
EDUCATION, EMPLOYMENT
AND TRAINING IN THE
YOUTH LABOUR MARKET

Richard Green



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*EDUCATION, EMPLOYMENT
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YOUTH LABOUR MARKET*

Richard Breen

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DUBLIN, 1991

ISBN 0 7070 0118 8

Acknowledgements

I wish to thank Damian Hannan, Jerry Sexton and an external referee for useful comments and criticisms of earlier drafts of this paper. I am grateful to the Youth Employment Agency who provided funding to cover the collection of the data on which this paper is based.

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GENERAL SUMMARY

Introduction

This paper analyses the workings of the Irish youth labour market. It does this by examining what happened to a cohort of young people between the time they left school, in 1982, and late 1987. Our focus is on the way in which educational qualifications shape young people's labour market experiences and our particular concern is with the position of unqualified school leavers.

In recent years a good deal of research effort has been expended on the issue of the relationship between educational qualifications and how well young people fare in the labour market. The bulk of this effort has used data collected for the annual *School Leaver Survey* (published by the Department of Labour) which provides information on school leavers' position one year after leaving school. The present paper extends the time horizon of our knowledge from one year to five and a half years. One year after leaving school young people are in the very early stages of the transition from education to the labour market; five and a half years after leaving school this transition process is, for many of them, virtually complete.

The data we use come from interviews with those 1981-82 school leavers who formed the 1983 School Leaver Survey sample. These same young people have been interviewed twice more since then – in November 1984 and December 1987/January 1988. In this report we look at what happened to that sub-sample who did not enter third level education when they left school. This exclusion of third level entrants leaves us with a sample of just over 1,100, for whom we have complete labour market histories. That is, we have information (including the date of entering and leaving) on every job they held over these five and a half years, every spell of unemployment, each training programme in which they participated, and so on. Such data give us a very detailed insight into the process of transition from education to the labour market and how the youth labour market works.

Results

By late 1987, virtually all the 1981-82 school leavers who had not gone on to third level were still in the labour market (92 per cent). Seventy-three

per cent of the cohort were in jobs, 18 per cent were unemployed, and only 1 per cent were, at that time, on a FÁS training or temporary employment scheme. Almost everyone who was in the labour market had had at least one job: we calculate that only about 2 per cent of the cohort were still seeking a first job.

Over the entire five and a half years for which the cohort were followed they had had, on average, two jobs each (this is the median) and one spell of unemployment. Hence, while the image of young people in the labour market as moving in and out of jobs with great frequency may be true of some young people, it is not the typical picture.

How young people fare in the labour market is very closely linked to the level of educational qualifications they possess. One might also anticipate gender differences in this respect but these are, by and large, not really evident. The major distinction between men and women lies in their rates of labour force participation, women having slightly lower rates than men. Unqualified women have the lowest rates of all, and their rate declines the longer they have been out of school. However, within the labour force, the experiences of men and women (in terms of their chances of having a job, of being unemployed, and so on, which are the measures we concentrate on in this study) are, with one or two exceptions, remarkably similar. For both, educational qualifications are crucial in how they fare.

One means of illustrating this is to look at how the time spent by young people in the labour market over this five and a half year period was divided between working, unemployment (including first job seeking) and participation in state programmes of training and temporary employment. For those who left school before sitting for any examination, around half their time was spent at work, 45 per cent in unemployment and search for a first job, and the balance in training and/or temporary employment schemes. Those who left school after sitting for the Group and/or Intermediate Certificate spent around 70 per cent of their time at work and 28 per cent unemployed. For the best qualified – those who left school after completing senior cycle – the figures are 81 per cent of their time at work and 16 per cent of their time spent in unemployment.

While these figures show how educational qualifications influence labour market outcomes, they do not shed light on what was one of our most striking findings, namely that labour market differentials according to educational qualifications increased over the period of our study. However, virtually all of this increase occurred within the first 24 to 30 months after leaving school. For example, in December 1982, six months after leaving school, unemployment rates (including first job seeking) were 48 per cent among the unqualified; around 37 per cent among post-junior

cycle leavers; and 28 per cent among post-senior cycle leavers. Two years later (30 months after leaving school) the comparable figures were 41 per cent; 25 per cent; and 13 per cent. Clearly, the differentials had widened over this period. Afterwards, however, they remained stable, so that in December 1987 the figures were 43 per cent; 26 per cent and 12 per cent.

This growth of differentiation for two to two and a half years followed by aggregate stability has been noted in other countries (notably France). It points to this period as being crucial in the formation of longer lasting labour market differentials arising from differences in educational qualifications.

To explain how this differentiation occurs we must look in some detail at the workings of the youth labour market, and this is done in Chapters 5 and 6. Our conclusion is that differentials widen because of the cumulative, self-reinforcing processes at work in job acquisition and job loss.

Our results suggest that employers use two basic criteria when deciding whether or not to hire a young person. The higher the level of educational qualifications the more likely is someone to be hired; and the better his or her labour market record the more likely he or she is to get a job. Two aspects of labour market record are particularly important. Young people who have had a previous job are in a better position than those who have never worked; and the longer a job seeker has been unemployed the smaller are his or her chances of employment.

In analysing movements in the opposite direction – that is from a job into unemployment – two factors are again important. Higher probabilities of job loss are linked to poor quality jobs (that is, jobs with low pay in manual and lower non-manual occupations) and are found among people who have poor employment or labour market records.

Taking both sets of findings together we can outline the cumulative, self-reinforcing process to which we referred above. Early labour market experiences are strongly shaped by educational qualifications. For example, the length of time spent seeking a first job is directly related to the qualifications young people possess. Qualifications, together with the duration of first job seeking, determine the kind of job a young person eventually gets, but this in turn is an important factor in how long the person holds his or her job before becoming unemployed. This, in its turn, shapes a person's labour market record, which is one of the things employers look at when hiring new workers. Thus a cycle is entered in which poor qualifications lead to a poor labour market record leading to long periods of unemployment and to employment in unstable jobs, both of which further worsen a young person's labour market record. It is by such a process that educational differences are turned into labour market

differentials.

Of course, not everyone who leaves school without qualifications is trapped in this kind of cycle. Young people without educational qualifications can escape – but they are relatively unlikely to do so without the aid of some form of intervention in the labour market. In Chapter 7 of this paper we analyse the effectiveness of state programmes of training and temporary employment in increasing the likelihood of unemployed young people getting jobs. Our results are not particularly encouraging. We find that participating in such programmes improves the chances of young people getting a job in the short term. So, for example, participating in FÁS training improves the chances of an unemployed person getting a job immediately by about 20 per cent. However, just under one year after participation the probability of being in a job shows little or no difference between participants in programmes and similar unemployed non-participants.

This paper is primarily an investigation into the workings of the Irish youth labour market. Our main policy conclusion is that interventions to assist unqualified school leavers once they have entered the labour market, while necessary, are probably insufficient to tackle the problem. A growing body of research demonstrates that the causes of early school leaving are to be found not only in the educational system (at both post-primary and primary levels) but also in the pre-school environment and in the complex inter-relationships between family, community and school.

Chapter 1

INTRODUCTION

1.1 *Introduction*

In recent years a good deal of attention has been focused on the position of early school leavers in the labour market and, more broadly, the relationship between labour market position and educational qualifications (see, for example, Breen, 1984; Hannan, 1986; Sexton, Whelan and Williams, 1988, among others). By early school leavers is usually meant either those young people who leave school lacking any formal educational qualifications or those who leave school before having sat for any public examination.

The bulk of such research has been based on the data collected in the *School Leaver Survey*. This has been carried out annually on behalf of the Department of Labour by The Economic and Social Research Institute since 1980. In May and June of each year around 2,000 young people who left the second level school system during the previous academic year are interviewed. Since most young people leave school in June this means that the survey takes place roughly one year after leaving school. Thus the reports of this survey (published by the Department of Labour) and research which has further analysed this material all relate to the position of young people in the labour market at a point roughly one year after leaving school.

This research has demonstrated that, during this period, unqualified job seekers face considerable difficulties. Broadly speaking they spend much longer in seeking a first job and appear to be more likely to lose a job once they have found it, than do their peers who possess some qualifications (see, for example, Breen, 1985).

In this paper we trace the fortunes of one cohort of school leavers during a much longer period – for 5½ years after leaving school. This will enable us to gain a good deal more insight into the problems that are faced by young people who leave school lacking in qualifications, as well as allowing us to investigate the more general issue of how educational qualifications shape the labour market experiences of young people.

Some information on this cohort has already been published. Their position one year after leaving school is outlined in *School Leavers 1982*

published by the Department of Labour. The position of the cohort 2¹/₂ years after leaving school is contained in Youth Employment Agency (YEA) (1986), and their position 5¹/₂ years after leaving school in FÁS (1989). However, all these reports present only cross-sectional data: that is, they are static analyses which describe the cohort at a specific point in time. This study takes a different approach, concentrating on the dynamics of the process of transition from education into the labour market. We attempt to construct a parsimonious model which captures the essential features of this transition process.

In this paper we will seek to answer the following questions:

(i) Do the initial handicaps faced by early school leavers during their first year in the labour market – particularly their greater likelihood of being unemployed at any particular point in time – persist, and, if so, does their position, relative to other job seekers, improve or deteriorate?

(ii) What is the process which underlies the differences in unemployment rates between groups of individuals with different qualifications over the first 5¹/₂ years in the labour market? For example, we might ask in what measure is the higher unemployment rate of unqualified school leavers due to their susceptibility to frequent unemployment or to a longer duration in unemployment? Clearly the policy consequences of finding that, say, high levels of unemployment are due to numerous spells of unemployment of average duration differ from those which would follow from finding a high level of unemployment due to an above average duration of unemployment coupled with an average likelihood of entering unemployment.

(iii) What is the effect of participation in state programmes of training and temporary employment – notably those administered by FÁS, the state training agency – on young people's employment status? In particular we should like to discover whether certain categories of young people are more or less likely than others to enter such programmes; what the effects of participation are; and how long any such effects may persist.

In order to address (iii) we must be able to evaluate the effectiveness of such labour market programmes. In Chapter 7 of this study we develop a method for evaluating training and temporary employment programmes not only in the youth labour market but more generally.

1.2. *Outline of the Approach Used*

The data we use in this paper include the complete job histories of a sample of 1,100 young people over the period 1982 to 1988. Thus, we have, for example, the dates of each change in their labour market status during this time (from, say, employment to unemployment or from one job to

another). While this is a rich data source, it is, in some respects, almost an embarrassment of riches, in so far as usual methods of data analysis are inadequate to cope with the wealth of detail available to us. Accordingly, we have adopted a technique of analysis not hitherto used in Ireland. This is known as event history analysis. Because of its unfamiliarity we have devoted a large part of Chapter 4 and an appendix to explaining this technique.

1.3. *Data Sources*

The results in this paper come from analyses of three surveys of the same sample of individuals taken between 1983 and 1988. This sample is drawn from the cohort of young people who left post-primary school in the academic year 1981-82 (most of them left in June 1982). They were originally interviewed in May or June 1983 as that year's *School Leaver Survey*. Later – in November 1984 – they were interviewed a second time on behalf of the Youth Employment Agency. Finally, they were interviewed a third time in December 1987 or January 1988. In the 1984 interview, detailed data were collected on each "economic state" (job, spell of unemployment, spell of training, period out of the labour force, and so on) each sample member had experienced since leaving school. In the 1988 interview similar data were collected in respect of each state occupied since the 1984 interview. This historical data from these two interviews provides the bulk of the information that we use in this paper.

1.4 *An Approach to the Transition*

Most of what follows in this study concerns our attempt, which we referred to earlier, to construct a parsimonious model which captures the essential features of the transition from education to the labour market. We base this model on a general approach to the study of the transition. Over the last 20 years numerous empirical studies of the transition process have been published. In many countries resources are devoted to surveys of school leavers and to longitudinal studies of young people in the labour market, which have formed the basis of much published work. However, theoretical developments in this area have been less impressive. While elements of more general labour market theory (such as segmented labour market approaches) have been employed in studying the youth labour market, theories concerned with the process of transition itself have been absent. We do not presume to try to develop such a theory. However, the empirical analyses that we undertake (and report in Chapters 5 and 6 especially) are shaped by what, we suggest, is a useful general approach to the study of the transition process.

The study of the transition from full time education to the labour

market deals with the “trajectories” followed by young people over a given period of time. By trajectories we mean the sequence of positions or states they occupy during this period and the length of time for which each is occupied. So, a trajectory for a given school leaver might, for example, comprise a period of searching for a first job, lasting for 7 months, followed by a job which lasts 10 months, followed by another job lasting 8 months, then a period of unemployment for 4 months and a spell of 3 months on a FÁS programme, and so on. We refer to these trajectories as “job histories” or, more accurately, “labour market histories”.

Given the focus on trajectories, our interest is in questions such as how these evolve; what accounts for differences between people in their trajectories; and what the essential features of the set of a cohort’s trajectories are. The set of states that can be occupied at any point during this process is finite, and the objects of the study of the transition (i.e., the explanandum) should be, we suggest, not the distribution of young people over these possible states at any given point in time; but, rather, the probabilities of moving between states.¹ There are two reasons for this. First, many of the substantive questions in which we are interested have to do with such “transition probabilities”, as they are termed. For example: how do the chances of escaping from unemployment into a job differ between young people according to their educational qualifications? Second, it is in fact the case that *all* substantive questions in which we are interested – even if they do not seem to involve transition probabilities – can be rephrased in terms of them. It is a feature of any dynamic process that, if we know the initial distribution of our sample over the possible states and each sample member’s transition probabilities between states, then we can calculate the distribution of the sample over all states at any point in time. In our case the initial distribution of the sample is that they are all in full time education. So, to answer a question like “what is the unemployment rate among school leavers two years after leaving school?” we need to know the set of transition probabilities² between the states “At Work”, “Unemployed”, “Not in the Labour Force” and “In Full Time Education”. Given this information we can calculate the distribution, after two years, of our sample over these four states and so arrive at an unemployment rate.

1. Strictly speaking this is true only if we assume that changes of state occur at discrete, fixed points in time. In our analyses we actually assume that moves between states can, potentially, occur at any point in time. Thus the explanandum in this instance – where the state space is discrete but time is regarded as continuous – is the set of hazard rates relating to movement between pairs of states. Transition probabilities are functions of hazard rates.

2. Note that the probabilities for a given person need not be constant over time.

Sociological concern with these transition probabilities centres on the factors which determine them and, in particular, the reasons why they differ as between individuals. We argue that three sets of factors account for inter-individual differences. The first set deals with the things that young people bring to the labour market – preeminently their level of formal educational qualifications but also their gender and assets such as the location of themselves and their families and friends in formal and informal networks which may, for example, be important in helping them to acquire jobs. The second set of factors relates to the individual's labour force history. This includes such things as the number and kinds of jobs a person has had; the length of time spent in unemployment during his or her working life to date; skills acquired through post-school training or in previous employment. And the third set of factors relates to characteristics of the labour market states themselves. So, for example, if someone is in a job which pays a high wage, provides training and holds out the prospect of a career, he or she is probably less likely to change jobs than is someone whose job provides none of these things.

It is easiest to see how these three sets of factors operate if we take a specific example, that of the probability of moving from unemployment into a job. Employers, when hiring young people, attach importance to the level of educational qualifications they possess. Likewise, as noted above, some young people will stand a better chance of getting a job by virtue of contacts they have with employers or with people who know about actual or forthcoming job vacancies. When hiring workers, employers seem to attach a good deal of importance of a person's labour market history. For example, employers will generally prefer not to hire young people who have spent a lot of time in unemployment. Similarly, they will give preference to young people who have had some experience of the kind of work the employer is offering. Finally, an important feature of the current state (in this case unemployment) will be how long it has lasted. Employers are reluctant to hire the long-term unemployed, for example; so, the longer the state of unemployment has been occupied the less likely is a job seeker to be successful. This example, of movement from unemployment to a job, is analysed in some detail in Chapter 5.

So far we have not addressed the issue of whether or not these probabilities change over time. Do we believe that the probability of a young person's escaping from unemployment in, say, 1982, was the same as in 1986? In fact, in an important way, our model allows these probabilities to change over time. This is because some of the factors, or, rather, the variables that comprise them, change over time. This is true of our labour force history measures and also our measures relating to current state.

Even if the effects which these have can be assumed constant over time (i.e., the parameters of the model are constant over time) individuals' values on the variables which measure these things will change. People's labour force histories evolve as time passes; likewise the nature of their current state changes too – the duration of unemployment increases, earnings change, and so forth. In other words the model is truly dynamic even with constant coefficients, since the probabilities will change over time by virtue of individuals' own circumstances changing.

1.5. *Outline of Paper*

More details of the sample and the questionnaires are contained in Chapter 2. Chapter 3 presents some summary data about the economic position of our sample in January 1988 and about how their position changed over the entire 5½ year period since leaving school. Chapter 4 contains our findings about how individuals with different levels of educational qualifications differ in their rates of movement between different economic states in the labour force. We concentrate in particular on job changing (moving from one job to another), job loss (moving from work into unemployment), job attainment (moving in the opposite direction) and movements into training and temporary employment schemes. This analysis allows us to answer a number of simple questions – such as whether or not high rates of job changing by young people are associated with low levels of formal qualifications.

Chapters 5 and 6 expand this analysis to look more closely at movement between work and unemployment. Apart from educational qualifications, what other factors play a role in determining rates of, say, job loss? Our analyses in these chapters lead us to formulate a model of the early labour market experiences of school leavers which provides an explanation of why, as our results in Chapter 3 will show, differences in unemployment rates according to educational qualifications, far from narrowing, grew wider over the 5½ year period during which we followed this cohort.

In Chapter 7 we turn to state training and temporary employment schemes. We first discuss how such programmes are to be evaluated in terms of their effectiveness in increasing participants' chances of getting a job. We then apply the resulting methodology to our data.

Each chapter in this study closes with a brief summary of findings. More substantive conclusions and a discussion of the implications of our findings are contained in Chapter 8.

Chapter 2

DATA

2.1. *Introduction*

This chapter describes the data used in this paper and its collection.

2.2. *Data Collection*

The data on which this research is based come from repeated interviews of a sample of young people who left full-time post-primary education in the school year 1981-82. The great majority of them left in June 1982. Initially this sample were interviewed in May and June 1983 as the 1983 *School Leaver Survey*. This survey is carried out annually by The Economic and Social Research Institute on behalf of the Department of Labour. The 1983 survey returned 1,969 completed interviews which comprise (after a slight weighting) a representative sample of the cohort of approximately 62,000 who left full-time post-primary education in 1981-82. In June 1983, roughly one-quarter of those surveyed were found to have entered some form of full-time third level education. The bulk of the rest were in the labour force.³

In November 1984 the members of this sample were re-interviewed, again by the ESRI, this time on behalf of the Youth Employment Agency (YEA). Whereas each annual *School Leaver Survey* provides us with information about the first year out of school ⁴, this follow-up extended that period to almost 2¹/₂ years. Some results from this re-survey were published in YEA 1986. Of the original sample cohort, interviews were secured with 1,839.

In late 1987/early 1988 this same sample was re-interviewed for a second time, again by the ESRI, commissioned by the YEA (since incorporated into FAS). Data were collected on 1,644 respondents in total. In the vast majority of cases this information was collected directly in interviews with the sample member. In a minority of cases – chiefly where the sample

3. More details of the position of the sample as of June 1983 can be found in Department of Labour, 1983.

4. Two studies have made comparisons of the fortunes of successive cohorts using these surveys. Breen (1984) used data for the 1980, 1981 and 1982 surveys and Breen, Whelan and Costigan (1986) used data from the first six surveys.

member had emigrated – the information was obtained from his or her parent. Prior to analysis, the data were weighted in order to preserve its representativeness. One advantage of interviewing the sample cohort at this time lies in the fact that, at this stage, initially all those who entered third level education had completed their course and gone into the labour market. Thus it is possible to compare how they fared in the labour market with those who entered directly from school. We do not do this in the present study, however.

The *School Leaver Survey* collected data relating to the respondent's educational qualifications, parents' occupation, and his or her current economic status. In those cases where the individual is in the labour force the range of information sought is quite extensive. For example, for those at work, information is sought concerning whether the job is full-time or part-time, permanent or temporary, the occupation of the job and the industry in which it is located, weekly earnings, and so on. Questions were asked of all respondents in the labour force concerning methods of job search and the usage of state placement and training agencies. For those in full-time third level education, data are collected regarding the work they are following and its location.

The 1984 re-survey of the 1981-82 sample cohort questionnaire followed a similar pattern, except that more information was collected concerning young people's experience of training and temporary employment programmes. In addition, labour force history data were collected, and we discuss this below.

The 1988 re-survey was considerably more extensive. In addition to data on current economic status, information was sought on experience of emigration (dates of leaving and returning, reasons for emigrating, etc.); detailed household composition; marital status; and, if married, details of spouse's education, current economic status, and so on. In addition, a large number of questions were included dealing with attitudes towards, and assessment of, individuals' education. As in the 1984 survey, detailed labour force history was also collected.

This paper does not use much of the data collected. Hannan and Shortall (1991) have analysed that which relates to *ex-post* evaluations of education. In the present report our analyses are largely based on the labour force history data from the 1984 and 1988 re-surveys.

2.3. *Labour Force History Data*

In the 1984 survey, detailed labour force histories of all individuals between leaving school and the survey date were collected. In the 1988 survey for those who had been surveyed in 1984, this history was updated

to cover the period November 1984 to January 1988. For those who had not been surveyed in 1984 but were included in 1988, the complete history from leaving school was collected. Thus for all respondents we have a labour force history covering the period between leaving school and January 1988.

Such a labour force history comprises the following information. Eight states are defined. These are:

1. Regular job
2. Unemployed (this includes seeking a first job)
3. On State Scheme (i.e., temporary employment scheme)
4. In full-time education or training
5. Holiday
6. Home duties
7. Ill
8. Seasonal/Vacation Job

The total time between leaving school and the date of the survey is allocated between these eight states. We collected information on the date of entering each state (which, of course, is also the date of leaving the previous state). In addition, extra data were collected concerning each period spent in states 1 (job) and 4 (education or training). Data relating to a job include occupation, industry, earnings, whether or not training was received, and reasons for leaving. In respect of education and training, data were collected on the title of the course, its location, who organised it, how long it lasted and whether or not the individual completed the course. This information allowed us to distinguish between educational courses, AnCO courses and CERT courses.⁵

While this provides the bulk of the information we use in this study, we confined our analysis only to those young people who did not go directly into third level education after leaving school. Thus we are, for the most part, confining ourselves to young people who entered the labour market on leaving school. As a result of the exclusion of third level entrants, this reduces the size of the sample on which the results of this report are based to 1,116. Table 2.1 shows the educational status of this subsample on which our analyses are based.

5. CERT is responsible for training for the hotel, catering and tourism sector. AnCO previously had responsibility for the bulk of training and was amalgamated, along with the Youth Employment Agency and the National Manpower Service, into FÁS in 1987

Table 2.1: *Educational Status of Sample*

Highest Examination Sat for:	<i>Percentage</i>
None	9.9
Group or Intermediate Certificate	39.3
Leaving Certificate	48.1
Some Third Level (not completed)	0.6
Third Level Completed	2.0
	<hr/> 99.9

N = 1,116

Chapter 3

THE INTEGRATION OF YOUNG PEOPLE INTO THE LABOUR MARKET

3.1 Introduction

In this chapter we address the question of how the position of a cohort changes as we follow it through its first 5 years after leaving full time post-primary education. We are particularly concerned, in this chapter and the next, with establishing how this transition process depends upon educational qualifications. As stated in earlier chapters, we are dealing here with those young people who, when they left school in 1982, did not enter, prior to November 1982, any other form of full-time education.

3.2 Economic Status at the Survey Date

An examination of the economic status of our sample at the survey date (January 1988) gives us a picture of the outcome of the transition process after 5 years. These data are shown in Table 3.1 which reports economic status according to educational qualifications and sex. Educational qualifications distinguishes three categories: those who left school having sat for no public examination; those who left having sat for the Group and/or Intermediate Certificate; and those who left school having sat for the Leaving Certificate. A small proportion of this latter group, notwithstanding the fact that none of them entered any form of third level education immediately after leaving school, had, by the time of the survey, acquired experience of, or some formal qualification from, third level education.

The economic status distinctions made in Table 3.1 will be used throughout this report. The category "Not in the Labour Force" includes all those who reported themselves as not currently participating in the labour force for any reason except for the reason of being in full-time education (this group appear under the heading "Full Time Education"). Reasons for not participating include, for example, being ill or being engaged on home duties. It is important to bear in mind that these employment status categories make no distinction between young people in Ireland and those who have emigrated. Thus the "At Work" group includes, for example, young people in our sample who were at work abroad.

Table 3.1: *Economic Status at Time of Survey (January 1988) by Sex and Educational Qualification*

	<i>Women</i>			
	NQ	G/IC	LC+	All
At work	36.5	62.5	79.2	70.4
Seeking First Job	9.3	3.3	0.9	2.4
Unemployed	27.7	14.2	8.9	12.3
On Training Programme or Temporary Employment Scheme	0.0	1.6	0.6	0.8
Full-Time Education	0.0	0.0	0.9	0.6
Not in Labour Force	26.4	18.4	9.3	13.6
Total	99.9	100.9	99.9	100.1
N	52	161	336	549
	<i>Men</i>			
	NQ	G/IC	LC+	All
At work	63.2	71.4	86.3	76.7
Seeking First Job	7.5	2.8	0.4	2.3
Unemployed	29.3	23.8	11.1	19.4
On Training Programme or Temporary Employment Scheme	0.0	1.2	0.4	0.8
Full-Time Education	0.0	0.0	1.3	0.5
Not in Labour Force	0.0	0.7	0.0	0.3
Total	100.0	99.9	99.9	100.0
N	58	273	227	558

NQ: left school without sitting for any public exam;
 G/IC: left school after sitting Group and/or Inter Cert;
 LC+: left school after sitting Leaving Certificate.

Table 3.1. shows that by January 1988 the majority of the cohort were in the labour market (i.e., in the categories At Work; Seeking First Job; Unemployed; On Training Programme or Temporary Employment Scheme), though substantially more women than men were outside the labour market (14 per cent of all women as against less than one half of

one per cent of men). Virtually none of those not participating were in full-time education. Among women, the rate of labour force participation was strongly related to educational qualifications: rates of participation being particularly low among the unqualified. The great majority of non-participating women classified themselves as "On Home Duties".

Among those in the labour market virtually none were, by this stage, undergoing any form of state training (from FÁS or CERT) or participating in any kind of state run temporary employment programme. In all cases, with the exception of unqualified women, the bulk of the cohort in each educational category was at work. The percentages of first job seekers were small, again with the exception of the unqualified, where a significant proportion had not yet found a first job. Both this figure and the percentage in unemployment (having lost or given up a job) bear an obvious relationship to educational qualifications. This is also evident in Table 3.2 which shows unemployment rates as calculated from the data of Table 3.1. This rate includes both the unemployed and first job seekers. The unqualified have extremely high rates of unemployment, even 5 years or more after leaving school⁶.

Table 3.2: *Unemployment Rate at Survey, Men and Women by Educational Qualifications*

	[unemployment rate defined as <i>First-Job Seekers + Unemployed</i> <i>First-Job Seekers + Unemployed + At Work</i>]			
	NQ	G/IC	LC+	All
Women	50.3	21.9	11.0	17.5
Men	36.8	27.1	12.1	21.9

Unemployment rates are also high among those having sat for the Group and/or Intermediate Certificate. Conversely, the percentage of the cohort at work is also linked to qualifications: the highest percentages at work are found among men and women who left school having sat for the Leaving Certificate.

⁶ In interpreting data relating to this group one must bear in mind the small sample sizes involved as shown in Table 3.1. Thus the difference between the male and female unemployment rates among the unqualified – which are shown as quite substantial in Table 3.2 – are susceptible to large change based on changes in the employment status of quite small numbers in the sample.

3.3 *Employment Status Changes over Time*

Tables 3.1 and 3.2, then, show a very marked relationship between educational qualifications and

- (i) rates of labour force participation among women;
- (ii) percentages still seeking a first job;
- (iii) percentages unemployed;
- (iv) percentages at work.

From these results we can immediately conclude that the effects of educational qualifications on labour force status persist for at least a period of 5¹/₂ years after leaving school. The question we now address, however, is whether these effects show any diminution over this period. In other words, is there any evidence that the relationship between labour force status and educational qualifications is weaker at the end of this 5¹/₂ year period than it was at some times during it?

The relevant data are shown in Tables 3.3A, B and C. These show the labour market status of the cohort at six points in time, corresponding to December of each year following the end of full-time education. This information is presented separately for men and women and broken down according to educational qualifications. Thus, the columns of Table 3.3A show the labour force status of unqualified men and women at December 1982 (column A); December 1983 (column B); and so on, through to December 1987 (column F). Tables 3.3B and C are similarly arranged.

These tables show a general trend for the percentage at work to increase with time, albeit with some noticeable fluctuations among those lacking in qualifications. On the other hand, the percentages unemployed, while they decline quite markedly among those who leave school post-Leaving Certificate, show a much less clear decline over time among those who leave after sitting for a junior cycle examination, and do not change very much at all among the unqualified. A not dissimilar picture emerges from Table 3.4 which shows the unemployment rate for men and women at each of these dates, again broken down by qualifications. For both sexes and all educational qualifications the percentage unemployment rates display a decline, but this decline is quite modest among the unqualified and also among those who sat for a Junior Cycle examination. The greatest decline is seen among those who left school after completing the Senior Cycle. The result of this is that differentials in unemployment rates widen, as between those having different levels of educational qualifications, particularly during the first few years in the labour market. In this sense at least, the impact of qualifications on labour market position seems to grow stronger rather than weaker.

Table 3.3A: *Economic Status at Six Points in Time according to Sex; School Leavers with no Qualifications*

<i>Men</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>
At Work	44.6	50.0	51.8	58.6	49.1	57.9
Unemployed	42.9	37.5	37.5	34.5	49.1	40.4
Employment Scheme	3.6	7.1	8.9	5.2	1.8	1.8
Full-Time Education	0.0	1.8	0.0	0.0	0.0	0.0
Training Programme	1.8	1.8	0.0	0.0	0.0	0.0
Not in Labour-Force	7.1	1.8	1.8	1.7	0.0	0.0
<i>Women</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>
At Work	40.4	45.1	53.0	50.0	49.1	43.0
Unemployed	36.5	43.1	35.0	40.4	39.6	38.0
Employment Scheme	5.8	0.0	0.0	0.0	0.0	0.0
Full-Time Education	0.0	2.0	0.0	0.0	0.0	0.0
Training Programme	3.8	2.0	0.0	0.0	1.9	0.0
Not in Labour-Force	13.5	7.8	12.0	9.6	9.4	19.0

Key: A: December 1982
 B: December 1983
 C: December 1984
 D: December 1985
 E: December 1986
 F: December 1987

Table 3.3B: *Economic Status at Six Points in Time according to Sex; School Leavers who Left School After Sitting for the Group and/or an Intermediate Certificate*

<i>Men</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>
At Work	53.82	67.87	68.1	71.31	69.11	71.76
Unemployed	28.92	25.30	24.2	21.91	26.25	25.57
Employment Scheme	6.43	2.01	3.2	3.59	0.77	0.76
Full-Time Education	0.80	0.40	3.2	0.40	0.39	0.38
Training Programme	6.43	1.20	0.0	1.59	1.54	0.38
Not in Labour-Force	3.61	3.21	1.2	1.20	1.93	1.15
<i>Women</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>
At Work	46.5	67.09	69.81	69.81	63.35	63.52
Unemployed	29.9	27.22	21.38	22.64	24.84	23.27
Employment Scheme	10.8	0.00	1.26	1.26	1.24	0.63
Full-Time Education	4.5	0.63	3.77	0.63	0.62	0.00
Training Programme	3.8	1.27	0.63	0.00	0.00	0.63
Not in Labour-Force	4.5	3.80	3.14	5.66	9.94	11.95

Key: As Table 3.3A

Table 3.3C: *Economic Status at Six Points in Time According to Sex: School Leavers who Left School After Sitting for the Leaving Certificate*

<i>Men</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>
At Work	57.2	69.9	80.00	80.09	80.63	84.62
Unemployed	20.9	12.8	12.56	12.67	13.51	11.31
Employment Scheme	8.8	5.0	0.47	1.36	0.45	0.00
Full-Time Education	3.3	5.9	6.98	5.43	4.50	1.36
Training Programme	5.6	4.1	0.00	0.00	0.45	0.90
Not in Labour-Force	4.2	2.3	0.00	0.45	0.45	1.81
<i>Women</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>
At Work	45.9	71.9	78.48	80.06	76.6	80.06
Unemployed	18.7	12.9	12.03	10.28	12.0	11.04
Employment Scheme	13.9	4.1	0.95	0.62	0.0	0.31
Full-Time Education	7.3	5.7	4.11	3.12	3.7	1.84
Training Programme	6.0	2.8	0.95	1.87	1.5	0.00
Not in Labour-Force	8.2	2.5	3.48	4.05	6.2	6.75

Key: As Table 3.3A

Table 3.4: *Unemployment Rates at Six Points in Time, Broken Down by Sex and Educational Qualifications*

	<i>NQ</i>		<i>G/IC</i>		<i>LC+</i>	
	<i>Men</i>	<i>Women</i>	<i>Men</i>	<i>Women</i>	<i>Men</i>	<i>Women</i>
<i>A</i>	49	47	35	39	27	29
<i>B</i>	43	49	27	29	15	15
<i>C</i>	42	40	26	23	14	13
<i>D</i>	37	45	24	24	14	11
<i>E</i>	50	45	28	28	14	14
<i>F</i>	41	47	26	27	12	12
Unemployment Rate	= $\frac{\text{Unemployed} + \text{First Job Seekers}}{\text{Unemployed} + \text{First Job Seekers} + \text{At Work}}$					

Key: as Table 3.3A.4

There is a steady decline over time in the percentages of young people in training or temporary employment schemes, with the exception of unqualified men. Here the percentage in training increases during the first 2½ years, then declines. Among all others the position is one of relatively high participation rates in December 1982 and a decline thereafter. Participation rates at December 1982 were particularly high among those

who left school having sat for any examination, and this is very noticeable among women. For example, among female post-Leaving Certificate leavers, 1 in 5 was on a training or temporary employment scheme in December 1982 – 6 months after leaving school. The most plausible explanation is that these figures reflect the impact of the Work Experience Programme (WEP). This was a relatively large temporary employment scheme, the intake of which was noticeably biased towards better qualified women, most of whom entered the programme very shortly after leaving school (see Breen (1988) for a discussion and evaluation of this programme).

Percentages not in the labour force (and not in full-time education) are, again, more significant among women than among men. Among the latter the percentage not in the labour force declines over time. Among women, differences in labour force participation rates between school leavers with different levels of qualifications widen through time.

Overall, then, the data presented in Tables 3.3A to C and 3.4 show two main trends: increasing percentages at work; and a modest decline in percentage unemployment rates. However, these trends operate much more strongly among the post-Leaving Certificate leavers than among all others. As a consequence, when we distinguish between those having different levels of educational qualifications, there is clear evidence of a widening of differentials.

We also note that, while there is little or no difference in the percentage of unqualified women classed as unemployed or seeking a first job (when compared with unqualified men), a much smaller percentage of them report having been in full-time training or employment schemes. This is particularly noticeable after December 1983. This group contains a higher percentage not in the labour market than do unqualified men. This suggests that, among unqualified women (and possibly among some of those with qualifications also), prolonged failure to obtain a job may lead to withdrawal from the labour force.

3.4 The Labour Force: Summary Statistics

In the remainder of this chapter we confine our attention to the labour force experiences of our cohort – not least because most of them spent the vast majority of their time in the labour market during the 5½ years that this study covers.

Table 3.5 categorises the sample in terms of the number of jobs held and number of spells of unemployment experienced. The median number of jobs was 2, the median number of spells of unemployment was 1. Table 3.6 shows the average distribution of time spent (to the survey date) in the

labour force across the three states – at work; unemployed (which includes time spent seeking a first job); and in state training or temporary employment schemes. The overall patterns for men and women are remarkably similar. Just under three quarters of their time in the labour force was spent at work; just under a quarter in unemployment; and around 3 per cent in training or employment schemes. A broadly similar picture holds if we make the comparison within a given level of educational qualifications. For both sexes, the mean percentage of time spent unemployed declines with higher levels of qualifications, while the

Table 3.5: *Percentage of Cohort Having Held 0,1,2,3, etc., Jobs, and Percentage Having Experienced 0,1,2,3, etc., Spells of Unemployment*

<i>Number of Jobs Held/ Spells of Unemployment</i>	<i>Jobs %</i>	<i>Unemployment Spells %</i>
0	7.7	32.9
1	32.9	30.8
2	30.4	16.5
3	15.7	11.8
4	7.5	4.9
5 or more	5.9	3.1

Table 3.6: *Average Distribution of Total Time in Labour Force by Education and Sex*

	<i>Percentage of total time in labour force spent</i>		
	<i>At Work</i>	<i>Unemployed*</i>	<i>Training/ Temp. Employment</i>
<i>Women</i>			
No Qualifications	51.3	47.6 (14.1)	1.1
Group/Inter Cert.	68.9	28.4 (9.0)	2.7
Leaving Cert.	80.8	15.8 (3.8)	3.4
All	74.3	22.8 (6.2)	2.9
<i>Men</i>			
No Qualifications	51.3	43.5 (11.7)	5.2
Group/Inter Cert.	69.4	27.8 (9.4)	2.8
Leaving Cert.	80.8	16.7 (5.8)	2.5
All	72.2	24.9 (8.1)	2.9

*Average percentage of time in labour force spent searching for first job in parentheses

percentage of time spent at work increases. The only differences lie in the time spent in training and employment schemes. Among men this shows a decline as we move to higher levels of qualification. In particular, unqualified male school leavers have spent more of their time in the labour force on schemes than have any other group. Among women, however, the pattern is reversed. This may be due to the preponderant effect of WEP, which drew its clientele predominantly from among qualified female school leavers. Nevertheless, as noted earlier, unqualified female school leavers, when compared with their male counterparts, have a very low level of participation in training and temporary employment schemes.

3.5 Allocation of Time in the Labour Force: Changes Over Time

Figures 3.1 to 3.3 show the evolution of the labour force position of the cohort through time. Each of the figures shows four lines, corresponding to the position of the sample as a whole and to those in each educational category. Figure 3.1 then shows, for each of these groups, the time spent at work as a percentage of total time in the labour force over the previous six months. Figure 3.2 shows the time spent in unemployment as a percentage of total time in the labour force over the previous six months; while Figure 3.3 refers to time spent in state training or temporary employment programmes as a percentage of total time in the labour force over the previous six months. Taken together these graphs present a picture of the changing distribution of time spent in the labour force over the period since leaving school.⁷

The picture revealed by these graphs is substantially the same as that shown by previous tables. Overall the cohort has spent a growing proportion of its time at work and a declining proportion either in unemployment or state training/employment schemes. The rates of change, however, depend heavily upon educational qualifications. Among post-Leaving Certificate leavers there is a steady increase in the percentage of time spent at work; and the slope of this line is much steeper than that for those who left post-Junior Cycle or without any qualifications. The picture is reversed when we examine changes in the percentage of time spent unemployed. The consequence of this is that aggregate differences in the labour force position between those with different levels of qualifications initially widen as time passes.

7. The points on the graph are defined only at six monthly intervals since the necessary calculations were carried out at 11 points in time, starting at December 1982 and six monthly to December 1987. The lines themselves are thus interpolated between these points. The legend "Time in months since leaving school" assumes that all respondents left school in June 1982.

Figure 3.1 Percentage of Time In Labour Force Spent At Work by Educational Qualifications

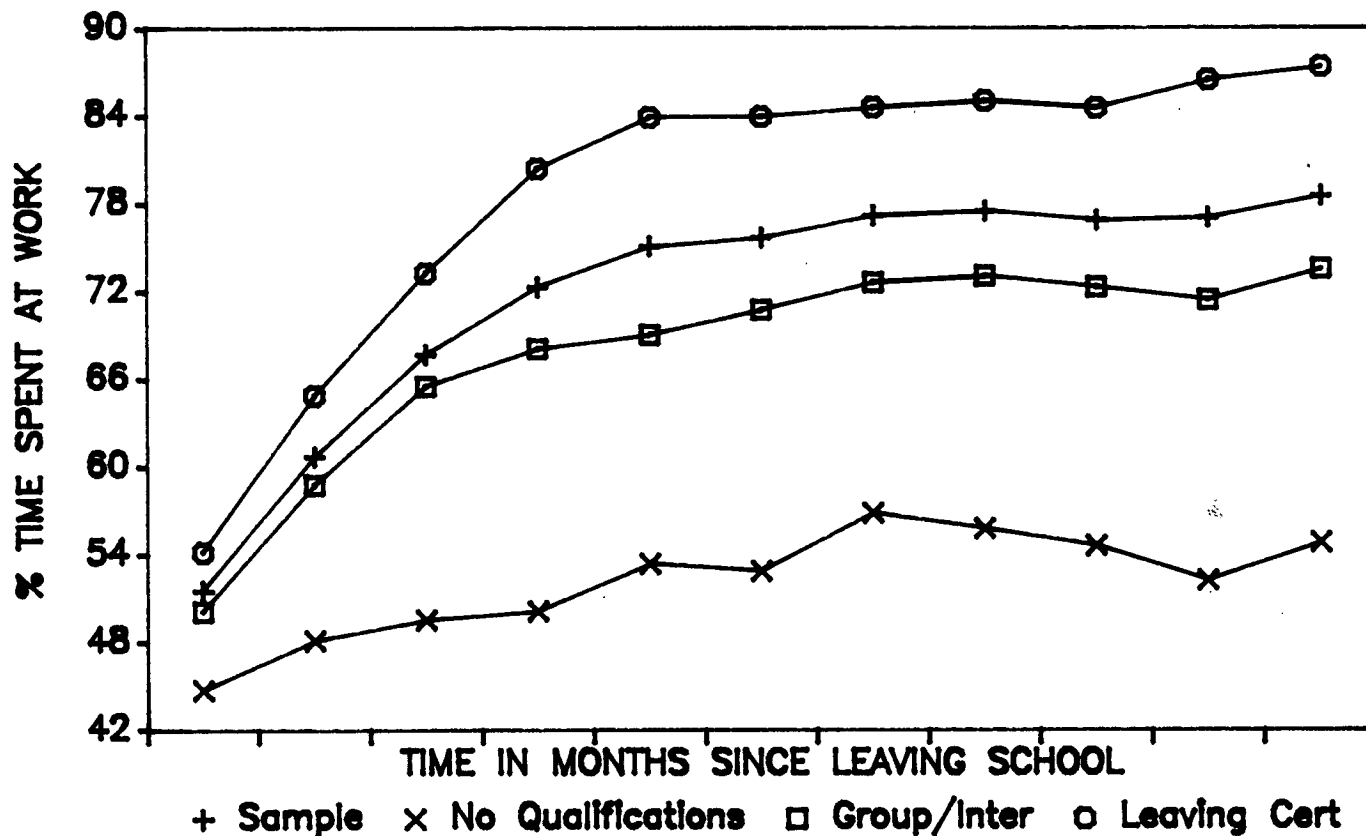


Figure 3.2 Percentage of Time in Labour Force Spent in Unemployment by Educational Level

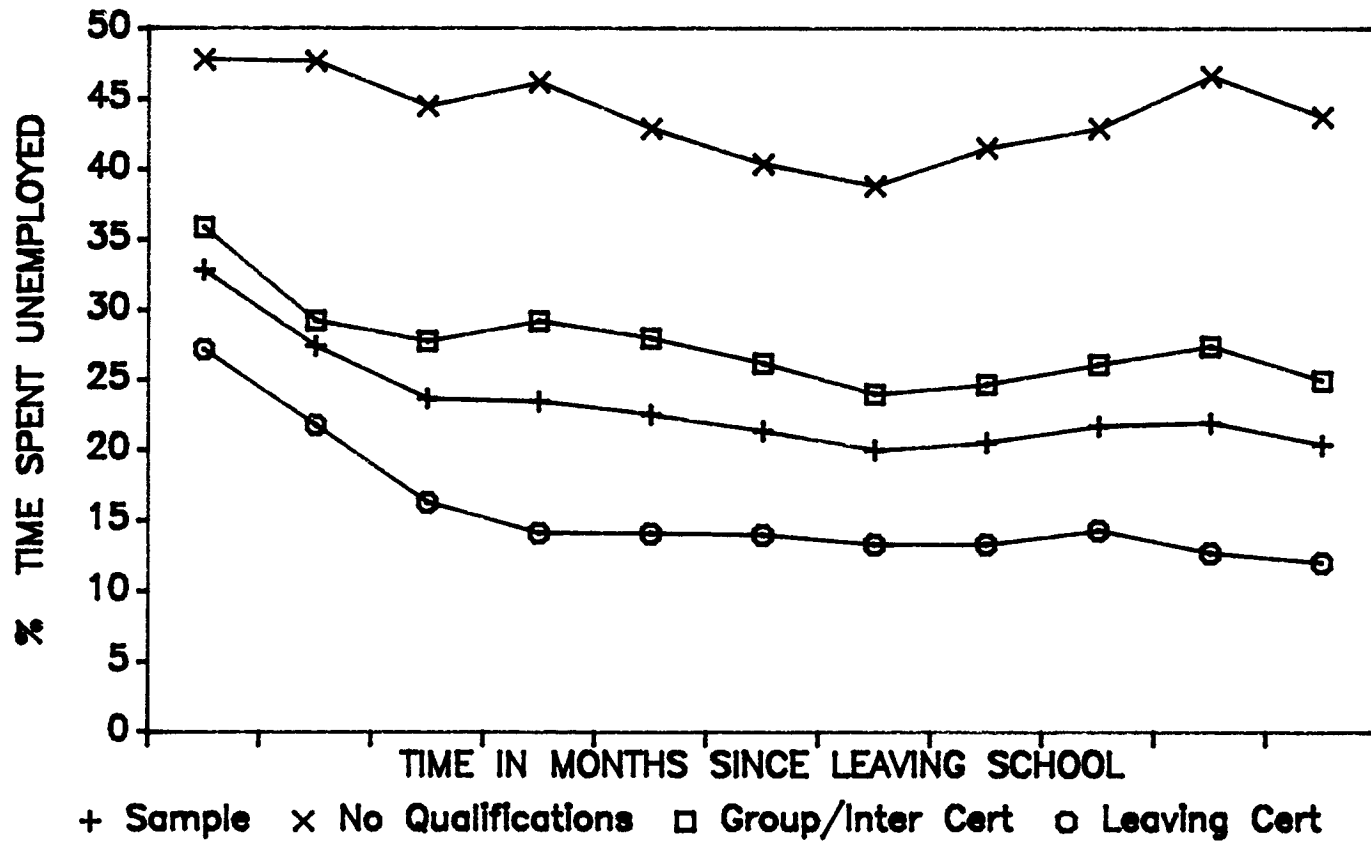
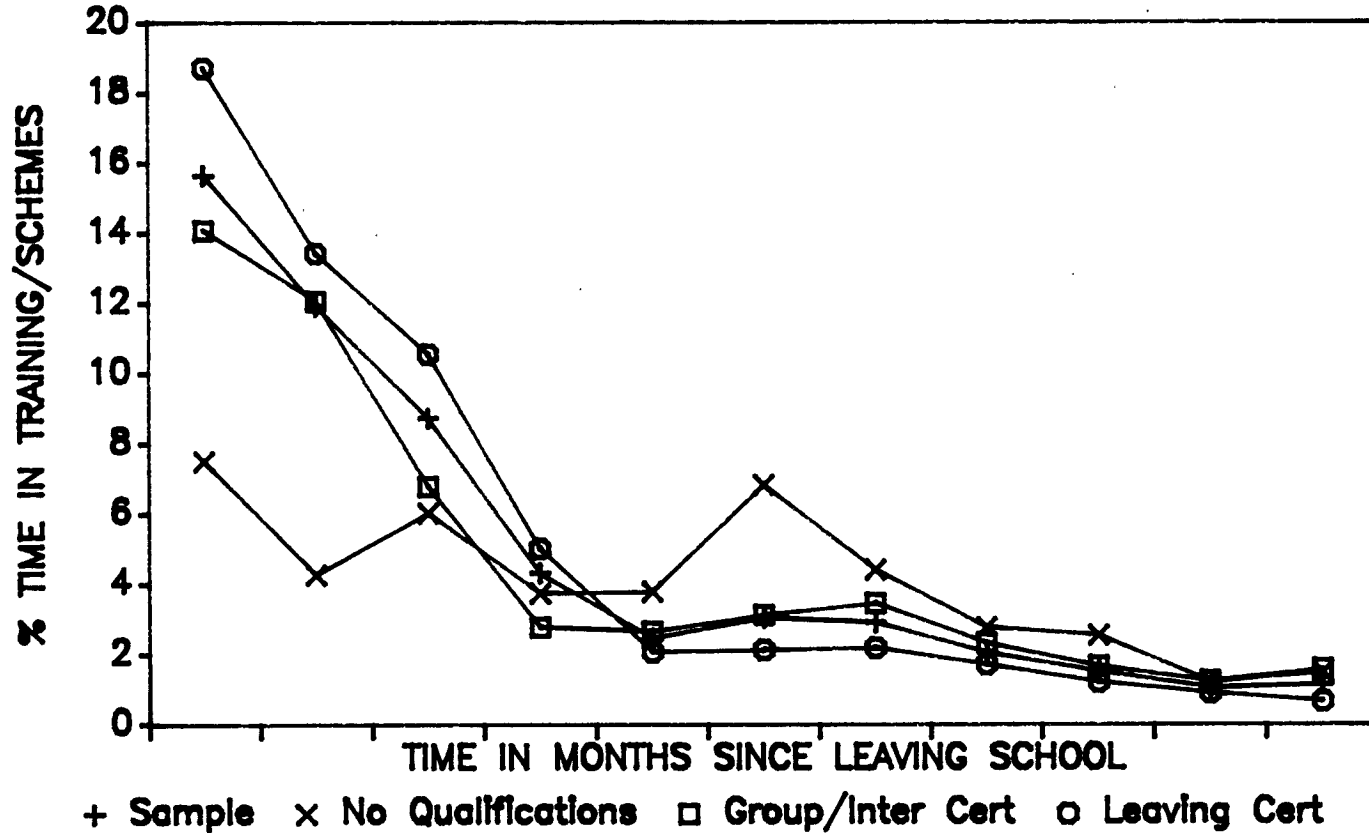


Figure 3.3 Percentage of Time In Labour Force Spent In Training/Employment Schemes



The new information revealed by Figures 3.1 and 3.2 is that most of the marked increase in the percentage in jobs and the decline in the percentage unemployed, occurs during the first two years the cohort spends in the labour market. Beyond this the percentage of time spent unemployed in each six month period, for example, seems to settle down to what looks like a long-run level, of around 40-45 per cent for the unqualified; 25 per cent for those who left post-Junior Cycle, and around 10 per cent for those who left after sitting for the Leaving Certificate. The fluctuations around this level are very small for this latter group. This would seem to indicate that, at this aggregate level at any rate, the educational qualification differentials establish themselves within 2 to 3 years of leaving school and change very little thereafter.

3.6 Summary

In this chapter we have examined data relating to the integration of young people into the labour market over the first 5½ years after they left school. Our main findings are that:

(i) female labour force participation is lower than male and tends to decline over this period of time. Among women labour force participation rates among those not in full-time education appear to be strongly related to educational qualifications.

(ii) within the labour force, as we might have anticipated, unemployment rates are negatively related to educational qualifications, employment rates positively. What we might not have expected, however, is that, as the cohort becomes integrated into the labour market and, overall, unemployment rates fall and a higher percentage of the cohort enters jobs, the differences between those with different levels of qualifications show clear evidence of widening.

(iii) this process of increasing differentiation occurs within the first 2 to 3 years after leaving school. Beyond that point the relative position of those with different levels of qualifications seems to change very little. This, in turn, points to this initial period of 2 to 3 years as being of crucial importance in determining the longer-term position of young people in the labour market.⁸

⁸ A similar phenomenon occurs in France. Data collected and analysed by CEREQ in Paris show a comparable widening of differentials during the first 2½ years, followed by relatively little change (see, for example, Zilberman, 1990).

Chapter 4

A SIMPLE EVENT HISTORY MODEL FOR CHANGES IN ECONOMIC STATUS

4.1 Introduction

This chapter presents further analysis of the relationship between, on the one hand, the economic statuses that individuals occupy during the period between leaving school and the time of the survey and, on the other, their educational qualifications. The purpose of this chapter is to provide some additional insight into the exact nature of this relationship rather than to explain how this relationship arises. The latter is a task for later chapters. What we hope to achieve in this chapter might best be explained via an example. We have seen that the unqualified are more likely than those who left school after sitting for a public examination to be unemployed or seeking a first job at any point during the first 5¹/₂ years after leaving school. Likewise they spend a greater percentage of their time in the labour force in unemployment. This situation could arise for one, or both of, two reasons. First, the unqualified may spend longer in unemployment – i.e., they find it harder to get a job. The fact that the unqualified spend longer seeking a first job suggests that this may well be the case. Second, the unqualified may spend shorter periods in employment – i.e., they may be more likely to lose or give up a job. In this chapter we seek to discover whether either or both of these hypotheses are correct.

The secondary aim of this chapter, however, is to introduce the main methodological approach which will be used in the remainder of the study. This is called event history analysis. A full description of the methodology can be found in the appendix. What follows is a very broad outline of the method.

4.2 Event History Analysis

The data on which this paper are based consists of the history of the economic statuses of a sample of young people who left school in 1982. By economic statuses we mean those categories – such as At Work, Unemployed, In Full-Time Education, and so on – shown in, for example, Table 3.1. In other words, we have data on every such economic status that the individual has occupied over the 5¹/₂ year period since leaving school.

These data include the date when each status was entered and left, and information relevant to that status, such as, in the case of a job, the wage, whether or not training was given on the job, the occupation the individual held, the industry in which the job was located, and so on. Clearly, such a body of data has the potential to tell us a great deal about the nature of the transition from education among this cohort. One of the problems of such data, however, is that it is almost too rich: a way must be found of extracting, from the mass of detailed information, the central and most important results. Event history analysis is a way of trying to do this.

Briefly, the use of event history analysis requires that we first define that set of economic statuses, or states, which interest us. The method then analyses transitions that individuals make between some or all pairs of such states. For our purposes we have defined four states as follows:

1. at Work;
2. unemployed (including seeking a first job);
3. on a state training or temporary employment programme;
4. Not in the Labour Force (for any reason whatsoever including being in full-time education)

The focus of the analysis is then transitions between these states (or some subset of them). For example, in the case of the state "At Work" we can define four possible transitions: from the origin state "At Work" to the destination state "At Work" in the sense of moving from one job to another; from At Work to Unemployed; from At Work to a State Training or Employment Scheme; and from At Work to Not in the Labour Force. In the case of the state "Unemployed" three transitions can be studied. The transition from Unemployed to Unemployed is not possible but the others – from unemployment into, respectively, a job, training/temporary employment scheme, or out of the labour force, are. Likewise three destination states can be studied in the case of the other two origin states⁹.

In estimating the event history model we obtain, as a result, a set of parameters for each origin status/destination status combination. So, for example, and as Table 4.2A shows, we have a set of parameters for the transition from one job directly to another job (At Work to At Work) and another set for the transition from a job to unemployment (At Work to Unemployed) and so on.

9. Note that this implies that we make no distinction, for example, between being in full-time education and thus out of the labour force and being out of the labour force for any other reason. So we do not distinguish between, for instance, a period in the state "Not in the Labour Force" made up of a single spell on home duties, from a period made up of separate but contiguous spells in home duties and in full-time education. However we do differentiate within the category "At Work" if individuals change jobs. Note too that we assume that one cannot make a transition directly from a state training scheme to a temporary employment scheme or vice versa.

The dependent variable in an event history analysis is the length of time the individual spends in an origin state before making a transition to a destination state.¹⁰ The parameters of the model, which relate to the effects of explanatory variables, show the influence of these variables in determining the length of time spent in the origin state. Also, the negative of the parameters shows the influence of the variables on the instantaneous risk of making the transition out of the origin state and into the particular destination state.¹¹

The instantaneous risk of making a given transition can be thought of, in a very approximate sense, as the risk of making the transition from one state to another within an infinitely tiny time interval. We refer to this instantaneous risk by a number of synonyms, such as the destination specific hazard rate, the transition rate and the instantaneous probability.¹² In interpreting these figures, however, an exact understanding of what they mean is not of central importance. Rather, we shall be focusing on how these figures differ between those having different levels of educational qualifications and between men and women. Hence it is these relativities which we will be using to understand something of the process of transition from education into the labour market.

One virtue of these models is that they allow the wealth of data on individuals' histories to be analysed in a reasonably parsimonious fashion. In addition the parameters of the model yield a number of useful measures, as we shall see below.¹³

4.3 *Assumptions of the Model*

In this chapter we estimate event history models relating to a subset of all possible transitions between the four defined states. We are concerned only with transitions out of jobs (At Work) and out of unemployment.

¹⁰ And the virtue of the method is that it recognizes, and takes into account, the fact that in many instances the individual in question will not have moved out of the origin status: for example, he or she will still be occupying one state at the time the survey was conducted. Such durations in a state are technically termed "right censored" in the event history literature.

¹¹ The event history models in this study were fitted using William H. Greene's LIMDEP program.

¹² Correctly speaking these instantaneous probabilities are hazard rates and not probabilities. Most importantly, unlike probabilities, they do not have an upper bound of one.

¹³ It is particularly useful to distinguish between this approach to modelling inter-status transitions and an approach based on, say, logit or probit analysis. The former has several advantages over the latter, not least in its ability to handle censored data. However, perhaps of most importance is the fact that whereas the parameters of a logit model would relate to the probability of making a given transition within a given period of time, the parameters of the event history model are not so restricted. Rather, they relate to the instantaneous transition probability, from which we can calculate specific transition probabilities for any chosen period of time.

We do not, therefore, focus on transitions into the labour force (i.e., into a job, unemployment or training) among those outside the labour force or transitions following training and temporary employment programmes. The latter are dealt with in some detail in Chapter 7.

In the analysis that follows we make three assumptions. The first is that the instantaneous probability of making a transition out of a particular origin state – call it state i into destination state j – is independent (given the variables included in the model) of making a transition out of the same state, i , into an alternative destination state – call this k . This is an assumption we maintain throughout all our subsequent analyses.

The second assumption is that the length of time an individual has spent in state i has no influence on his or her instantaneous probability of making a transition to any other state. In other words, we assume no duration dependence. This is equivalent to assuming that the waiting times to the particular transition have an exponential distribution. This is an assumption we will relax in later analyses.

Our final assumption is that, for both sexes, only educational qualifications have an impact on the instantaneous probability of making any transition. Again, we will be relaxing this assumption in later chapters, but we maintain it for the present in order to gauge the overall effect of qualifications on transition rates.

4.4 Parameter Estimates

Tables 4.1A and 4.1B show the basic data relating to transitions out of jobs and out of unemployment, while Tables 4.2A and 4.2B show the parameter estimates for the corresponding event history models.

We have complete data on 1,824 jobs held by members of our sample. Table 4.1A shows that jobs held by those with no qualifications are less likely to be still held at the time of the survey, less likely to have been terminated by a move directly to another job, and more likely to have been terminated by unemployment, when compared with jobs held by young people who left school after sitting for either the Group and/or Intermediate Certificate or the Leaving Certificate. Among the latter two groups the chief differences are that jobs held by those who leave after the Leaving Certificate are more likely to have been still occupied at the time of the survey and are less likely to have been terminated by unemployment. The final row of Table 4.1A shows the percentage breakdown of the 1,824 jobs according to the qualification level of the individuals who held them. If we compare this with the breakdown of the 1,116 members of our sample, given in Table 2.1, we can see that the two distributions are very similar. This means that the overall number of jobs held is unrelated to educational qualifications.

Table 4.1A: *Transitions out of Jobs by Educational Qualifications*

	<i>No Quals</i>	<i>Group/Inter Cert</i>	<i>Leaving Cert</i>	<i>All</i>
Percentage of jobs ending in transitions to				
another job	18	24	25	24
unemployment	44	33	24	29
another state*	6	7	9	8
Job still occupied at survey date	32	37	42	39
Number of jobs	163	698	963	1,824
Number of jobs as percentage of total	9	38	53	—

*includes not in labour force/full time education/training programme/temporary employment scheme

Table 4.1B: *Transitions out of Unemployment by Educational Qualifications*

	<i>No Quals</i>	<i>Group/Inter Cert</i>	<i>Leaving Cert</i>	<i>All</i>
Percentage of spells of unemployment ending in transition to				
a job	49	57	59	57
another state*	27	18	30	27
Unemployment spell still going on at survey date	24	18	11	16
Number of spells	212	603	613	1,428
Number of spells as percentage of total	15	42	43	—

*includes not in labour force/full time education/training programme/temporary employment scheme.

Table 4.2A: *Parameter Estimates for Simple Hazard Rate Model*
(standard errors of estimates in parentheses)

<i>Transitions:</i>		<i>Intercept</i>	<i>Explanatory Variables</i>		<i>Female</i>
<i>From:</i>	<i>To:</i>		<i>GIC</i>	<i>LC</i>	
At work	Job	4.706* (0.19)	-0.154 (0.20)	-0.200 (0.195)	0.104 (0.096)
At work	Unemployment	3.861* (0.12)	0.451* (0.12)	0.785* (0.12)	-0.050 (0.08)
At work	Training or temporary employment scheme	6.215* (0.40)	0.569 (0.47)	0.432 (0.47)	0.272 (0.31)
At work	Not in labour force	6.985* (0.531)	-0.407 (0.54)	-0.652 (0.52)	-0.500* (0.22)

* Statistically significant at $p < .05$.Table 4.2B: *Parameter Estimates for Simple Hazard Rate Model*
(standard errors of estimates in parentheses)

<i>Transitions:</i>		<i>Intercept</i>	<i>Explanatory Variables</i>		<i>Female</i>
<i>From:</i>	<i>To:</i>		<i>GIC</i>	<i>LC</i>	
Unemployment	Job	3.468* (0.09)	-0.408* (0.09)	-0.786* (0.09)	-0.054 (0.06)
Unemployment	Not in labour force	5.247* (0.24)	0.043 (0.25)	-0.360 (0.24)	-0.606* (0.19)
Unemployed	Training or temporary employment scheme				
	MALES	4.267* (0.20)	-0.362 (0.22)	-0.536* (0.23)	-
	FEMALES	5.262* (0.33)	-0.86* (0.37)	-1.717* (0.36)	-

* Statistically significant at $p < .05$.

Hence, if we take such a statistic as a measure of "instability" of occupation in the youth labour market, we would find such instability to be independent of qualifications. Clearly, however, when we examine the detailed pattern of transitions, as shown in the body of Table 4.1A, it becomes evident that there exist very marked patterns of differentiation according to qualifications.

Table 4.1B reports data on transitions out of spells of unemployment, of which we have a total of 1,428 (including searches for a first job) among our sample. Most spells of unemployment end in a job, though this is slightly more likely the higher the level of qualifications possessed by job seekers. Most obviously, however, the percentage of spells in progress at the time of our survey shows a very clear relationship with qualifications: spells of unemployment among those who lack qualifications are most likely to have been still going on at the time of the survey, while spells among those who left school post-Leaving Certificate are least likely. Finally, if we compare the percentage distribution of spells of unemployment shown at the foot of Table 4.1B with the distribution of the sample shown in Table 2.1 then it is clear that the unqualified experience more spells of unemployment than do those who leave school after sitting for any examination. Those who leave post-Leaving Certificate are noticeably less likely than anyone else to experience spells of unemployment.

The coefficients in Tables 4.2A and B show the overall impact of educational qualifications on the instantaneous probability of remaining in the origin state. The explanatory variables are entered into this simple model as dummy variables. Thus the intercept yields the instantaneous probability among those with no qualifications, while the columns headed GC/IC and LC+ indicate by how much the intercept should be increased or decreased to calculate the probability for those who left school after Junior Cycle or after the Leaving Certificate, respectively. Parameter estimates marked with an asterisk are statistically significantly different from zero at the 5 per cent level. In respect of each transition we initially estimated separate models for women and men, so allowing for the possibility that both the overall levels of instantaneous transition probabilities and the educational qualification relativities in these probabilities varied according to sex. In order to test this we then fitted simpler models in which some or all of the coefficients were set equal across both sexes. The results of this were that, for all transitions except one, a model which allowed the overall transition rate to vary by sex, but not the educational category relativities, was more than adequate. In other words the transition processes, at this aggregate level, are independent of sex. In these cases, then, we report the coefficient which measures the extent to which the female probability varies, on average, from that for men. The one exception was for the transition from unemployment into training or a temporary employment scheme. Here we had to fit separate models for men and women.

If we turn to the transitions out of the state "At Work" (Table 4.2A) we find that only one is influenced by educational qualifications and that is the transition which corresponds to job loss – from At Work to Unemployment.

Here we see a clear pattern: the likelihood of remaining in a job, as against moving into unemployment, increases with increasing levels of qualification. This pattern holds for both men and women, and the fact that the female coefficient is not statistically significant shows that the overall level of transition rates does not differ as between men and women. Conversely the risk of losing or giving up a job and becoming unemployed declines with increasing qualifications, and again we detect no sex differences in this pattern. Using the parameter estimates we can calculate that, on average, for those who left school post-Leaving Certificate their likelihood of losing a job is only half that of those with no qualifications. This can be seen in Table 4.3A which uses the coefficient estimates in Table 4.2A to calculate the instantaneous transition probabilities from a job to the other states.

Elsewhere there are no significant effects of educational qualifications. In particular, the rate of mobility between jobs (i.e., moving directly from one job to another) is unrelated to qualifications.

For all young people, the overall instantaneous probability of leaving a job is smaller than the probability of remaining in the job. However, Table 4.3A shows that for most young people the most likely transition for those with a job is into unemployment. This holds for everyone except those who have stayed at school to sit for the Leaving Certificate. What this means is that all those young people who lack qualifications or who left school after the junior cycle are less likely to change jobs than to become unemployed.

Only in one case do female and male transition rates out of a job differ, and this is in the likelihood of moving from a job out of the labour force. Here we find women are significantly more likely to make such a move than men, though, as Table 4.3A reveals, for both sexes the instantaneous probability of such a transition is quite small.

Turning now to transitions out of unemployment, our parameter estimates are given in Table 4.2B, and the corresponding hazard rates calculated using these estimates are given in Table 4.3B. These show that educational qualifications affect two of the three transitions. First, the higher the level of qualifications, the more likely the person is to leave unemployment for a job. Secondly, the higher the level of qualifications the more likely is the person to leave unemployment for a training/employment scheme. The differences associated with educational qualifications in this transition are particularly large. In addition, the effects of educational qualifications on the likelihood of making this transition are different among men and women. Among men, those who left school after the Leaving Certificate are significantly more likely to enter such programmes than are those who lack qualifications or who left

school after the Group or Intermediate Certificate. Among women, educational qualifications discriminate more finely: those who left school post-Junior Cycle are more likely to enter such programmes than those who lack qualifications; while those who sat for the Leaving Certificate are more likely again. In addition, the differences associated with increasing

Table 4.3A: *Estimated Hazard Rates by Sex and Educational Qualifications for Transitions (a) from One Job to Another; (b) from Job into Unemployment, Education, Training, or non-Labour Force Status; (c) from Jobs into Training or Temporary Employment Schemes; (d) from a Job Out of the Labour Force or into Full-Time Education*

<i>Transition:</i>	<i>Educational Qualifications</i>					
	<i>NQ</i>		<i>G/IC</i>		<i>LC+</i>	
	<i>Men</i>	<i>Women</i>	<i>Men</i>	<i>Women</i>	<i>Men</i>	<i>Women</i>
(a) Job to Job	.009	.008	.011	.010	.011	.010
(b) Job to Unemployment	.021	.022	.013	.014	.010	.010
(c) Job to Training or Employment Scheme	.002	.002	.001	.001	.001	.001
(d) Job to Education or out of Labour-Force	.001	.002	.001	.002	.002	.003

Table 4.3B: *Estimated Hazard Rates, by Sex and Educational Qualifications, for Transitions Out of Unemployment*

<i>Transition:</i>	<i>Educational Qualifications</i>					
	<i>NQ</i>		<i>G/IC</i>		<i>LC+</i>	
	<i>Men</i>	<i>Women</i>	<i>Men</i>	<i>Women</i>	<i>Men</i>	<i>Women</i>
(a) From Unempl. to a Job:	.031	.033	.047	.049	.068	.072
(b) from Unempl. Out of Labour-Force:	.005	.010	.005	.010	.008	.014
(c) from Unempl. to Training or Temporary Employment Scheme:	.014	.005	.020	.012	.024	.029

levels of qualification are much greater among women than among men. In particular, girls who completed senior cycle have a substantially greater likelihood of entering such programmes than anyone else. It is important to note also, however, that it is only among those who leave school post-Leaving Certificate that the female hazard rate for this transition exceeds that for men. Combined with the marked effects of educational qualifications among women this means that girls who lack qualifications have a very small likelihood of entering such programmes, as Table 4.3B shows. Furthermore, the transition rate for girls who leave after sitting for a junior cycle exam is considerably smaller than that for comparable men.

Women are more likely than men to leave unemployment and leave the labour market. We could discover no effect of educational qualifications on the likelihood of making this transition.

4.5 *Summary*

In this chapter we have examined the relationship between the probabilities of individuals moving between economic states and their educational qualifications. Our main results are:

- (i) for both men and women, the higher the level of educational qualifications the more likely is an individual to leave unemployment and the less likely is an individual to leave a job and become unemployed;
- (ii) movement between jobs (transitions from one job directly to another) are unrelated to either educational qualifications or gender;
- (iii) among the unemployed the likelihood of entering a state training or temporary employment programme is linked to educational qualifications: the higher the qualifications the more likely is entry to such a scheme. This is true of both men and women but the effect is stronger among women. One corollary of this is that women who lack qualifications have only a very small likelihood of entering such schemes.

Finally, to answer the question that we posed at the start of this chapter, we have shown that the unqualified find it harder to get a job than do other job seekers, and, equally, they are also more likely to lose a job and become unemployed. The magnitude of their relative disadvantage is remarkably similar in both respects. In comparison with those who left school after sitting for the Leaving Certificate the unqualified are roughly half as likely to get a job when unemployed and are twice as likely to lose a job and become unemployed.

Chapter 5

GETTING A JOB: THE TRANSITION FROM UNEMPLOYMENT TO WORK

5.1 Introduction

In Chapter 3 we looked at how the economic status occupied by individuals at any particular point in time was related to their educational qualifications. In Chapter 4 we examined transitions between these statuses or states and how the probabilities of moving between states were related to educational qualifications. In this chapter and the next we want to go beyond this and ask how the relationships between educational qualifications and transition probabilities arise. For example: our analyses in Chapter 4 showed that the risk of moving from a job into unemployment was strongly linked to educational qualifications. Yet this finding itself raises a number of questions – most notably the question of why this should be so. It is difficult to see, for instance, why, once an individual is in a job, her educational qualifications should then figure in an employer's decision to fire her or in her own decision to leave the job and become unemployed. It seems more likely that the relationship is indirect: possibly those who lack qualifications are more likely to move from a job into unemployment because such young people can only find jobs which do not offer secure employment. In other words, the link between job loss and educational qualifications must be mediated via other factors. The analyses in this chapter and in Chapter 6 are directed towards determining what such mediating factors might be.

In the present chapter we will be dealing with the transition from unemployment into a job (job acquisition), while in Chapter 6 we deal with two transitions. These are job changing (the transition from a job to another job); and job loss, either voluntary or involuntary (transitions from a job into unemployment). In Chapter 7 we will focus on transitions into and out of state training and temporary employment schemes.

5.2 Factors Influencing Job Acquisition

What determines the likelihood of an individual in the youth labour market moving from unemployment into a job? A simple economic model can be used to try to capture the essential elements.

We assume that individuals who are unemployed are seeking a job. Job offers "arrive" (or are found) at a rate, r , and the probability that the job

will be accepted by the unemployed person is p . If r and p are constant then the likelihood of leaving unemployment to take up a job will also be constant throughout the individual's period of unemployment. In other words, his or her chances of getting a job will not be influenced by how long he or she has been out of work. The hazard rate for job acquisition will be equal to r multiplied by p , and the time spent in unemployment prior to getting a job will have an exponential distribution.

However, it may well not be plausible to suppose that either r or p are constant. This will depend upon what factors in turn determine the values taken by r and p . The rate of job offers is often seen as depending upon the intensity of an individual's job search, and we might expect this intensity to decline as unemployment becomes prolonged and the job seeker becomes discouraged. In addition, however, the likelihood of an employer offering a job seeker a job will probably also decline as the duration of the individual's current spell of unemployment increases. This is because, broadly speaking, employers appear to be reluctant to hire the long-term unemployed (see, for example, Breen and Halpin, 1989). Both these considerations suggest that r will probably decline with time.

We might also expect that people who are unemployed for a long time will, if they are offered jobs at all, receive offers of poorer jobs than will people who have a shorter duration of unemployment. If this is so then, all other things equal, their probability of accepting a job, p , will decrease because the jobs they are being offered are of diminishing quality. This may, however, be offset by the fact that, as an individual's spell of unemployment lengthens, he or she becomes less choosy about what kind of job to accept.

Overall, then, there are reasons for supposing that r will decline the longer a person is unemployed, while p will, at best, remain constant. The net result is that the hazard rate for job acquisition will be a function of, among other things, the length of time a person has already been unemployed. In fact, we should expect it to decline with time. Hence the further time that an unemployed individual can expect to spend in unemployment prior to getting a job will depend upon how long he or she has already been unemployed. In our case we model this by allowing the time spent prior to getting a job to have a Weibull distribution.

The Weibull distribution is an elaboration of the exponential, but it includes an extra parameter, a , which captures the effect of prior unemployment on the hazard rate for job acquisition.¹⁴ If $a > 1$ then we have

¹⁴ The hazard rate for an exponential distribution of waiting times is given by k , a constant whose value is a function of the explanatory variables in the model. For the Weibull the hazard rate is given by kat^{a-1} , where k is again a constant whose value depends on the explanatory variables, t is the length of time already elapsed in the state, and a is the coefficient of duration dependence.

positive duration dependence (the longer spent unemployed the more likely is an individual to get a job). In the case where $a=1$ the Weibull distribution (and thus hazard rate) collapses to the simpler exponential. This is equivalent to saying that prior unemployment has no effect. If $a < 1$ we have negative duration dependence: the likelihood of getting a job declines the longer someone has been unemployed. We anticipate a value of $a < 1$.

As well as assuming that time unemployed will affect the chances of escaping from unemployment we also expect that other factors will have an influence. We argue that three sorts of factor will play a role. These are:

(1) the educational qualifications of the individual. We expect these to have a direct influence on the likelihood of someone moving from unemployment to a job. Here the more qualified the individual the better the chance of acquiring a job.

(2) other (non-labour force) characteristics of the individual and his/her family circumstances. Under this heading we examine one measure. This is the effect on the transition from unemployment of whether or not the individual, at the time he or she was unemployed, was resident in Ireland or abroad. We should expect that this would influence the probability of the individual's obtaining a job. There are two reasons for this. First, such young people will not, by definition, be living with their parents and so will be called upon to meet the full costs of unemployment themselves (whereas young people living with their parents may, for example, not have to meet expenses such as rent). We anticipate that this should make them more likely to accept jobs offered to them. Secondly, the labour markets of the countries to which young people emigrated (chiefly the UK) were much tighter than the Irish labour market during the mid-1980s. On this basis too, therefore, we should expect emigrants to spend less time in unemployment.

(3) the labour force history of the individual. The individual's previous labour force history may play a role in determining his or her transition probabilities into a job from unemployment. This will be the case if employers use the job seeker's labour market record as a criterion in the hiring decision. We examine four measures that relate to the individual's labour force history prior to entering unemployment. These are the number of jobs the individual has had; the number of state training schemes (run by FÁS or CERT) which the individual had completed prior to entering unemployment; the number of state run temporary employment programmes the individual had completed prior to entering unemployment; and the labour force state that the individual occupied immediately prior to entering the unemployment spell in question.

The number of prior jobs may act as a proxy variable for various individual characteristics that cannot be measured directly. For example,

the accumulation of a large number of such spells may indicate that the individual is willing to accept jobs which do not offer particularly attractive career prospects and which might be refused by other jobs seekers.

A naïve view would suggest that the number of state schemes of training and temporary employment completed should reduce the likelihood of individuals moving into unemployment and may also increase the chance of them changing job. This is because, controlling for differences in educational qualifications, the accumulation of skills through such courses should make young people more attractive to employers who can offer them jobs which they prefer to their current job. But, in reality, the reverse may well be true. The number of such schemes completed will have a signalling function which may be more important than any considerations of the particular skills accumulated via participation. Given that most participants enter these programmes following a spell of unemployment (possibly because they believe themselves unlikely to find a job) having completed a large number of schemes may well be viewed with disfavour by employers.

The state occupied by the individual prior to the current spell of unemployment is included for a number of reasons. For example, if employers prefer to hire individuals who have some recent work experience then we should expect that those who become unemployed having been at work would have the best chance of leaving unemployment. Likewise, if state training and temporary employment schemes do confer some benefits on participants, then we should expect to see those who enter unemployment following participation in such a programme acquire a job more quickly than those who enter unemployment from another state.

5.3 Operationalisation of Factors

The foregoing factors were operationalised in a set of variables which are listed and explained in Table 5.1.

It is important to be aware of the relationship between, say, the number of prior jobs a person has had and whether or not that person was in a job immediately prior to the spell of unemployment. Clearly, all those who were in a job immediately prior to unemployment will have had at least one job and would therefore score at least one on the variable counting the number of jobs held (the reverse implication does not, of course, hold). Thus the effect on the expected duration of unemployment of whether or not a job was occupied prior to unemployment would equal the coefficient for the variable indicating whether or not a job was held prior to unemployment plus the coefficient for the variable measuring the total number of jobs held. This would make interpretation of the former coefficient quite awkward. The same difficulties arise in relation to all variables measuring the number

of times an economic state was entered and the variables indicating whether or not those states were occupied immediately prior to unemployment.

Table 5.1: *Variables Used in Analyses of Transitions out of Unemployment*

<i>(dv=dummy variable)</i>		
<i>Factor</i>	<i>Variable Name</i>	<i>Explanation</i>
Educational Qualifications:	G/IC	dv=1 if individual left school after sitting for Group and/or Inter Cert;
	LC+	dv=1 if individual left school after sitting for Leaving Cert;
		omitted category: school leavers who left before sitting for any public exam.
Non-Labour Force Characteristics:	AWAY	dv=1 if individual lives outside Ireland;
Labour Force History:	NSW	number of spells of work prior to entering the state occupied before unemployment;
	NST	number of spells on training programmes prior to entering the state occupied before unemployment;
	NTS	number of spells on temporary employment schemes prior to entering the state occupied before unemployment;
Previous Labour Force Status:	PJOB	dv=1 if status immediately prior to current was At Work;
	PTEMP	dv=1 if status immediately prior to current was state employment scheme;
	PTRAIN	dv=1 if status immediately prior to current was state training scheme;
	PNIL	dv=1 if status immediately prior to current was not in labour force;
		omitted category: previously in full time education.

To overcome these difficulties the variables which measure the number of times a specific economic state (such as a job or any training programme) has been entered since leaving school exclude both the present state (unemployment) and the state immediately preceding it. So, for example, the variable measuring the number of jobs held (NSW) measures the number of jobs held in the period between leaving school and up to, but not including, the state occupied prior to the spell of unemployment.

5.4 *Modelling Transitions out of Unemployment*

In estimating the effects of these various factors on the process of job acquisition we fitted event history models as described in Chapter 4. There we listed three constraints we imposed on the simple models we employed. In the present analysis we relaxed two of these constraints. First, we assumed that variables other than educational qualifications influence transition probabilities. The relevant variables are those listed in Table 5.1. Second, we relaxed the assumption of zero duration dependence. In other words, we allowed for the possibility that the length of time an individual is unemployed may itself have an effect on how likely he or she is to leave unemployment. We modelled this duration dependence by allowing the waiting times to a transition to have a Weibull distribution.

In all our analyses we began by fitting separate models for women and men and by fitting separate models in respect of each spell of unemployment. We then tested (using a likelihood ratio test) whether pooling different spells of unemployment (in other words, constraining all parameters to have the same value regardless of which spell of unemployment the individual was in) led to a significantly poorer fitting model. We carried out similar tests pooling men and women. In all cases we found that the pooled models fitted the data as well as the separate models. Hence the results we present in this chapter are based on the aggregation of all spells of unemployment and of men and women. We do, however, include in our analysis a dummy variable, SEX, distinguishing women (for whom SEX=1) from men (SEX=0).¹⁵

5.5 *Transitions from Unemployment into Work*

Table 5.2 shows the coefficient estimates for this transition. Those who leave school post-Leaving Certificate spend shorter periods unemployed than those who leave at any earlier time. Among the latter, those who leave post-Group/Intermediate Certificate have significantly shorter durations of unemployment than do the unqualified. Residing overseas appears to have no effect on unemployment durations, nor is there a difference in durations between men and women.

15. One reason for finding that we do not need to treat separate spells of unemployment (the first, second, third, and so on) separately in our analysis relates to the fact that the variables included in the model themselves change in value over time. In particular, by introducing variables relating to the history of previous states each individual has occupied, we have abandoned the Markov property that only the current state influences the probability of moving to another state. However, the inclusion of such variables means that any differences in expected duration of unemployment between specific spells of unemployment is due, in our model, to differences in the value of the variables – such as the number of jobs previously held – in each spell of unemployment.

The variables NSW, NST and NTS capture an individual's labour force history up to, but not including, the state occupied prior to unemployment. It is clear from Table 5.2 that these have an important effect on the likelihood of escaping from unemployment. Those who have had more jobs are more likely to find a job. The coefficient for the number of spells of training is also statistically significant, suggesting that having participated in training at some period in the past tends to help unemployed young people find a job.

Table 5.2: *Coefficient Estimates for Unemployment to Job (Job Acquisition) Model*

Number of Spells of Unemployment 1,428 Log-Likelihood -1,849.3			
<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>T-ratio (Sig.Lvl)</i>
ONE	3.58009	0.1250	28.643 (0.00000)
GIC	-0.340646	0.1228	-2.773 (0.00555)
LC	-0.718580	0.1199	-5.995 (0.00000)
SEX	-0.107409E-01	0.7871E-01	-0.136 (0.89145)
AWAY	-0.914981E-01	0.1686	-0.543 (0.58726)
NSW	-0.101391	0.4119E-01	-2.462 (0.01382)
NST	-0.189624	0.9502E-01	-1.996 (0.04597)
NTS	0.146925	0.9431E-01	1.558 (0.11926)
PJOB	-0.429606	0.9445E-01	-4.548 (0.00001)
PTEMP	-0.277953	0.1504	-1.849 (0.06452)
PTRAIN	-0.319506E-01	0.1697	-0.188 (0.85070)
PNIL	0.249335	0.1746	1.428 (0.15319)
Sigma	1.17737	0.3732E-01	31.551 (0.00000)
<i>Parameter</i>	<i>Estimate</i>	<i>Std. Error</i>	<i>Confidence Interval</i>
A	0.84935	0.02692	0.7966 to 0.9021

Percentage reduction in Log-Likelihood: 23

The final set of coefficients relate to the effect of prior state on the transition from unemployment to a job. These variables – PJOB, PTEMP, PTRAIN and PNIL – are all dummy variables whose effects are measured relative to the position of those who become unemployed following a period in full-time education. There is a very strong effect associated with having become unemployed following a job: such young people are substantially

more likely to get a job than are those who become unemployed following full-time education. This result, together with the significant coefficient for NSW, indicates that experience of work is an asset in acquiring a job (see Breen, 1986a, for further evidence). The coefficient for the variable PTEMP (indicating whether or not an individual became unemployed after a period on a temporary employment scheme) is almost statistically significant. This is suggestive of a positive effect on the chances of escaping from unemployment through getting a job. It is known that most young people who got jobs following temporary employment schemes did so by being retained by their sponsoring employer (see, for example, Breen, 1988). The result obtained here, however, indicates that even those young people who were not retained (or who were on schemes that did not involve placement on an employer's premises) may have been at an advantage in acquiring a job over young people who had just left school.

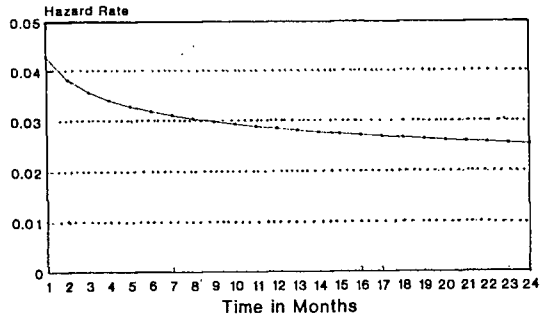
The final parameter to be discussed is α , the parameter that reflects the nature of time dependence in the model. Since this is less than unity ($=.84935$) it shows negative duration dependence. In other words, the longer a person is unemployed, the smaller his or her chance of getting a job. We demonstrate this effect graphically in Figure 5.1. Here we show, for the average member of our sample, the hazard rate for leaving unemployment for a job as it changes with the duration of unemployment. If the parameter $\alpha=1$ this line would be flat. In this case, however, it declines, showing the diminishing chances of leaving unemployment as the period of unemployment lengthens.

Figure 5.2 shows the impact of experience of work. If we take a number of people, all of whom become unemployed at the same time, then our parameter estimates allow us to estimate what proportion of them would still be unemployed at any given later points in time. Figure 5.2 shows this graphically, and the two lines both relate to the average member of our sample, but the higher line relates to those who became unemployed following full-time education (largely first job seekers) while the lower line relates to those who became unemployed following a job.¹⁶ Clearly, the group who become unemployed following a job escape from unemployment again much more quickly.

16. To be more specific: we evaluated the survivorship function at the mean value of all the variables except PJOB. We call this the mean value survivorship function. Our two lines in Figure 5.2 then refer to the mean value survivorship function with and without the addition of the effect of the coefficient PJOB.

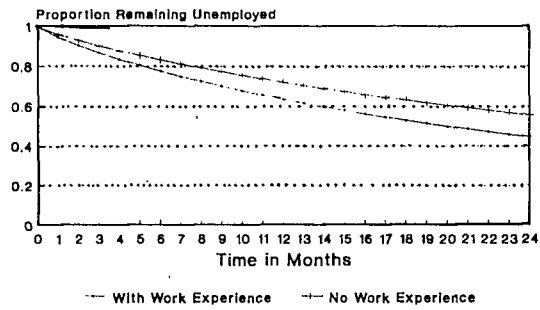
Hazard Rate for Job Acquisition Model

Figure 5.1



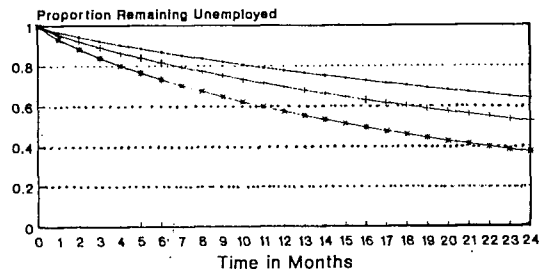
Proportion Remaining Unemployed According to Work Experience

Figure 5.2



Proportion Remaining Unemployed by Educational Qualifications

Figure 5.3



Lastly, Figure 5.3 shows the same thing in respect of those with different levels of educational qualifications. A higher level of qualifications leads to a quicker exit from unemployment. As time passes, the proportion of those with the Leaving Certificate who are still unemployed diminishes much more quickly than does the proportion who left post-Junior Cycle, which in turn diminishes more quickly than the proportion who lack qualifications.

5.6 *How Well Does the Model Fit?*

In conventional regression analyses it is usual to present a statistic (such as R^2) to indicate how well the model explains or accounts for the data. No such measures exist for event history models. However, at the foot of Table 5.2 we report the percentage reduction in the log-likelihood brought about by the model. This compares the log-likelihood for the sample as whole assuming a common expected duration of unemployment with that obtained when we allow the expected duration to be a function of the variables included in the model. Clearly, a 100 per cent reduction in the log-likelihood would indicate a perfectly fitting model. In this case our model explains 23 per cent of the log-likelihood. We also employ this measure in the analyses reported in the next chapter.

5.7 *Summary*

In this chapter we have used the event history approach to assess the effects of a number of factors on the transition from unemployment to a job. Another way of putting this is to say that we have examined the way in which various factors determine the length of time that people spend in unemployment before getting a job.

Our results suggest that employers use two basic criteria when deciding whether or not to hire a young person. These are educational qualifications and the young person's labour market record. Two aspects of labour market record seem to be particularly important. These are whether or not the young person has ever worked, and the length of time the young person has currently been unemployed.

Chapter 6

JOB CHANGING AND JOB LOSS

6.1 *Introduction*

In Chapter 5 we looked at the process of getting a job. In this chapter we turn to two aspects of employment – job changing (moving from one job to another job); and job loss, either voluntary or involuntary (transitions from a job into unemployment).

6.2 *Job Changing and Job Loss*

High rates of job changing have long been recognised as a characteristic of the youth labour market. While this is often attributed to the process of young people “settling down” into the world of work, much research has shown that it is among young unskilled workers that job changing – both directly from one job to another and via a spell of unemployment – is most prevalent. Within this group a core of “chronic job changers” (Casson, 1979, pp. 28-29; Clarke, 1980, p.10; OECD, 1980, p.63) accounts for a large proportion of all job changing. Young workers in jobs that offer the prospect of a career – in apprenticeships or white collar work – appear to be much less prone to change jobs.

The greater rates of job change among the unskilled can be attributed to several factors. The nature of the jobs that young people lacking skills and qualifications can acquire may itself be a cause of job change. Since such jobs offer no prospects of advancement and little intrinsic value, job changing will provide a means of escape from the undesirable aspects of such work. Furthermore, these jobs may themselves be insecure or temporary in nature, or may be located in industries which are particularly vulnerable to economic vicissitudes. This is in contrast to employment in areas such as the public sector, which is, for the most part, open only to those with educational qualifications.

In formulating our models of job changing and job loss we attempted, so far as possible, to take these issues into account. We used four sets of factors, as follows:

(1) the educational qualifications of the individual. These may well have a direct influence on, for example, the likelihood of moving from one job to another. Here the more qualified the individual the better the chance of

acquiring a better job and hence the more likely is the individual to move from one job to another. On the other hand (following our discussion in section one of Chapter 5) we should not expect educational qualifications to have any direct effect on the likelihood of leaving a job and becoming unemployed.

(2) other (non-labour force) characteristics of the individual and his/her family circumstances. Under this heading we examine, first, the effect on transitions of whether or not the individual, at the time he or she was occupying a particular state, was resident in Ireland or abroad. Given that most members of our sample resident abroad were in England, where, in the mid to late 1980s jobs were much more readily available than in Ireland, we should expect this measure to increase the likelihood of job changing. It may also act to reduce the probability of the individual's voluntarily leaving a job to become unemployed. This could occur in so far as individuals living abroad may not have acquired any entitlement to unemployment insurance or assistance pay if they become unemployed. Furthermore, they will not, by definition, be living with their parents and so will be called upon to meet the full costs of unemployment themselves, as noted in Chapter 5. In addition, in a more buoyant economy the chances of being made redundant should be lower.

The second item we examine is whether or not the individual in question got married during the time he or she was occupying a particular job. We expect that this would have little or no effect on the probability of job changing but marriage may act to reduce the likelihood of an individual giving up his or her job to become unemployed. The third variable we examine is whether or not the individual in question had a child during the time he or she held a particular job. We might expect the effects of this on the various transition probabilities to be similar to the effects of marriage.

(3) the labour force history of the individual. We employ four measures that relate to the individual's labour force history prior to entering the job, transitions out of which we are focusing on. These are the number of spells of unemployment the individual had experienced; the number of state training schemes (run by FÁS or CERT) which the individual had completed prior to entering the job; the number of state temporary employment schemes which the individual had completed prior to entering the job; and the labour force state that the individual occupied immediately prior to entering the job in question.

The number of prior spells of unemployment may act as a proxy variable for various individual characteristics that cannot be measured directly. For example, the accumulation of a large number of such spells may indicate

that the individual tends to experience difficulties in adjusting to the routine of work or that there are characteristics of the individual that make employers more likely to terminate his or her employment. This should be a significant variable in explaining transitions from jobs to unemployment. In addition, however, this variable may also act as a proxy for certain features of the individual's job which have not been measured directly. For example, individuals with poor employment records may be able only to obtain employment which is relatively unstable in the sense of having poor promotion prospects or offering very insecure tenure. On these bases, then, we should expect that the more spells of previous unemployment the individual has had the more likely he or she should be to seek to move to another (possibly better) job; and the more likely he or she would be to move from a job to unemployment.

Concerning the effect of the number of state schemes of training and temporary employment completed the same considerations apply as discussed in Chapter 5. That is to say, we might argue that more such schemes completed should reduce the likelihood of individuals moving into unemployment and may also increase the chance of them changing job. This arises because the accumulation of skills through such courses should make young people more attractive to employers who can offer them jobs which they prefer to their current job. However, this would be a rather naïve view. Employers are likely to look with some suspicion on a labour market record that includes participation in a number of such schemes. They are likely to view it as indicative of a young person's inability to secure a permanent job or, possibly, to settle into a particular line of work. On this basis, then, we might anticipate that this variable would reduce the chances of job changing. It is not clear whether it would have any direct influence on the likelihood of becoming unemployed.

The state occupied by the individual prior to having a job is included chiefly because it may act as a proxy variable for the kind of job an individual occupies. If, for example, employers tend to prefer to hire employees who are currently employed, rather than hiring from among the unemployed, then the better jobs (in the senses discussed earlier) will go to those whose previous state was At Work. Those whose previous state was Unemployed may then be expected to have a higher chance of becoming unemployed again.

(4) characteristics of the individual's job. We have suggested that certain variables may act as proxies for unmeasured characteristics of the jobs occupied by individuals. However, we also have a number of direct measures of the nature of the job occupied by individuals. These are: the individual's earnings in the job; whether or not the individual was

receiving training as part of the job; and the individual's occupation.

Earnings seem likely to influence transitions out of a job in two ways. First, individuals are less likely to voluntarily leave a job which pays well. Second, the rate of pay may again act as a proxy variable for other aspects of the job – notably the stability or security of employment. Hence for this reason too, high wages are likely to be linked to low transitions rates out of a job.

The effect of on-the-job training on rates of leaving a job is more difficult to predict. On the one hand, jobs which offer training are likely to be more stable and secure, which should reduce the transition rate into unemployment. Similarly, young people may be less likely to leave a job if it affords training since this may be indicative of promotion possibilities. On the other hand, providing training to employees may make them more marketable and increase their chances of acquiring a better job. We are therefore unable to make any prediction about the direction of the effect of such training on transitions from one job to another.

Lastly, occupation is likely to be a very important determinant of transitions from a job to either another job or to unemployment. Occupation is our best available measure of the overall quality of a job. We hypothesise that occupations can, broadly speaking, be dichotomised into those that offer stable employment and those that do not. The former comprise employment in family businesses (chiefly farms), professional, managerial and higher white collar jobs. The latter comprise lower white collar jobs, such as clerical workers, typists, etc.; non-manual jobs such as those in personal services; and all manual occupations (skilled, semi-skilled or unskilled). Within each of these categories some occupations will be more unstable than others (unskilled manual work is likely to offer less secure employment than, say, skilled manual work), but this dichotomy provides a useful starting point. Broadly speaking we should expect higher transition rates (into other jobs and into unemployment) from occupations in the latter category than in the former. In itself, of course, this is a fairly crude categorisation of occupations. It makes no distinction between, for example, large multinational manufacturing and small indigenous firms, or firms which are unionised and those which are not. However, taking the occupation variable together with our measures of earnings and whether or not training is given does, in fact, allow us to discriminate quite finely between occupations of different "quality".

6.3 Operationalisation of Factors

The foregoing factors were operationalised in a set of variables which are listed and explained in Table 6.1. The occupational categories which we use are based on those employed by the census, and the correspondence

Table 6.1: *Variables Used in Analyses of Transitions out of Jobs*

<i>(dv=dummy variable)</i>		
<i>Factor</i>	<i>Variable Name</i>	<i>Explanation</i>
Educational Qualifications:	G/IC	dv=1 if individual left school after sitting for Group and/or Inter Cert;
	LC+	dv=1 if individual left school after sitting for Leaving Cert;
		omitted category: school leavers who left before sitting for any public exam.
Non-Labour Force Characteristics:	AWAY	dv=1 if individual lives outside Ireland;
	MARRIED	dv=1 if individual got married during time spent in current status;
	CHILD	dv=1 if individual had child during time spent in current status;
Labour Force History:	NSU	number of spells of unemployment prior to entering the state occupied before the job;
	NST	number of training programmes completed prior to entering the state occupied before the job;
	NTS	number of temporary employment programmes completed prior to entering the state occupied before the job;
Previous Labour Force Status:	PUNEM	dv=1 if status immediately prior to current was unemployment;
	PJOB	dv=1 if status immediately prior to current was At Work;
	PTEMP	dv=1 if status immediately prior to current was state employment scheme;
	PTRAIN	dv=1 if status immediately prior to current was state training scheme;
	PNIL	dv=1 if status immediately prior to current was not in labour force;
		omitted category: previously in full-time education.
Job Characteristics:	LEARN	logarithm of gross weekly earnings;
	OJT	dv=1 if individual is receiving training on the job;
Occupation:	HNM	dv=1 if individual in higher non-manual occupation;
	SALEMP	dv=1 if individual is salaried employee;
	INM	dv=1 if individual is in lower white collar occupation;
	ONM	dv=1 if individual is in routine non-manual job;
	SMAN	dv=1 if individual is in skilled manual job;
	SSMAN	dv=1 if individual is in semi-skilled manual job;
	USMAN	dv=1 if individual is in unskilled manual job;
		omitted category: individuals in agricultural occupations.

between the two is shown in Table 6.2. Note that, once again, the variables counting the number of times a state has been entered (i.e., NSW, NTS, NST) count only up to, and not including, the state occupied prior to the current job.

6.4 *Modelling Transitions out of Employment*

In estimating the effects of these various factors on transitions made by individuals between states, we fitted event history models as described in Chapter 4. As in Chapter 5 we now assume that variables other than educational qualifications influence transition probabilities. The relevant variables are those listed in Table 6.1. Secondly, we relaxed the assumption of zero duration dependence. In other words, we allowed for the possibility that the length of time an individual is in a job may itself have an effect on how likely he or she is to leave that job. Once again we modelled this duration dependence by allowing the waiting times to a transition to have a Weibull distribution. Our expectation was that we should find negative duration dependence: in other words, the longer someone occupied a job the less likely s/he would be either to move to another job or to become unemployed. This would imply a value for our coefficient, a , which would be <1 .

Table 6.2: *Correspondence between Occupational Groupings and Census Socio-economic Occupational Groupings*

<i>Census Category</i>	<i>Our Category</i>
0. Farmers, Farmers' Relatives, Farm Managers.	FARM
1. Other Agricultural Occupns.	
2. Higher Professional.	} HNM
3. Lower Professional.	
4. Self-Employed - Employs Others - and Managers.	
5. Salaried Employees	SALEMP
6. Intermediate Non-Manual.	INM
7. Other Non-Manual.	ONM
8. Skilled Manual.	SMAN
9. Semi-Skilled Manual.	SSMAN
10. Unskilled Manual.	USMAN

As with the analyses in Chapter 5 we began by fitting separate models for women and men and by fitting separate models in respect of each spell of employment. We then tested (using a likelihood ratio test) whether pooling different spells of employment (in other words, constraining all parameters to have the same value regardless of which job the individual was in) led to a significantly poorer fitting model. We carried out similar tests pooling men and women. In all cases we found that the pooled models fitted the data as well as the separate models. Hence the results we present in this chapter are based on the aggregation of all jobs and of men and women. We do, however, include in our analysis a dummy variable, SEX, distinguishing women (for whom SEX=1) from men (SEX=0).

6.5 *Job Changing*

The coefficient estimates for the job changing model are given in Table 6.3. Young people who left school after sitting for the Group or Intermediate Certificate are much more likely to change jobs than are those who lack qualifications. Similarly, those who left after sitting for the Leaving Certificate are yet more likely to change jobs. Young people are more likely to remain in a given job the higher the wage it pays. The coefficient for on-the-job training, although not statistically significant, suggests that on-the-job training may, all other things being equal, induce young people to remain longer in a job than they otherwise would.

It is noticeable that girls are less likely to change jobs than boys, and those who get married during their time in a job are more likely to remain in that job. This effect may arise because marriage induces stability. In other cases (and possibly more plausibly) it may be that individuals postpone marriage until they have acquired a job with which they are satisfied – in terms of the income and prospects it provides. There is no evidence, in our results, that living overseas or having a child has any clear impact on how long a young person will stay in a job.

Nor is there any clear effect of previous state on duration in a job. Here the variables PUNEM, PJOB, and so on are measured with reference to those who enter a job directly from full-time education. The coefficient for PTEMP falls slightly short of significance, suggesting that those who enter a temporary employment scheme may tend to change job more quickly than those who enter from another job. There is no statistically significant evidence that the previous number of spells of unemployment, training or temporary employment programmes influence the time spent in a job before moving to another.

It is when we turn to the occupation entered that we see a clear effect on the likelihood of changing job. The impact of each occupation on the

instantaneous risk of changing job is measured relative to agricultural occupations. The latter tend, of course, to be extremely stable, since most entrants to agriculture work on the home farm. Thus we should expect all other occupations to demonstrate higher rates of job change, and thus to have negative coefficients in Table 6.3. This is, in fact, what we find, with the exception of salaried employees, whose coefficient is not significantly different from zero. This means that the propensity to change jobs of young people in these occupations is no greater than that of young people in farm work. Otherwise, we see a clear hierarchy of occupations. Ranked in order

Table 6.3: *Coefficient Estimates for Job Changing Model*

	Number of Jobs Log-Likelihood		1,824 -1,205.3
<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>T-ratio (Sig.Lvl)</i>
ONE	1.28333	0.3657	3.510 (0.00045)
GIC	-0.423288	0.1936	-2.187 (0.02874)
LC	-0.616381	0.1937	-3.182 (0.00146)
SEX	0.267468	0.9833E-01	2.720 (0.00653)
AWAY	0.260079	0.1936	1.343 (0.17916)
MARRIED	2.72510	0.6809	4.002 (0.00006)
CHILD	-1.28478	0.6743	-1.905 (0.05673)
PUNEM	-0.117105	0.1447	-0.809 (0.41832)
PJOB	-0.241804	0.1465	-1.650 (0.09889)
PTEMP	-0.345350	0.1842	-1.875 (0.06082)
PTRAIN	-0.364005	0.2558	-1.423 (0.15477)
PNIL	0.282131E-01	0.1530	0.184 (0.85368)
NSU	-0.802436E-01	0.8001E-01	-1.003 (0.31591)
NST	0.371297E-01	0.1276	0.291 (0.77101)
NTS	-0.177007	0.1030	-1.719 (0.08565)
LEARN	1.16848	0.8651E-01	13.507 (0.00000)
OJT	0.170515	0.1053	1.619 (0.10546)
HNM	-1.12096	0.2985	-3.756 (0.00017)
SALEMP	0.184302	0.5088	0.362 (0.71721)
INM	-1.59604	0.2496	-6.395 (0.00000)
ONM	-1.28455	0.2539	-5.060 (0.00000)
SMAN	-1.09359	0.2592	-4.219 (0.00002)
SSMAN	-1.45896	0.2901	-5.030 (0.00000)
USMAN	-1.75494	0.2847	-6.165 (0.00000)
Sigma	0.895665	0.3637E-01	24.628 (0.00000)
Parameter	Estimate	Std. Error	Confidence Interval
A	1.11649	0.04533	1.0276 to 1.2053

Percentage reduction in log-likelihood: 59

of increasing likelihood of job changing these are skilled manual and higher non-manual; followed by other non-manual; semi-skilled manual; intermediate non-manual; and, lastly, unskilled manual. The greater propensity to change jobs occurs in occupations which we earlier suggested were less likely to offer stable employment and clear career paths.

Finally, we turn to the parameter α , which measures the change in the instantaneous risk of job changing as the length of time spent in the current job increases. We see, in Table 6.3, that this parameter is >1 . This indicates that the longer an individual spends in a job the more likely he or she is to leave it for another job. This effect is shown graphically in Figure 6.1, where we see that the hazard rate (the instantaneous risk of changing job) grows quickly over the first few months of employment, then begins to flatten out somewhat. This shows a tendency for young people to have quite short-lived jobs (6 months and less) and also probably reflects the fact that many people who enter jobs in the youth labour market do so in the knowledge and expectation that they are not going to remain in these jobs for more than a few years at most.

6.6 *Transitions from Work to Unemployment*

The coefficient estimates for this transition are given in Table 6.4. We label this transition "job loss" for short: this also reflects the fact that the majority of such transitions are likely to have been involuntary rather than voluntary.

In contrast to our simpler analyses in Chapter 4, once we control for job characteristics and labour force history and so forth, educational qualifications no longer have a direct effect on the chances of losing a job. What appear to be important are, by and large, the nature of the job and the labour force history of the individual. Jobs which pay higher wages are less likely to be lost. In this context we might view earnings as a proxy for the quality of job: a high rate of pay implying reasonably secure employment. Young people in our sample also display unemployment proneness: that is to say, the more spells of unemployment the individual has had the more likely he or she is to lose his or her job. In addition, those who entered the job from unemployment are more likely to become unemployed again. We suggest two (not mutually exclusive) interpretations of these results. First, measures of the individual's labour force history may be acting as a proxy for personal characteristics. These results seem to indicate that there are aspects of individuals' character, ability or skills that make them more susceptible to job loss than others. Second, it may be that individuals' labour force history acts as a proxy for the type of job they can secure. In other words, those who have histories of

Figure 6.1

Hazard Rate for Job Changing

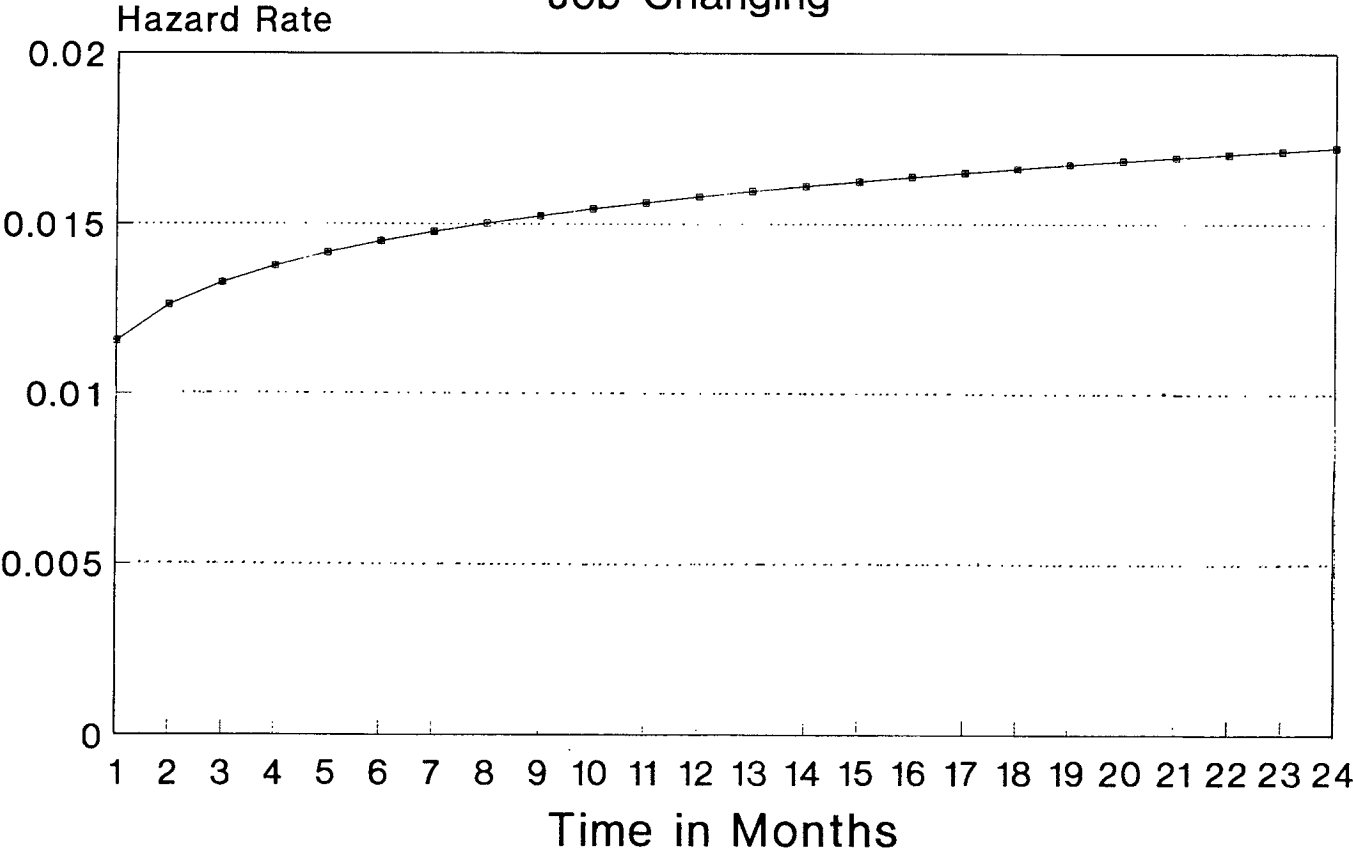


Table 6.4: *Coefficients for Job to Unemployment Model*

<i>Variable</i>	Number of Jobs Log-Likelihood		1,824 -1,494.8
	<i>Coefficient</i>	<i>Std. Error</i>	<i>T-ratio (Sig.Lvl)</i>
ONE	1.37731	0.4219	3.265 (0.00110)
GIC	0.120848	0.1455	0.831 (0.40606)
LC	0.269512	0.1474	1.828 (0.06752)
SEX	0.287278E-01	0.9924E-01	0.289 (0.77221)
AWAY	0.584532	0.2087	2.800 (0.00511)
MARRIED	1.28748	0.4669	2.758 (0.00582)
CHILD	-0.152548	0.5277	-0.289 (0.77253)
PUNEM	-0.938787	0.1445	-6.495 (0.00000)
PJOB	-0.215450	0.1795	-1.200 (0.23015)
PTEMP	-0.218253	0.2144	-1.018 (0.30870)
Ptrain	-0.748182	0.2120	-3.529 (0.00042)
PNIL	-0.160151	0.1656	-0.967 (0.33344)
NSU	-0.218366	0.6540E-01	-3.339 (0.00084)
NST	0.122140	0.1273	0.960 (0.33717)
NTS	0.140806	0.1091	1.291 (0.19680)
LEARN	1.03720	0.9578E-01	10.829 (0.00000)
OJT	0.875138E-01	0.1001	0.874 (0.38193)
HNM	-0.637585	0.3099	-2.058 (0.03963)
SALEMP	-0.471344E-02	0.4477	-0.011 (0.99160)
INM	-1.33354	0.2462	-5.417 (0.00000)
ONM	-1.06619	0.2507	-4.253 (0.00002)
SMAN	-1.08820	0.2559	-4.252 (0.00002)
SSMAN	-1.35457	0.2775	-4.881 (0.00000)
USMAN	-1.88194	0.2691	-6.993 (0.00000)

Percentage reduction in log-likelihood: 49

unemployment can only secure jobs which in themselves are unstable and unlikely to provide secure employment.

Direct measures of the type of job show the pattern we anticipated: namely that the transition into unemployment is significantly more likely from jobs in the other non-manual and skilled manual categories and very much more likely from jobs in the categories intermediate non manual, semi-skilled manual and unskilled manual.

Those young people who enter a job directly from a training programme are significantly more likely to become unemployed again than are those who enter a job directly from another job. Hence, although, as we show in Chapter 7, young people on training programmes are more likely to get jobs than are the unemployed, these results seem to suggest that training does not confer any advantage in retaining a job. This is something we will return to in the concluding chapter.

Lastly, living outside Ireland and getting married during the tenure in a job both reduce the likelihood of losing a job. In the first case this may be because, to a large extent, young people will only be persuaded to leave home if they have the offer of a stable job; or because the more favourable labour markets to which young people move are likely to offer more stable employment. In the second case the most plausible explanation is that which we advanced before, namely that individuals postpone marriage until they have acquired a stable job.

Table 6.4 reports no value for the coefficient α . This is because we were unable to reject the hypothesis that the true value of α was 1. This indicates that waiting times to losing a job follow an exponential rather than a Weibull distribution. In other words, the length of time that a young person occupies a job has no effect on how likely he or she is to leave or lose it and become unemployed.

6.7 Summary

In this chapter we have used the event history approach to assess the effects of a number of factors on job changing and on transitions between jobs. Our results can be summarised as follows.

Job Changing: Our results here indicate two sets of variables linked with job changing. On the one hand, well qualified individuals, who have entered a job directly from another job, are likely to spend a shorter period in the job (i.e., are likely to change jobs more frequently) than those who are less well qualified. On the other hand, job changing rates are high in jobs which offer low pay and which are themselves relatively unstable and insecure.

We hypothesise that these two sets of variables may be associated with two different processes of job change. One, at what we might term the top end of the market, comprises relatively well qualified young people pursuing upward mobility into better jobs, through largely voluntary job transitions. At the other end of the market are young people seeking to escape from poor quality jobs into better ones via voluntary job change but also being obliged to seek other employment by virtue of being in jobs which are insecure or unstable.

Job Loss: Here the pattern is clearer. Higher probabilities of job loss can be linked to poor quality (low pay, insecure) jobs and are found among individuals who have poor employment or labour market records. Educational qualifications play no direct role.

If we use these results, together with those from Chapter 5 relating to job acquisition, to examine transitions between work and unemployment –

in both directions – then we begin to see the outline of a cyclical process that explains the central result of Chapter 3 – namely that, not alone do educational qualifications have a long-term effect in determining labour market status, but labour market differentials, as between those with different levels of educational qualifications, widen through time. Early labour market experiences are shaped very much on the basis of educational qualifications. For example, we have already seen that the time spent seeking a first job is strongly related to this. Education and early labour market history thus influence the duration of unemployment and also the kind of job the individual acquires. The latter, however, is also important in determining how long an individual holds onto a job before becoming unemployed again. Hence it helps shape the individual's labour market history, which in turn helps determine how long he or she will spend unemployed and what sort of job he or she will eventually get, and so on. Of course such a process is not deterministic. Rather, educational qualifications are linked to the probability of entering this feedback cycle of poor labour market histories leading to poor jobs leading to poorer labour market histories, and so on. Young people without educational qualifications can escape this cycle – but they are unlikely to without some form of intervention in the labour market. It is to this issue that we turn in the next chapter.

Chapter 7

ASSESSING THE EFFECTIVENESS OF TRAINING AND TEMPORARY EMPLOYMENT SCHEMES

7.1 Introduction

In common with most other western European countries, Ireland responded to the rise in unemployment during the 1970s and early 1980s by expanding the provision of training and temporary employment programmes for the unemployed. In this chapter we attempt to estimate the degree to which some of these programmes were effective during the mid-1980s in improving the chances of unemployed young people finding work. Specifically, we have two main objectives in this chapter. First, we have seen that labour market differentials linked to educational qualifications appear to widen as time passes. It is reasonable, therefore, to ask how effective are post-school programmes and qualifications in shaping labour market position. Implicit in this is the further query: can the disadvantages associated with a lack of school qualifications be overcome or counteracted by the use of post-school training and temporary employment schemes? Our second objective in this chapter is to look at how the effectiveness of such programmes should be measured. At present, FÁS, the national training agency, reports only simple placement rates – that is, the percentage of participants in a programme who obtain jobs on the programme’s completion. In this chapter we show that this is not a measure of effectiveness, and we outline various ways of measuring effectiveness. The concluding section of the chapter compares the different conclusions that follow from the use of different kinds of effectiveness measure.

7.2 Background

During the 1960s and early 1970s the role of manpower policy in Ireland was seen to lie in training the labour force (and retraining those sections of it leaving the declining traditional industries) and generally facilitating the efficient matching of the supply of, and demand for, labour. These aims were consistent with the then current ideas of an “active manpower policy” as advocated by the OECD in the mid-1960s. This policy in turn arose out of a European climate of full employment and economic growth.

In the mid-1970s the role of manpower policy was widened. Growth in unemployment led, initially, to the introduction of a range of schemes whose main rationale was the provision of temporary jobs. So, in 1975 AnCO introduced the Community Youth Training Programme (CYTP). In the same year the Premium Employment Programme was introduced by the Department of Labour. This was a job-subsidy scheme to encourage recruitment. In the following year the Environmental Improvement Scheme, run by the Department of the Environment was set up, and in 1977 the Department of Education's Temporary Grant Scheme for Youth Employment came into operation. These latter two – the Environmental Improvements Scheme and the Temporary Grant Scheme for Youth Employment – were both temporary employment programmes for young people. One of the most important of temporary employment schemes – the Work Experience Programme – was established in 1978.

The focus on temporary employment schemes arose because, during the mid-1970s, the employment crisis was held to be a temporary phenomenon. This view can be found in official reports and plans of the time. The Coalition governments's White Paper *Economic and Social Development 1976-1980*, for example, coupled a call for the maintenance of cost competitiveness via wage restraint with expressions of optimism that the economy's difficulties would be only temporary. At the end of the 1970s and into the 1980s, when the invalidity of this view became apparent, there was a discernible shift towards an expansion of training.

Initially, AnCO had been given responsibility for three areas of training – apprenticeship; in-firm training; and non-apprenticeship adult training. From the mid-1970s and subsequently this third strand came to take on an increasing importance: it became, in effect, training for the unemployed. Initially, non-apprenticeship adult training had been a relatively minor part of AnCO's activities, and all such training was undertaken directly by AnCO itself. However, as provision in this area increased, AnCO began to use the services of outsiders who were contracted to provide specific adult training courses. Thus there developed "external" training, alongside direct training by AnCO. The growth of AnCO adult non-apprenticeship training is charted in Table 7.1. It is clear from this table that there exists a strong correlation between the size of the unemployment problem and the provision of training.

While training provision for the unemployed continued to grow during the 1980s, increasing unemployment, and the need for governments to be seen to be "doing something" about the problem, led to a resurgence of temporary employment schemes, notably in the form of the introduction of the Social Employment Scheme in 1985.

Table 7.1: *Numbers Trained Annually on AnCO Non-Apprenticeship Training Programmes*

<i>Year</i>	<i>Training Centres</i>	<i>External Training</i>	<i>CYTP</i>	<i>Other Workshops</i>	<i>Total</i>
1970/71	1,113	0	0	0	1,113
1975	5,302	1,415	0	0	6,717
1980	7,546	3,430	2,071	914	13,961
1984	16,717	9,771	5,567	3,279	35,335
1987	16,893	7,207	4,021	3,646	31,767

Source: AnCO Annual Reports, various

The Objectives of Training and Temporary Employment Schemes

This chapter focuses on training and temporary employment schemes. Since virtually all of these are provided for the unemployed it is reasonable to assume that helping them to get a job is a major objective of such schemes¹⁷. Of course, it may not be the only objective. The immediate aim of many FÁS courses is to provide individuals with specific skills. However, if these individuals cannot then obtain jobs one might legitimately question the effectiveness or suitability of the programmes. In addition, most of those, in our sample, who entered training programmes or temporary employment schemes did so from unemployment. One can readily conclude, therefore, that such young people are motivated to enter in the expectation that participation will improve their chances of escaping from unemployment.

The degree to which such schemes improve the labour market position of participants can only be measured relative to what participants' positions would have been if they had not participated. So, conventional measures of "effectiveness", such as the percentage of participants who get jobs after finishing a programme, are not proper measures of effectiveness, because they neglect the issue of how many of these participants would have got jobs even if they had never participated. To give an example: in some work we did on the now defunct Work Experience Programme (Breen, 1988) we estimated that, although over two-thirds of participants got jobs after participating, roughly this proportion of them would have got jobs even if they had not participated. Thus the effectiveness of the scheme was much less than its placement rate might have suggested.

17. Even if former participants acquire jobs after training we should like to know the degree to which they made use of their newly acquired skills. This, and related issues such as the impact of training on earnings, is a question we cannot pursue here.

7.3 *Aims of Analysis*

Our aim in this chapter is to assess the effectiveness of training and temporary employment programmes in improving participants' chances of getting a job. By training programmes we mean all non-apprenticeship courses of not more than six months' duration: in other words, this includes all courses that fall under the heading of FÁS (formerly AnCO) adult training. Temporary employment schemes refer chiefly to the Work Experience Programme and Teamwork.

We use two measures of the effectiveness of such programmes in helping young people to acquire jobs. The first of these is a measure of short-term effect, based on the probability of acquiring a job immediately following participation on a programme. The second is a longer-term measure, based on the probability of a former participant being in a job just under one year after participation ended. We do not confine ourselves to participants who completed such programmes: those who left without completing are included in the analyses. A small percentage of participants (10 per cent in our data) entered a programme directly from a job and, since we shall be making comparisons between participants and the unemployed, we exclude them from our analyses.

As outlined earlier, the effectiveness of a programme in securing some objective (such as improving the chances of participants getting a job), should be measured as an incremental effect. In other words, how much does the programme increase the likelihood of participants' getting a job *above what it would have been had they not participated?* So to assess effectiveness in this way we require more than merely placement rates: we also need some estimate of what would have happened under the counterfactual assumption. There are various ways in which we can try to make this latter estimate, but in this chapter we do so by comparing what happened to a sample of people on training and temporary employment programmes with what happened to a sample of unemployed people who did not participate in any programme. The issue on which the correctness of this type of evaluation depends is whether or not this yields an accurate estimate of the outcome under the counterfactual scenario. This is something we discuss later. Before that, however, we outline the mechanics of our analysis.

(a) Training

We began by drawing seven samples of participants in training, defined as follows. The first sample comprised all those who were on a training programme in December 1983. The second comprised all those on a training programme in June 1984. The third through to seventh groups

were defined similarly in respect of June and December of each year to December 1986. We refer to these dates, for convenience, as our "sampling dates". The choice of six monthly intervals ensured that an individual would not be included in two samples in respect of the same period of training¹⁸. We terminated the sampling in December 1986 because the level of participation in training after this date by members of the cohort was negligible. As well as these participant groups we also drew a corresponding set of seven samples of what we term comparison groups: these were all individuals who were unemployed or seeking a first job at each of these dates. Essentially our analysis comprises a comparison of the fortunes of the members of the seven participant and seven comparison groups.

(b) Temporary employment

The set-up was essentially the same for temporary employment schemes, except that here we drew four annual samples (rather than seven semi-annual) of all participants at December 1983, 1984, 1985 and 1986, and corresponding comparison groups of the unemployed. This was necessitated by the longer duration of temporary employment programmes.

While there are a number of ways in which we could analyse these data, we adopted what is probably the simplest method to measure the long- and short-term effectiveness of training.

(i) Short-term effectiveness. Here our dependent variable was, of necessity, defined slightly differently for members of the participant and comparison groups. For members of the participant group it measured whether or not they entered a job immediately after leaving training or a temporary employment scheme. For members of the comparison group it measured whether or not they were in a job t months after the sampling date, where t is the average time remaining, at the sampling date, on the programme among the participant group. For example, consider the sample in training in December 1985 and the comparison group of individuals unemployed in December 1985. The former score 1 on the dependent variable if the state they entered after training was a job, 0 otherwise. At December 1985 the participants would have been on schemes of varying length, and would each have already participated for some period before December 1985. For this group we calculated the average period which they spent on the programmes after December 1985. This latter is our measure t . The members of the comparison group then scored 1 on the

18. Though an individual could, of course, be included in more than one sample in respect of different spells of training. There are no cases of this in our data.

dependent variable if they were in a job t months after December 1985, 0 otherwise. In other words, the comparison is between the probability of getting a job after training and the probability of an unemployed person getting a job within the same time period.

(ii) Long-term effectiveness. Here the dependent variable was constructed in the same way for participant and comparison groups: 1 if they were in a job one year after the initial observation date (i.e. December 1986 for those on a programme or unemployed in December 1985), 0 otherwise. We excluded from this analysis any members of the comparison groups who themselves entered and left a programme during this one year interval.

7.4 Aggregation

The data on which these analyses were carried out were not collected specifically for the purpose of evaluating training and temporary schemes. As a result they are not ideal for this exercise. In particular, the numbers participating in training and temporary employment schemes are quite small, as Table 7.2 shows. This meant that we were unable to analyse specific programmes individually. In addition the small number of participants also meant that, at each sampling date, the numbers in the participant groups were small. To overcome this we have aggregated the seven training participant samples taken at each date into one sample, and likewise for the four temporary employment scheme samples and the corresponding comparison groups. Thus the participant and comparison groups are not samples of individuals but samples of spells spent in training, temporary employment or unemployment, and each individual can, in theory at least, contribute more than one spell to each sample as well as appearing in more than one sample.

Table 7.2: *Sample Numbers Participating in Training and Temporary Employment Programmes*

Training	122
Temporary Employment	272
Comparison Group	1,562

7.5 Methodological Issues

As we have set up the analysis, we measure effectiveness not by the percentage of the participant group in jobs either immediately or one year after participation, but by the difference in the percentage of participants in jobs and the percentage of the comparison groups in jobs. Essentially, then, the comparison group is being used to tell us what would have happened to participants if they had not participated.

This identification of what happens to the comparison group with what would have happened to participants had they not participated is (relatively) unproblematic if individuals can be randomly assigned to either the participant or comparison group – in which case we should refer to the latter as a control group. This is the usual strategy adopted in controlled experiments – to evaluate the effectiveness of a new drug, for example. This approach has been followed in evaluating some manpower measures in the United States (e.g., Lalonde, 1986) though, as one might imagine, it is politically unpopular and difficult to do. It is more usually the case that participants and comparison group members are not randomly assigned. This leads to two difficulties. First, the two groups may, on average, differ in respect of characteristics which have a bearing on the outcome measure. In our case, there may be differences between the two groups according to, say, their educational qualifications, which will have a bearing on the probability of their acquiring a job. This means that it is not sufficient simply to compare the percentages getting a job among the two groups: we need information on how the two groups differ in respect of characteristics which also have a bearing on the likelihood of getting a job, and we need to take this into account in our analysis. The second problem is that we may not have measured all such relevant characteristics. For example, among the unemployed it may be those who are, in some broad sense, “better motivated” who participate in programmes. But such motivation may also be an asset in finding a job. If we have not measured this in some way then we will overestimate the effectiveness of the programme because we will be counting the effect of motivation as an effect of the programme.

Overcoming the first of the two difficulties is straightforward; overcoming the second is not, and has led to a great deal of debate and empirical work, particularly in the United States. This began in the 1970s with the work of Heckman (1979) and others, who devised estimators of programme effectiveness which purported to take account of the effect of possible omitted variables such as motivation. A range of methods now exists for this purpose (see, for example, Heckman, Hotz and Dabos, 1987; Heckman and Hotz, 1989) and we make use of some of them later in this chapter.

In the remainder of this chapter we present our estimates of effectiveness, controlling for observed differences between members of the participant and comparison groups, and we test whether or not omitted variables are likely to have biased our results.

7.6 Participation in Programmes

Tables 7.3A and 7.3B show the parameter estimates from a logit regression of the probability of being in a training programme at any of

the seven sampling dates. Note that this is the probability of being on a programme, rather than unemployed, at any particular point in time, and is thus not the same thing as the probability of entering a programme. We express this probability as a function of a set of independent variables defined as follows.

GIC: a dummy variable; 1 if individual left school after sitting for the Group or Intermediate Certificate; 0 otherwise;

Table 7.3A: *Log-Odds of Participating in Training at Sampling Date: Men*

Log-Likelihood -130.87 Restricted (Slopes=0) Log-L -188.10 Chi-Squared 114.46 Degrees of Freedom 8 Significance Level 0.32173E-13			
<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>T-ratio (Sig.Lvl)</i>
ONE	-12.9790	142.4	-0.091 (0.92739)
GIC	12.3667	142.4	0.087 (0.93080)
LC	11.7614	142.4	0.083 (0.93418)
PREDUR	0.554597E-01	0.5003E-01	1.109 (0.26764)
MILF	-0.212872	0.4273E-01	-4.981 (0.00000)
NSW	-0.902745E-01	0.3519	-0.257 (0.79754)
NSU	2.28847	0.3686	6.208 (0.00000)
NST	-0.821294E-01	0.3945	-0.208 (0.83507)
NTS	-2.32020	0.9002	-2.577 (0.00996)

Table 7.3B: *Log-Odds of Participating in Training at Sampling Date: Women*

Log-Likelihood -166.68 Restricted (Slopes=0) Log-L -230.50 Chi-Squared 127.62 Degrees of Freedom 8 Significance Level 0.32173E-13			
<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>T-ratio (Sig.Lvl)</i>
ONE	-3.20454	0.7793	-4.112 (0.00004)
GIC	1.30308	0.7921	1.645 (0.09993)
LC	2.33735	0.7520	3.108 (0.00188)
PREDUR	0.677762E-01	0.3226E-01	2.101 (0.03565)
MILF	-0.132504	0.2872E-01	-4.613 (0.00000)
NSW	-1.30543	0.3379	-3.864 (0.00011)
NSU	1.83272	0.2903	6.313 (0.00000)
NST	-1.36266	0.5300	-2.571 (0.01014)
NTS	0.761263	0.4153	1.833 (0.06680)

LC: a dummy variable; 1 if individual left school after sitting for the Leaving Certificate; 0 otherwise;

PREDUR: in the case of the comparison group this is measured as the duration of unemployment (in months) prior to the sampling date. For the participant group it is measured as the duration of unemployment (in months) prior to entry to the programme plus (for those who were unemployed prior to entry to the programme) the time spent on the programme;

MILF: months in the labour force prior to the sampling date;

NSW: number of jobs (spells of work) held since leaving school;

NSU: number of spells of unemployment since leaving school;

NST: number of previous spells on training programmes;

NTS: number of previous spells on temporary employment schemes.

In all the analyses reported here we tested whether or not the coefficients for men and women were statistically significantly different. In most cases they were not. However, in modelling the probability of being on a training programme the male and female coefficients are quite different, as Tables 7.3A and 7.3B show.

Among both men and women, labour force history, as measured by the variables NSW, NSU, NST and NTS, has the effects one might have anticipated: those who have had more jobs are less likely to participate (though not significantly so among men); those who have had more spells of unemployment are more likely, while previous spells on training or temporary employment schemes reduce the likelihood. The likelihood of participation declines the longer an individual has been in the labour force, reflecting the fact that the inflow to these programmes occurs relatively early in young people's career. The positive coefficient for the effect of previous duration of unemployment reflects the fact that, by and large, young people enter training because they are finding it difficult to get a job. The major difference between men and women lies in the effect of educational qualifications. Among men there is no relationship between education and participation, controlling for other variables in the model. Among women there is a positive relationship: the higher the level of qualification the more likely is participation. The stronger relationship between participation and qualifications among girls than among boys was something which we referred to in our analysis in Chapter 4.

A similar picture emerges from Tables 7.4A and 7.4B which relate to the probability of being on a temporary employment scheme. What is also noteworthy here is that the likelihood of participating declines (rather than increases) the longer a woman has been unemployed (though the coefficient falls marginally short of statistical significance) whereas it does not among men. The kinds of schemes entered by men and women are

probably rather different: women most probably entered the Work Experience Programme (WEP), while men are more likely to have been found in either WEP or Teamwork or its forbears. It was generally accepted that entry to WEP took place relatively soon after leaving school: indeed it was to prevent this that a rule refusing entry to WEP for anyone who had been out of school for less than six months was instituted during the mid-1980s (see Breen, 1988).

Table 7.4A: *Log-Odds of Participating in Temporary Employment Schemes at Sampling Date: Men*

	Log-Likelihood		-170.00
	Restricted (Slopes=0) Log-L		-211.84
	Chi-Squared		83.666
	Degrees of Freedom		8
	Significance Level		0.32173E-13
<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>T-ratio (Sig.Lvl)</i>
ONE	-1.65998	0.4234	-3.921 (0.00009)
GIC	0.139050	0.4088	0.340 (0.73375)
LC	0.615892	0.4216	1.461 (0.14402)
PREDUR	0.326971E-01	0.2658E-01	1.230 (0.21857)
MILF	-0.781066E-01	0.2194E-01	-3.560 (0.00037)
NSW	-1.31301	0.3945	-3.329 (0.00087)
NSU	1.88524	0.2722	6.926 (0.00000)
NST	-0.683569	0.3743	-1.826 (0.06783)
NTS	-0.846969	0.3530	-2.399 (0.01643)

Table 7.4B: *Log-Odds of Participating in Temporary Employment Schemes at Sampling Date: Women*

	Log-Likelihood		-160.60
	Restricted (Slopes=0) Log-L		-231.88
	Chi-Squared		142.57
	Degrees of Freedom		8
	Significance Level		0.32173E-13
<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>T-ratio (Sig.Lvl)</i>
ONE	-2.10238	0.7847	-2.679 (0.00738)
GIC	1.62964	0.7806	2.088 (0.03682)
LC	2.50084	0.7600	3.291 (0.00100)
PREDUR	-0.873574E-01	0.4495E-01	-1.944 (0.05195)
MILF	-0.699554E-01	0.2321E-01	-3.014 (0.00258)
NSW	-1.58345	0.3606	-4.391 (0.00001)
NSU	1.55940	0.2832	5.507 (0.00000)
NST	-1.11198	0.4972	-2.236 (0.02532)
NTS	-1.09045	0.5833	-1.870 (0.06155)

7.7 Effectiveness of Programmes

In analysing the effectiveness of programmes we use five explanatory variables in addition to those used in the analysis of participation. These are:

SEX: a dummy variable; 1 for women; 0 for men;

PEDTR: a dummy variable; 1 if the state prior to training was full time education; 0 otherwise;

PNIL; a dummy variable; 1 if the state prior to training was not in the labour force; 0 otherwise;

TRAINING; a dummy variable; 1 if the individual participated in a training programme; 0 otherwise (i.e., if the individual is in the comparison group);

SCHEME; a dummy variable; 1 if the individual participated in a temporary employment scheme; 0 otherwise (i.e., if the individual is in the comparison group).

7.7.1 Short-Term Effects

Table 7.5 shows the observed percentages in jobs among the training and temporary employment groups and their comparison groups. This relates to the short term effectiveness of the programmes, hence, as explained above, the measure relates to the percentage of participants in jobs immediately after participation and the percentage of the comparison group in jobs within the same time period.

Table 7.5: *Short Term Effects of Training and Temporary Employment: Percentages in Jobs*

<i>Training</i>		<i>Temporary Employment</i>	
<i>Participant</i>	<i>Comparison</i>	<i>Participant</i>	<i>Comparison</i>
28	11	37	10.5

Clearly, participants were more likely to get jobs immediately after participating than were non-participants in the same time period. However, these figures take no account of the observed differences between participants and the comparison group members. Table 7.6 contains the results of a logit regression analysis of the probability of being in a job after training or within the same length of time among the comparison group, as a function of the set of independent variables discussed earlier, plus the dummy variable TRAINING which distinguishes

the participant from the comparison group.¹⁹ The fact that this variable has a significant positive coefficient shows that participation does confer advantages in finding a job, at least in the short term, even controlling for observed relevant differences between programme participants and unemployed non-participants.

Table 7.6: *Log-Odds of Being in a Job Immediately Following Participation in Training Programme or Within Same Time Period*

	Log-Likelihood		-565.00
	Restricted (Slopes=0) Log-L		-617.70
	Chi-Squared		105.40
	Degrees of Freedom		12
	Significance Level		0.32173E-13
<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>T-ratio (Sig.Lvl)</i>
ONE	-1.77899	0.3679	-4.835 (0.00000)
GIC	0.311290	0.2714	1.147 (0.25143)
LC	0.520999	0.2698	1.931 (0.05348)
SEX	0.454476	0.1627	2.794 (0.00520)
PREDUR	-0.521052E-01	0.1522E-01	-3.424 (0.00062)
MILF	-0.123177E-01	0.9915E-02	-1.242 (0.21412)
NSW	0.146435	0.1331	1.100 (0.27132)
NSU	-0.138021	0.1224	-1.128 (0.25948)
NST	0.225128E-01	0.1887	0.119 (0.90501)
NTS	0.240040	0.1897	1.265 (0.20573)
PEDTR	-0.395750	0.2389	-1.657 (0.09758)
PNIL	-0.598047	0.2704	-2.212 (0.02699)
TRAINING	1.21902	0.2482	4.912 (0.00000)

Table 7.7 shows the same thing in respect of temporary employment schemes: here the variable SCHEME distinguishes participants from the comparison group. Again, this variable has a positive and significant effect, suggesting that participation in temporary employment schemes also confers short-term advantages in finding a job.

In passing we note that the effects of the other variables are as we might have expected. Those most likely to get a job following either participation or unemployment are those who have the highest levels of educational qualifications and who have been unemployed for the shortest time. Young

19. This is equivalent to assuming that the effect of training or temporary employment on the log-odds of having a job are constant across all levels of the other explanatory variables. We carried out analyses comparable to those shown in Tables 7.6 and 7.8 in which we allowed the effects of training and temporary employment to vary according to the level of the other variables – e.g., according to educational qualifications, duration of unemployment, and so on. However we found no evidence that the effects varied significantly in this manner.

people appear to have a better chance of getting a job early in their career rather than later. Once we take account of these effects, then the variables measuring the number of previous jobs, spells of unemployment, training and temporary employment programmes, have no effect on the likelihood of getting a job. It is interesting to note that those who enter programmes from outside the labour market (from full-time education or elsewhere) tend to do relatively poorly in finding a job, and that girls appear more likely to get jobs than boys.

Given that participation has positive effects, how large is this effect? Since the coefficients in Tables 7.6 and 7.7 relate to a logit analysis, the partial effect of a variable on the probability of getting a job is not linear: it depends on the values of all the other variables in the model. However, if we take the average member of our joint training participation and comparison group sample, we estimate that participating in training increases his or her chances of finding a job in the short term by 16.5 percentage points. Carrying out the same calculation for temporary employment schemes we arrive at a figure of 22.8 percentage points.

Table 7.7: *Log-Odds of Being in a Job Immediately Following Participation in Temporary Employment Programme or Within Same Time Period*

	Log-Likelihood		-350.39
	Restricted (Slopes=0) Log-L		-437.12
	Chi-Squared		173.46
	Degrees of Freedom		12
	Significance Level		0.32173E-13
<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>T-ratio (Sig.Lvl)</i>
ONE	-1.63903	0.4669	-3.510 (0.00045)
GIC	0.496743	0.3544	1.402 (0.16101)
LC	0.702099	0.3537	1.985 (0.04716)
SEX	0.582747	0.2031	2.870 (0.00411)
PREDUR	-0.548159E-01	0.2275E-01	-2.409 (0.01598)
MILF	-0.356013E-01	0.1289E-01	-2.762 (0.00574)
NSW	-0.721980E-01	0.1969	-0.367 (0.71388)
NSU	0.193619	0.1679	1.153 (0.24895)
NST	-0.257014	0.2890	-0.889 (0.37385)
NTS	-0.708463E-01	0.2711	-0.261 (0.79381)
PEDTR	-0.508802	0.2978	-1.709 (0.08753)
PNIL	-0.758435	0.3166	-2.395 (0.01660)
SCHEME	1.66267	0.2419	6.873 (0.00000)

7.7.2 Long Term Effects

Table 7.8 shows the observed percentages in jobs among the training and temporary employment groups and their comparison groups one year after the sampling date. This relates to the long-term effectiveness of the programmes.

Table 7.8: *Long-Term Effects of Training and Temporary Employment: Percentages in Jobs*

	<i>Training</i>		<i>Temporary Employment</i>
<i>Participant</i>	<i>Comparison</i>	<i>Participant</i>	<i>Comparison</i>
48	31	45	31

Again, there are clear differences between the participant and comparison groups, though these are less than those shown in Table 7.5. This result is what we might perhaps have expected. It is not unreasonable to suppose that, if we observed a sample of unemployed people over a long enough period virtually all of them would eventually get jobs. Hence if participation in training or temporary employment schemes improves individuals' chances of getting a job we might expect this effect eventually to "wash out" with the passing of time.

In Table 7.9 we analyse the probability of having a job after one year using the logit regression framework. In this case we can include participants in both types of programme in the one analysis because the dependent variable is defined in the same way for the comparison group in both cases²⁰. Here we note that, controlling for all relevant differences between participant and comparison groups, the variable SCHEME is still strongly significant, whereas the variable TRAINING, while positive, is not significant. The coefficients of the other variables are as we might have anticipated: jobs are more likely to be found by those with better qualifications and shorter prior spells of unemployment. For the average member of our combined sample, participating in a temporary employment scheme improves his or her probability of having a job one year later by 26 percentage points.

At this point, then, our provisional conclusions are that both training and temporary employment programmes confer a positive short term benefit in improving the chances of getting a job, but, while this relative improvement persists for at least a year among those who were in temporary employment, it disappears within this period among those who were in training.

20. Whereas in the analysis of short-term effects the definition of the dependent variable for each comparison group depended upon the mean number of months of remaining participation among the relevant participation group.

Table 7.9: Log-Odds of Being in a Job One Year After Participation in Training or Temporary Employment Programme or Within Same Time Period

Variable	Coefficient	Std. Error	T-ratio (Sig. Lvl)
Log-Likelihood			-1005.2
Restricted (Slopes=0) Log-L			-1087.8
Chi-Squared			165.24
Degrees of Freedom			13
Significance Level			0.32173E-13
Variable	Coefficient	Std. Error	T-ratio (Sig. Lvl)
ONE	-1.07345	0.2579	-4.163 (0.00003)
GIC	0.655708	0.1810	3.622 (0.00029)
LC	0.942292	0.1840	5.121 (0.00000)
SEX	0.183555	0.1109	1.655 (0.09791)
PREDUR	-0.238621E-01	0.1053E-01	-2.267 (0.02340)
MILF	-0.173311E-01	0.8398E-02	-2.064 (0.03905)
NSW	0.124074	0.1064	1.166 (0.24348)
NSU	-0.547486E-01	0.9574E-01	-0.572 (0.56744)
NST	0.292096E-01	0.1389	0.210 (0.83340)
NTS	0.133654	0.1442	0.927 (0.35413)
PEDTR	-0.276460E-01	0.1693	-0.163 (0.87027)
PNIL	0.954407E-01	0.1799	0.531 (0.59566)
TRAINING	0.288366	0.2211	1.304 (0.19215)
SCHEME	1.09093	0.1746	6.249 (0.00000)

7.8 Omitted Variables and Selection Bias

We turn now to the second problem we identified in studies of this kind: are there omitted variables which, had we been able to include them, would have altered our conclusions concerning effectiveness? We applied a number of tests for such omitted variables: all gave the same result. Here we report the results of the simplest such test.

Consider the general case where we have two equations: the first of these is a selection equation:

$$y1 = \sum_i a_i z_i + u1 \quad (1)$$

and the second is termed the substantive equation:

$$y2 = \sum_j b_j x_j + c y1 + u2 \quad (2)$$

Note that the LHS variable from Equation (1) is on the RHS of Equation (2). In Equation (2) the x_j variables are assumed to include all the z_i variables. Equation (1) might model access to training, for example, with Equation (2) modelling some effect of training, with the variable $y1$ distinguishing between those who received training ($y1=1$) and those who

did not ($y_1=0$). The coefficient c will only be an unbiased estimate of the effect of participation on y_2 if there do not exist variables w_k omitted from both (1) and (2) which influence both y_1 (the likelihood of participation) and y_2 (the outcome). How do we test whether or not such variables exist? The simplest way to do this is to estimate Equations (1) and (2) and examine the correlation between the residuals. Doing this we find that, for both the training and temporary employment programmes, there is indeed a non-zero correlation between the residuals from the selection and substantive equations. In such cases the most straightforward approach to overcoming this problem of correlated residuals is to use instrumental variables on the substantive equation. In this case the instrument we use is the fitted values from the selection equation. This is because it is highly correlated with the variable y_1 but is uncorrelated with the residuals from Equation (1).

We estimate Equation (2) using two stage least squares.²¹ We can then compare the coefficients with those that arise if we estimate (2) via ordinary least squares – i.e., a linear probability model that does not correct for the correlated errors. The results are shown in Table 7.10, in respect of both the short-term and long-term effects of training and temporary employment schemes. There we see that the OLS (linear probability) model returns a slightly higher measure of the effectiveness of programmes than does the logit evaluated at the means. Our concern here, however, is whether the two stage least squares estimates are significantly different from the OLS estimates. In the case of the effects of training the OLS and two stage least squares estimates are virtually identical. In the analysis of the short-term effects of temporary employment schemes the instrumental variables technique substantially increases the estimated effect of temporary employment programmes.²² We can conclude, then, that omitted variables do not seem to be biasing our estimates of employment programme short-term effectiveness

21. Ideally we should want to estimate our instrumental variables correction to Equation (2) via a logit or probit equation. This would necessitate estimating the model using nonlinear two stage least squares. Here we report the results of a simpler strategy.

22. If we use the original Heckman (1979) inverse Mills ratio measure to correct Equation (2) we arrive at exactly the same conclusion. In all cases except the short-term effect of temporary employment schemes the inclusion of the extra (inverse Mills ratio) variable into Equation (2) caused the coefficient for programme effectiveness to change from its OLS value in almost the identical manner as we saw in the use of 2SLS. Using the Heckman approach the coefficients and their standard errors are 0.25 (.095) for short-term training, which is, again, statistically significant and slightly greater than the OLS estimate; 0.035 (.138) for long-term training, which is not significantly greater than zero; 0.78 (.098) for short-term temporary employment (this coefficient is once again much greater than the OLS value); and 0.180 (.143) for long-term temporary employment, which, although greater than the 2SLS estimate, is not significantly greater than zero.

Table 7.10: *Effects of Possible Omitted Variables on Coefficient Estimates (standard errors in parentheses)*

	<i>Training</i>		<i>Temporary Employment</i>	
	<i>OLS</i>	<i>2SLS</i>	<i>OLS</i>	<i>2SLS</i>
Coefficient for effect of training or temporary employment schemes				
short-term effect	0.198 (.034)	0.234 (.162)	0.301 (.032)	0.864 (.138)
long-term effect	0.067 (.050)	0.062 (.167)	0.250 (.050)	0.102 (.095)

downward. However, the high degree of sensitivity of the parameter is a little worrying. Most puzzling is the fact that, if we correct for omitted variables in this case, we arrive at an estimate of the short-term effectiveness of temporary employment schemes which is implausibly large – larger, indeed, than the raw placement rate for schemes of this type. In other words, even if participants' prior probability of getting a job were zero, an effect of participation of this magnitude would far exceed the observed placement rate.

Some of these difficulties may arise because the set of programmes characterised as temporary employment schemes is rather diverse. It is made up primarily of two types of temporary employment: one where the young person is placed in a firm or business (as was the case with the Work Experience Programme); the other where the young person is placed in a voluntary or community organisation (as with Teamwork). Clearly, the chances of getting a job are greater for the first type of placement than the second. Data from WEP (see Breen, 1988) clearly show that the overwhelming majority of those who obtained jobs on completion of the programme were in fact "retained" by the employer with whom they had been placed on WEP. As a result of these important differences in what constitutes a temporary employment programme it seems likely that any more reliable measure of their effectiveness would have to be undertaken using data which allowed us to identify more accurately the particular type of programme.

Turning to the coefficients for the long-term effect of temporary employment programmes, the two stage least squares estimate is less than half that of the OLS coefficient and is not statistically significant. This suggests that unmeasured variables are influencing both the likelihood of

entering such a scheme and the probability of having a job one year after the sampling date. Thus, the positive effect of temporary employment programmes is not robust to tests for omitted variable bias. This may well be due to the fact that many temporary employment schemes (notably WEP) involved placements on employers' premises. There has always been a suspicion of high levels of deadweight in WEP in the sense that employers may well have been using the scheme to fill a vacancy which they were, in any case, intending to fill and were recruiting, for this purpose, young people who would, in any case, have been very likely to get a job. As a result, while a scheme like WEP may have helped young people to get jobs more quickly than they otherwise would (and hence would show a positive short-term effect) we should not expect it to have a longer-term effect. That we find no such longer-term effect supports the results of previous research into the programme (Breen, 1988).

7.9 Conclusion

This chapter has dealt with some of the issues involved in estimating the effectiveness of training and other labour market programmes. The evaluation issues raised, however, extend to any non-experimental evaluation (i.e., which does not use random assignment): thus they are of potentially very wide applicability.

Finally, Table 7.11 compares four measures of the effectiveness of training and temporary employment programmes using our data. These measures range from the very simple – placement rates – through simple comparisons of participants and non-participants, to comparisons which take account of observed and unobserved differences between the two groups. Note that in the case of temporary employment schemes we are able only to suggest a range in which their short-term effectiveness lies. The lower figure is obtained from our logit estimates, as described in the text, while the higher figure is the upper bound to effectiveness set by the raw placement rate.

It will not always be the case, as it is here, that the measures proposed in this chapter will yield lower effectiveness measures than do placement rates. For example, a policy of targeting interventions at those who have the poorest labour market position will almost inevitably depress placement rates. On the other hand, it ought not to reduce the measured effectiveness of the scheme if we measure effectiveness in the way we have described. If evaluations could be carried out of individual programmes, then we might well find that some of those with low placement rates – such as Travellers' Workshops – actually had a high effectiveness measure, because the individuals for whom they cater have such very low prior

probabilities of finding a job. Viewed from a broader perspective, the need to evaluate manpower programmes in the way we have outlined is important in any cross-national comparisons. A comparison of Irish placement rates with those of similar programmes in, say, Germany, would almost certainly show higher placement rates in the latter, regardless of the actual worth of the programmes themselves. A measure which took account of the pre-participation differences in the chances of participants getting a job would obviously be a fairer basis on which to draw comparisons.

Our substantive findings are a positive short-term effect of both training and temporary employment schemes, but significant long-term effects for neither.

Table 7.11: *Percentage Measures of Effectiveness*

	<i>Short-Term</i>		<i>Long-Term</i>	
	<i>Training</i>	<i>TempEmp</i>	<i>Training</i>	<i>TempEmp</i>
1. Placement Rate	28	37	48	45
2. Difference between Participant and Comparison Groups	17	26.5	17	13.2
3. Difference between Participant and Comparison Groups controlling for observed differences	16.5	22.8 - 37	7*	25
4. Difference between Participant and Comparison Groups controlling for unobserved differences	16.5	22.8 - 37	7*	10*

* not significantly different from zero at 5% level.

Chapter 8

SUMMARY AND CONCLUSIONS

8.1 Introduction

This chapter summarises the results obtained in this research and discusses some issues arising from them.

8.2 Summary of Findings

Our central aim has been to examine patterns of employment and unemployment among a cohort of school leavers followed over a period of 5¹/₂ years after leaving school. Our initial finding is that not only did educational qualifications exercise an effect on unemployment rates 5¹/₂ years after leaving school, but differences in unemployment rates among those with different levels of academic qualification (and, among girls, differences in labour force participation rates) widened over this five and a half year period. Thus the unqualified fall further behind the rest over time.

In Chapters 4, 5 and 6 we sought to discover how this state of affairs comes about. At its simplest, the unemployment rate of any group in the labour force is determined by two flows – from a job into unemployment and from unemployment into a job²³. A higher than average rate of movement in the former direction and/or a lower than average rate of movement in the latter direction will cause a specific group to have a higher than average rate of unemployment. In Chapter 4 we found that there were statistically significant differences in both these rates of flow according to educational qualifications. The lower the level of qualifications the less likely was an individual to move from unemployment into a job and the more likely he or she was to move from work into unemployment.

In Chapters 5 and 6 we tried to develop a model of the process by which individuals in our sample moved between states. Our findings suggest that the movement out of work into unemployment is linked to the type of job

23. These are the major flows. We ignore, for the moment, movement between training/temporary employment and unemployment or work and also between these latter states and non-participation in the labour force.

held by the individual and also to individual characteristics. Higher rates of job loss occur from occupations that would not generally offer what we might call stable, high quality jobs. We identified these with manual jobs (especially unskilled and semi-skilled) and routine non-manual occupations, such as personal services. In addition, individuals with poor employment records (for example, having had many previous spells of unemployment) also seem to be more prone to job loss. Movement from unemployment into a job seems to depend on two sets of factors which employers use to select workers. The first of these is educational qualifications, the second is the individual's labour force record, where the duration of current unemployment is important in reducing the chances of getting a job.

Taken together these findings suggest the following process by which the labour market gap between those with different levels of qualifications widens over time. Initially, given that employers use qualifications to select workers, early school leavers are at a disadvantage: thus, on average, they spend longer in the search for a first job and, when they do secure a first job, they are likely to end up with jobs which are of poor quality.²⁴ Our results indicate that such jobs are likely to be short-lived, and hence the unqualified young person becomes unemployed. Such prolonged first job search and/or a period of unemployment following quite quickly (in relative terms) after first job acquisition, establishes a labour force record which reinforces the effect of poor qualifications when these young people come to search for another job. This is then further reinforced by the fact that the longer young people are unemployed the poorer their chances of getting a job. Thus a vicious cycle becomes established: because they have no qualifications and a poor employment record they are unable to get a stable job - which further worsens their employment record, and so on. Another way of expressing this is to see it as a positive feedback or reinforcing process. Possibly the finding that best summarises this process is contained in Table 6.4. Individuals are more likely to lose their job and enter unemployment (all other things being equal) if they come into this job from unemployment than if they come into it from another job.

The position of such young people is worsened (relative to those with qualifications) not because the magnitude of the effect of variables like educational qualifications and labour force history measures change over time, but because the individuals' labour force histories themselves become poorer (in the sense of making them less attractive to employers).

24. Alternatively it may be that young people who lack qualifications leave school partly because they are disillusioned with the educational system and partly because a job is offered to them. However, for the most part such jobs are unlikely to be stable or to offer good career prospects.

However, this dynamic process does appear to settle fairly quickly into a steady state, in so far as educational qualification differentials are concerned. Our data in Chapter 3 (notably Table 3.4 and Figures 3.1, 3.2 and 3.3) reveal that differences in unemployment rates and in the time spent in a job widen for 2 to 2¹/₂ years but then remain constant. We do not know how long these relativities persist unchanged, but our data tell us that they hold for at least a further 2 years.

Given the dynamic process outlined here, the question naturally arises: can this positive feedback link be broken via post-school interventions in the form of training and temporary employment schemes? This leads us on to the second main aim of this study, which was to provide a framework in which we could answer the question: how effective are such labour market programmes?

8.3 Training and Temporary Employment Programmes

To date measures of effectiveness which have been applied to such programmes have been inadequate, notably because they fail to take account of the counterfactual: how would participants have fared in the labour market even if they had not participated? In Chapter 7 we outlined a means of taking account of this in developing measures of effectiveness, and we measured effectiveness in terms of the degree to which participation improved both the short-term and long-term chances of participants' acquiring a job, though the approach would be the same regardless of the measure of effectiveness used.

Chapter 7 also contains the results of this analysis, though evidence of other effects of training and temporary employment is found in Chapters 5 and 6. We found that participation in a training programme added between 16 and 20 points (depending on whether we used a logit or a linear probability specification in our model) to the probability of getting a job at the time of completion of the programme. Participation in a temporary employment scheme added between 23 and 37 points. Here the large margin of uncertainty is due to the instability of the relevant coefficient when we correct for unobserved factors. More robust results might be obtained in subsequent analyses which distinguished between temporary employment schemes that involve placement in an employer's premises and those which provide work in non-commercial contexts. In the longer term neither training nor temporary employment schemes were found to have a significant impact on the probability of being in a job one year after finishing the programme.

These results are evidence that such labour market programmes are partially effective. We were unable to carry out disaggregated analyses on

separate programmes of training or separate temporary employment schemes, but we should expect to find considerable variation in the effectiveness across schemes and programmes. Clearly, since this study is the first to attempt to measure the impact of training and temporary employment *taking account of the likelihood that some participants would have got jobs even without participation*, then our results constitute a basis for suggesting that the evaluation of the effects of training should become a central issue.

Methodologically, we contrasted this approach with the use of placement rates as a measure of effectiveness. In the analyses in Chapter 7 we found that our measures suggested a lower level of effectiveness than would placement rates. However, this will not always be the case. For example, a policy of targeting interventions at those who have the poorest labour market position will almost inevitably depress placement rates. On the other hand, it ought not to reduce the measured effectiveness of the scheme if we measure effectiveness in the way we have described. If evaluations could be carried out of individual programmes, then we might well find that some of those with low placement rates - such as Travellers' Workshops - actually had a high effectiveness measure, because the individuals for whom they cater have such very low prior probabilities of finding a job. Viewed from a broader perspective, the need to evaluate manpower programmes in the way we have outlined is important in any cross-national comparisons. A comparison of Irish placement rates with those of similar programmes in, say, Germany, would almost certainly show higher placement rates in the latter, regardless of the actual worth of the programmes themselves. A measure which took account of the pre-participation differences in the chances of participants getting a job would obviously be a fairer basis on which to draw comparisons.

Chapters 5 and 6 also contained information relating to training and employment schemes. In Chapter 5 we saw some indication that young people who were unemployed and who had participated in a temporary employment scheme could expect to spend a shorter time in unemployment than those who had not participated (though this effect was not statistically significant). Having participated in training programmes at an earlier date was found significantly to reduce the time spent unemployed. However, this result was somewhat offset by the finding in Chapter 6 that those young people who entered a job directly following participation in training were just as likely to lose it again as those who had entered directly from unemployment (who, in turn, are more likely to lose such a job than are young people who entered directly from another job). This finding supports our result (in Chapter 7) of no significant long-term effect of training on the chances of being in work. It also raises questions

pertaining to other measures of the effectiveness of training, such as whether or not participation helps people get jobs which are more skilled or more stable than those they would otherwise have entered.

Our analyses in this study also allow us to say something about the issue of who participates in labour market programmes. The experiences of this cohort of school leavers suggest that many of those who appear to most need some form of positive intervention in the labour market are unlikely to get it. Our results in Chapters 3 and 4 point to unqualified female school leavers as being one notable such group. Findings of this kind have recurred in studies of training and temporary employment provision during the 1980s (e.g., NESC, 1985; Breen, 1984 among others).

It would be unfair to suggest that the training agencies are indifferent to the issue of who gets training. A number of initiatives, of which the *Social Guarantee* is perhaps the most far reaching, have been introduced to try to ensure that those who most need such assistance receive it. Currently the Outreach scheme is the main mechanism by which programmes are made available to poorly qualified young people (see O'Connell and Stokes, 1989). Evidence from recent *School Leaver Surveys* shows that, within the period of one year after leaving school, participation rates in training among the unqualified have been rising while rates among the qualified have been falling.

An alternative - or, in some circumstances, complementary - approach would entail addressing the problems of early and/or unqualified school leavers before they leave school. As Damian Hannan (1986, p.45) has pointed out:

While we have got very worried about these young people when they reach 15 or 16, we have continued to ignore the genesis of the problem as it arises at ages 4 to 8 or 9 to 14. It would in fact be cheaper, and is likely to be more effective in the long run, to intervene at an earlier age.

Not least among the merits of such an approach is that some of the difficulties of participation referred to above are overcome. Essential in such an innovation in educational policy would be intervention at an early age, built around the development of stronger links between school, home and the community. Remedial provision, curricular reform and so on, if introduced at the post-primary level only would, while obviously helpful, be insufficient.

Post-school interventions should not, we believe, be the preferred method of dealing with youth labour market disadvantage. If they were to

play this role, the obvious question that one would have to ask would be "what have such young people gained from their formal education?" One suspects that the answer, for many of them, would be "almost nothing". This in itself is a waste not alone of resources, but also of a large proportion of a young person's life. A policy which allots to post-school interventions the responsibility for fitting a large number of young people into the mainstream labour market implicitly devalues the role of the educational system. Such a policy contains many paradoxes - not least, for example, the fact that in the early 1980s remedial teachers ceased to be automatically ex-quota and post-primary schools have experienced the greatest difficulty in getting Department of Education sanction for ex-quota remedial teachers. Yet at the same time, one of the major strands of the Social Guarantee/Youthreach programme is the provision of precisely the skills and competencies that remedial education would seek to instill.

We are not suggesting that post-school training and temporary employment schemes do not have a role to play. What we are suggesting, however, is that more attention ought to be given to prevention of the problem that such schemes are meant to address. The roots of early school leaving lie not alone in the educational system but in the pre-school environment and in the complex set of relationships between families, communities and schools. If a serious attempt is to be made to address the problems of unqualified school leavers in the labour market it is in these areas that policies must be pursued (see, for example, Breen, 1990; O'Brien, 1990).

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APPENDIX: HAZARD RATE AND EVENT HISTORY MODELS IN THE STUDY OF LABOUR MARKET DATA

A. 1 *Introduction*

One of the central issues in research focused on the transition of young people from education into the labour market has been the question of how educational qualifications are related to labour market experiences. The simplest means of investigating this has been to relate the labour market status of the members of the sample at one point in time (say one year after leaving school) to the educational qualifications possessed by them. Such research has shown a strong link between the rate of unemployment and the level of educational qualifications possessed by young job seekers. One unfortunate consequence of such a research strategy, however, will be to understate the magnitude of the relationship between educational qualifications and labour market status if any or all of the following hold: those with higher qualifications (a) find first jobs more quickly than those who lack such qualifications; (b) hold onto jobs longer than those who lack such qualifications; or (c) have shorter durations of unemployment between jobs than those who lack such qualifications. To clarify this, consider the first case: if school leavers with the Leaving Certificate all get jobs within 3 months of leaving school and those with the Inter. Cert. all get jobs within 9 months of leaving school, then an analysis of the labour force status/level of education relationship at a point one year after leaving school will show no apparent difference in the fortunes of those with the Leaving and those with the Inter, whereas, in fact, such a link does exist. This tends to suggest that an approach should be based on an analysis of the length of time school leavers spend in searching for their first job. At first sight this might appear to be a relatively straightforward exercise: given that we know when each of our sample members left education and when he or she got a first job, we could regress the length of time spent looking for a first job on level of education and other explanatory variables. Unfortunately, difficulties are likely to arise in so far as, at the time we gather our data some members of our sample may still be seeking their first job. In addition, some of our job seekers might have given up the search at some point before this and withdrawn from the labour force. Such cases, where the transition in question (in this case from seeking a first job into a first job) does not take place during the

period in which the sample is observed, are said to be “censored”. For such cases we lack any measure of the time between leaving school and acquiring a first job because they never, to our knowledge, acquired a first job. In a regression analysis we could either exclude such cases or set their duration measure according to the date of censoring. But in either case this will seriously bias our coefficient estimates. To overcome such problems social scientists have increasingly turned to models for the analysis of duration data which were developed in engineering and the biomedical sciences: these are usually called hazard rate or survivorship models.

The basic hazard rate model focuses on the length of time an individual spends in one particular state before making a transition to a different state. However, to return to the youth labour market, it is clear that to focus on one transition, as we have been doing (from first job seeking to first job) is going to be inadequate in at least two senses. First, no one would argue that the education/labour market relationship can be wholly captured by examining this one transition only: theories of the transition from education to the labour market also suggest that, for example, the frequency of job changing ought to be related to educational qualifications as should the likelihood of job loss and unemployment and also the likely duration of such spells of unemployment. Second, the two-state model is too simple: while most young people will move between the statuses of “At Work” and “Unemployed” (in which we include seeking a first job), many others will enter other states: some will withdraw from the labour market into what are termed “Home Duties” while others will enter state training or work experience programmes; still others might return to full-time education. It seems reasonable to suggest that an important component of the labour force status/education relationship may be located in the analysis of such transitions. Furthermore, the analysis of certain transitions – such as those out of state training programmes – will be important for policy purposes.

In other words, a proper study of the relationship between education and the position of young people in the labour market ought to focus on a complex set of transitions between numerous labour force statuses, included in which will be transitions into states (such as unemployment) that individuals may have entered and left previously. The requisite data are becoming increasingly available as we collect more longitudinal/retrospective material.

The obvious danger is that such complex data will be an embarrassment of riches: how do we analyse it so as to acquire reasonably parsimonious measures of the relationship between education and labour market

position? One approach is what is termed, in sociology, an "event history analysis" but which is nothing more than the simple hazard rate model extended to incorporate multiple states and repeated events. In Section A. 2 of this appendix we describe the hazard rate model and how it generalises to event history analysis.

A. 2 *Non-parametric Estimation of Hazard Rates*

Suppose that we observe a sample of N people, all of whom become unemployed at time $T = 0$. Our interest is in examining the length of time in which they remain unemployed before getting a job. We can calculate a set of hazard rates, λ_t , corresponding to each point in time at which at least one person gets a job. In practice, of course, these points in time are likely to be intervals of time – a day, for example, or a week. At each point in time, t , a certain number, n_t , of our original sample will still be unemployed and still in our sample. Conversely, $N - n_t$ will either have got jobs prior to t or will have been censored prior to t (e.g., by dropping out of the study). An estimate of the hazard rate for time t is the number who get jobs at $t(=j_t)$ divided by the number who had not got jobs or been censored prior to t . That is:

$$\lambda_{t=j_t} = \frac{\text{number of "failures" at } t}{n_t} \quad (\text{A1})$$

Note, however, that

$$\lambda_{t+1} = \frac{j_{t+1}}{n_t - j_t - c_{t+1}}$$

where c_t is the number of observations censored in the interval $[t-1, t)$.

This estimate of λ_t then gives rise to the Kaplan-Meier estimate of the survivor function (which is the proportion remaining unemployed at t) as

$$S_t = \prod_{t=1}^t (1 - \lambda_t) \quad (\text{A2})$$

S_t tells us, in effect, the probability of surviving in unemployment to t . A simple example is shown in Table A1.

A. 3 *Parametric Estimation of Hazard Rates*

If we assume that the time spent in unemployment has a known

parametric distribution, then we can write the hazard rate as a function of this distribution. The cumulative distribution function will be the probability that an unemployed person gets a job before t :

$$F(t) = \text{prob} (T < t)$$

where T is a random variable with known distribution. Obviously the survivor function is simply:

$$1-F(t) = \text{prob} (T > t) = S(t) \quad (\text{A3})$$

The density function is

$$f(t) = dF(t)/dt$$

and the hazard rate is defined as the ratio of the density to the survivor function:

$$\lambda(t) = f(t)/S(t). \quad (\text{A4})$$

Table A.1: *Hypothetical Data for Non Parametric Hazard and Kaplan Meier Survivorship Function*

Total Sample: 100					
	c_t	n_t	j_t	λ_t	S_t
Day					
1	0	100	20	.20	.800
2	5	75	12	.16	.672
6	4	59	10	.17	.558
7	8	41	8	.20	.449
15	3	30	5	.17	.374

c_t : number censored in the interval $(t-1, t)$

n_t : number acquiring jobs at t

j_t : number surviving at t

λ_t : hazard at t

S_t : K - M survivor function

To see why (A4) holds consider the case where $f(t)$ and $S(t)$ are defined on discrete distributions. (A4) then expresses $\lambda(t)$ as the probability that an individual leaves unemployment at t (given by $f(t)$) conditional on having survived to t . In a continuous distribution $\lambda(t)$ is the limit of this probability as the time interval, t , approaches 0:

$$\lambda(t) = \lim_{\delta \rightarrow 0} \text{prob} (t \leq T \leq t + \delta \mid T \geq t) / \delta$$

Thus unlike a probability, $\lambda(t)$ is confined to the interval $[0, \infty)$ rather than $[0, 1]$.

The most widely used distribution for t is the Weibull of which the Exponential distribution is a special case. We are going to concentrate on these two. Table A.2 shows the expressions for the density, distribution, survivor and other functions of these two.

Table A.2: *The Exponential and Weibull Distributions*

	<i>Exponential</i>	<i>Weibull</i>
$f(t)$	$\gamma \exp(-\gamma t)$	$\gamma a t^{a-1} \exp(-\gamma t^a)$
$F(t)$	$1 - \exp(-\gamma t)$	$1 - \exp(-\gamma t^a)$
$S(t)$	$\exp(-\gamma t)$	$\exp(-\gamma t^a)$
$\lambda(t)$	γ	$\gamma a t^{a-1}$
$\Lambda(t)$	γt	γt^a
$E(t)$	$1/\gamma$	$\Gamma(1+a^{-1}) \exp((-\ln \gamma) a^{-1})$

The Weibull is a two parameter distribution (γ, a) while the Exponential has only one, γ . It is clear from Table A.2 that the latter is a Weibull with $a = 1$.

The Exponential is widely used. It implies that the hazard rate is constant over time. In other words, the chance of an unemployed person getting a job is unaffected by how long he or she has been unemployed. Under the Weibull distribution the hazard varies with time according to the magnitude of a (which is always positive). For $a > 1$ we have an increasing hazard (or positive duration dependence). So, the longer someone is

unemployed, the greater the likelihood of getting a job. For a < 1 the hazard is decreasing (negative duration dependence) so that the longer someone is unemployed the smaller the likelihood of getting a job. This seems the most plausible of the three possible scenarios.

Many distributions commonly used in hazard rate studies (including the Weibull) give rise to a monotonic hazard over time. However, some distributions, such as the log-logistic, allow the rate to be non-monotonic.

Fitting a parametric distribution to survival data is usually done by maximum likelihood. Briefly this entails maximising a log-likelihood which has two parts: the density function values of completed (uncensored) durations and the survivor function values of the censored observations. We write the density of unemployment duration as a function of parameter(s) θ , $f(t, \theta)$, where θ is to be estimated (θ being γ in the exponential case, in the Weibull it is the two element vector γ, a). The log-likelihood, $L(\theta)$ is given by:

$$L(\theta) = \sum_{i=1}^n d_i \ln f(t_i, \theta) + \sum_{i=1}^n (1-d_i) \ln S(t_i, \theta) \quad (\text{A5})$$

where n is the number of observations and $d_i = 1$ if the observation is uncensored, 0 otherwise. (A5) can be simplified considerably as follows:

Define

$$\Lambda(t, \theta) = \int_0^t \lambda(u, \theta) du \quad (\text{A6})$$

Λ is known as the "integrated hazard" and its value for the Weibull and Exponential is shown in Table A.1. Suppressing θ temporarily we have:

$$\begin{aligned} \lambda(t) &= f(t)/S(t) \\ &= \frac{dF(t)}{dt} / S(t) \\ &= \frac{-dS(t)}{dt} / S(t) \\ &= \frac{-d \ln S(t)}{dt} \end{aligned} \quad (\text{A7})$$

Substituting (A7) into (A6)

$$\begin{aligned}\Lambda(t) &= \int_0^t \frac{-d \ln S(t)}{dt} dt \\ &= -\ln S(t)\end{aligned}\tag{A8}$$

Also from (A4) we can write

$$f(t) = \lambda(t)S(t)\tag{A9}$$

Substituting (A9) into the log-likelihood

$$L(\theta) = \sum d_i \ln \lambda(t_i, \theta) + \sum d_i \ln S(t_i, \theta) + \sum \ln S(t_i, \theta) - \sum d_i \ln S(t_i, \theta)$$

cancelling and using (A8):

$$L(\theta) = \sum d_i \ln \lambda(t_i, \theta) - \sum \Lambda(t_i, \theta)\tag{A10}$$

For the exponential this gives

$$L(\gamma) = \sum_i d_i \ln \gamma - \gamma \sum_i t_i$$

and for the Weibull:

$$L(\gamma, a) = \sum_i d_i \ln \gamma + \sum_i d_i \ln a + (a-1) \sum_i d_i \ln t_i - \gamma \sum_i t_i^a$$

(see Kiefer, 1988, pp. 662-3).

The Exponential yields a closed form solution for γ whereas the Weibull does not.

Finally, in this section, the estimated expected duration of unemployment can be obtained from the hazard model via the expressions on the last line of Table A.1. In the case of the Weibull, Γ denotes the gamma function, defined as:

$$\Gamma(x) = \int_0^{\infty} t^{x-1} e^{-t} dt$$

As is well known, for positive integers, x ,

$$\Gamma(x) = (x-1)!$$

so that where $a = 1$ the expression for the Weibull simplifies to that for the Exponential.

A.4 *Incorporating Explanatory Variables*

Suppose now that we want to account for the duration of unemployment in terms of a set of explanatory variables. For example, we might want to examine how characteristics of individuals (sex, age, qualifications and so on) influence the length of time they spend unemployed. Frequently economists have been concerned with the influence on this of the level of unemployment insurance received by individuals.

The most widely used method of incorporating explanatory variables is via the proportional hazards model. The basic idea here is that there exists an underlying or baseline hazard which is a function of time, and that the characteristics of individuals act to increase or decrease this hazard in a multiplicative fashion. This is convenient in so far as providing that the values of an individual's explanatory variables do not change over time (as they may well do: consider the likely changes in the amount of unemployment compensation received by an individual during a spell of unemployment) the coefficients can be given the usual partial derivative interpretation.

This model can be written:

$$\lambda(t, x) = h(t) \exp(\beta x)$$

where x is a vector of individual characteristics and $h(t)$ is the underlying hazard. The second term is in exponential form to ensure that it is positive. Suppose x contains only a dummy variable (0 = male; 1 = female): then the hazards are

$$\lambda(t, x = 0) = h(t) \text{ for males}$$

$$\lambda(t, x = 1) = h(t) \exp(\beta) \text{ for females.}$$

This elaboration can be coupled with both the parametric and non-parametric approaches outlined earlier. In the non-parametric approach no distributional form is specified for $h(t)$ which is defined only at points where an event occurs. This leads to Cox's proportional hazards model

(Cox, 1972) which can be regarded as an extension of the Kaplan Meier estimation to a regression framework. Cox's model is very widely used and leads to a method of estimation called partial likelihood. We do not deal with the model here (see, for example, Allison, 1984; McCullagh and Nelder, 1983; Tuma, 1982; Whitehead, 1980) except to note that in practice it can be extremely time consuming to estimate.

The parametric approach is very straightforward. Applying it to the cases of the Weibull and Exponential we set:

$$\gamma = \exp(\beta x)$$

and substitute accordingly in the log-likelihoods. The hazard rates are thus

$$a^{-1} \exp(\beta x)$$

for the Weibull, and

$$\exp(\beta x)$$

for the Exponential. The other quantities in Table A.2 can be rewritten similarly.

A. 5 *Competing Risks and Repeated Events*

The model described above can be elaborated in (at least) two ways. First, the model allows for repeated events. Our focus is not simply on the hazard rate of escaping from unemployment – rather we look at a series of transitions between states. Second, the number of states which an individual can occupy over a period of time is extended from two (unemployed/at work) to many. In other words, we examine the patterns of movements between a set of labour market states.

In order to analyse repeated events in the simple two state case (e.g., analysing transitions over time back and forth between unemployment and work) it is obviously necessary that neither state be what is termed “absorbing” – that is, in which the probability of escape is zero. Hazard rate models were developed in applications where one state is absorbing: for example, in studying the hazard rate for death (“the force of mortality” as it is sometimes called) in patients diagnosed as having a fatal disease or in estimating the expected length of life of mechanical equipment (such as light bulbs). In labour market data and other data used in the social sciences states are infrequently absorbing.

In analysing repeated events the assumption is usually made that conditional independence holds between the repeated events observed for the same individual. For example, this means that the duration of an individual's m^{th} spell of unemployment is independent of the duration of

all previous spells once we control for the explanatory variables in the model. In this case the log likelihood is extended from (A10) to:

$$L(\theta_m) = \sum_{m=1}^m \sum_{i=1}^n d_{mi} \ln \lambda (t_{mi}, \theta_m) - \sum_{i=1}^n \Lambda (t_{mi}, \theta_m) \quad (A11)$$

Here m is the number of times the event (e.g., leaving unemployment) is repeated and $d_{mi} = 1$ if the m^{th} event is uncensored, 0 if censored. We have allowed the parameters (θ) to vary depending on the transition but this is not necessary: indeed it is a sensible hypothesis to seek to test.

In the extension to competing risks we have, instead of two possible states, J states. These might be at work/unemployed/not in labour force. In order to estimate this kind of model it must be assumed that conditional independence holds between these states. This parallels the assumption that censoring is independent of the event in question in the simpler hazard rate case. However, it is rather harder to justify this assumption than the earlier one of independence of the same type of event through time. However, this assumption allows us to write the log-likelihood for competing risks as:

$$L(\theta_j) = \sum_{j=1}^J \sum_{i=1}^n d_{ji} \ln \lambda (t_{ji}, \theta_j) - \sum \Lambda (t_{ji}, \theta_j) \quad (A12)$$

This is very similar to (A11). Here we should almost certainly want θ to vary with j . Note too that d_{ji} is the dummy variable which takes the value 1 if the j^{th} event is observed. This means that in the likelihood for the j^{th} event, observations which have made a different transition are treated as censored.

It is straightforward to combine (A11) and (A12) into the log-likelihood for a competing risks, repeated events model. This kind of model is termed in sociology an event history model, and is particularly associated with the work of Tuma and Hannan (1984).

While we have developed this model via survival analysis, event history methods are often developed from Markov theory. Here the competing risk multiple event models are viewed as discrete state continuous time semi-Markov processes. The instantaneous transition probabilities of such processes are nothing more than origin and distribution specific hazard rates. For an economic application of this model see Burdett *et al.*, 1984.