0.74	0.00	-0.23	-0.32	-0.16	-0.03	-0.01	0.00
8.4 Clothing/Textile Operatives	-1.12	0.00	-0.31	-0.52	-0.27	-0.02	0.00	0.00
8.5 Other Plant/Production Oper	0.41	0.00	0.15	0.17	0.08	0.01	0.00	0.00
8.6 Packers/Bottlers	0.16	0.00	0.05	0.06	0.04	0.00	0.00	0.00
9.1 Foremen	-0.41	0.00	-0.12	-0.15	-0.10	-0.03	0.00	0.00
10.1 Drivers	3.00	0.02	1.29	1.17	0.46	0.04	0.02	0.00
10.2 Postmen/Couriers	-0.66	0.00	-0.23	-0.23	-0.18	-0.01	0.00	0.00
10.3 Other Transport workers	-1.17	0.00	-0.39	-0.53	-0.25	0.00	0.00	0.00
11.1 Brokers and Agents	3.06	0.02	0.19	0.63	1.50	0.47	0.24	0.02
11.2/3 Other Sales workers	10.66	0.03	1.30	3.94	4.81	0.47	0.12	0.00
12.1 Army/Gardai (Other Ranks)	1.67	0.00	0.18	0.50	0.84	0.13	0.02	0.00
12.2 Other Security workers	4.28	0.03	1.48	1.51	1.02	0.15	0.06	0.03
13.1 Catering Occupations	5.20	0.03	1.10	1.90	1.50	0.64	0.03	0.00
13.2 Other Personal Service wkrs	8.39	0.06	2.87	2.67	2.29	0.38	0.10	0.01
14.1 Labourers	-2.62	-0.04	-1.33	-0.90	-0.31	-0.02	-0.01	0.00
14.2 Occupation Unstated	0.53	0.16	0.10	0.08	0.14	0.04	0.01	0.00
Total	100.00	0.46	-0.32	20.88	41.08	18.56	15.64	3.72

Source: See text

constant over the period 1991-98. The percentages in each occupational group at each educational level in Table 3 are multiplied by the relative growth rate for the period 1991-98 for that group in Table 6. The results for each level of education are added together. The totals, given in Table 10, show the level of education which will be required to fill the net new jobs which are expected to be created between 1991 and 1998.

The table shows a strong trend towards higher educational requirements. The median years of education required for net new jobs, 10.4 years, is significantly more than for the existing jobs, 9.1 years. In practical terms this means that the great majority of new jobs will be filled persons with a Leaving Certificate or third level education. Thus, nearly 40 per cent of all new jobs will require third level education at non-university diploma or university degree level. About 10 per cent of all jobs in 1991 required third level university education whereas 20 per cent of new jobs will require this level. Most of those filling new jobs requiring degree level education will need a primary degree but higher level university degrees will be required for many jobs. Non-university third level education will be far more important for new jobs than for existing jobs as 19 percent of new jobs will require such qualifications compared with less than 11 per cent of existing jobs. The increases in educational requirements for new jobs mean that there will be virtually no opportunities for persons with only a basic primary level of education to fill the new jobs being created. Less than one tenth of a percent of all new jobs are likely to be taken by persons with primary education. There should however be opportunities for employment of persons with Intermediate level education as 21 per cent of new jobs will require this level of education.

Table 10: Educational profile of employment in 1991 and 1998 and of expected net new jobs

Educational Qualification	Current Jobs 1991	Future Jobs 1998	New Jobs 1998
Primary or No Education	21.7	19.7	0.1
Intermediate Level	26.2	25.7	20.9
Leaving Certificate Level	30.8	31.7	41.1
Third Level (Non-University)	10.8	11.6	18.6
Third Level (University)	8.4	9.1	15.6
Higher University Degree Level	2.1	2.2	3.8
Total	100	100	100
Median Years Education	9.1	9.3	10.4

Source: See text

Another way of looking at our results is to consider Table 5 which shows the ranking of the absolute percentage growth projected for each occupational sub-group and its associated median years of education. Of the 26 occupational categories which are expected to grow faster than average over half will require more than the median level of education for all existing jobs. Of the remaining 13 categories which are projected to grow less than the average only one - religious occupations - requires more than the median education.

Conclusions

Our results can be summarised as follows: the occupational employment outlook for the period up to 1998 is better than it has been for the last two decades and there should be strong demand from employers for school and college leavers with Leaving Certificate and third level education, a continuing, but weakening, demand for those with Intermediate level education and virtually no demand for those with only primary education. The challenge for educational and training institutions is to ensure that those coming out of the educational system are properly equipped to take advantage of the projected demand for workers with high levels of education.

It is evident that educational qualifications have become more important in determining prospects for employment in the labour market. In the future there should be favourable employment prospects in those occupations in which the occupants possess high educational qualifications, particularly in the professional, associate professional and managerial/proprietors sub-groups. In contrast, those individuals with poor qualifications are likely to be concentrated in occupations which are forecast to experience low or negative growth over the period 1991-98 (e.g. agriculture, labourers, skilled clothing workers, transport workers, and clothing/textile operatives). This suggests that unemployment will rise among the poorly qualified and moreover, with fewer opportunities for employment growth, that many of them will continue to experience long-term unemployment. Poorly qualified male workers, in particular, will be adversely affected in the future by the changes now underway in the labour market.

Changes in the occupational structure away from primary manufacturing in favour of services will provide opportunities for females both qualified and unqualified. Females are expected to gain most of the expanding opportunities, particularly in the services sector. Indeed it is anticipated that services employment will increase from just over 60 per cent of total employment in 1993 to 63 per cent by 2000 and 66 per cent in 2005 (see Ireland 1995, and Cantillon, Curtis and Fitz Gerald 1994).

There have been similar developments in the UK labour market. Lindley (1994) and Wilson (1994) argue that the industrial structure of employment will continue to change in favour of services and at the expense of the primary and manufacturing sectors. Wilson (1994: p. 27) argues that "changes in ... employment in favour of services will tend to provide job opportunities which traditionally have tended to be regarded as typically female. The level of women's employment is therefore likely to grow substantially". Furthermore, Crompton (1994) argues that it is apparent that levels of qualifications are rising amongst women in the UK., and that more women are moving into professional and managerial occupations. Canny, Hughes and Sexton (1995) anticipate significant increases in the female proportion in Ireland

in the managerial and sales agent occupations, and in the professional and engineering and science occupations.

The changes in the Irish occupational structure over the period 1991-98 at the top of the occupational ladder reflect trends noted elsewhere in Europe by Glyn (1995) and Ashton, Green and Lowe (1993) and in the United States by Jaffe (1987). Glyn shows that employment of professional and managerial workers is rising on average about 2 per cent faster than total employment. This suggests that the occupations in which employment and share of employment is expanding are those which require high educational qualifications. Conversely, those occupations in which employment is declining are in general the domain of the less qualified worker. Glyn (1995, p. 6) notes that the average educational level of the OECD potential labour force has been rising to such an extent that "each decade's cohort of working age has shown around a 10 per cent higher share of people with at least an 'upper secondary education' than that of the previous decade". Wilson (1994) analyses Labour Force Survey data for the UK. to argue that blue collar, manual, generally poorly qualified and unskilled workers have been negatively affected by the changes which have taken place in the labour market over recent decades. Conversely growth has been concentrated primarily, in white collar, non-manual, well-qualified and highly skilled occupations. Thus, the importance of educational credentials in determining success in the labour market has become increasingly apparent over the last decade.

Although one cannot make a direct connection between educational qualifications and skills there is some evidence that the skill level of the labour force is rising. Gallie (1994) used British data from the *Social Change and Economic Life Initiative* to examine the patterns of skill change in terms of an upskilling, deskilling or polarisation of skills. He found that those who argued there was a tendency towards deskilling throughout the occupational structure in recent decades were mistaken. Indeed, he asserts that there has been a long term rise in non-manual employment and this growth represents a real increase in skill content of jobs. In the survey, he found that 52 per cent of employees reported an increase in the level of skill they used in their jobs; thus it is clear that the general trend has been towards the growth of more skilled occupations. However, there has been an increasing polarisation of skills and this has increased since the 1980s; "those that already had relatively high levels of skills witnessed an increase in their skill levels, while those with low levels of skill saw their skills stagnate" (Gallie, 1994: p75). The OECD (1988) studied the relationship between technical change and skill levels in firms and concluded that new technologies are, in general, raising the skill content of jobs.

The evidence for Ireland points to the growing importance of educational qualifications in a labour market which is becoming increasingly white collar. It suggests that there will be a need for a labour force in the future which is well educated and highly skilled. It will become increasingly important that poorly qualified workers presently in the workforce be given opportunities to attain further educational qualifications and/or training and it is vital that all school leavers should be encouraged to remain in school and attain qualifications which will equip them to take advantage of the new and expanding opportunities which are opening up in the labour market.

Finally, the results presented in this paper are confined solely to an analysis of occupation and educational qualifications. Ideally for a comprehensive examination of the relationship between occupation and educational qualifications, both gender and age would

have to be taken into account. It is quite apparent from the analysis presented in this paper that age plays an important factor in determining the qualification profile of a number of occupations, particularly those occupations where seniority/experience appears to be important. This is evident when one examines the qualification profile of the proprietors and managers group.

In relation to gender, as was discussed in part one of this paper, females are well positioned to take advantage of the new and expanding opportunities in the labour market; many unskilled males are concentrated in the low growth occupations. It is well documented that the educational experience of males and females is quite different, particularly at higher levels of education. Males are more likely to pursue engineering and technology courses while females are more likely to be concentrated in the humanities and social science courses (see Clancy, 1988). On leaving school it is clear that both qualified and unqualified males enter quite different occupations to their female counterparts and any analysis of occupational and educational profile would have to take this into consideration.

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